

Compilation of Records of Surface Waters of the United States, October 1950 to September 1960

Part 5. Hudson Bay and Upper Mississippi River Basins

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GEOLOGICAL SURVEY WATER-SUPPLY PAPER 1728



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PREFACE

This report contains summaries of streamflow records in the Hudson Bay and upper Mississippi River basins. It was prepared by the United States Geological Survey in the Water Resources Division, L. B. Leopold, chief, under the general direction of E. L. Hendricks, chief, Surface Water Branch, and F. J. Flynn, chief, Reports Section.

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COMPILATION OF RECORDS OF SURFACE WATERS OF HUDSON BAY AND UPPER
MISSISSIPPI RIVER BASINS, 1951-60

PURPOSE AND SCOPE

This volume is one of a series of reports presenting monthly and yearly summaries of streamflow and reservoir data collected by the Geological Survey during the period October 1, 1950, to September 30, 1960. Included with these data are some records furnished by other Federal, State, and private agencies. This series of reports is a condensation of the detailed streamflow information presented in the annual series of reports known as "Surface Water Supply of the United States" for each of the years 1951 through 1960. The area covered by this report is the Hudson Bay and upper Mississippi River basins.

The purpose of the present series of reports is to make available in summarized form all of the surface-water records collected October 1, 1950, to September 30, 1960, and to continue the series of reports known as Water-Supply Papers 1301-19 and 1372 which summarized all surface-water records through September 30, 1950. The present series of reports includes corrections of errors which have been found in the earlier series. Also included are some records collected prior to October 1, 1950, that were omitted from the 1950 compilation series.

The Geological Survey collected the records mainly in cooperation with State, municipal, and other Federal agencies, and published them in detail in the series of annual reports known as "Surface Water Supply of the United States." Some records furnished by other agencies have been included in the annual reports and in the present series of reports; such records are identified in the station description.

The data presented consist of records of discharge of streams and contents of reservoirs summarized on a monthly and yearly basis. Results of miscellaneous discharge measurements and, in general, stage records have been excluded. Included is a map of the area showing the location of each station (pl. 1). The reports of the present series are generally similar in the type of data they contain and in the form of presentation; moreover, they conform in style with the earlier series of compilation reports so that the entire record for any station up to September 30, 1960, is available in one or two volumes.

All records compiled for these summary reports were examined for major errors. A few revisions were made and the revised figures, noted as such, are included. Some previously unpublished information is included, as well as a few estimates of discharge that were made to fill short gaps in an otherwise complete period of record.

DESCRIPTION OF DATA

The gaging-station records are arranged in downstream order. The order used in this report is the same as that adopted for use in the annual series of reports on surface-water supply beginning with the water year 1951. In a downstream direction along the main stem, all stations on a tributary entering above a main-stem station are listed before that station. If a tributary enters between two main-stem stations, it is listed between them. A similar order is followed in listing stations on first rank, second rank, and other ranks of tributaries. To indicate the rank of any tributary on which a gaging

station is situated and the stream to which it is immediately tributary, each indentation in the listing of gaging stations in the table of contents represents one rank. This downstream order and system of indentation show which gaging stations are on tributaries between any two stations on a main stem and the rank of the tributary on which each gaging station is situated.

As an added means of identification, each station was assigned a number which is shown on the index map and which is a part of the station name in the heading of the description in the text. The numbers are assigned in downstream order in each part (see explanation of "parts" under the heading "Publications," p. 4) beginning with the most upstream station. The numbers are not consecutive because gaps are left to allow for new stations that may be established.

The data presented for most of the gaging stations comprise a description of the station, a table of monthly discharge in cubic feet per second, a table of monthly runoff in inches, and a yearly summary table. The station description gives the name of the river basin, the station number and name, the location, drainage area, records available, types and datums of gages, average discharge, extremes of discharge, general remarks concerning the data, and a credit statement if records were furnished by another agency.

The location of the gaging station and the drainage area are obtained from the best available maps. When more than one site was used during water years 1951-60 and the difference in drainage areas is significant, the area for the latest site is shown first followed by the areas for other sites in chronological order. In some instances drainage-area figures have not been obtained because of the lack of suitable maps or because the boundaries cannot be defined or the effective drainage area determined.

The paragraph "Records available" lists all periods for which there are published records generally equivalent to those at the present site. If equivalent records have been published under another station name, that fact is also noted.

The gage described first is the present gage or the one used most recently. Information is then given in chronological order for all gages used earlier, giving changes in location, type of gage, or datum. The location or datum of all earlier gages is given with reference to the present or most recently used gage. The datum of the gage is the elevation of the zero of the gage above mean sea level. Where information as to datum is not available, the altitude of the gage is given.

The average discharge for a station is the average of all complete water years and is published only if there are five or more complete water years of record. The years used to determine the average are not necessarily consecutive. The average discharge is not published for some stations because of extensive changes in diversion or storage, or other water development, that have occurred upstream.

In general, the momentary maximum and minimum discharges and stages for the entire period of record are published in the "Extremes" paragraph. These are qualified if necessary according to the type of gage used and the completeness of the record. Maximum and minimum discharges at nonrecording gaging stations are qualified as "observed" unless determined from a graph drawn through actual gage heights which approximate the actual hydrograph.

Under "Remarks" information is given on factors which affect the basin runoff characteristics. These include upstream regulation, diversion, and utilization--the history of changes in these items during the period 1951-60 is given when known. Also references

are made to the records of storage or diversion upstream and to records concerning quality of water, if published.

When discharge records are furnished by another agency, credit is given under "Cooperation."

The streamflow data summarized in this report generally are contained in two monthly tables and one yearly table. The first monthly table is a tabulation of monthly and yearly mean discharges in cubic feet per second. These figures represent discharge passing the station; they are unadjusted for storage or diversion upstream unless otherwise specified under "Remarks" for the individual station. Each monthly figure is the mean flow for the entire month; generally no record for part of a month is tabulated. Likewise, each yearly figure is the mean flow for a full year, and no figure is shown for a partial year. Usually the months are arranged on a water-year basis. Exceptions to this rule are made in connection with seasonal records wherein the months are grouped to give a complete season for each calendar year.

The second monthly table is a tabulation of monthly and yearly runoff in inches. For streams that are subject to considerable regulation, the second table contains the adjusted runoff in inches. The table of runoff in inches is omitted if the data do not represent natural yield without gross error, whether adjusted or unadjusted.

The third table contains a yearly summary of the streamflow data. The column headed "WSP" lists the number of the water-supply paper in which the figures of daily and monthly discharge are published. If a part of the record has been revised and the revision published, then reference is made to both the original report and the one containing the revised record; if the daily discharge record for the entire year has been republished to include the revisions, then only the later report is listed. However, there is no reference in this column for revisions published for the first time in this report as the corresponding revised figures of daily discharge will be published in a water-supply paper which will contain daily records for the period 1961-65. For some stations the third table is omitted; however, the report containing records for any particular year can generally be found by referring to the table given on page 6.

In the third table the momentary maximum discharge for each water year and the date of its occurrence is given if known. For nonrecording gage records, momentary maximums were obtained from graphs drawn through the gage readings. The momentary maximum discharge, however obtained, is not qualified in any way if it is believed to be representative of the absolute maximum for the water year.

The minimum daily discharge for each water year is listed if known. Other data listed in this table are the annual mean discharge and runoff for both the water year and the calendar year. The figures listed for the water year are the same as those given in the yearly columns of the preceding tables. In addition, the annual mean discharge per square mile is listed for the water year. If figures of runoff have been adjusted for regulation or diversion in the preceding table, adjusted figures are listed in the yearly summary table. For a few stations regulation affects monthly figures seriously, but the effect on annual figures is either negligible or can be adequately adjusted for; for these stations the monthly table of runoff in inches is omitted, but the annual runoff is given.

Most canal and diversion records are given in a single table. There are some records for large canals, however, that are published in the same detail as those for streams. Records of reservoirs also are given in a single table which shows the contents at the end of each month.

Revised figures of discharge for water years 1951-60 are not so indicated if they have been published in an annual report, but are noted as "revised" if they have not been published in an annual report. Revised daily figures which have not been published in annual reports will be published in the water-supply paper containing records for water years 1961-65, except for special cases involving only a few figures which are included in this series of reports. Figures that represent corrections of typographical or computational errors whereas no figures of daily discharge have been revised or changed are indicated as "corrected" in this report, except corrected figures of runoff in inches which are not noted if the correction is due solely to a revision of drainage area. Estimates of discharge made to complete months or years for this report are noted as estimates and as "not previously published."

Revisions or corrections of records published in WSP 1308 are included in this report. However, revised figures of runoff in inches or discharge per square mile for records prior to October 1, 1950, resulting solely from a revision of drainage area, are not given.

PUBLICATIONS

This series of reports comprises 20 volumes of water-supply papers (WSP) as numbered below. The "Part" numbers and the areas covered are the same as those used for the annual series of reports on surface-water supply of the United States since 1951. The boundaries of the parts are indicated on figure 1.

Numbers of water-supply papers for 1960 series of compilation reports

WSP	Part	Area
1721	1-A	North Atlantic slope basins, Maine to Connecticut.
1722	1-B	North Atlantic slope basins, New York to York River.
1723	2-A	South Atlantic slope basins, James River to Savannah River.
1724	2-B	South Atlantic slope and eastern Gulf of Mexico basins, Ogeechee River to Pearl River.
1725	3-A	Ohio River basin except Cumberland and Tennessee River basins.
1726	3-B	Cumberland and Tennessee River basins.
1727	4	St. Lawrence River basin.
1728	5	Hudson Bay and upper Mississippi River basins.
1729	6-A	Missouri River basin above Sioux City, Iowa.
1730	6-B	Missouri River basin below Sioux City, Iowa.
1731	7	Lower Mississippi River basin.
1732	8	Western Gulf of Mexico basins.
1733	9	Colorado River basin.
1734	10	The Great Basin.
1735	11	Pacific slope basins in California.
1736	12	Pacific slope basins in Washington and upper Columbia River basin.
1737	13	Snake River basin.
1738	14	Pacific slope basins in Oregon and lower Columbia River basin.
1739	-	Hawaii.
1740	-	Alaska.

Records prior to September 30, 1950, were summarized in a series of water-supply papers as listed below. Each of these volumes contains a list of the annual reports from which data prior to 1951 were summarized.

Numbers of water-supply papers for 1950 series of compilation reports

WSP	Part	WSP	Part	WSP	Part
1301	1-A	1308	5	1315-A	11-B
1302	1-B	1309	6-A	1315-B	11-A
1303	2-A	1310	6-B	1316	12
1304	2-B	1311	7	1317	13
1305	3-A	1312	8	1318	14
1306	3-B	1313	9	1319	Hawaii
1307	4	1314	10	1372	Alaska

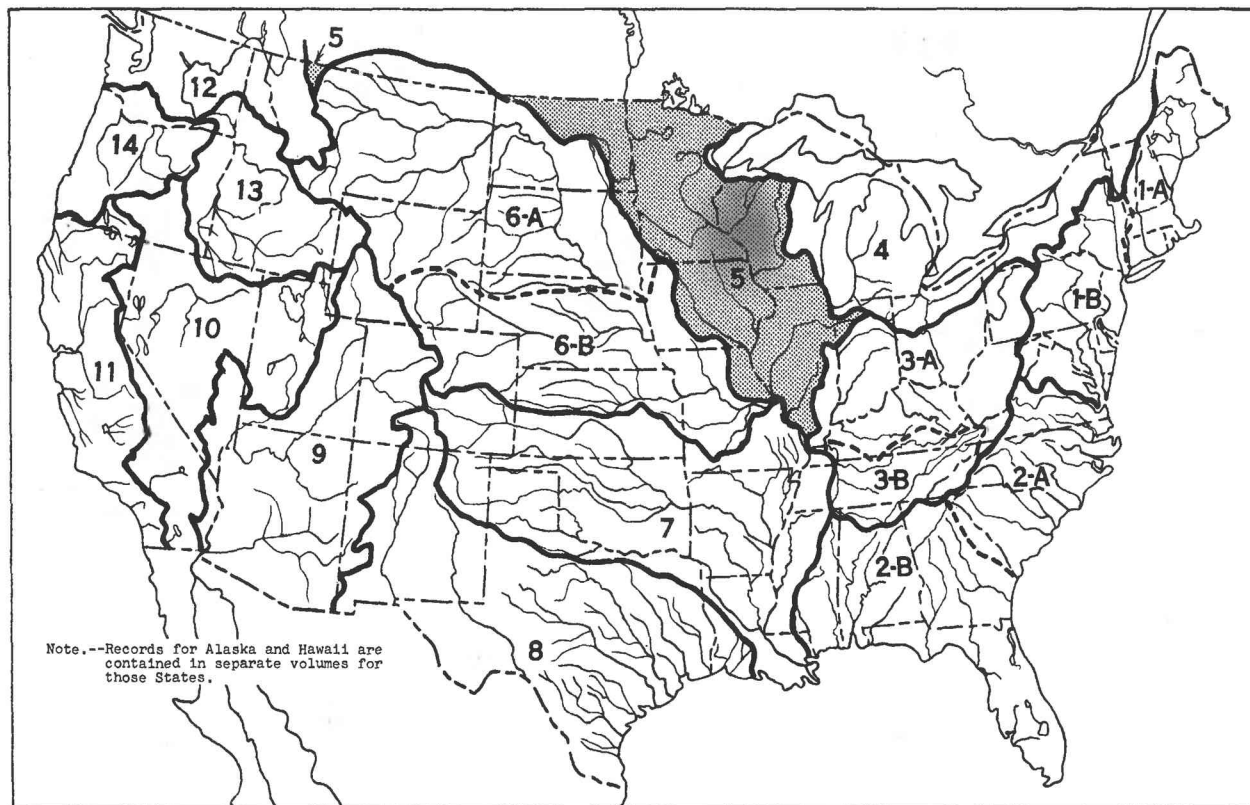


Figure 1.--Map of the conterminous United States showing areas covered by 18 of the 20 volumes on surface water supply. The area covered by this report is shaded.

This report is summarized from the following 10 annual reports which contain records of daily discharge for each of the water years from 1951 to 1960.

Annual water-supply papers, Part 5, 1951-60			
Water year	WSP	Water year	WSP
1951	1208	1956	1438
1952	1238	1957	1508
1953	1278	1958	1558
1954	1338	1959	1628
1955	1388	1960	1708

In addition to the customary records of discharge collected during the systematic operation of gaging stations there is much additional hydrologic information available, both published and unpublished.

A list of flood reports and other special reports is contained in the introductory pages of each of the annual reports listed above.

Records for many stations have been analyzed by an electronic computer to give: the number of days in each year that the discharge was between selected limits (duration tables); the lowest and highest mean discharges for selected numbers of consecutive days in each year; and other statistical summaries.

Data on low flow or peak flows or both are available for many sites other than gaging stations.

Specific information on unpublished data available can be obtained by writing directly to the district engineer for the State in which the site or gaging station is located.

HYDROLOGIC CONDITIONS

Streamflow, a residual of precipitation after other demands have been met, varies considerably from year to year and from place to place. Figure 2 shows yearly discharge for three gaging stations in Hudson Bay and upper Mississippi River basins. The pattern of yearly runoff shown by these streams is generally representative of hydrologic conditions in their parts of the report area.

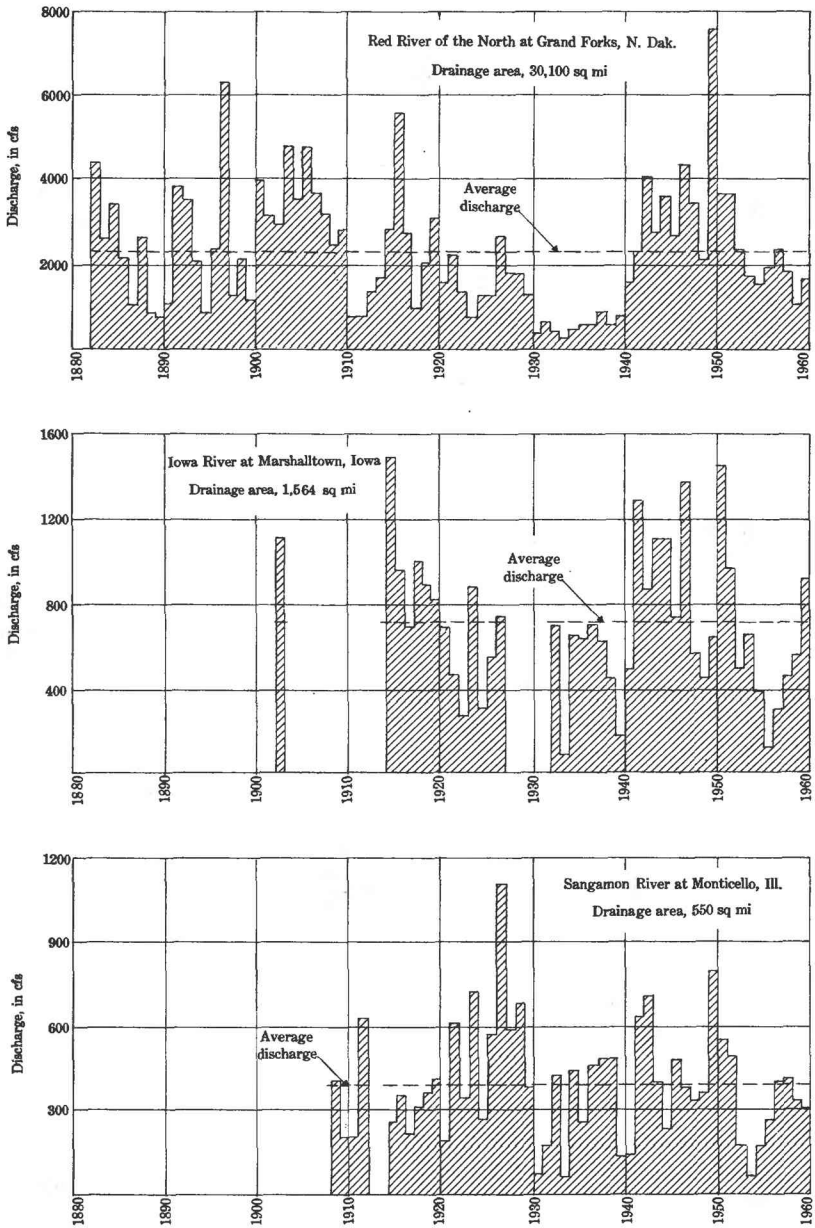


Figure 2.—Yearly discharge at three representative gaging stations.

Location.--Lat 48°59'20", long 113°45'50", in S $\frac{1}{2}$ sec.2, T.37 N., R.17 W. (unsurveyed), on left bank three-quarters of a mile south of international boundary, 5 $\frac{1}{2}$ miles upstream from mouth, 8 miles southeast of Waterton Park, Alberta, and 17 $\frac{1}{2}$ miles northwest of Babb, Mont.

Cooperation.--This is one of a number of stations which are maintained jointly by the United States and Canada.

[illegible][illegible][illegible]

107. Mountain View Irrigation District Canal near Mountain View, Alberta

(International gaging station)

Location.--Lat 49°06'00", long 113°41'30", in NW¼ sec.4, T.2, R.28 W., fourth meridian, in Alberta, on left bank 1½ miles downstream from headgate, 5 miles southwest of Mountain View, and 7 miles north of international boundary.

Records available.--May 1935 to November 1960 (seasonal records only). Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 4,377.26 ft above mean sea level (Irrigation Surveys datum). Prior to May 12, 1950, staff gage at site about 600 ft upstream at different datum. May 12, 1950, to May 22, 1952, staff or chain gage at site a quarter of a mile upstream at different datums.

Extremes.--1935-60: Maximum daily discharge, 143 cfs June 30, 1960; no flow at times each year.

Remarks.--Canal diverts water from Belly River on right bank for irrigation in Belly and St. Mary River basins in Alberta.

Cooperation.--This is one of a number of stations which are maintained jointly by Canada and the United States.

Monthly and seasonal diversion, in acre-feet

Water year	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Season
1951	-	-	-	388	390	1,130	99	228	-	-
1952	-	-	-	2,460	1,060	1,060	1,850	1,520	233	-
1953	-	229	711	809	290	1,960	1,960	2,410	485	8,860
1954	61	137	458	614	3,410	70	28	28	-	4,800
1955	0	0	481	587	437	462	2,360	1,570	34	5,930
1956	0	0	459	5,260	2,060	2,350	2,540	241	-	12,910
1957	0	30	2,610	4,140	1,280	3,850	3,160	1,610	-	16,680
1958	-	65	1,050	2,430	236	2,050	1,420	4,040	54	11,340
1959	5.4	118	276	1,410	3,540	1,850	4,570	477	-	12,250
1960	-	594	311	2,680	6,180	2,610	1,930	2,900	219	17,420

110. Belly River near Mountain View, Alberta

(International gaging station)

Location.--Lat 49°06', long 113°42', in NE $\frac{1}{4}$ sec. 5, T. 28 N., R. 28 W., fourth meridian, in Alberta, on right bank 2 miles downstream from intake of Mountain View Irrigation District Canal, 5 miles southwest of Mountain View, and 7 miles north of international boundary.

Drainage area.--121 sq mi.

Records available.--November 1911 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 4,344.90 ft above mean sea level (Irrigation Surveys datum). Prior to Apr. 6, 1949, staff or chain gage at site 20 ft upstream at same datum.

Average discharge.--22 years (1912-34), prior to operation of Mountain View Irrigation District Canal, 327 cfs (236,700 acre-ft per year); 26 years (1934-60), 303 cfs (219,400 acre-ft per year).

Extremes.--1911-60: Maximum discharge, 4,500 cfs June 4, 1953 (gage height, 6.64 ft), from rating curve extended above 2,500 cfs on basis of slope-area measurement of peak flow; minimum observed, 8.3 cfs Dec. 17, 1930 (gage height, 1.18 ft).
Flood in June 1908 reached a stage about 5.5 ft higher than that of June 4, 1953.

Remarks.--Natural flow of stream affected by diversion to Mountain View Irrigation District Canal 2 miles upstream from station.

Cooperation.--This is one of a number of stations which are maintained jointly by Canada and the United States.

Corrections.--In WSP 1308, the minimum day for 1931 is listed in error; it should be 18 cfs.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	255	244	164	105	106	70.4	240	1,102	1,145	1,141	407	457	455
1952	442	153	118	72.9	82.0	53.8	335	733	677	469	327	125	298
1953	70.4	52.5	65.0	62.7	100	58.5	232	920	1,685	951	323	149	403
1954	66.7	110	73.4	46.9	66.0	73.4	123	1,052	1,217	1,060	425	296	386
1955	315	192	110	71.5	46.0	46.9	91.4	514	1,413	818	292	115	336
1956	273	179	94.8	66.4	48.9	58.0	194	951	1,049	697	277	128	336
1957	180	109	92.1	59.0	52.4	54.3	105	1,299	903	368	123	85.4	287
1958	144	154	86.0	60.4	70.0	86.2	139	993	965	465	214	146	295
1959	122	138	114	111	55.3	54.1	228	713	1,519	643	253	290	338
1960	358	175	105	76.0	60.2	96.4	251	558	940	451	223	118	285

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	15,680	14,430	10,080	6,450	5,900	4,350	14,270	67,790	68,140	70,170	25,040	27,210	329,600
1952	27,160	9,080	7,240	4,480	3,570	3,510	19,940	45,080	40,260	28,830	20,100	7,460	216,500
1953	4,350	3,120	4,000	5,080	5,580	3,660	11,990	56,590	110,400	58,480	19,840	6,890	292,000
1954	4,100	6,540	4,510	2,890	3,670	4,510	7,340	64,690	72,430	85,180	26,140	17,610	279,600
1955	19,360	11,420	6,750	4,390	2,550	2,880	5,440	31,600	84,100	50,270	17,970	6,830	243,600
1956	16,800	10,650	5,830	4,080	2,810	3,560	11,560	58,470	62,390	42,840	17,040	7,600	243,600
1957	11,070	6,460	5,660	3,630	2,910	3,540	6,260	79,880	53,730	22,490	7,540	4,960	207,900
1958	8,880	9,190	5,410	3,710	3,890	5,420	8,270	61,030	57,290	28,590	13,180	6,860	213,500
1959	7,520	8,210	6,990	6,850	3,630	3,530	13,600	43,870	78,510	59,540	15,570	17,240	244,900
1960	22,030	10,400	6,480	4,670	3,460	5,930	14,960	34,290	55,910	27,730	13,690	6,990	206,500

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	-	278,100
1951	1208	3,020	June 24, 1951	56	45	329,600	460	332,800
1952	1238	1,020	June 12, 1952	40	298	216,500	254	194,500
1953	1278	4,500	June 4, 1953	20	403	292,000	408	295,700
1954	1358	2,470	May 20, 1954	17	386	279,600	417	302,000
1955	1388	2,140	June 25, 1955	28	336	243,600	331	239,300
1956	1438	2,180	May 22, 1956	27	336	243,600	322	233,500
1957	1508	2,000	May 14, 1957	35.8	287	207,900	288	208,200
1958	1558	1,900	June 10, 1958	25	295	213,500	294	212,800
1959	1628	1,960	June 6, 1959	40	338	244,900	361	261,000
1960	1708	1,550	June 4, 1960	38	285	206,500	-	-

115. Waterton River near international boundary

(International gaging station)

Location.--Lat 48°57'20", long 113°54'00", in NW¼ sec.23, T.37 N., R.18 W. (unsurveyed), on right bank 100 ft downstream from Olson Creek, 3 miles south of international boundary, and 7 miles south of Waterton Park, Alberta.

Drainage area.--61.0 sq mi.

Records available.--May 1947 to September 1960 (no winter records after 1957).

Gage.--Water-stage recorder. Altitude of gage is 4,200 ft (from topographic map). Prior to Sept. 12, 1947, staff gage at bridge a quarter of a mile downstream at different datum.

Average discharge.--10 years (1947-57), 273 cfs (197,600 acre-ft per year).

Extremes.--1947-60: Maximum discharge, 2,710 cfs May 20, 1954 (gage height, 6.51 ft); minimum recorded, 8.7 cfs Dec. 24, 1952 (gage height, 1.97 ft).

Remarks.--No regulation or diversion.

Cooperation.--This is one of a number of stations which are maintained jointly by the United States and Canada.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	278	188	143	71.9	78.9	37.4	156	896	932	848	176	230	338
1952	300	67.5	55.1	28.4	21.5	15.7	315	848	756	303	118	51.7	241
1953	29.3	16.5	14.1	51.8	46.7	25.9	114	629	1,290	769	160	66.4	268
1954	32.9	61.8	40.4	24.9	24.6	27.2	65.7	889	1,129	1,081	244	159	317
1955	199	136	69.7	31.9	21.0	16.1	39.2	330	1,269	640	132	59.4	246
1956	274	145	61.3	38.7	23.7	29.3	145	898	1,199	534	127	69.1	296
1957	120	69.8	41.0	25.6	23.7	31.5	75.4	1,165	965	244	77.5	46.7	242
1958	-	-	-	-	-	-	-	-	771	187	83.2	95.0	-
1959	152	89.8	-	-	-	-	-	-	1,452	644	151	294	-
1960	317	107	67.4	-	-	-	-	-	1,082	496	120	74.3	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	17,080	11,210	8,790	4,420	4,380	2,300	9,260	55,110	55,440	52,130	10,810	13,670	244,600
1952	18,450	4,010	3,390	1,750	1,240	968	18,740	52,150	45,000	18,600	7,270	3,080	174,800
1953	1,800	983	869	3,190	2,590	1,590	6,790	38,660	78,750	47,310	9,860	3,960	194,300
1954	2,030	3,680	2,490	1,530	1,360	1,670	3,910	54,680	67,190	66,470	15,000	9,460	229,500
1955	12,240	8,110	4,290	1,960	1,170	988	2,330	20,290	75,500	39,370	8,090	3,540	177,900
1956	16,850	8,600	3,770	2,380	1,370	1,800	8,610	55,240	71,370	32,860	7,790	4,110	214,800
1957	7,410	4,150	2,520	1,570	1,310	1,940	4,480	71,640	57,420	15,030	4,760	2,780	175,000
1958	-	-	-	-	-	-	-	-	45,900	11,520	5,120	5,650	-
1959	9,320	5,350	-	-	-	-	-	-	86,380	39,580	9,310	17,520	-
1960	19,480	6,370	4,140	-	-	-	-	-	64,400	30,520	7,360	4,420	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1950	-	-	-	-	-	-	-	328	72.85	237,200	
1951	1208	2,190	June 16, 1951	32.0	338	5.54	75.18	244,600	323	71.80	233,600
1952	1238	1,520	June 6, 1952	-	241	3.95	53.74	174,800	210	46.86	152,400
1953	1278	2,520	June 13, 1953	9	268	4.39	59.73	194,300	275	61.12	198,900
1954	1358	2,710	May 20, 1954	15	317	5.20	70.52	229,500	340	75.58	245,900
1955	1388	2,260	June 23, 24,	12	246	4.03	54.68	177,900	252	58.09	182,500
1956	1438	2,360	June 2, 1956	16	296	4.85	66.01	214,800	275	61.36	199,600
1957	1508	1,870	June 4, 1957	15	242	3.97	53.79	175,000	-	-	-
1958	1628	1,850	May 24, 1958	-	-	-	-	-	-	-	-
1959	1628	2,390	June 6, 1959	-	-	-	-	-	-	-	-
1960	1708	2,020	June 17, 1960	-	-	-	-	-	-	-	-

120. Street Creek at international boundary

(International gaging station)

Location.--Lat 48°59'20", long 113°52'40", in NE $\frac{1}{4}$ sec.11, T.37 N., R.18 W. (unsurveyed), on left bank half a mile upstream from mouth, three-quarters of a mile south of international boundary, and 5 miles south of Waterton Park, Alberta.

Drainage area.--6.0 sq mi, approximately.

Records available.--October 1947 to October 1955 (no winter records after 1952).

Gage.--Water-stage recorder. Altitude of gage is 4,400 ft (from topographic map).

Average discharge.--5 years (1947-52), 16.6 cfs (12,020 acre-ft per year).

Extremes.--1947-55: Maximum discharge, 437 cfs June 3, 1953 (gage height, 4.5 ft, from floodmarks), from rating curve extended above 140 cfs on basis of slope-area measurement of peak flow; minimum daily, 0.2 cfs Nov. 25-27, 1952, but may have been less during periods of ice effect or no gage-height record.

Remarks.--No regulation or diversion.

Cooperation.--This is one of a number of stations which are maintained jointly by the United States and Canada.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	12.3	8.53	4.03	1.48	2.09	1.30	5.80	58.9	59.2	55.9	11.5	21.1	20.3
1952	17.5	4.02	3.32	1.46	.68	.4	18.7	46.3	35.1	15.0	8.27	2.57	12.8
1953	1.10	.46	-	-	-	-	-	49.4	85.7	43.2	8.25	3.69	-
1954	1.22	3.19	-	-	-	-	-	58.3	61.9	43.4	12.4	8.19	-
1955	14.6	7.24	-	-	-	-	-	24.7	78.1	33.8	5.46	2.01	-
1956	15.2	-	-	-	-	-	-	-	-	-	-	-	-
1957	-	-	-	-	-	-	-	-	-	-	-	-	-
1958	-	-	-	-	-	-	-	-	-	-	-	-	-
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	758	507	248	91	116	80	345	3,620	3,520	3,430	708	1,260	14,680
1952	1,070	239	204	90	39	25	1,110	2,850	2,090	924	508	153	9,300
1953	68	28	-	-	-	-	-	3,040	5,690	2,660	508	219	-
1954	75	190	-	-	-	-	-	3,600	3,680	2,670	765	488	-
1955	900	431	-	-	-	-	-	1,520	4,640	2,060	336	120	-
1956	936	-	-	-	-	-	-	-	-	-	-	-	-
1957	-	-	-	-	-	-	-	-	-	-	-	-	-
1958	-	-	-	-	-	-	-	-	-	-	-	-	-
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year			
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	20.3	45.96	14,730
1951	1208	113	July 1, 1951	-	20.3	3.38	45.90	14,680	20.3	45.93	14,680
1952	1258	-	-	-	12.8	2.13	29.10	9,300	-	-	-
1953	1278	437	June 3, 1953	-	-	-	-	-	-	-	-
1954	1338	187	(a)	-	-	-	-	-	-	-	-
1955	1388	180	(b)	-	-	-	-	-	-	-	-
1956	1388	-	-	-	-	-	-	-	-	-	-
1957	-	-	-	-	-	-	-	-	-	-	-
1958	-	-	-	-	-	-	-	-	-	-	-
1959	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-

a May 19 or 20, 1954

b June 24 or 25, 1955.

125. Boundary Creek at international boundary

(International gaging station)

Location.--Lat 48°59'50", long 113°54'20", in NE $\frac{1}{4}$ sec.3, T.37 N., R.18 W. (unsurveyed), on right bank a quarter of a mile upstream from mouth, a quarter of a mile south of international boundary, and 4 miles south of Waterton Park, Alberta.

Drainage area.--21.0 sq mi.

Records available.--October 1947 to September 1960 (no winter records after 1957).

Gage.--Water-stage recorder. Altitude of gage is 4,300 ft (from topographic map).

Average discharge.--10 years (1947-57), 78.0 cfs (56,470 acre-ft per year).

Extremes.--1947-60: Maximum discharge, 904 cfs June 4, 1953; maximum gage height, 5.34 ft June 21 or 22, 1950, from floodmarks; minimum discharge recorded, 4.0 cfs Mar. 23-26, Apr. 3-8, 12, 1948, Mar. 15, 1952, but may have been less during periods of ice effect or no gage-height record.

Remarks.--No regulation or diversion.

Cooperation.--This is one of a number of stations which are maintained jointly by the United States and Canada.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	80.9	64.2	41.4	23.3	29.6	14.1	61.8	243	244	203	63.4	92.1	97.0
1952	99.5	23.2	14.7	8.61	9.60	6.03	86.7	221	182	92.5	48.6	22.0	68.0
1953	12.5	7.98	7.57	25.4	20.6	11.9	40.6	192	376	211	55.4	27.7	82.5
1954	13.2	29.6	18.9	11.1	12.5	11.1	26.9	230	299	253	78.5	56.3	87.1
1955	71.6	45.5	25.6	16.2	10.2	9.14	13.6	96.2	328	172	45.8	21.2	71.4
1956	73.0	44.5	22.2	15.9	9.50	11.3	43.2	239	304	147	51.2	26.9	82.4
1957	41.0	22.9	18.7	10.8	10.7	13.6	27.0	315	243	71.3	35.4	20.8	69.3
1958	-	-	-	-	-	-	-	-	204	68.8	25.1	-	-
1959	35.2	30.4	20.8	-	-	-	-	-	376	158	48.1	85.6	-
1960	90.3	37.8	-	-	-	-	-	-	268	113	40.4	26.4	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	4,970	3,820	2,540	1,430	1,640	870	3,680	14,910	14,530	12,460	3,900	5,480	70,230
1952	6,120	1,380	902	530	552	371	5,160	13,560	10,810	5,680	2,990	1,310	49,360
1953	766	475	466	1,560	1,140	731	2,420	11,780	22,340	12,980	3,400	1,850	59,710
1954	813	1,760	1,160	680	694	681	1,600	14,120	17,780	15,570	4,830	3,350	63,040
1955	4,400	2,710	1,580	997	568	562	807	5,920	19,500	10,570	2,820	1,260	51,690
1956	4,490	2,650	1,370	976	547	693	2,570	14,700	18,090	9,010	3,150	1,600	59,850
1957	2,520	1,360	1,150	666	595	839	1,610	19,270	14,470	4,380	2,050	1,240	50,150
1958	-	-	-	-	-	-	-	-	12,130	4,230	2,190	1,670	-
1959	2,160	1,810	1,280	-	-	-	-	-	22,370	8,740	2,960	5,090	-
1960	5,550	2,250	-	-	-	-	-	-	15,960	8,970	2,480	1,570	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30										Calendar year		
		Momentary maximum					Runoff					Runoff		
		Discharge	Date	Minimum day	Mean	Per square mile	Inches	Acre-feet	Mean	Inches	Acre-feet	Mean	Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	86.2	35.65	62,360	-	-	-
1951	1208	*635	June 15, 1951	12.0	97.0	4.62	62.74	70,230	93.0	39.12	67,300	-	-	-
1952	1238	366	Oct. 1, 1951	5.4	68.0	3.24	44.08	49,360	58.8	38.11	42,670	-	-	-
1953	1278	904	June 4, 1953	5	82.5	3.93	53.31	59,710	85.3	35.13	61,730	-	-	-
1954	1338	555	May 19, 1954	6	87.1	4.15	56.30	63,040	93.9	30.72	68,000	-	-	-
1955	1388	542	June 23, 1955	6	71.4	3.40	46.15	51,690	71.1	45.98	51,510	-	-	-
1956	1438	586	May 21, 1956	6	82.4	3.92	53.41	59,850	77.6	30.31	56,370	-	-	-
1957	1508	474	May 14, 1957	7	69.3	3.30	44.76	50,150	-	-	-	-	-	-
1958	1628	430	May 24, 1958	-	-	-	-	-	-	-	-	-	-	-
1959	1628	625	June 6, 1959	-	-	-	-	-	-	-	-	-	-	-
1960	1708	488	June 3, 1960	-	-	-	-	-	-	-	-	-	-	-

* Revised.

130. Waterton River near Waterton Park, Alberta

(International gaging station)

Location.--Lat 49°07', long 113°50', in NE $\frac{1}{4}$ sec. 8, T. 2, R. 29 W., fourth meridian, in Alberta, on right bank 300 ft (revised) downstream from highway bridge, a quarter of a mile upstream from Crooked Creek, and 5 miles northeast of Waterton Park.

Drainage area.--238 sq mi.

Records available.--June to September 1908, April to November 1909, April to November 1910, May to October 1911, March 1912 to May 1931, September 1932, June to August 1933, April 1948 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 4,154.19 ft above mean sea level (Irrigation Surveys datum). Prior to Feb. 7, 1917, staff gages at various sites and datums within 200 ft of present site. Feb. 7, 1917, to Aug. 26, 1933, and Mar. 19, 1948, to Mar. 18, 1949, chain gage on downstream side of old bridge 200 ft upstream, at present datum.

Average discharge.--30 years (1912-30, 1948-60), 674 cfs (488,000 acre-ft per year).

Extremes.--1908-33, 1948-60: Maximum discharge, 24,000 cfs June 6, 1908 (gage height, 9.5 ft, site and datum then in use, from graph based on gage readings), from rating curve extended above 7,000 cfs by logarithmic plotting; minimum observed, 14 cfs Feb. 4, 1955 (gage height, 1.65 ft on wire-weight gage, backwater from ice), caused by temporary storage behind ice jam upstream.

Remarks.--No regulation or diversion.

Cooperation.--This is one of a number of stations which are maintained jointly by Canada and the United States.

Correction.--In WSP 1308, the figures of runoff in acre-feet for August and September 1914 are listed in error; they should be 26,501 and 23,445 acre-ft, respectively.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	457	580	429	286	304	163	502	2,593	2,566	2,258	601	832	968
1952	944	278	217	160	117	98.5	692	1,903	1,578	847	443	183	624
1953	103	59.3	45.5	159	154	121	331	1,806	3,911	1,789	431	207	761
1954	106	147	136	106	153	129	255	2,208	2,694	2,360	618	530	791
1955	587	586	226	131	90.7	85.7	147	927	3,185	1,645	592	184	665
1956	428	401	174	132	86.0	113	438	2,154	2,721	1,321	393	191	714
1957	235	190	143	92.5	94.1	118	153	2,977	2,231	615	208	123	602
1958	247	319	126	114	98.4	174	299	2,519	2,096	692	265	161	595
1959	249	249	225	249	170	115	462	1,480	3,308	1,430	374	573	741
1960	732	472	284	157	115	149	558	1,181	2,495	1,082	348	173	645

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	28,090	34,520	26,390	17,580	16,880	10,000	29,900	159,400	152,700	138,900	36,960	49,500	700,800
1952	58,040	16,560	15,340	9,830	6,760	6,060	41,170	117,000	93,920	52,080	27,270	11,180	453,200
1953	6,320	3,530	2,800	9,760	8,570	7,410	19,690	111,100	232,700	110,000	26,480	12,290	550,600
1954	6,520	8,740	8,370	6,500	8,510	7,950	15,190	135,600	160,300	145,100	38,000	31,550	572,300
1955	36,090	22,940	13,920	8,050	5,040	5,270	8,760	57,010	189,500	101,200	24,130	9,790	481,700
1956	26,320	23,870	10,700	8,140	4,940	6,930	26,090	132,400	161,900	81,200	24,180	11,370	518,000
1957	14,450	11,330	8,810	5,690	5,220	7,240	9,110	183,000	132,800	37,790	12,810	7,690	435,900
1958	15,190	18,990	7,770	7,020	5,460	10,680	17,800	154,900	124,700	42,560	16,290	9,600	431,000
1959	15,310	14,840	13,840	15,320	9,450	7,070	27,470	91,000	196,800	87,910	23,020	34,360	536,400
1960	45,010	28,080	17,440	9,640	6,640	9,130	33,230	72,630	148,500	66,550	21,410	10,320	468,600

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	820	46.78	593,400
1951	1208	4,360	June 16, 1951	128	968	4.07	55.21	700,800	967	55.12	699,800
1952	1238	2,580	May 21, 1952	88	624	2.62	35.69	453,200	521	29.77	377,900
1953	1278	7,570	June 4, 1953	33.3	761	3.20	43.39	550,600	776	44.25	561,600
1954	1338	5,310	May 21, 1954	80	791	3.32	45.09	572,300	859	48.98	631,600
1955	1388	4,500	June 25, 1955	31	665	2.79	37.95	481,700	649	36.99	469,600
1956	1438	4,890	May 22, 1956	80	714	3.00	40.82	518,000	677	38.75	491,700
1957	1508	3,990	May 15, 1957	72	602	2.53	34.35	435,900	612	34.94	443,300
1958	1558	3,790	May 25, 1958	60	595	2.50	33.95	431,000	598	34.11	433,000
1959	1628	4,970	June 6, 1959	103	741	3.11	42.27	536,400	805	45.87	582,900
1960	1708	5,910	June 4, 1960	98	645	2.71	36.91	468,600	-	-	-

139. Grinnell Creek at Grinnell Glacier, near Many Glacier, Mont.

Location.--Lat 48°45'30", long 113°43'30", in SW $\frac{1}{4}$ sec.25, T.35 N., R.17 W. (unsurveyed), on left bank a quarter of a mile downstream from Grinnell Glacier, a quarter of a mile upstream from Grinnell Falls, 4 miles southwest of Many Glacier, and 15 miles southwest of Babb.

Drainage area.--1.1 sq mi, approximately.

Records available.--July 1959 to September 1960 (no winter records).

Gage.--Water-stage recorder. Datum of gage is 6,322 ft above mean sea level (plane table bench mark).

Extremes.--1959-60: Maximum discharge, 100 cfs Aug. 3, 1960 (gage height, 3.65 ft); maximum gage height recorded, 4.28 ft June 30, 1960 (backwater from ice jam); minimum not determined.

Remarks.--No regulation or diversion.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1959	-	-	-	-	-	-	-	-	-	40.0	27.6	20.6	-
1960	10.8	-	-	-	-	-	-	-	-	45.1	27.7	16.4	-

Monthly and yearly discharges, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1959	-	-	-	-	-	-	-	-	-	2,480	1,700	1,230	-
1960	662	-	-	-	-	-	-	-	-	2,770	1,700	975	-

140. Grinnell Creek near Many Glacier, Mont.

Location.--Lat 48°46'20", long 113°41'50", in SE $\frac{1}{4}$ sec.21, T.35 N., R.16 W. (unsurveyed), on right bank 500 ft upstream from trail crossing, 1,000 ft downstream from Grinnell Lake, a quarter of a mile upstream from mouth, 3 miles southwest of Many Glacier, and 13 $\frac{1}{2}$ miles southwest of Babb.

Drainage area.--3.47 sq mi.

Records available.--August 1949 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 5,000 ft (from topographic map). Prior to Oct. 12, 1949, staff gages at various sites and datums.

Average discharge.--11 years (1949-60), 24.9 cfs (18,030 acre-ft per year).

Extremes.--1949-60: Maximum discharge, 242 cfs June 22, 1950 (gage height, 3.45 ft), from rating curve extended above 120 cfs by logarithmic plotting; minimum, probably less than 0.2 cfs at times in winter periods.

Remarks.--No regulation or diversion.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	31.6	12.9	8.40	2.09	2.04	1.24	13.5	47.9	58.8	71.7	35.2	27.8	25.5
1952	28.9	4.23	2.84	1.75	1.79	1.78	12.9	49.4	62.1	48.9	35.4	16.9	22.4
1953	5.66	.96	.87	7.44	4.91	2.52	8.19	38.3	88.5	78.2	41.8	18.4	24.8
1954	6.00	7.15	5.04	2.60	2.52	2.43	7.94	50.3	79.7	93.2	50.3	30.5	28.3
1955	17.9	11.1	4.17	2.49	.75	.84	4.17	21.4	93.3	78.6	37.7	17.4	24.1
1956	30.2	8.61	4.91	2.26	.63	1.27	9.12	53.0	82.4	60.8	38.9	18.9	26.1
1957	15.3	4.01	2.62	1.72	.76	2.36	6.40	71.5	69.0	44.3	30.3	18.4	22.2
1958	9.38	4.34	1.74	1.25	2.28	1.98	5.56	73.8	65.8	44.3	37.0	22.7	22.8
1959	13.9	8.17	4.63	5.11	2.61	1.84	13.0	32.4	92.6	70.0	36.7	35.2	26.7
1960	24.4	6.71	1.87	1.35	1.81	4.35	9.93	28.7	82.5	67.9	33.8	20.0	23.7

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,840	770	516	128	113	76	803	2,950	3,500	4,410	2,180	1,850	19,020
1952	1,650	252	162	45	45	48	1,130	3,030	3,700	3,000	2,170	1,598	16,230
1953	348	57	54	457	273	155	487	2,350	5,260	4,810	2,570	1,150	17,970
1954	369	425	310	160	140	149	473	3,090	4,740	5,730	3,090	1,810	20,490
1955	1,100	661	256	153	42	52	248	1,320	5,550	4,710	2,320	1,440	17,450
1956	1,860	512	302	139	36	78	543	3,260	4,900	3,740	2,390	1,180	18,940
1957	942	239	161	106	42	145	381	4,400	4,110	2,720	1,860	874	16,080
1958	577	258	107	75	127	122	319	4,540	5,910	2,720	2,270	1,470	16,500
1959	858	486	285	314	145	113	774	1,990	5,510	4,310	2,260	2,280	†19,320
1960	1,500	399	115	83	104	268	591	1,770	4,910	4,180	2,080	1,190	17,190

† Corrected.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year			
		Momentary		Minimum day	Mean	Per square mile	Runoff	Mean	Runoff		
		Discharge	Date						Inches	Acre-feet	
1950	-	-	-	-	-	-	-	28.8	117.70	20,880	-
1951	1208	155	June 15, 1951	0.5	26.3	7.58	102.58	19,020	24.7	96.50	17,850
1952	1258	138	Oct. 1, 1951	.3	22.4	6.46	87.74	16,230	20.2	79.06	14,620
1953	1278	198	June 13, 1953	.2	24.8	7.15	97.16	17,970	25.7	100.64	18,620
1954	1338	142	July 8, 1954	-	28.3	8.16	110.74	20,490	29.6	115.69	21,400
1955	1388	179	June 25, 1955	-	24.1	6.95	94.27	17,450	25.0	97.80	18,110
1956	1438	154	June 2, 1956	-	26.1	7.55	102.37	18,940	24.3	95.18	17,610
1957	1508	111	May 20, 1957	-	22.2	6.40	86.87	16,080	21.7	84.72	15,680
1958	1558	130	May 26, 1958	-	22.8	6.57	89.19	16,500	23.7	92.89	17,180
1959	1628	138	June 5, 1959	1	26.7	7.69	104.38	†19,320	27.2	106.45	19,710
1960	1708	194	June 16, 1960	-	23.7	6.83	92.83	17,190	-	-	-

† Corrected.

145. Swiftcurrent Creek at Many Glacier, Mont.

(International gaging station)

Location.--Lat 48°48'10", long 113°39'20", in SE $\frac{1}{4}$ sec.11, T.35 N., R.16 W. (unsurveyed), on right bank 100 ft upstream from outlet of Swiftcurrent Lake at Many Glacier, Glacier National Park, and 11 miles southwest of Babb.

Drainage area.--31.4 sq mi.

Records available.--June 1912 to September 1960 (records incomplete most years prior to 1959). Published as "at McDermott Lake" 1912-14. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Altitude of gage is 4,860 ft (from topographic map). Prior to May 23, 1916, staff gage on left bank of lake opposite present gage at same datum. May 23, 1916, to June 15, 1918, staff gage at same site and datum.

Extremes.--1912-60: Maximum discharge, 2,250 cfs June 13, 1937 (gage height, 6.89 ft, backwater from bridge); minimum observed, 8.7 cfs Apr. 1, 1913, result of discharge measurement.

Remarks.--No diversion or regulation.

Cooperation.--This is one of a number of stations which are maintained jointly by the United States and Canada.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	238	-	-	-	-	-	99.5	455	437	390	137	182	-
1952	190	-	-	-	-	-	-	349	352	213	120	56.5	-
1953	26.8	-	-	-	-	-	-	373	661	407	149	67.6	-
1954	32.8	-	-	-	-	-	48.6	445	549	505	197	143	-
1955	151	94.4	-	-	-	-	-	205	588	353	123	58.4	-
1956	190	-	-	-	-	-	-	435	519	290	129	75.3	-
1957	119	-	-	-	-	26.5	57.3	553	437	168	78.7	44.8	-
1958	56.6	-	-	-	-	25.2	66.6	526	392	163	95.2	104	-
1959	108	78.1	52.9	64.6	34.1	119	119	305	616	325	133	235	174
1960	200	68.3	43.3	17.2	18.3	34.1	104	264	538	257	107	67.5	143

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	14,610	-	-	-	-	-	5,920	27,970	25,980	24,010	8,420	10,810	-
1952	11,670	-	-	-	-	-	-	21,450	20,920	13,110	7,370	3,360	-
1953	1,850	-	-	-	-	-	-	22,920	39,360	25,020	9,160	4,020	-
1954	2,020	-	-	-	-	-	2,890	27,340	32,670	31,060	12,120	8,520	-
1955	9,260	5,620	-	-	-	-	-	12,590	34,990	22,070	7,560	3,470	-
1956	11,710	-	-	-	-	-	-	26,610	30,890	17,860	7,960	4,480	-
1957	7,330	-	-	-	-	1,630	3,410	34,010	26,020	10,330	4,840	2,670	-
1958	3,480	-	-	-	-	1,550	3,960	32,360	23,340	10,040	5,850	6,170	-
1959	6,630	4,650	3,250	3,970	1,890	1,270	7,100	18,790	36,660	19,960	8,170	13,960	126,300
1960	12,290	4,070	2,660	1,060	1,050	2,100	6,160	16,220	32,010	15,790	6,590	4,020	104,000

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year			
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff	Mean		Runoff	
		Discharge	Date					Inches	Acre-feet	Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	-	-	-
1951	1208	1,010	June 16, 1951	-	-	-	-	-	-	-	-
1952	1238	811	Oct. 2, 1951	-	-	-	-	-	-	-	-
1953	1278	1,320	June 13, 1953	-	-	-	-	-	-	-	-
1954	1338	1,280	May 20, 1954	-	-	-	-	-	-	-	-
1955	1388	955	June 25, 1955	-	-	-	-	-	-	-	-
1956	1438	1,100	May 21, 1956	-	-	-	-	-	-	-	-
1957	1508	821	May 8, 1957	-	-	-	-	-	-	-	-
1958	1558	834	May 10, 1958	-	-	-	-	-	-	-	-
1959	1628	1,010	June 6, 1959	18	174	5.54	75.41	126,300	181	78.09	130,800
1960	1708	968	June 17, 1960	12	143	4.55	62.13	104,000	-	-	-

155. Lake Sherburne at Sherburne, Mont.

(International gaging station)

Location.--Lat 48°49'50", long 113°31'10", in SE $\frac{1}{4}$ sec.35, T.36 N., R.15 W., in gatehouse at Lake Sherburne on Swiftcurrent Creek, 4 $\frac{1}{2}$ miles southwest of Babb.

Drainage area.--63.7 sq mi.

Records available.--May 1915 to September 1923 (fragmentary), May 1924 to September 1925, November 1925 to June 1926, September 1926 to March 1936 (no winter records some years), May 1936 to May 1937, July 1937 to September 1960. Month-end contents for some periods, published in WSP 1308. Published as "Sherburne Lake Reservoir at Sherburne" 1915, 1917-28, 1931-52, and as "Sherburne Lake Reservoir near Babb" 1929-30.

Gage.--Water-stage recorder. Datum of gage is at mean sea level (levels by Bureau of Reclamation). Prior to May 7, 1931, staff gage at same site and datum.

Extremes.--1915-60: Maximum contents, 63,740 acre-ft July 9, 1960 (elevation, 4,786.58 ft); no usable contents at times.

Remarks.--Reservoir is formed on natural lake by earthfill dam completed in 1921. Prior to 1919, flashboards on a temporary dam provided limited storage. Storage behind main dam began in 1919. Capacity, 66,200 acre-ft (corrected) between elevations 4,726 ft (6 ft above lowest outlet gate sill) and 4,788 ft (spillway crest). Streambed above gates prevents withdrawal of storage to sill elevation. Dead storage negligible. Figures given herein represent usable contents. Water is used for irrigation on Milk River project of Bureau of Reclamation.

Cooperation.--This is one of a number of stations which are maintained jointly by the United States and Canada.

Contents, in acre-feet, on last day of month

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	11,876	9,896	19,051	23,491	27,901	30,806	39,948	41,612	50,290	58,924	40,221	16,020
1952	6,875	11,316	14,441	16,971	18,450	19,630	28,539	46,900	58,278	51,976	32,180	6,234
1953	5,018	6,658	7,665	13,173	16,845	19,330	25,250	29,760	50,050	54,020	32,776	5,440
1954	5,070	10,130	13,020	15,970	18,330	21,410	14,140	20,340	47,340	59,250	43,960	16,150
1955	3,060	10,830	14,850	16,980	18,420	19,990	23,230	40,730	49,100	58,240	33,290	3,640
1956	4,930	12,530	16,600	19,040	20,700	22,840	25,150	23,770	45,040	61,020	39,820	12,930
1957	8,450	12,550	15,330	16,300	18,810	21,080	17,670	46,540	55,250	45,280	16,550	4,480
1958	9,950	14,500	16,840	18,430	21,080	23,960	26,610	57,970	62,060	47,020	16,360	8,200
1959	16,600	23,170	26,680	34,420	37,020	36,960	29,290	18,690	45,980	60,690	34,260	10,190
1960	2,980	8,860	13,350	15,430	17,160	21,430	28,770	31,460	57,240	53,740	21,470	3,950

160. Swiftcurrent Creek at Sherburne, Mont.

(International gaging station)

Location.--Lat 48°50'00", long 113°30'50", in SW $\frac{1}{4}$ sec.36, T.36 N., R.15 W., on left bank 1,000 ft downstream from outlet of Lake Sherburne Dam at Sherburne and $\frac{1}{2}$ miles south-west of Babb.

Drainage area.--64.3 sq mi.

Records available.--July 1912 to November 1915 (no winter records), March 1916 to October 1923, May 1924 to September 1960 (no winter records). Monthly discharge only for some periods, published in WSP 1308. Published as "at Sherburne Lake" 1912-14.

Gage.--Water-stage recorder. Datum of gage is 4,720.81 ft above mean sea level (Bureau of Reclamation bench mark). Prior to Aug. 10, 1920, staff gages at two sites within 1,000 ft of present site at different datums. Aug. 10, 1920, to May 17, 1921, staff gage at present site and datum.

Average discharge.--7 years (1916-23), 199 cfs (144,100 acre-ft per year), unadjusted.

Extremes.--1912-60: Maximum discharge, 2,280 cfs June 17, 1916 (gage height, 7.85 ft, site and datum then in use); no flow at times when gates in dam were closed.

Remarks.--No diversion. Flow regulated by Lake Sherburne.

Cooperation.--This is one of a number of stations which are maintained jointly by the United States and Canada.

Correction.--In WSP 1308, the figure of runoff in acre-feet for July 1924 is listed in error, it should be 44,100 acre-ft.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	477	-	-	-	-	-	-	674	509	422	505	689	-
1952	438	-	-	-	-	-	-	*221	306	396	494	527	-
1953	61.6	-	-	-	-	-	75.0	540	670	442	532	563	-
1954	66.0	-	-	-	-	0	215	653	339	474	520	653	-
1955	414	-	-	-	-	-	-	53.8	679	323	570	582	-
1956	232	-	-	-	-	-	98.4	741	377	134	518	556	-
1957	230	-	-	-	-	-	158	359	460	381	576	268	-
1958	.08	-	-	-	-	-	62.7	215	492	477	624	277	-
1959	.06	-	-	-	-	35.8	334	681	443	184	602	732	-
1960	388	-	-	-	-	-	52.7	364	286	377	678	399	-

* Not previously published; partly estimated on basis of records for nearby stations.

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	29,530	-	-	-	-	-	-	41,430	30,280	25,980	31,050	40,980	-
1952	26,950	-	-	-	-	-	-	113,580	18,210	24,360	30,380	31,390	-
1953	3,790	-	-	-	-	-	4,470	33,200	39,890	27,180	32,720	33,480	-
1954	4,060	-	-	-	-	0	12,790	40,180	20,190	29,170	31,980	38,860	-
1955	25,460	-	-	-	-	-	-	3,310	40,380	19,870	35,060	34,650	-
1956	14,240	-	-	-	-	-	5,860	45,570	22,430	8,270	31,860	33,110	-
1957	14,110	-	-	-	-	-	9,380	22,050	27,360	23,420	35,420	15,930	-
1958	4.8	-	-	-	-	-	3,730	13,230	29,250	29,340	56,370	16,510	-
1959	4.0	-	-	-	-	-	19,860	41,870	26,370	11,340	37,000	43,570	-
1960	23,870	-	-	-	-	2,200	3,130	22,350	17,030	23,170	41,710	23,770	-

* Not previously published; see footnote to preceding table.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30				Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean
		Discharge	Date				
1950	-	-	-	-	-	-	-
1951	1208	1,420	June 16, 1951	-	-	-	-
1952	1238	1,100	Oct. 1, 1951	-	-	-	-
1953	1278	1,270	June 14, 1953	-	-	-	-
1954	1338	1,920	Sept. 15, 1954	0	-	-	-
1955	1388	1,180	June 24, 1955	-	-	-	-
1956	1438	1,630	May 22, 1956	-	-	-	-
1957	1508	805	June 9, 1957	0	-	-	-
1958	1558	1,070	June 19, 1958	0	-	-	-
1959	1628	1,190	Sept. 30, 1959	0	-	-	-
1960	1708	2,180	July 28, 1960	-	-	-	-

175. St. Mary River near Babb, Mont.

Location.--Lat 48°50'00", long 113°25'00", in SE $\frac{1}{4}$ sec.34, T.36 N., R.14 W., on right bank half a mile upstream from outlet of Lower St. Mary Lake and 2 miles southeast of Babb.

Drainage area.--278 sq mi. Prior to Oct. 1, 1915, 303 sq mi.

Records available.--July 1901 to October 1902, May 1910 to September 1925, October 1950 to September 1960. Monthly discharge only for some periods, published in WSP 1708. Published as "at Main" 1901-2, and as "below Swiftcurrent Creek at Babb" 1910-15. April 1902 to September 1915, May 1929 to September 1932, October 1934 to September 1950 at sites about 1 $\frac{1}{2}$ miles downstream; records not equivalent because flow of Swiftcurrent Creek not included 1902-15 and because diversion by St. Mary Canal not included 1929-50.

Gage.--Water-stage recorder. Datum of gage is 4,468.13 ft above mean sea level, datum of 1929. Prior to Oct. 1, 1915, water-stage recorder or staff gages at several sites about 3 $\frac{1}{2}$ miles downstream at different datums. Oct. 1, 1915, to Sept. 30, 1925, water-stage recorder or staff gages at several sites within 1 $\frac{1}{2}$ miles downstream at different datums.

Average discharge.--26 years (1901-2, 1910-25, 1950-60), 797 cfs (577,000 acre-ft per year), unadjusted.

Extremes.--1901-2, 1910-25, 1950-60: Maximum discharge observed, 9,300 cfs July 4, 1902 [gage height, 6.50 ft, site and datum then in use]; minimum, 26 cfs Jan. 5, 1953 Jan. 8, 1958

Remarks.--Entire flow of Swiftcurrent Creek below Lake Sherburne is diverted into Lower St. Mary Lake above station. Flow of Swiftcurrent Creek regulated by Lake Sherburne since 1919. Stage record for Lower St. Mary Lake may be computed from the rating table.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,031	772	344	256	196	143	404	2,537	2,375	2,330	1,173	1,244	1,073
1952	1,323	259	188	131	96.2	63.0	486	1,781	1,758	1,361	1,017	777	773
1953	213	58.5	33.5	117	185	116	263	1,930	3,575	2,033	1,136	830	877
1954	227	117	103	79.6	126	101	357	2,498	2,789	2,697	1,202	1,092	954
1955	863	356	226	104	88.4	60.5	108	670	2,962	1,895	1,076	799	770
1956	716	364	192	161	85.0	93.1	349	2,341	2,841	1,412	1,045	841	872
1957	551	181	121	94.7	76.2	82.5	237	2,573	2,452	1,090	870	452	736
1958	158	183	87.0	54.8	72.9	103	197	1,911	2,159	1,174	982	587	642
1959	331	246	217	198	147	126	630	1,766	3,071	1,594	1,131	1,291	897
1960	960	422	229	112	88.3	81.6	364	1,132	2,290	1,454	1,067	637	739

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	63,420	45,970	21,170	15,750	10,860	8,790	24,040	156,000	141,300	143,300	72,120	74,000	776,700
1952	81,330	15,430	11,560	8,030	5,540	3,880	28,940	109,500	104,500	83,700	62,550	46,230	561,200
1953	13,100	3,480	2,060	7,180	10,280	7,120	15,670	118,900	212,700	125,000	69,830	49,400	634,700
1954	13,980	6,960	6,310	4,890	6,980	6,230	21,260	153,600	166,000	165,800	73,900	65,000	690,900
1955	53,090	21,170	13,900	6,420	4,910	3,720	6,400	41,210	176,200	116,500	66,190	47,550	557,300
1956	44,040	21,630	11,780	9,910	4,890	5,730	20,760	144,000	169,100	86,800	64,280	50,050	633,000
1957	33,890	10,760	7,440	5,830	4,230	5,070	14,080	158,200	145,900	67,040	53,520	26,920	532,900
1958	9,710	10,920	5,350	3,370	4,050	6,330	11,710	117,500	128,500	72,160	60,370	34,940	464,900
1959	20,360	14,650	13,340	12,180	8,190	7,730	37,490	108,600	182,700	97,980	69,520	76,820	649,600
1960	60,240	25,110	14,080	6,870	5,080	5,020	21,670	69,580	136,300	89,400	65,600	37,910	536,900

Yearly discharge, in cubic feet per second

Year	W. S. P. no.	Water year ending Sept. 30										Calendar year			
		Observed					Adjusted a/					Observed		Adjusted a/	
		Momentary maximum		Minimum	Mean	Acre-feet	Per square mile		Runoff in inches	Mean	Acre-feet	Mean	Acre-feet	Mean	Runoff in inches
		Discharge	Date	day			Mean	square mile							
1951	1208	4,090	June 18, 1951	131	1,073	776,700	1,066	3.83	52.02	1,042	754,500	1,036	50.57		
1952	1238	2,670	Oct. 4, 1951	48	773	561,200	760	2.73	37.17	650	471,500	640	31.34		
1953	1278	5,120	June 14, 1953	27	877	634,700	876	3.15	42.77	889	643,300	896	43.76		
1954	1338	4,960	May 22, 1954	46	954	690,900	969	3.49	47.33	1,039	751,800	1,036	50.84		
1955	1388	4,260	June 26, 1955	40	770	557,300	751	2.71	36.75	755	546,600	757	36.99		
1956	1438	5,110	May 24, 1956	57	872	633,000	885	3.18	43.32	837	607,600	835	40.89		
1957	1508	3,300	June 10, 1957	67	736	532,900	724	2.60	35.37	703	506,800	702	34.28		
1958	1558	2,880	June 12, 1958	36	642	464,900	647	2.33	31.59	670	487,500	689	33.65		
1959	1628	4,300	June 8, 1959	94	897	649,600	900	3.24	43.95	968	700,600	947	46.23		
1960	1708	3,240	June 5, 1960	60	739	536,900	731	2.63	35.79	-	-	-	-		

a Adjusted for change in contents in Lake Sherburne.

185. St. Mary Canal at St. Mary crossing, near Babb, Mont.

(International gaging station)

Location.--Lat 48°56'50", long 113°22'30", in SW $\frac{1}{4}$ sec.19, T.37 N., R.13 W., on left bank 50 ft upstream from inlet of St. Mary River siphon, 7 miles northeast of Babb, and 9 miles downstream from intake.

Records available.--July 1918 to October 1960 (seasonal records only). Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 4,440 ft (from topographic map). Prior to June 14, 1951, water-stage recorder at several sites three-quarters of a mile downstream at different datums.

Extremes.--1918-60: Maximum daily discharge, 767 cfs June 19, 28, 1936; no flow at times each year.

Remarks.--Canal diverts water from left bank of St. Mary River near Babb and discharges into North Fork Milk River. This water flows in the natural channel of Milk River through Canada then back into Montana, where it is used for irrigation in Milk River Valley east of Havre. Some water may be returned to St. Mary River at Kennedy Creek and St. Mary crossings.

Cooperation.--This is one of a number of stations which are maintained jointly by the United States and Canada.

Monthly and seasonal diversion, in acre-feet

Water year			Apr.	May	June	July	Aug.	Sept.			The season
1951			0	0	9,670	29,290	35,750	9,400			84,110
1952			0	0	0	29,670	35,330	34,060			107,200
1953			4,690	32,680	6,440	11,480	30,420	23,400			116,500
1954			0	8,040	23,310	34,940	36,580	4,090			107,000
1955			0	5,300	18,310	32,620	36,700	17,930			110,900
1956			6,910	32,360	35,480	36,590	35,690	32,760			195,100
1957			8,070	37,260	36,210	36,010	34,970	19,860			172,400
1958			2,680	36,390	38,020	39,350	39,430	17,710			172,600
1959			20,960	38,590	37,830	36,350	39,220	38,990			221,300
1960			2,350	31,690	38,240	39,350	39,140	23,530			174,300

* Not previously published.

190. St. Mary Canal at Hudson Bay Divide, near Browning, Mont.

(International gaging station)

Location.--Lat 48°59', long 113°04', in sec.5, T.37 N., R.11 W., on right bank 3 miles upstream from canal outlet and 30 miles north of Browning on Blackfeet Indian Reservation.

Records available.--March 1917 to October 1960 (seasonal records only). Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 4,380 ft (from topographic map). Prior to Sept. 9, 1918, staff gage at site 1 mile upstream at different datum. Apr. 23, 1919, to June 28, 1920, water-stage recorder 40 ft upstream at datum 0.40 ft lower. June 29, 1920, to June 9, 1930, water-stage recorder on left bank opposite present site at present datum.

Extremes.--1917-60: Maximum daily discharge, 758 cfs June 13, 1937; no flow at times each year.

Remarks.--Canal diverts water from left bank of St. Mary River near Babb and discharges into North Fork Milk River. This water flows in the natural channel of Milk River through Canada then back into Montana, where it is used for irrigation in Milk River Valley east of Havre. Some water may be returned to St. Mary River basin at Kennedy Creek, St. Mary and Hall's Coulee crossings.

Cooperation.--This is one of a number of stations which are maintained jointly by the United States and Canada.

Monthly and seasonal diversion, in acre-feet

Water year			Apr.	May	June	July	Aug.	Sept.	Oct.		The season
1951			0	0	9,540	28,920	34,900	10,050	0		83,410
1952			0	0	0	28,090	34,270	32,830	8,620		103,800
1953			4,390	32,350	8,690	10,630	29,170	28,540	2,010		115,800
1954			-	7,470	22,120	33,550	35,340	4,580	-		-
1955			-	45,270	16,900	32,350	36,350	18,460	0		-
1956			6,200	31,650	34,930	35,530	34,810	32,210	16,160		191,500
1957			7,110	36,030	34,800	34,430	33,600	19,670	95		165,700
1958			2,330	35,050	36,990	38,030	37,010	18,070	0		167,500
1959			19,730	37,970	37,230	35,490	37,830	37,840	9,970		216,200
1960			2,090	30,900	37,490	38,650	38,520	24,020	0		171,700

† Corrected.

* Not previously published; estimated on basis of records for St. Mary Canal at St. Mary crossing.

205. St. Mary River at international boundary

(International gaging station)

Location.--Lat 49°00'10", long 113°18'50", in SW $\frac{1}{4}$ sec.5, T.1,R.25 W., fourth meridian, in Alberta, on right bank a quarter of a mile north of international boundary, 2 $\frac{1}{2}$ miles downstream from Boundary Creek, 7 miles southwest of Kimball, Alberta, and 11 miles northeast of Babb, Mont.

Drainage area.--469 sq mi. At site used 1913-55, 497 sq mi.

Records available.--September 1902 to September 1960. Monthly discharge only for some periods, published in WSP 1308. Published as "near Cardston, Alberta" and "at Cook's Ranch, Alberta" 1902-12, and as "near Kimball, Alberta" 1913-55.

Gage.--Water-stage recorder. Altitude of gage is 4,120 ft (from topographic map). Prior to Jan. 1, 1913, wire-weight gages at two sites within a quarter of a mile of present site at different datums. Jan. 1, 1913, to Oct. 25, 1955, water-stage recorder at several sites about 8 miles downstream from present site at various datums.

Average discharge.--14 years (1902-16), prior to operation of St. Mary Canal, 1,003 cfs (726,100 acre-ft per year). 44 years (1916-60), 708 cfs (512,600 acre-ft per year).

Extremes.--1902-60: Maximum discharge, about 40,000 cfs June 5, 1908 (gage height, 12.75 ft, from floodmarks, site and datum then in use), from rating curve extended above 6,000 cfs by logarithmic plotting; minimum daily, 16 cfs Nov. 29, 1936.

Remarks.--Since 1917, St. Mary Canal has diverted water from river near Babb, Mont., to North Fork Milk River. Flow regulated by Lake Sherburne on Swiftcurrent Creek.

Cooperation.--This is one of a number of stations which are maintained jointly by Canada and the United States.

Correction.--In WSP 1308, the mean discharge and runoff for the months of May 1913 and May 1915 are listed in error; they should be 1,913 and 1,644 cfs and 117,626 and 101,086 acre-ft, respectively.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	604	856	408	287	261	260	678	3,322	3,129	2,581	840	1,423	1,224
1952	1,588	448	229	147	151	182	827	2,121	2,018	993	572	273	799
1953	169	107	78.5	175	244	209	454	2,116	5,110	2,210	711	403	1,000
1954	294	194	130	119	175	157	525	3,024	2,842	2,371	719	1,155	980
1955	983	473	261	118	109	66	215	1,141	3,250	1,581	568	567	781
1956	819	455	225	194	127	173	355	2,286	2,712	1,136	564	347	784
1957	369	232	160	126	114	140	199	2,485	2,205	599	369	20	605
1958	247	266	148	76.1	109	143	287	1,706	2,086	751	420	363	552
1959	298	295	274	249	177	216	482	1,833	3,204	1,244	569	762	775
1960	988	514	306	184	127	159	488	868	1,966	961	519	314	617

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	37,160	49,730	24,980	17,650	14,490	16,000	40,360	204,300	186,200	158,700	51,660	85,050	886,300
1952	97,640	26,640	14,050	9,050	8,690	11,170	49,220	130,400	120,100	61,080	35,140	16,830	579,800
1953	10,360	5,360	4,820	10,740	13,550	12,850	26,990	130,100	324,100	135,900	43,720	24,140	723,600
1954	18,110	11,920	8,020	7,320	9,700	9,640	31,240	185,900	118,100	145,800	44,190	68,760	709,300
1955	60,420	28,160	16,060	7,230	6,070	5,270	12,810	70,130	193,400	97,190	34,910	33,850	565,500
1956	50,380	27,070	13,860	11,940	7,300	10,660	21,110	140,500	161,400	69,870	34,650	20,260	569,000
1957	22,680	13,790	9,830	7,780	6,330	8,590	11,850	152,800	131,200	36,850	22,680	12,220	436,600
1958	15,190	15,800	9,100	4,680	6,040	8,800	17,090	104,900	124,100	46,190	25,800	21,730	399,400
1959	23,710	17,570	16,860	15,290	9,830	13,290	28,670	100,400	178,700	76,460	35,010	45,310	561,100
1960	60,740	30,590	18,840	11,320	7,320	9,780	29,050	53,580	117,000	59,110	31,900	18,670	447,700

† Corrected.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	1,027	743,700
1951	1208	9,230	June 24, 1951	191	1,224	86,500	1,261	912,700
1952	1238	3,130	Oct. 5, 1951	134	799	579,800	638	465,100
1953	1278	11,590	June 3, 1953	44	1,000	723,600	1,022	739,700
1954	1338	5,860	May 22, 1954	30	980	709,300	1,072	776,300
1955	1388	4,670	June 25, 1955	25	781	565,500	763	552,200
1956	1438	5,430	May 24, 1956	70	784	569,000	722	524,000
1957	1508	3,560	May 8, 1957	60	605	436,600	595	430,400
1958	1558	3,200	June 12, 1958	50	552	399,400	577	417,500
1959	1628	4,330	June 8, 1959	140	775	561,100	847	613,100
1960	1708	2,950	June 5, 1960	60	617	447,700	-	-

300. Otter Tail River near Detroit Lakes, Minn.

Location.--Lat 46°50', long 95°42', in sec.23, T.139 N., R.40 W., on right bank 10 ft upstream from highway bridge, 5 miles downstream from Height of Land Lake, and 7½ miles east of city of Detroit Lakes.

Drainage area.--270 sq mi.

Records available.--March 1937 to September 1960.

Gage.--Water-stage recorder and concrete control. Datum of gage is 1,409.49 ft above mean sea level, datum of 1929.

Average discharge.--23 years (1937-60), 52.9 cfs (38,300 acre-ft per year).

Extremes.--1937-60: Maximum discharge, 371 cfs June 26, 1943 (gage height, 4.78 ft from graph based on partial record); maximum gage height, 6.96 ft Jan. 27, 1950 (backwater from ice); minimum daily discharge, 0.1 cfs Mar. 23, 1940.

Remarks.--Flow partly regulated by dams of Minnesota Department of Conservation on several lakes above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	5.40	6.37	7.65	5.65	20.5	55.1	74.6	149	142	65.0	16.4	17.0	47.1
1952	35.9	38.7	53.1	56.6	54.1	53.7	106	113	33.8	76.8	93.9	35.4	62.6
1953	14.6	8.67	9.01	7.09	7.79	33.2	86.7	125	189	115	146	81.9	68.9
1954	40.9	21.3	24.4	33.1	37.0	47.1	110	175	120	51.6	10.4	5.10	56.4
1955	13.6	13.5	14.1	10.2	17.0	24.7	53.8	79.6	69.0	83.5	161	84.8	52.3
1956	44.4	13.8	9.40	8.97	11.8	16.8	91.3	122	81.4	25.2	10.6	3.89	36.7
1957	2.15	6.97	7.91	10.0	10.6	18.0	65.3	122	103	102	57.8	47.8	46.3
1958	56.8	4.94	40.1	55.5	46.0	42.3	31.3	27.5	50.7	50.5	27.7	31.1	38.8
1959	16.4	27.7	63.7	48.3	27.4	18.3	44.0	52.9	99.9	106	83.2	56.9	53.9
1960	29.5	24.3	25.9	37.4	17.5	14.0	97.0	160	135	95.0	27.3	†65.6	60.7

† Corrected.

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	332	379	470	348	1,140	3,390	4,440	9,140	8,430	4,000	1,010	1,010	34,090
1952	2,210	2,300	3,280	3,480	3,110	3,300	6,320	6,950	2,010	4,720	5,770	2,110	45,540
1953	900	516	554	436	433	2,040	5,160	7,660	11,220	7,090	9,000	4,980	49,890
1954	2,520	1,270	1,500	2,040	2,060	2,890	6,520	10,740	7,170	3,170	637	303	40,820
1955	839	801	869	626	944	1,520	3,200	4,900	4,100	5,140	9,920	5,050	37,910
1956	2,730	821	578	552	678	1,030	5,430	7,520	4,840	1,550	649	231	26,610
1957	133	415	487	617	589	1,110	3,890	7,480	6,130	6,270	3,550	2,850	33,520
1958	3,490	294	2,460	3,410	2,560	2,600	1,960	1,690	3,020	3,110	1,710	1,850	28,100
1959	1,010	1,650	3,820	2,970	1,520	1,120	2,620	3,250	5,950	6,520	5,110	3,380	39,020
1960	1,810	1,440	1,590	2,300	1,010	861	5,770	9,660	8,010	5,840	1,680	3,910	44,080

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	67.5	48,880
1951	1208	190	June 2, 1951	2.4	47.1	34,090	56.2	40,680
1952	1238	167	Apr. 21, 1952	20	62.8	45,540	54.8	39,740
1953	1278	218	June 15,16,1953	5.3	68.9	49,890	73.5	53,210
1954	1338	193	May 5,11-14,1954	3.1	56.4	40,820	52.5	38,040
1955	1388	198	Aug. 3, 1955	4.6	52.3	37,910	54.8	39,530
1956	1438	139	May 3,4, 1956	1.5	36.7	26,610	32.4	23,520
1957	1508	133	May 14, 1957	1.5	46.3	33,520	53.5	38,750
1958	1558	72	Oct. 16, 1957	3.8	38.8	28,100	39.2	28,390
1959	1628	136	June 11, 1959	3.6	53.9	39,020	51.5	37,280
1960	1708	214	May 3, 1960	13	60.7	44,080	-	-

400. Pelican River near Detroit Lakes, Minn.

Location--Lat 46°43'26", long 95°54'56", in NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.31, T.138 N., R.41 W., in upstream concrete retaining wall at highway crossing at Buck's Mill, 200 ft downstream from concrete millpond dam, and 6 $\frac{1}{2}$ miles southwest of city of Detroit Lakes.

Drainage area--123 sq mi.

Records available--July 1942 to November 1953.

Gage--Staff gage. Altitude of gage is 1,315 ft (from topographic map).

Average discharge--11 years (1942-53), 38.9 cfs (28,160 acre-ft per year).

Extremes--1942-53: Maximum discharge, 229 cfs June 20, 1953; maximum gage height, 4.40 ft Aug. 15, 1952, affected by backwater from aquatic vegetation; minimum daily discharge, 0.1 cfs Sept. 4, 1950, and many days during 1951.

Remarks--Flow regulated by lakes above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.16	0.13	0.80	8.00	13.2	23.9	46.0	64.3	70.9	33.1	16.2	15.6	24.4
1952	32.9	35.0	56.5	55.4	41.4	34.3	83.8	92.1	9.00	103	147	83.7	64.8
1953	13.5	2.61	1.43	1.56	1.38	77.2	131	109	198	106	70.1	61.2	64.5
1954	18.7	9.75	-	-	-	-	-	-	-	-	-	-	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	10	7.9	49	492	732	1,470	2,740	3,960	4,220	2,030	999	926	17,640
1952	2,020	2,080	3,470	3,410	2,380	2,110	4,990	5,660	539	6,330	9,050	4,980	47,020
1953	831	155	88	96	77	4,750	7,790	6,690	11,780	6,510	4,310	3,640	46,720
1954	1,150	580	-	-	-	-	-	-	-	-	-	-	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	38.4	27,840
1951	1208	a117	June 3, 1951	0.1	24.4	17,640	34.7	25,140
1952	1238	a214	Aug. 15, 1952	2.4	64.8	47,020	55.8	40,520
1953	1278	229	June 20, 1953	.8	64.5	46,720	-	-

a Maximum observed.

405. Pelican River near Fergus Falls, Minn.

Location.--Lat 46°20'10", long 96°07'00", in NE $\frac{1}{4}$ sec.17, T.133 N., R.43 W., on right bank 90 ft downstream from bridge on U.S. Highway 52, 3 miles northwest of Fergus Falls, and 7 $\frac{1}{2}$ miles upstream from mouth.

Drainage area.--482 sq mi.

Records available.--June 1909 to December 1912, July 1942 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,179.98 ft above mean sea level, datum of 1929 (levels by Minnesota Highway Department). June 19, 1909, to Dec. 31, 1912, staff gage at site 1 mile downstream at different datum. July 1, 1942, to Nov. 6, 1955, staff gage at present site and datum.

Average discharge.--20 years (1910-12, 1942-60), 70.0 cfs (50,680 acre ft per year).

Extremes.--1909-12, 1942-60: Maximum discharge, 756 cfs Mar. 29, 1943 (gate height, 5.53 ft); maximum gage height observed, 5.60 ft Mar. 28, 1950 (backwater from ice); no flow for many days in 1946, 1949, and 1950.

Remarks.--Flow affected by storage in lakes above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	21.6	23.9	36.0	33.6	32.1	36.0	138	113	103	68.7	48.5	61.2	59.6
1952	68.3	89.6	105	117	98.9	99.0	231	151	85.1	97.2	106	105	113
1953	76.7	57.0	38.2	29.6	25.9	54.4	171	200	356	266	179	130	132
1954	111	116	94.1	57.5	64.3	126	161	167	151	107	56.5	47.0	105
1955	38.4	30.3	20.6	19.8	22.9	32.6	107	86.9	85.5	123	116	105	65.9
1956	108	64.5	28.8	25.5	27.9	35.4	207	195	128	52.3	47.5	20.3	78.4
1957	10.8	12.4	8.39	6.03	3.83	43	94.1	136	112	87.4	88.5	108	59.4
1958	87.2	76.5	56.6	49.4	41.5	55.0	69.2	52.8	52.3	1108	65.2	70.3	65.5
1959	40.5	50.5	39.1	28.3	27.3	78.9	78.9	104	129	87.5	56.9	58.8	65.2
1960	66.1	58.6	55.0	65.1	58.0	60.6	149	175	125	71.8	40.9	46.8	80.9

† Corrected.

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,330	1,420	2,210	2,070	1,780	2,210	8,200	6,960	6,120	4,220	2,980	3,640	43,140
1952	4,200	5,330	6,450	7,220	5,690	6,090	13,770	9,270	5,070	5,980	6,530	6,280	81,880
1953	4,710	3,390	2,350	1,820	1,440	3,350	10,160	12,290	21,180	16,330	11,000	7,710	95,730
1954	6,800	6,920	5,790	3,540	3,570	7,730	9,590	10,280	8,960	6,600	3,480	2,800	76,060
1955	2,360	1,800	1,270	1,220	1,270	2,010	6,390	5,340	5,090	7,560	7,120	6,270	47,700
1956	6,640	3,840	1,770	1,560	1,610	2,180	12,340	12,000	7,610	3,210	2,920	1,210	56,890
1957	663	758	516	371	213	2,640	5,600	8,340	6,680	5,370	5,440	6,420	42,990
1958	5,360	4,550	3,480	3,040	2,300	3,380	4,120	3,250	3,110	6,630	4,010	4,180	47,410
1959	2,490	3,010	2,400	1,740	1,520	4,850	4,690	6,410	7,680	5,380	3,500	3,500	47,170
1960	4,060	3,490	3,380	4,000	3,330	3,730	8,880	10,730	7,440	4,420	2,510	2,790	58,760

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	72.6	53,290
1951	1208	177	Apr. 7, 1951	-	59.6	43,140	74.8	54,160
1952	1238	388	Apr. 14, 1952	53	113	81,880	105	76,350
1953	1278	680	June 15-16, 1953	25	132	95,730	145	104,800
1954	1338	242	July 2, 1954	13	105	76,060	85.6	61,980
1955	1388	250	Apr. 4, 1955	19	65.9	47,700	75.3	54,520
1956	1438	315	Apr. 13, 1956	12	78.4	56,890	64.1	46,560
1957	1508	216	Apr. 20, 1957	1.2	59.4	42,990	75.2	54,460
1958	1558	125	July 6, 7, 1958	35	65.5	47,410	57.9	41,920
1959	1628	164	May 31, 1959	25	65.2	47,170	65.3	50,200
1960	1708	206	Apr. 27, 1960	21	80.9	58,760	-	-

459.5 Orwell Reservoir near Fergus Falls, Minn.

Location.--Lat 46°12'55", long 96°10'40", in SW $\frac{1}{4}$ sec.26, T.132 N., R.44 W., at dam on Otter Tail River at outlet of Orwell Reservoir, 7 miles southwest of Fergus Falls, Minn.

Drainage area.--1,830 sq mi, approximately.

Records available.--March 1953 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,000.00 ft above mean sea level, adjustment of 1912. Gage readings reduced to elevations above mean sea level.

Extremes.--1953-60: Maximum contents, 15,290 acre-ft June 17, 1953 (elevation, 1,071.03 ft); minimum (after initial filling), 844 acre-ft Aug. 26, 27, 1953 (elevation, 1,046.96 ft).

Remarks.--Reservoir is formed by earth dam with concrete spillway with one tairtor gate; storage began in March 1953. Capacity at elevation 1,075 ft (maximum operating stage) is 20,400 acre-ft of which 19,400 acre-ft is controlled storage above elevation 1,048 ft (minimum operating stage). Dead storage, 210 acre-ft. Reservoir is used for flood control and to increase low flow for water supply and pollution abatement. Records of chemical analyses for october 1954 are published in report of the Geological Survey.

Cooperation.--Records furnished by Corps of Engineers.

Water year	Contents, in acre-feet, on last day of month												The year
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	0	720	5,630	12,920	9,510	960	1,500	6,440	-
1954	14,110	13,600	9,690	3,770	2,790	970	1,380	1,610	1,340	1,160	5,810	7,370	-
1955	13,890	13,810	10,420	4,180	2,090	1,870	5,490	7,690	8,880	9,800	8,860	8,870	-
1956	12,840	9,550	8,740	3,110	2,520	1,260	1,120	1,740	1,060	3,650	5,270	5,690	-
1957	6,460	11,280	12,820	10,650	8,680	5,690	5,690	5,420	5,600	3,670	4,080	7,200	-
1958	12,800	13,660	8,740	5,480	4,010	1,180	1,140	2,080	7,120	8,120	9,880	13,190	-
1959	14,220	13,770	13,290	9,040	6,500	5,940	4,880	5,880	5,820	4,480	8,840	11,060	-
1960	13,660	12,550	11,020	9,200	7,200	7,030	9,000	8,120	4,740	3,340	6,200	9,900	-

460. Otter Tail River below Orwell Dam, near Fergus Falls, Minn.

Location.--Lat 46°12'35", long 96°11'05", in NE $\frac{1}{4}$ sec.34, T.132 N., R.44 W., on left bank 0.7 mile downstream from Orwell Dam, 6.1 miles downstream from Dayton Hollow Dam, 8 miles southwest of Fergus Falls, and 11.1 miles downstream from Pelican River.

Drainage area.--1,830 sq mi, approximately. Nov. 18, 1933, to Mar. 21, 1953, 1,810 sq mi, approximately.

Records available.--October 1930 to September 1960. Prior to October 1952, published as Otter Tail River below Pelican River, near Fergus Falls, Minn.

Gage.--Water-stage recorder. Datum of gage is 1,029.65 ft above mean sea level, adjustment of 1912 (levels by Corps of Engineers). Oct. 11, 1930, to Nov. 17, 1933, at same site at datum 2.00 ft higher; Nov. 18, 1933, to Mar. 21, 1953, at site 6.1 miles upstream at datum 40.30 ft higher.

Average discharge.--30 years (1930-60), 252 cfs (182,400 acre-ft per year).

Extremes.--1930-60: Maximum discharge, 1,710 cfs June 17, 1953 (gage height, 5.60 ft, backwater from aquatic vegetation); minimum, 1.0 cfs May 2, 1934, Sept. 30, 1935; minimum daily, 1.6 cfs Feb. 7, 1937.

Remarks.--Flow regulated by Orwell Reservoir beginning Mar. 21, 1953, and by powerplants upstream.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	131	98.2	111	144	200	260	608	635	662	463	332	322	331
1952	324	353	441	479	484	489	787	823	564	426	447	463	506
1953	349	242	203	169	212	334	421	558	1,260	1,250	747	507	523
1954	395	466	444	400	312	482	614	856	903	522	189	229	485
1955	117	146	211	230	190	240	410	355	319	467	466	502	305
1956	390	322	185	235	194	235	642	808	652	247	192	109	351
1957	68.9	44.0	2	111	113	275	377	592	578	436	436	436	322
1958	351	395	392	282	272	401	382	218	143	332	226	189	299
1959	153	163	155	239	234	289	321	319	516	431	208	172	267
1960	152	173	218	236	254	234	484	785	703	426	171	116	329

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	8,070	5,850	6,830	8,830	11,100	16,010	36,160	39,040	39,360	28,500	20,420	19,140	239,300
1952	19,910	21,020	27,140	29,430	27,880	30,050	46,850	50,590	33,550	26,200	27,480	27,570	367,600
1953	21,480	14,410	12,490	10,410	11,780	20,530	25,050	34,330	75,090	76,600	45,920	30,170	378,300
1954	24,320	27,710	27,280	24,600	17,330	29,640	36,540	52,610	53,740	32,080	11,630	13,630	351,100
1955	7,220	8,690	13,000	14,150	10,560	14,760	24,420	21,840	19,000	28,690	28,640	29,860	220,800
1956	23,960	19,140	11,380	14,480	11,160	14,450	38,220	49,670	38,790	15,190	11,790	6,510	254,700
1957	4,250	2,620	4,260	6,820	6,260	16,900	25,390	39,000	35,250	35,560	30,630	25,940	232,900
1958	21,590	23,480	23,480	17,510	15,100	24,660	22,710	13,420	9,480	20,410	13,890	11,640	216,200
1959	9,410	9,700	9,500	14,690	12,970	17,760	19,100	19,590	30,680	26,490	12,810	10,240	192,900
1960	9,330	10,310	13,380	14,510	14,630	14,400	28,850	46,280	41,810	26,190	10,540	6,890	239,100

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	347	251,100
1951	1208	1,160	Apr. 5, 1951	22	331	239,300	396	286,600
1952	1238	1,040	Apr. 10, 1952	267	506	367,600	479	348,000
1953	1278	1,710	June 17, 1953	66	523	378,300	565	409,200
1954	1338	1,210	June 20, 1954	79	485	351,100	415	300,700
1955	1398	750	Aug. 6, 1955	82	305	220,800	340	246,400
1956	1438	1,080	May 29, 1956	46	351	254,700	291	211,400
1957	1508	794	May 23, 1957	20	322	232,900	401	290,300
1958	1558	534	Mar. 4, 5, 1958	100	299	216,200	243	176,200
1959	1628	612	June 8, 1959	124	267	192,900	273	197,400
1960	1708	810	May 26, 1960	60	329	239,100	-	-

475. Mustinka ditch above West Branch Mustinka River,
near Charlesville, Minn.

Location.--Lat 45°53'25", long 96°21'30", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.17, T.128 N., R.45 W., near right bank on upstream side of highway bridge, 0.2 mile upstream from West Branch Mustinka River, 6 miles southwest of Charlesville, and 7.8 miles northeast of Wheaton.

Records available.--April 1943 to September 1955. Monthly discharge only for some periods, published in WSP 1308. Prior to October 1949, published as "above Twelve Mile Creek, near Charlesville."

Gage.--Staff gage. Datum of gage is 990.00 ft above mean sea level, adjustment of 1912 (levels by Corps of Engineers). Prior to May 11, 1948, reference mark at same site referred to same datum.

Average discharge.--10 years (1943-45, 1947-55), 15.8 cfs (11,440 acre-ft per year).

Extremes.--1943-55: Maximum discharge, 1,550 cfs Apr. 9, 1952 (gage height, 14.19 ft), from rating curve extended above 320 cfs on basis of slope-area measurement of peak flow; no flow for several months most years.

Remarks.--Slight regulation on some days from dam east of Norcross. At very high stages flow bypasses the station via Five Mill Creek basin which crosses Mustinka ditch 0.4 mile above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2.78	1.41	0.03	0	0.21	0	156	52.6	29.5	15.0	3.60	1.93	21.8
1952	7.77	3.52	2.24	.81	0	0	311	69.4	16.3	22.5	3.36	1.53	36.2
1953	.07	.44	.90	.32	.30	15.9	21.8	13.6	15.7	2.74	.44	0	6.02
1954	.14	1.35	.10	0	0	2.95	14.8	13.4	47.0	7.45	3.58	4.48	7.90
1955	1.96	2.49	.68	.02	0	1.29	15.5	2.74	13.1	24.6	1.93	.29	5.40

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	171	84	2.0	0	12	0	9,300	3,240	1,750	925	221	115	15,820
1952	478	210	138	50	0	0	18,510	4,260	967	1,380	207	91	26,290
1953	4.2	26	55	19	17	975	1,300	835	934	169	27	0	4,360
1954	8.3	80	8.0	0	0	180	881	822	2,790	458	220	265	5,710
1955	120	148	42	1.0	0	79	925	168	778	1,510	118	17	3,910

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30				Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean
		Discharge	Date				
1950	-	-	-	-	-	-	29.4
1951	1208	*534	Apr. 7, 1951	0	21.8	15,820	22.6
1952	1238	1,550	Apr. 9, 1952	0	36.2	26,290	35.2
1953	1278	*77	June 27, 1953	0	6.02	4,360	6.04
1954	1338	280	June 8, 1954	0	7.90	5,710	8.19
1955	1388	162	July 13, 1955	0	5.40	3,910	-

* Not previously published.

480. Mustinka ditch below West Branch Mustinka River
near Charlesville, Minn.

Location.--Lat 45°53'20", long 96°21'45", in SE¹/₄SE¹/₄ sec.18, T.128 N., R.45 W., on right bank 100 ft downstream from inlet structure to West Branch Mustinka River, 6 miles southwest of Charlesville, and 7.7 miles northeast of Wheaton.

Records available.--April 1943 to September 1955. Prior to October 1949, published as "below Twelve Mile Creek, near Charlesville."

Gage.--Staff gage. Datum of gage is 987.00 ft above mean sea level, adjustment of 1912 (levels by Corps of Engineers). Prior to May 11, 1948, reference mark and May 11, 1948, to July 10, 1955, staff gage, at site on West Branch Mustinka River 40 ft downstream from inlet to Mustinka ditch, at datum 3.00 ft higher.

Average discharge.--12 years (1943-55), 8.60 cfs (6,230 acre-ft per year).

Extremes.--1943-55: Maximum discharge, 997 cfs Apr. 9, 1952, from rating curve extended above 270 cfs (gage height, 13.73 ft, from floodmark); no flow for several months each year.

Remarks.--Flow is diverted to Mustinka ditch at medium and high stages, to relieve flood conditions in West Branch Mustinka River basin. Dredging of Mustinka ditch passed inlet from West Branch Mustinka River May 25, 1955, and thereafter all flow diverted into Mustinka ditch except that at medium and high stages which is partly diverted in West Branch.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0	0	0	0	0	0	110.9	7.53	1.91	0.10	0	0	9.92
1952	0	0	0	0	0	0	252	17.0	.84	3.99	0	0	22.5
1953	0	0	0	0	0	6.70	.10	.03	4.03	.08	0	0	.92
1954	0	0	0	0	0	0	.52	.02	13.9	0	0	0	1.18
1955	0	0	0	0	0	1.10	.44	.75	20.2	49.1	3.88	.37	6.39

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0	0	0	0	0	0	8,600	463	114	6.3	0	0	7,180
1952	0	0	0	0	0	0	15,020	1,040	50	246	0	0	16,360
1953	0	0	0	0	0	412	6.1	1.8	240	4.8	0	0	665
1954	0	0	0	0	0	0	31	1.4	825	0	0	0	857
1955	0	0	0	0	0	68	26	46	1,200	3,020	239	22	4,620

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year			
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet		
		Discharge	Date							
1950	-	-	-	-	-	-	15.3	-	11,040	
1951	1208	a500	Apr. 7, 1951	0	9.92	7,180	9.92	7,180		
1952	1238	997	Apr. 9, 1952	0	22.5	16,360	22.5	16,360		
1953	1278	47	June 27, 1953	0	.92	665	.92	665		
1954	1338	207	June 8, 1954	0	1.18	857	1.18	857		
1955	1388	318	July 13, 1955	0	6.39	4,620	-	-		

a Maximum daily discharge.

485. West Branch Mustinka River below Mustinka ditch, near Charlesville, Minn.

Location.--Lat 45°53'20", long 96°21'45", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.18, T.128 N., R.45 W., on left bank 150 ft downstream from inlet from Mustinka ditch, $\frac{1}{2}$ miles upstream from mouth, 6 miles southwest of Charlesville, and 7.7 miles northeast of Wheaton.

Records available.--April 1943 to September 1955. Monthly discharge only for some periods, published in WSP 1308. Prior to October 1949, published as Twelve Mile Creek below Mustinka ditch, near Charlesville.

Gage.--Staff gage. Datum of gage is 990.00 ft above mean sea level, adjustment of 1912 (levels by Corps of Engineers). Prior to May 11, 1948, reference mark and May 11, 1948, to July 10, 1955, staff gage, at site 110 ft upstream at same datum.

Average discharge.--12 years (1943-55), 50.7 cfs (36,710 acre-ft per year).

Extremes.--1943-55: Maximum discharge, 13,700 cfs Apr. 9, 1952 (gage height, 13.73 ft, from floodmarks), from rating curve extended above 1,200 cfs on basis of slope-area measurement of peak flow; no flow most winters.

Remarks.--Flow diverted to Mustinka ditch at medium and high stages to relieve flood conditions in West Branch Mustinka River basin. Diverted flow discharged into Mustinka River 6.4 miles upstream from gaging station on Mustinka River above Wheaton. Dredging of Mustinka ditch passed inlet from West Branch Mustinka River May 25, 1955, and thereafter all flow diverted into Mustinka ditch except that at medium and high stages which is partly diverted into West Branch.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	3.15	1.58	0.04	0	0	0.24	522	113	78.4	59.7	4.56	2.26	63.4
1952	7.25	3.36	3.71	1.15	0	0	1,582	195	40.7	86.5	16.2	4.27	159
1953	.36	.86	1.13	1.66	.82	137	63.6	34.3	58.7	16.3	.55	0	26.3
1954	.20	1.65	.13	0	0	17.4	35.1	29.1	104	8.17	4.01	5.25	17.0
1955	3.15	2.92	.91	.03	0	8.75	28.9	2.60	0	5.46	0	0	4.39

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	193	94	2.2	0	0	15	31,070	6,970	4,660	2,440	280	135	45,860
1952	445	200	228	70	0	0	94,150	11,980	2,420	5,320	994	254	116,100
1953	22	51	70	40	46	8,410	3,790	2,110	3,500	1,000	34	0	19,070
1954	12	98	7.7	0	0	1,070	2,090	1,790	6,210	502	247	313	12,340
1955	193	174	56	1.8	0	538	1,720	160	0	336	0	0	3,180

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	83.8	60,670
1951	1208	2,800	Apr. 7, 1951	0	63.4	45,860	64.2	46,440
1952	1238	13,700	Apr. 9, 1952	0	159	116,100	159	115,300
1953	1278	4532	Mar. 23, 1953	0	26.5	19,070	26.5	19,050
1954	1338	794	June 8, 1954	0	17.0	12,340	17.5	12,640
1955	1388	178	Apr. 1, 1955	0	4.39	3,180	-	-

* Not previously published.

490. Mustinka River above Wheaton, Minn.

Location.--Lat 45°49'15", long 96°29'25", in SW $\frac{1}{4}$ sec.8, T.127 N., R.46 W., on left bank 20 ft upstream from bridge on U.S. Highway 75, 1 mile upstream from Chicago, Milwaukee, St. Paul and Pacific Railroad bridge, 1.2 miles north of railroad depot in Wheaton, and 8 miles upstream from mouth.

Drainage area.--834 sq mi.

Records available.--October 1915 to September 1924, October 1930 to September 1958.

Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 973.30 ft above mean sea level, datum of 1929 (levels by Minnesota Highway Department). June to November 1916 staff gage at site $\frac{3}{8}$ miles downstream at different datum. March 1917 to September 1924, chain gage at site 100 ft upstream from present site at different datum. March 1931 to Oct. 30, 1945, chain gage and Oct. 31, 1945, to Oct. 21, 1946, temporary staff gage and reference point in vicinity of present gage. October 22, 1946, to June 30, 1954, wire-weight gage at site 20 ft downstream at datum 4.00 ft higher. July 1, 1954, to Apr. 2, 1956, wire-weight gage at site 20 ft downstream at same datum.

Average discharge.--37 years (1915-24, 1930-58), 44.9 cfs (32,510 acre-ft per year).

Extremes.--1915-24, 1930-58: Maximum discharge, 7,320 cfs Apr. 10, 1952 (gage height, 16.56 ft, from graph based on gage readings); no flow at times in most years.

Remarks.--Some diversion to Rabbit Creek basin about 10 miles upstream during periods of very high flow.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2.42	1.47	0.18	0.01	0.39	0.06	673	117	82.7	43.7	5.25	1.96	76.8
1952	4.70	6.81	3.54	2.03	1.27	1.38	1,767	225	50.3	69.0	7.97	4.68	177
1953	.26	.43	1.09	.74	.82	154	73.1	42.1	92.8	35.7	1.34	0	33.7
1954	.006	.74	.23	0	0	17.1	43.6	26.3	91.1	9.16	5.86	5.73	16.6
1955	2.84	3.54	.81	.04	0	16.7	61.0	3.49	18.3	.68.7	3.72	.57	14.8
1956	.18	.01	0	0	0	.06	143	70.7	40.2	6.82	75.3	4.50	28.3
1957	.48	2.89	1.49	.10	0	33.7	169	98.8	221	34.5	20.4	25.0	50.5
1958	20.9	41.3	4.47	.73	11.0	104	124	21.0	7.20	4.01	1.55	2.20	28.5
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	149	87	11	0.6	22	4.0	40,070	7,200	4,920	2,690	323	117	55,590
1952	289	405	217	125	73	85	105,100	13,820	2,990	4,240	490	278	128,100
1953	16	26	67	45	46	9,450	4,350	2,590	5,520	2,200	82	0	24,390
1954	.4	44	14	0	0	1,050	2,600	1,620	5,420	563	361	341	12,010
1955	175	210	50	2.4	0	1,050	3,630	215	1,090	4,230	229	34	10,900
1956	11	.4	0	0	0	3.6	8,510	4,340	2,390	419	4,630	268	20,580
1957	30	172	91	6.1	0	2,070	10,050	6,080	13,190	2,120	1,250	1,490	36,540
1958	1,280	2,460	275	44.8	611	6,380	7,370	1,290	428	246	96	131	20,620
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	116	84,200
1951	1208	#3,180	Apr. 8, 1951	0	76.8	55,590	77.7	56,260
1952	1238	7,320	Apr. 10, 1952	.9	177	128,100	175	127,300
1953	1278	#572	Mar. 26, 1953	0	33.7	24,390	33.6	24,340
1954	1338	393	June 9, 1954	0	16.6	12,010	17.1	12,390
1955	1398	484	July 13, 1955	0	14.8	10,900	14.5	10,470
1956	1438	655	May 29, 1956	0	28.3	20,580	28.7	20,860
1957	1508	1,610	Apr. 21, 1957	0	50.5	36,540	55.6	40,270
1958	1558	690	Apr. 8, 1958	0	28.5	20,620	-	-
1959	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-

† Not previously published.

500. Bois de Sioux River near White Rock, S. Dak.

Location.--Lat 45°51'45", long 96°34'25", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.27, T.128 N., R.47 W., on left bank just downstream from Big Slough Outlet, 300 ft downstream from White Rock Dam, 4 miles south of White Rock, and 5 miles northwest of Wheaton, Minn.

Drainage area.--1,160 sq mi, approximately.

Records available.--October 1941 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 959.89 ft above mean sea level, adjustment of 1912 (levels by Corps of Engineers). Prior to Jan. 14, 1943, staff gage at same site and datum.

Average discharge.--19 years (1941-60), 74.3 cfs (53,790 acre-ft per year).

Extremes.--1941-60: Maximum discharge, 1,410 cfs June 3, 1952 (gage height, 10.36 ft); no flow at times in most years.

Remarks.--Flow regulated by Lake Traverse-Bois de Sioux Flood Control and Water Conservation project (available capacity for flood control, 137,000 acre-ft).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	4.87	20.5	20.0	6.36	1.02	3.88	186	820	331	69.6	29.5	4.94	126
1952	4.49	13.0	22.9	20.5	12.7	55.0	260	1,002	944	260	7.52	15.6	218
1953	.43	.48	.07	0	0	28.9	9.86	74.0	57.9	60.2	33.4	15.6	23.6
1954	1.85	1.19	0	0	0	2.89	5.56	4.66	6.75	2.00	1.33	2.36	2.38
1955	1.31	.85	.08	0	0	4.12	5.91	1.66	2.81	18.1	3.69	.72	3.30
1956	.41	.04	0	0	0	.01	13.1	3.29	1.35	.31	5.85	.28	2.05
1957	.16	.70	.13	0	0	1.20	24.3	235	324	154	14.8	24.8	63.5
1958	33.6	39.0	4.32	3.6	10.8	41.9	223	41.5	7.74	6.51	.21	.79	35.1
1959	.12	0	0	0	0	1.50	.60	1.45	4.36	3.75	09	.003	.99
1960	.02	0	0	0	0	1.87	19.1	72.8	68.5	19.6	.13	0	15.2

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	299	1,220	1,230	393	57	238	11,060	50,440	19,680	4,280	1,810	294	91,000
1952	276	776	1,410	1,260	732	3,380	15,470	61,590	56,190	16,010	463	21	†157,600
1953	26	28	4.2	0	0	1,770	587	4,550	3,450	3,700	2,050	930	17,100
1954	114	71	0	0	0	178	331	286	402	123	82	141	1,730
1955	80	50	†5.2	0	0	253	352	102	167	1,110	227	43	2,390
1956	25	2.4	0	0	0	.8	780	202	80	19	360	17	1,490
1957	9.9	†41	7.9	0	0	74	1,450	14,460	19,310	8,270	910	1,480	46,010
1958	2,080	2,320	266	839	600	2,580	13,270	2,550	460	400	13	47	25,420
1959	7.5	0	0	0	0	92	36	89	259	230	5.4	.2	719
1960	1.0	0	0	0	0	115	1,130	4,480	4,080	1,210	8.1	0	11,020

† Corrected.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet	
		Discharge	Date						
1950	-	-	-	-	-	-	145	104,900	
1951	1208	959	May 16, 1951	0	126	91,000	125	90,710	
1952	1238	1,410	June 3, 1952	0.3	218	†157,600	214	155,200	
1953	1278	187	May 27, 1953	0	23.6	17,100	23.8	17,220	
1954	1338	124	Sept. 17, 1954	0	2.38	1,730	2.32	1,680	
1955	1368	152	July 11, 1955	0	3.30	2,390	3.15	†2,280	
1956	1438	303	Aug. 8, 1956	0	2.05	1,490	21.0	1,520	
1957	1508	610	June 22, 1957	0	63.5	46,010	69.9	50,620	
1958	1558	418	Apr. 16, 1958	.1	35.1	25,420	28.7	20,770	
1959	1628	43	July 5, 1959	0	.99	719	.99	713	
1960	1708	131	June 11, 1960	0	15.2	11,020	-	-	

† Corrected.

510. Rabbit Creek at Campbell, Minn.

Location.--Lat 46°05'40", long 96°24'40", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 2, T.130 N., R.46 W., near center of span on upstream side of highway bridge in Campbell, 1 mile downstream from South Fork and 10 miles upstream from mouth.

Drainage area.--266 sq mi.

Records available.--June 1942 to November 1951.

Gage.--Wire-weight gage. Altitude of gage is 970 ft (from topographic map). Prior to Mar. 29, 1943, staff gage and Apr. 8, 1943, to Aug. 10, 1948, chain gage, at same site and datum.

Average discharge.--9 years (1942-51), 36.0 cfs (26,060 acre-ft per year).

Extremes.--1942-51: Maximum discharge, 1,940 cfs Apr. 7, 1951 (gage height, 12.10 ft); maximum gage height, 15.07 ft Apr. 2, 1943, from floodmark (backwater from ice); no flow during large part of each year.

Remarks.--During periods of very high flow, some water is diverted from Mistinka River basin.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.48	0.18	0.02	0	0	4.55	487	9.73	20.0	2.88	0.50	0.38	43.3
1952	1.37	.74	-	-	-	-	-	-	-	-	-	-	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	29	11	1.0	0	0	280	29,010	598	1,190	177	31	23	31,350
1952	84	44	-	-	-	-	-	-	-	-	-	-	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	45.9	33,220
1951	1208	1,940	Apr. 7, 1951	0	43.3	31,350	-	-

515. Red River of the North at Wahpeton, N. Dak.

Location.--Lat 46°15'55", long 96°35'40", in NE $\frac{1}{4}$ sec.8, T.132 N., R.47 W., on left bank in Wahpeton, 800 ft downstream from confluence of Bois de Sioux and Otter Tail Rivers and at mile 548.6.

Drainage area.--4,010 sq mi, approximately.

Records available.--April 1942 to September 1960. Gage-height records collected in this vicinity since 1917 are contained in reports of U.S. Weather Bureau.

Gage.--Water-stage recorder and concrete and wooden dam. Datum of gage is 913 ft above mean sea level, datum of 1929. Prior to Aug. 6, 1943, U.S. Weather Bureau staff gage 800 ft upstream, converted to present datum. Aug. 6, 1943, to Oct. 27, 1950, chain gage at present site and datum.

Average discharge.--17 years (1943-60), 506 cfs (366,300 acre-ft per year).

Extremes.--1942-60: Maximum discharge, 7,130 cfs Apr. 12, 1952 (gage height, 14.99 ft); minimum, 10 cfs Sept. 27, 1960 (gage height, 2.46 ft).
Maximum stage known, 17.0 ft in spring of 1897.

Remarks.--Flow regulated by Orwell Reservoir (capacity, 28,400 acre-ft), Lake Traverse (capacity, 137,000 acre-ft, available for flood control), numerous other controlled lakes and ponds, and several powerplants.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	146	124	126	155	148	242	2,208	1,615	1,063	593	371	332	594
1952	355	385	501	525	535	468	3,161	1,876	1,554	746	409	443	910
1953	352	236	189	167	193	550	543	756	1,669	1,347	856	565	620
1954	368	463	454	377	350	562	677	852	1,041	541	201	235	512
1955	124	138	199	245	186	266	543	330	306	510	445	448	332
1956	376	305	184	248	216	260	847	812	699	241	273	119	381
1957	70.8	49.7	65.7	106	114	448	672	931	1,067	790	522	462	443
1958	375	461	385	316	285	485	656	260	141	363	228	179	345
1959	143	160	173	260	245	315	370	426	564	514	214	162	296
1960	153	147	202	234	249	344	902	869	797	467	181	112	387

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	8,990	7,400	7,760	9,540	8,210	14,860	131,400	99,310	63,230	36,450	22,800	19,730	429,700
1952	21,810	22,900	30,820	32,250	30,780	28,800	188,100	115,400	92,490	45,880	25,170	26,390	660,800
1953	21,620	14,030	11,630	10,240	10,700	33,790	32,300	46,480	99,330	82,800	52,650	33,610	449,200
1954	23,850	27,540	27,900	23,170	19,450	34,550	40,280	52,370	61,970	33,240	12,340	13,970	370,600
1955	7,640	8,180	12,220	15,090	10,350	16,380	32,310	20,300	18,200	31,340	27,390	26,660	226,100
1956	23,130	18,170	11,310	15,230	12,400	15,970	50,420	49,930	41,620	14,800	16,780	7,060	276,800
1957	4,350	2,960	4,040	6,520	6,330	27,560	39,990	57,240	63,520	48,600	32,070	27,470	320,600
1958	23,060	27,430	23,700	19,460	15,850	29,790	39,040	15,970	8,420	22,300	14,000	10,680	249,700
1959	8,770	9,520	10,610	15,970	13,610	19,400	22,020	26,180	33,560	31,620	13,150	9,650	214,100
1960	9,380	8,750	12,400	14,360	14,320	21,120	53,650	53,440	47,420	28,690	11,120	6,640	281,300

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30				Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean
		Discharge	Date				
1950	-	-	-	-	-	-	657
1951	1208	6,090	Apr. 7, 1951	70	594	429,700	664
1952	1238	7,130	Apr. 12, 1952	182	910	660,800	871
1953	1278	3,150	June 21, 1953	92	620	449,200	665
1954	1338	1,860	June 9, 1954	83	512	370,600	441
1955	1388	1,150	Apr. 2, 1955	67	312	226,100	346
1956	1438	1,980	Apr. 14, 1956	43	381	276,800	324
1957	1508	2,290	Apr. 22, 1957	15	443	320,600	530
1958	1558	866	Apr. 15, 1958	99	345	249,700	282
1959	1628	1,050	May 27, 1959	91	296	214,100	298
1960	1708	2,370	Apr. 7, 1960	14	367	281,300	-

RED RIVER OF THE NORTH BASIN

516. Wild Rice River near Rutland, N. Dak.

Location.--Lat 46°01'20", long 97°30'40", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.36, T.130 N., R.55 W., on bank 1,000 ft upstream from bridge on county highway, 2 miles south of Rutland, and 10 miles upstream from Lake Tewaunkon.

Drainage area (revised).--546 sq mi, of which about 250 sq mi is probably noncontributing.

Records available.--October 1959 to September 1960.

Gage.--Staff gage.

Extremes.--1959-60: Maximum discharge, 102 cfs Apr. 15 (gage height, 4.80 ft); no flow for several months.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1960	0	0	0	0	0	0.18	41.8	1.51	0.21	0.06	0	0	3.59

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1960	0	0	0	0	0	11	2,480	93	12	3.6	0	0	2,600

517. Wild Rice River near Cayuga, N. Dak.

Location.--Lat 46°07'30", long 97°21'40", on line between secs. 29 and 30, T.131 N., R.53 W., on left bank 20 ft downstream from county highway bridge, $1\frac{1}{4}$ miles downstream from Shortfoot Creek, $2\frac{1}{2}$ miles downstream from Crooked Creek, and $3\frac{1}{2}$ miles northeast of Cayuga.

Drainage area (revised).--955 sq mi, of which about 390 sq mi is probably noncontributing.

Records available.--May 1956 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,095.64 ft above mean sea level, datum of 1929 (levels by Bureau of Reclamation). Prior to Oct. 9, 1957, wire-weight gage three-quarters of a mile upstream at different datum.

Extremes.--1956-60: Maximum discharge, about 150 cfs Apr. 19 and June 23, 1957; maximum gage height, 6.07 ft Apr. 19, 1957, site and datum then in use (backwater from beaver dams); no flow at times each year.

Remarks.--Some regulation by Fish and Wildlife Service wildfowl refuges, of which Lake Tewaunkon is the largest. Some small diversions for irrigation. Records of chemical analyses and water temperatures for the period June 1957 to September 1960 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	-	-	-	-	-	-	-	-	1.52	0.18	0.31	0	-
1957	0	0	0	0	0	0.94	10.8	6.79	31.3	11.5	10.5	26.5	8.16
1958	11.2	16.2	5.35	0.72	1.20	33.4	101	16.3	1.00	.35	0	0	15.5
1959	0	0	0	0	0	0	0	0	1.82	.12	0	0	.16
1960	.01	.03	.05	.04	.04	4.99	54.0	15.3	.45	0	0	0	6.19

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	-	-	-	-	-	-	-	-	91	11	19	0	-
1957	0	0	0	0	0	58	643	418	1,860	705	647	1,570	5,900
1958	691	963	329	44	67	2,050	5,980	1,000	59	22	0	0	11,200
1959	0	0	0	0	0	0	0	0	108	7.1	0	0	115
1960	.6	1.8	3.1	2.5	2.3	307	3,210	938	27	0	0	0	4,490

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year				
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean		Acre-feet		
		Discharge	Date								
1957	1508	150	Apr. 19, June 23	0	8.16	5,900	10.9		7,880		
1958	1558	131	Apr. 15, 1958	0	15.5	11,200	12.8		9,220		
1959	1628	54	June 12, 1959	0	.16	115	.17		121		
1960	1708	123	Apr. 19, 1960	0	6.19	4,490	-		-		

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520. Wild Rice River near Mantador, N. Dak.

Location.--Lat 46°10'20", long 97°00'35", on south of east line of sec.12, T.131 N., R.51 W., on downstream side of county highway bridge, 1½ miles west of Mantador.

Drainage area (revised).--1,357 sq mi, of which about 550 sq mi is probably noncontributing.

Records available.--October 1943 to September 1951. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Wire-weight gage. Datum of gage is 997.78 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark). Prior to Nov. 3, 1949, staff gage at same site and datum.

Average discharge.--8 years (1943-51), 34.7 cfs (25,120 acre-ft per year).

Extremes.--1943-51: Maximum discharge, 938 cfs Mar. 20, 1945 (gage height, 9.57 ft): no flow at times each year.

Flood in the spring of 1943 reached a stage of about 12.8 ft from floodmarks.

Remarks.--Some regulation by Fish and Wildlife Service wildfowl refuges, of which Lake Tewauken is the largest. Some small diversions for irrigation.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0	0	0	0	0	2.13	100	25.5	21.6	9.66	0	0	13.2

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0	0	0	0	0	131	5,950	1,570	1,290	594	0	0	9,540

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30				Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean
		Discharge	Date				
1950	-	-	-	-	-	-	-
1951	1208	275	Apr. 4, 1951	0	13.2	9,540	46.9
							33,990

530. Wild Rice River near Abercrombie, N. Dak.

Location.--Lat 46°28'05", long 96°47'00", in NE1/4 sec. 36, T.135 N., R.49 W., on right bank 420 ft upstream from bridge on county highway, three-quarters of a mile upstream from rubble masonry dam which serves as control, 3 1/4 miles northwest of Abercrombie, and 7 miles downstream from Antelope Creek.

Drainage area (revised).--2,082 sq mi, of which about 590 sq mi is probably noncontributing.

Records available.--April 1932 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder and masonry control. Datum of gage is 907.94 ft above mean sea level, datum of 1929. Prior to Dec. 7, 1939, chain gage at site 420 ft downstream at datum 5.0 ft lower. Dec. 7, 1939, to Nov. 24, 1952, staff gage at site three-quarters of a mile downstream at present datum.

Average discharge.--28 years (1932-60), 56.3 cfs (40,760 acre-ft per year); median of yearly mean discharges, 29 cfs (21,000 acre-ft per year).

Extremes.--1932-60: Maximum discharge, 5,500 cfs Apr. 2, 1943 (gage height, 21.02 ft, from floodmark); no flow for many days each year.
Flood in spring of 1897 reached a stage of 27.5 ft, present site and datum, from floodmark pointed out by local residents.

Remarks.--Some regulation by Fish and Wildlife Service wildfowl refuges, of which Lake Tewaucken is the largest. Some small diversions for irrigation. Records of chemical analyses for the period August 1955 to June 1956 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0	0	0.2	0	0	14.6	584	41.0	27.1	19.8	0.46	0.96	56.7
1952	1.59	4.22	9.2	1.19	.70	150	2,352	279	22.4	29.4	4.88	.37	223
1953	0	.48	1.20	.75	.99	95.4	39.7	27.3	47.5	6.25	.20		66.8
1954	0	0	.07	.05	.27	44.2	41.4	51.8	66.0	48.5	4.7	1.54	19.6
1955	.27	.26	.98	.19	.03	23.1	106	3.33	1.29	1.93	16.9	.02	12.8
1956	0	0	0	0	0	0	196	35.8	2.94	0	3.60	0	19.6
1957	0	0	0	0	0	46.0	95.7	58.0	80.8	47.5	21.6	79.8	35.8
1958	51.8	27.0	10.4	2.76	3.26	37.5	160	74.1	16.1	25.8	.08	.02	32.4
1959	0	0	0	0	0	11.9	6.70	2.93	23.2	4.05	0		4.06
1960	0	0	0	0	0	20.5	207	54.0	5.07	2.94	.09	0	23.9

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0	0	0	0	0	896	34,720	2,520	1,610	1,220	28	57	41,050
1952	98	251	565	73	40	31	140,000	17,160	1,330	1,810	288	22	161,700
1953	0	29	74	45	55	5,870	2,560	16,760	19,140	2,920	394	12	47,650
1954	0	0	4.2	5.0	1.5	2,720	2,470	1,960	5,930	2,980	29	91	14,200
1955	16	15	60	12	1.6	1,420	6,530	205	77	119	1,040	1.2	9,300
1956	0	0	0	0	0	0	11,650	2,200	175	0	222	0	14,250
1957	0	0	0	0	0	2,830	5,690	3,570	4,810	2,920	1,330	4,750	25,900
1958	1,950	1,600	642	170	181	2,300	9,500	4,550	960	1,580	5.2	1.8	23,440
1959	0	0	0	0	0	729	398	180	1,380	249	0	0	2,940
1960	0	0	0	0	0	1,260	12,310	3,320	301	181	5.4	0	17,580

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30				Calendar year			
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet	
		Discharge	Date						
1950	1208	-	-	-	-	-	138	-	99,740
1951	1208	1,890	Apr. 6, 1951	0	56.7	41,050	58.0	-	41,960
1952	1258	5,400	Apr. 12, 1952	0	223	161,700	222	-	160,900
1953	1278	2,500	May 29, 1953	0	65.8	47,550	65.7	-	47,550
1954	1338	800	July 2, 1954	0	19.6	14,200	19.7	-	14,290
1955	1388	a550	Apr. 1, 1955	0	12.8	9,300	12.7	-	9,210
1956	1438	750	Apr. 12, 1956	0	19.6	14,250	19.6	-	14,250
1957	1508	408	Apr. 19, 1957	0	35.8	25,900	41.6	-	30,090
1958	1558	262	Apr. 9, 1958	0	32.4	23,440	26.6	-	19,250
1959	1628	222	June 17, 1959	0	4.06	2,940	4.06	-	2,940
1960	1708	640	Apr. 6, 1960	0	23.8	17,580	-	-	-

a About.

540. Red River of the North at Fargo, N. Dak.

Location.--Lat 46°50'50", long 96°46'50", in SE¹/₄ sec.18, T.139 N., R.48 W., in downstream end of hollow pier of bridge on Interstate Highway 94 in Fargo near south city limits, 27 miles upstream from mouth of Sheyenne River and at mile 45.5.

Drainage area.--6,800 sq mi, approximately.

Records available.--May 1901 to September 1960. Published as "at Moorhead, Minn." 1901.

Gage.--Water-stage recorder and concrete control. Datum of gage is 867.4 ft above mean sea level, datum of 1929. Prior to Sept. 1, 1914, staff gage at site $3\frac{1}{2}$ miles downstream at datum 6.65 ft lower. Sept. 1, 1914, to July 31, 1928, staff gage at site 3 miles downstream at datum 3.70 ft higher. Aug. 1, 1928, to Apr. 12, 1959, staff gage at site 3 miles downstream at present datum.

Average discharge.--59 years (1901-60), 488 cfs (353,300 acre-ft per year, unadjusted); median of yearly mean discharges 410 cfs (297,000 acre-ft per year, unadjusted).

Extremes.--1901-60: Maximum discharge, 16,300 cfs Apr. 15, 16, 1952; maximum gage height, 28.79 ft Apr. 16, 1952; no flow for many days in each year during period 1932-41. Maximum stage known, 40.1 ft Apr. 7, 1897, site and datum in use prior to 1914 (discharge, 25,000 cfs).

Remarks.--Flow regulated by Orwell Reservoir (capacity, 28,400 acre-ft), Lake Traverse (capacity, 137,000 acre-ft, available for flood control), other controlled lakes and ponds and several powerplants. Some small diversions for municipal supply. Figures of monthly discharge do not include diversion by city of Fargo. Records of chemical analyses and water temperatures for the period October 1955 to September 1960 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	145	96.7	117	153	153	256	3,233	1,712	1,114	633	388	341	694
1952	349	338	511	529	535	533	7,256	2,149	1,609	1,270	426	445	1,322
1953	324	249	186	139	133	686	1,253	3,781	1,539	899	568	834	834
1954	374	477	412	357	344	631	863	944	1,190	721	234	240	566
1955	154	143	171	222	187	277	863	375	322	705	456	455	361
1956	402	299	174	238	220	251	1,410	834	831	288	266	114	443
1957	62.3	44.0	59.0	87.2	104	459	902	962	1,112	899	574	627	492
1958	451	468	419	323	307	574	849	379	1,164	794	227	174	429
1959	148	152	161	245	243	364	1,408	428	687	617	215	165	320
1960	144	124	206	208	228	309	1,493	955	835	529	179	108	442

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	8,920	5,750	7,180	9,430	8,510	15,710	192,400	105,300	66,310	38,900	23,860	20,300	502,600
1952	21,460	20,120	31,450	32,520	30,770	32,800	431,800	132,100	95,740	78,070	26,220	26,500	959,600
1953	19,930	14,790	11,420	8,490	10,180	42,180	41,150	77,040	195,200	94,610	55,300	37,830	604,100
1954	22,960	28,400	21,960	18,100	18,820	51,350	58,040	70,800	44,340	14,360	14,310	409,800	409,800
1955	9,470	6,530	10,510	13,640	10,370	17,010	51,330	23,080	19,170	43,370	28,060	27,050	261,600
1956	24,740	17,790	10,720	14,660	12,630	15,420	83,880	51,300	49,440	17,700	16,350	6,780	321,400
1957	3,830	2,620	3,630	5,360	5,800	28,210	53,670	59,130	66,160	55,250	35,310	37,320	356,300
1958	27,720	27,850	25,760	19,860	17,030	35,300	50,550	23,310	9,770	48,830	13,970	10,330	310,300
1959	9,090	9,070	9,880	15,070	13,480	22,390	24,250	26,300	40,910	37,970	13,280	9,810	231,500
1960	8,870	7,400	12,700	12,790	13,120	18,990	68,860	58,730	49,670	32,510	11,010	6,430	321,100

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year					
		Observed			Adjusted a/			Observed			Adjusted a/		
		Momentary maximum		Minimum day	Mean	Acre-feet	Acre-feet	Mean	Acre-feet	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date										
1950	1208	-	-	-	-	-	-	1,033	748,200	1,041	753,500	-	-
1951	1208	8,010	Apr. 11, 1951	63	694	502,600	701	507,900	765	553,800	772	559,000	-
1952	1258	16,300	Apr. 15-16	143	1,322	959,600	1,330	965,100	1,285	932,700	1,293	938,300	-
1953	1278	6,720	June 1, 1953	93	834	604,100	842	609,400	877	634,700	884	640,400	-
1954	1358	1,920	July 4, 1954	88	566	409,800	574	415,400	499	361,600	506	366,700	-
1955	1388	2,760	Apr. 4, 1955	70	361	261,600	369	267,000	395	286,300	403	291,800	-
1956	1458	3,870	Apr. 16, 1956	48	443	321,400	450	326,900	383	278,200	391	283,700	-
1957	1508	2,540	Apr. 24, 1957	12	492	356,300	500	361,700	591	427,500	598	432,800	-
1958	1568	2,280	July 6, 1958	131	429	310,300	436	315,600	355	257,000	362	262,400	-
1959	1628	1,250	July 8, 1959	96	320	231,500	328	237,300	321	232,400	329	238,100	-
1960	1708	3,900	Apr. 8, 1960	35	442	321,100	450	326,900	-	-	-	-	-

a Adjusted for diversion by city of Fargo.

Location.--Lat 47°42'10", long 99°56'55", in SW¹SE¹ sec.24, T.149 N., R.73 W., on right bank just downstream from county road, 2 miles upstream from unnamed tributary and 4½ miles south of Harvey.

Records available.--September 1955 to September 1960.

Average discharge.--5 years (1955-60), 4.33 cfs (3,130 acre-ft per year).

Extremes.--1955-60: Maximum discharge, 224 cfs Apr. 11, 1956 (gage height, 8.92 ft); maximum gage height, 9.50 ft Mar. 23, 1960 (backwater from ice); no flow at times each year.

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	1.41	1.05	0.26	0.11	0	11.0	69.3	19.1	19.2	5.49	0.91	1.58	10.5
1957	1.32	2.77	.38	.15	0	5.39	4.25	4.27	2.39	1.58	1.05	2.11	2.15
1958	2.56	2.46	1.10	.64	3.57	7.15	4.97	2.38	2.07	6.94	.10	.44	2.86
1959	1.07	1.50	.10	0	0	6.50	2.99	2.59	1.13	.41	0	.19	1.38
1960	5.95	.98	.90	.32	0	30.6	5.76	6.68	3.40	.18	.92	.74	4.75

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	86	63	16	6.9	0	674	4,130	1,170	1,140	214	56	84	7,650
1957	81	165	23	9.3	0	332	253	262	142	97	65	126	1,560
1958	157	146	68	39	198	439	296	146	123	427	6.2	26	2,070
1959	66	89	6.3	0	0	399	178	159	67	25	0	11	3,000
1960	366	58	55	19	0	1,880	343	412	203	11	57	44	1,450

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1956	1458	224	Apr. 11, 1956	0	10.5	7,650	10.7	7,750
1957	1508	26	Mar. 23, 1957	0	2.15	1,560	2.29	1,660
1958	1558	308	June 30, 1958	0	2.86	2,070	2.57	1,860
1959	1628	15	Mar. 28, 1959	0	1.38	1,000	1.92	1,320
1960	1708	209	Mar. 27, 1960	0	4.75	3,450	-	-

Location.--Lat 47°47'25", long 99°53'25", in SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.21, T.150 N., R.72 W., 90 ft north of Harvey Water Works, 0.4 mile upstream from small tributary, and $\frac{2}{3}$ miles northeast of Harvey.

Records available.--October 1945 to September 1956.

Gage.--Staff gage. Datum of gage is 1,520.10 ft above mean sea level, datum of 1929. Prior to June 11, 1946, staff gage at site 3 miles upstream at different datum.

Average discharge.--11 years (1945-56), 14.0 cfs (10,140 acre-ft per year); median of yearly mean discharges, 10 cfs (7,240 acre-ft per year).

Extremes.--1945-56: Maximum discharge, 1,430 cfs Apr. 18, 1950; maximum gage height observed, 6.95 ft Apr. 17, 1950, affected by ice; no flow during several months in most years.

Remarks.--Small diversions for local farm and power use.

[illegible]

Monthly and yearly discharge, in acre-feet, of Sheyenne River near Harvey, N. Dak.

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sent.	The year
1951	50	89	90	109	45	133	7,420	1,380	2,360	277	63	168	12,180
1952	69	73	95	0	0	363	6,790	649	190	403	1.8	0	8,630
1953	0	0	0	0	0	425	455	769	515	191	0	0	2,360
1954	0	0	5.0	2.8	496	517	502	198	5,130	1,660	333	341	8,980
1955	204	158	109	13	0	1,120	1,930	670	819	140	5.0	0	5,170
1956	0	0	0	0	0	774	5,090	1,200	1,360	196	32	36	8,690
1957	-	-	-	-	-	-	-	-	-	-	-	-	-
1958	-	-	-	-	-	-	-	-	-	-	-	-	-
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	1208	-	-	-	-	-	47.3	34,220
1951	1208	340	Apr. 7, 1951	0.1	16.8	12,180	16.8	12,180
1952	1238	258	Apr. 7, 1952	0	11.9	8,630	11.6	8,400
1953	1278	a60	June 30, 1953	0	3.25	2,360	3.26	2,360
1954	1338	351	June 17, 1954	0	12.4	8,980	13.1	9,450
1955	1388	a120	Mar. 31, 1955	0	7.13	5,170	6.48	4,700
1956	1438	316	Apr. 10, 1956	0	12.0	8,690	-	-
1957	-	-	-	-	-	-	-	-
1958	-	-	-	-	-	-	-	-
1959	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-

a Maximum observed.

551. North Fork Sheyenne River near Wellsburg, N. Dak.

Location.--Lat 47°52'34", long 99°43'05", at north line of sec.26, T.151 N., R.71 W., on right bank 7 ft downstream from bridge on county highway, 1 mile upstream from mouth, and $\frac{3}{2}$ miles northeast of Wellsburg.

Drainage area (revised).--693 sq mi, of which about 490 sq mi is probably noncontributing (includes 227 sq mi in closed basins).

Records available.--September 1957 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,455 ft (from topographic map).

Extremes.--1957-60: Maximum discharge, 216 cfs Apr. 2, 1960 (gage height, 3.39 ft); maximum gage height, 3.46 ft Apr. 2, 1960 (backwater from ice); no flow for several months each year.

Remarks.--Much of the stream channel above station consists of wide marsh areas. Minor diversions for livestock watering.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sent.	The year
1958	0.63	1.28	0.05	0	0.37	2.21	10.2	0.588	0.084	2.47	0.007	0	1.48
1959	0	0	0	0	0	1.99	1.60	.25	.02	0	0	0	1.32
1960	0	0	0	0	0	1.0	42.5	4.73	6.02	.20	0	0	4.46

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sent.	The year
1958	39	76	3.0	0	21	136	804	36	5.0	152	0.4	0	1,070
1959	0	0	0	0	0	122	95	15	1.2	0	0	0	233
1960	0	0	0	0	0	61	2,520	291	358	12	0	0	3,250

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1958	1558	29	Apr. 2, 1957	0	1.48	1,070	1.32	954
1959	1628	4.7	Mar.26-28, 1959	0	.32	233	.32	233
1960	1708	216	Apr. 2, 1960	0	4.48	3,250	-	-

552. Big Coulee near Maddock, N. Dak.

Location.--Lat 47°57'30", long 99°34'53", on line between secs. 23 and 26, T.152 N., R.70 W., on left downstream wingwall of county highway bridge, 2 miles west of Maddock and 5 miles above mouth.

Drainage area (revised).--140 sq mi, of which about 50 sq mi is probably noncontributing.

Records available.--October 1956 to September 1960.

Gage.--Water-stage recorder.

Extremes.--1956-60: Maximum discharge, 262 cfs Mar. 27, 1960 (gage height, 2.50 ft); no flow during part of each year.

Remarks.--Probably small diversions for farm use.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957	0	0	0	0	0	2.67	0.01	0.35	0.20	0.21	0.27	0.48	0.35
1958	.06	0	0	0	2.29	1.65	1.98	.27	.27	3.31	0	0	.80
1959	0	0	0	0	0	3.88	.01	0	0	0	0	0	.33
1960	0	0	0	0	0	21.7	28.0	4.40	1.62	.10	0	0	4.65

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957	0	0	0	0	0	164	0.6	21	12	13	17	29	257
1958	.4	0	0	0	127	101	118	17	16	203	0	0	582
1959	0	0	0	0	0	239	.8	0	0	0	0	0	240
1960	0	0	0	0	0	1,330	1,670	270	97	6.0	0	0	3,370

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet	
		Discharge	Date						
1957	1508	33	Mar. 21, 1957	0	0.35	257	0.36	257	
1958	1558	21	Feb. 25, 1958	0	.80	582	.80	582	
1959	1628	42	Mar. 13, 1959	0	.33	240	.33	240	
1960	1708	262	Mar. 27, 1960	0	4.65	3,370	-	-	

555. Sheyenne River at Sheyenne, N. Dak.

Location.--Lat 47°50'20", long 99°07'30", in NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.5, T.150 N., R.66 W., at recreation-pool dam, 1 mile north of Sheyenne.

Drainage area (revised).--1,790 sq mi, approximately, of which about 1,130 sq mi is probably noncontributing (includes 227 sq mi in closed basins).

Records available.--April 1929 to June 1933, October 1939 to September 1951. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Staff gage. Datum of gage is 1,412.54 ft above mean sea level, datum of 1929. Prior to Mar. 28, 1940, wire-weight and staff gages at points within 300 ft of present site, at different datums.

Average discharge.--15 years (1929-32, 1939-51), 41.7 cfs (30,190 acre-ft per year); median of yearly mean discharges, 31 cfs (22,400 acre-ft per year).

Extremes.--1929-33, 1939-51: Maximum discharge, 3,940 cfs Apr. 18, 1950; maximum gage height, 8.51 ft Apr. 18, 19, 1948; no flow at times in each year. Flood in 1919 reached a stage about 3 ft higher than that of April 1948.

Remarks.--No regulation or diversions of importance. Stage-discharge relation substantially affected by wind at times.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.38	1.62	1.4	1.34	0.71	10.4	426	70.6	53.0	7.87	0.87	3.56	47.8

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	23	96	85	82	40	638	25,380	4,340	3,150	484	54	212	34,580

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet	
		Discharge	Date						
1950	1208	-	-	-	-	-	164	-	119,000
1951	1208	1,420	Apr. 9, 1951	0	47.8	34,580	-	-	-

560. Sheyenne River near Warwick, N. Dak.

Location.--Lat 47°48'20", long 98°42'57", on south quarter of line between secs. 15 and 16, T.150 N., R.63 W., on left bank on downstream side of highway bridge 3.3 miles south of Warwick.

Drainage area (revised).--2,070 sq mi, approximately, of which about 1,310 sq mi is probably noncontributing (includes 227 sq mi in closed basins).

Records available.--October 1949 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder and rubble masonry control. Altitude of gage is 1,370 ft (by barometer). Prior to Nov. 21, 1949, wire-weight gage at same site and datum.

Average discharge.--11 years (1949-60), 57.1 cfs (41,340 acre-ft per year); median of yearly mean discharges, 40 cfs (29,000 acre-ft per year).

Extremes.--1949-60: Maximum discharge, 3,800 cfs Apr. 17, 1950 (gage height, 7.45 ft); no flow at times probably due to temporary regulation on the spring-fed tributary entering below gage.

Remarks.--Records include flow of spring which enters below gage and just above control. Records of chemical analyses and water temperatures for the period January 1951 to September 1960 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	12.0	11.1	8.23	10.6	6.68	21.7	440	90.5	70.1	21.5	2.68	11.6	58.5
1952	7.6	8.9	6.7	2.0	3.2	6.2	284	43.4	6.1	3.5	1.4		34.6
1953	1.2	8.0	2.6	2.4	2.6	13.3	38.5	60.3	61.2	64.4	3.1	2.1	21.7
1954	1.5	2.8	3.5	3.6	34.8	79.0	64.1	30.9	326	170	48.3	39.3	66.7
1955	33.5	18.5	9.06	3.14	2.43	40.4	332	65.4	77.5	23.6	4.48	2.11	50.8
1956	2.62	2.37	2.07	1.51	1.88	2.19	631	100	189	19.0	3.93	9.56	79.5
1957	6.05	23.8	6.84	2.62	1.50	43.3	51.3	56.4	21.1	24.5	25.8	63.0	25.5
1958	31.1	18.1	10.1	9.2	8.2	38.7	62.1	20.9	16.0	61.5	4.84	1.42	23.6
1959	3.05	5.23	4.63	3.20	2.49	48.6	35.2	23.9	8.92	2.57	1.11	.80	11.7
1960	6.11	11.0	4.18	2.61	1.82	21.7	392	97.4	63.4	12.6	4.46	1.04	51.2

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	736	660	506	653	371	1,330	26,200	5,560	4,170	1,320	165	688	42,360
1952	478	528	415	125	186	383	16,890	2,670	365	2,760	218	81	25,100
1953	71	474	161	145	143	819	2,290	3,710	3,640	3,960	168	123	15,720
1954	95	169	212	222	1,930	4,660	3,620	1,900	19,380	10,450	2,970	2,280	48,290
1955	2,060	1,100	557	193	135	2,480	19,790	4,020	4,610	1,450	275	126	36,800
1956	161	141	127	93	108	135	37,560	6,160	11,270	1,170	242	569	57,740
1957	372	1,410	420	161	72	2,660	3,050	2,240	1,260	1,510	1,590	3,750	18,500
1958	1,910	1,080	623	567	456	2,380	3,690	1,280	954	3,780	298	84	17,100
1959	168	311	285	197	138	2,990	2,100	1,470	531	158	68	48	8,480
1960	498	652	257	173	105	1,340	23,310	5,990	3,770	775	274	62	37,210

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	1208	-	-	-	-	-	205	149,500
1951	1208	-	-	-	-	-	67.9	41,890
1952	1238	1,240	Apr. 11, 1951	1	58.5	42,360	33.6	24,360
1953	1278	737	Apr. 8, 1952	1	34.6	25,100	21.4	15,490
1954	1338	204	July 3, 1953	1	21.7	15,720	71.2	51,530
1955	1358	878	June 19, 1954	1	66.7	48,290	46.3	33,510
1956	1368	1,330	Apr. 3, 1955	.9	50.8	36,800		
1956	1438	4,250	Apr. 18, 1956	1.1	79.5	57,740	82.0	59,510
1957	1508	249	Sept. 5, 1957	1.0	25.5	19,500	27.5	19,910
1958	1558	666	Mar. 3, 1958	1	23.8	17,100	19.7	14,270
1959	1628	153	Mar. 21, 1959	.1	11.7	8,480	12.6	9,110
1960	1708	1,450	Apr. 7, 1960	.1	51.2	37,210	-	-

561. Mauvais Coulee near Cando, N. Dak.

Location.--Lat 48°27', long 99°07', in NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.1, T.157 N., R.66 W., on left bank a third of a mile upstream from highway bridge, about 4 miles upstream from West Fork, $5\frac{1}{2}$ miles southeast of Cando, and 7 miles northeast of Maza.

Drainage area (revised).--387 sq mi, of which about 10 sq mi is probably noncontributing.

Records available.--May 1956 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,445 ft above mean sea level (unadjusted). Prior to July 2, 1957, staff gage at present site and datum.

Extremes.--1956-60: Maximum discharge, 570 cfs Apr. 10, 1960 (gage height, 8.14 ft, backwater from ice); no flow at times each year.
Flood of June 16, 1954, reached a stage of 9.83 ft, and flood of Apr. 20, 1956, reached a stage of 10.71 ft, from floodmarks, by local resident.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	-	-	-	-	-	-	-	-	4.40	0.64	0.16	0.01	-
1957	0.03	0.15	0	0	0	0.25	1.64	0.18	.02	.36	.14	1.97	0.39
1958	.58	.181	0.075	0	.006	0	.069	.044	.035	.32	.049	.003	.115
1959	0	.06	0	0	0	1.70	.75	.35	.17	0	0	0	.26
1960	0	0	0	0	0	0	189	4.73	1.38	.26	0	0	16.0

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	-	-	-	-	-	-	-	-	262	39	9.9	2.2	-
1957	1.6	8.7	0	0	0	16	98	11	1.4	22	8.3	118	285
1958	36	11	4.6	0	.03	0	4.1	2.7	2.1	20	3.0	.2	84
1959	0	3.8	0	0	0	105	45	22	9.9	0	0	0	186
1960	0	0	0	0	0	0	11,260	291	82	16	0	0	11,650

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30				Calendar year			
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet	
		Discharge	Date						
1956	-	-	-	-	-	-	-	-	-
1957	1508	3.6	Apr. 15, 1957	0	0.39	285	0.450	326	
1958	1558	1.4	Oct. 1, 1958	0	.115	84	.05	36	
1959	1628	20	Mar. 22, 1959	0	.26	186	.25	182	
1960	1708	570	Apr. 10, 1960	0	16.0	11,650	-	-	

561.5. Mauvais Coulee near Maza, N. Dak.

Location.--Lat 48°23', long 99°07', in NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.36, T.157 N., R.66 W., on downstream side of county highway bridge, three-quarters of a mile downstream from West Fork, about 2 miles upstream from Lac Aux Mortes, and 4 miles northeast of Maza.

Drainage area.--702 sq mi, of which about 40 sq mi is probably noncontributing.

Records available.--October 1955 to September 1956.

Gage.--Wire-weight gage.

Extremes.--1955-56: Maximum discharge, 3,600 cfs Apr. 20, 1956 (gage height, 12.30 ft); no flow during several months.

Remarks.--No regulation or diversion of importance.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	0	0	0	0	0	0	709	117	12.8	3.34	0.96	0.31	69.5

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	0	0	0	0	0	0	42,170	7,200	784	205	59	18	50,420

562. Edmore Coulee near Edmore, N. Dak.

Location.--Lat 48°20'10", long 98°39'40", on line between secs. 17 and 18, T.156 N., R.62 W., on left downstream wingwall of bridge on county highway, 11 miles southwest of Edmore and about 13 miles upstream from Sweetwater Lake.

Drainage area contributing.--382 sq mi (revised), of which about 100 sq mi is probably noncontributing.

Records available.--April to June 1956, June 1957 to September 1960.

Gage.--Water-stage recorder. Prior to June 26, 1957, staff gage at same site and datum.

Extremes.--1955-60: Maximum discharge, 875 cfs Apr. 23, 1956 (gage height, 6.30 ft, backwater from ice); no flow for several months each year.

Remarks.--Probably small diversions for farm use.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	-	-	-	-	-	-	206	52.9	-	-	-	-	-
1957	-	-	-	-	-	-	-	-	-	0.20	0.03	0.10	-
1958	0.23	0.04	0	0	0.05	0.01	.003	0	0	0	0	0	0.03
1959	0	0	0	0	0	4.2	12.4	0.09	0	0	0	0	1.38
1960	0	0	0	0	0	0	136	13.5	2.64	0	0	0	12.5

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	-	-	-	-	-	-	12,280	5,250	-	-	-	-	-
1957	-	-	-	-	-	-	-	-	-	12	2.0	6.0	-
1958	14	2.2	0	0	2.8	0.6	.2	0	0	0	0	0	20
1959	0	0	0	0	0	258	738	5.6	0	0	0	0	1,000
1960	0	0	0	0	0	0	8,090	828	157	0	0	0	9,080

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1956	-	875	Apr. 23, 1956	0	-	-	5	-
1957	-	12	Late in April 1957	0	-	-	-	-
1958	-	54	Feb. 24, 1958	0	0.03	20	0.005	3.6
1959	-	-	Apr. 3, 1959	0	1.38	1,000	1.38	1,000
1960	-	601	Apr. 15, 1960	0	12.5	9,080	-	-

563. Little Coulee at Leeds, N. Dak.

Location.--Lat 48°17', long 99°27', in center of sec.31, T.156 N., R.68 W., on right downstream wingwall of left one of twin box culverts on U.S. Highway 2, a quarter of a mile west of Leeds.

Drainage area.--280 sq mi, of which about 140 sq mi is probably noncontributing.

Records available.--October 1955 to September 1960.

Gage.--Staff gage.

Average discharge.--5 years (1955-60), 2.26 cfs (1,640 acre-ft per year).

Extremes.--1955-60: Maximum discharge, 515 cfs Apr. 15, 1956 (gage height, 7.2 ft); no flow most or all of each year.

Remarks.--Small diversions may be made into a railroad reservoir half a mile upstream.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	0	0	0	0	0	0	76.8	44.5	5.07	0	0	0	10.5
1957	0	0	0	0	0	.45	.02	0	0	0	0	0	.04
1958	0	0	0	0	0	0	0	0	0	0	0	0	0
1959	0	0	0	0	0	0	0	0	0	0	0	0	0
1960	0	0	0	0	0	.4	8.65	.09	0	0	0	0	.77

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	0	0	0	0	0	0	4,570	2,740	302	0	0	0	7,610
1957	0	0	0	0	0	28	1.2	0	0	0	0	0	29
1958	0	0	0	0	0	0	0	0	0	0	0	0	0
1959	0	0	0	0	0	0	0	0	0	0	0	0	0
1960	0	0	0	0	0	24	532	5.8	0	0	0	0	562

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet	
		Discharge	Date						
1956	1438	515	Apr. 15, 1956	0	10.5	7,610	10.5	7,610	
1957	1508	5	Mar. 23, 1957	0	.04	29	.04	29	
1958	1558	0	-	0	0	0	0	0	
1959	1628	0	-	0	0	0	0	0	
1960	1708	110	Apr. 4, 1960	0	.77	562	-	-	

564. Big Coulee near Churchs Ferry, N. Dak.
(Formerly published as Mauvais Coulee near Churchs Ferry)

Location.--Lat 48°10'40", long 99°13'15", in NW¼NW¼ sec.12, T.154 N., R.67 W., on downstream side of right abutment of bridge on U.S. Highway 281, 1 mile downstream from Little Coulee and 6 miles south of Churchs Ferry.

Drainage area (revised).--2,510 sq mi, approximately, of which about 690 sq mi is probably noncontributing.

Records available.--March 1950 to September 1960. Published as Mauvais Coulee near Churchs Ferry.

Gage.--Water-stage recorder. Prior to June 21, 1950, reference marks and June 21, 1950, to July 17, 1956, staff gage at former bridge on U.S. Highway 281, an eighth of a mile upstream, at datum 0.70 ft higher.

Average discharge.--10 years (1950-60), 19.8 cfs (14,330 acre-ft per year); median of yearly mean discharges, 0.9 cfs (650 acre-ft per year).

Extremes.--1950-60: Maximum discharge, 620 cfs June 6, 1950 (gage height, 4.4 ft, site and datum then in use); no flow at times each year.

Remarks.--Flow affected by many lakes on the main stem and tributaries. Records of chemical analyses for the period June 1954 to September 1960 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1950	-	-	-	-	-	0	150	410	450	200	70	30	-
1951	10	2	0	0	0	0.4	53	54	15	2.4	0.3	0	11.4
1952	0	0	0	0	0	0	0.1	0	0	0	0	0	.008
1953	0	0	0	0	0	0	0	0	0	0	0	0	0
1954	0	0	0	0	0	0.44	0	0	64.2	277	138	81.4	47.3
1955	59.9	32.7	22.7	18	8	4.9	225	178	90	45	15	3	58.6
1956	.05	.05	0	0	0	0	118	438	223	108	37.8	16.0	78.8
1957	3.79	2.77	.11	0	0	2.35	2.88	3.38	.28	.05	.01	0	1.31
1958	.16	.03	0	0	.30	.08	.35	.06	0	.03	0	0	.08
1959	0	0	0	0	0	1.07	.08	.04	.003	0	0	0	.10
1960	0	0	0	0	0	.5	2.57	1.53	.03	0	0	0	.39

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1950	0	-	-	-	-	0	6,850	25,210	26,780	12,300	4,300	1,790	-
1951	614	119	0	0	0	25	3,150	3,320	890	148	18	0	8,280
1952	0	0	0	0	0	0	6.0	0	0	0	0	0	6.0
1953	0	0	0	0	0	0	0	0	0	0	0	0	0
1954	0	0	0	0	0	27	0	0	3,820	17,060	8,520	4,840	34,270
1955	3,680	1,940	1,390	1,110	444	300	13,410	10,940	5,360	2,770	922	179	42,440
1956	3.2	3.0	0	0	0	0	7,050	26,950	13,270	6,640	2,320	952	57,190
1957	233	165	6.9	0	0	144	172	208	17	3.4	0.6	0	950
1958	9.9	1.6	0	0	17	5.0	21	3.8	0	2.0	0	0	60
1959	0	0	0	0	0	66	4.8	2.6	0.2	0	0	0	74
1960	0	0	0	0	0	34	153	94	1.8	0	0	0	283

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet	
		Discharge	Date						
1950	1438	a620	June 6, 1950	-	-	-	-	-	-
1951	1438	100	Apr. 4, 1951	0	11.4	8,280	10.4	7,500	0
1952	1438	b1	April 1952	0	.008	6.0	.008	6.0	0
1953	1438	0	-	0	0	0	0	0	0
1954	1438	329	June 30, 1954	0	47.3	34,270	57.0	41,280	0
1955	1438	364	Apr. 20, 1955	-	58.6	42,440	48.9	35,440	0
1956	1438	534	May 4, 1956	0	78.8	57,190	79.3	57,590	0
1957	1508	23	Mar. 21, 1957	0	1.31	950	.77	556	0
1958	1558	c3	Feb. 26, 1958	0	.08	60	.07	49	0
1959	1628	d11	Mar. 25, 1959	0	.10	74	.10	74	0
1960	1708	b30	Apr. 5 or 6, 1960	0	.39	283	-	-	0

a Maximum for period March to September.

b Estimated.

c About.

d Maximum observed.

570. Sheyenne River near Cooperstown, N. Dak.

Location.--Lat 47°26', long 98°02', in NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 27, T.146 N., R.58 W., on right bank 150 ft downstream from county bridge and 5 miles east of Cooperstown.

Drainage area (revised).--6,470 sq mi, approximately, of which about 5,200 sq mi is probably noncontributing (includes 3,800 sq mi in closed basins).

Records available.--October 1944 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 1,271.04 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark). Prior to Aug. 3, 1950, wire-weight gage at site 150 ft upstream at same datum.

Average discharge.--16 years (1944-60), 101 cfs (73,120 acre-ft per year); median of yearly mean discharges, 75 cfs (54,800 acre-ft per year).

Extremes.--1944-60: Maximum discharge, 7,830 cfs Apr. 17, 1950 (gage height, 18.69 ft); no flow Aug. 29 to Oct. 8, 1959.

Remarks.--Minor regulation and diversion.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	29.0	23.9	23.2	20.8	17.9	83.6	650	173	91.4	35.0	11.2	31.8	98.9
1952	18.1	16.4	15.7	11.6	10.6	44.3	447	80.0	32.0	85.6	12.1	6.26	64.6
1953	3.64	11.3	7.47	6.2	7.7	18.3	62.8	73.3	123	132	8.74	2.38	38.2
1954	4.19	9.25	8.77	7.7	48.2	122	117	51.3	313	213	65.5	47.3	83.8
1955	46.0	34.5	17.8	8.6	7.8	27.6	439	96.5	171	45.9	6.45	.86	74.8
1956	3.49	6.60	5.53	4.66	4.00	4.81	678	243	280	51.3	12.9	18.3	108
1957	13.2	37.8	15.0	9.9	7.4	75.4	109	75.1	45.3	47.3	36.7	155	52.3
1958	86.7	61.8	31.5	17.8	15.8	48.1	127	45.9	38.0	108	12.8	2.35	49.8
1959	3.48	9.91	6.41	3.30	1.48	36.9	130	42.1	24.3	10.4	.85	0	22.4
1960	8.50	8.35	6.57	5.08	3.74	52.8	616	101	121	31.8	8.20	4.24	79.9

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,780	1,420	1,430	1,280	996	5,140	38,700	10,660	5,440	2,150	686	1,890	71,570
1952	1,110	978	964	714	609	2,720	26,570	4,920	1,900	5,270	744	372	46,870
1953	224	675	459	383	428	1,120	3,740	4,500	7,330	8,140	537	142	27,680
1954	258	550	540	472	2,680	7,500	6,940	3,160	18,630	13,100	4,020	2,810	60,660
1955	2,830	2,050	1,090	528	435	1,700	26,110	5,940	10,200	2,820	397	51	54,150
1956	214	393	340	287	230	296	40,340	14,940	16,680	3,150	794	1,090	†78,750
1957	811	2,250	922	607	413	4,640	6,480	4,820	2,700	2,910	2,280	9,240	37,850
1958	5,330	3,680	1,940	1,090	877	2,960	7,540	2,820	2,260	8,620	789	140	36,050
1959	214	590	394	203	82	2,270	7,710	2,590	1,450	637	53	0	16,190
1960	523	497	404	312	215	3,250	36,660	6,230	7,220	1,950	504	252	58,020

† Corrected.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30				Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean
		Discharge	Date				
1950	1208	-	-	-	-	-	400
1951	1208	989	Apr. 19, 1951†	6.4	98.9	71,570	96.7
1952	1238	1,240	Apr. 14, 1952	1.6	64.6	46,870	62.2
1953	1278	271	July 3, 1953	.6	38.2	27,680	38.2
1954	1338	682	June 26, 1954	.5	83.8	60,660	90.2
1955	1388	1,060	Apr. 11, 1955	.1	74.8	54,150	67.9
1956	1438	2,600	Apr. 24, 1956	.6	108	†78,750	113
1957	1508	280	Sept. 4, 1957	7	52.3	37,850	61.9
1958	1558	340	Apr. 7, 1958	1.0	49.8	36,050	36.3
1959	1628	360	Apr. 1, 1959	0	22.4	16,190	22.7
1960	1708	1,340	Apr. 14, 1960	0	79.9	58,020	-

† Corrected.

572. Baldhill Creek near Dazey, N. Dak.

Location.--Lat 47°13', long 98°07', in SW¹ sec.2, T.143 N., R.59 W., on left bank 500 ft upstream from bridge on county highway, 4½ miles northeast of Dazey, and 14 miles upstream from mouth.

Drainage area (revised).--691 sq mi, of which about 340 sq mi is probably noncontributing.

Records available.--March 1956 to September 1960.

Gage.--Water-stage recorder. Prior to Nov. 9, 1956, wire-weight gage 500 ft downstream at same datum.

Extremes.--1956-60: Maximum discharge, 767 cfs Apr. 12, 1956 (gage height, 6.75 ft at former site, affected by ice); no flow at times during most years.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	-	-	-	-	-	-	118	12.1	10.6	3.25	1.75	1.84	-
1957	1.47	4.56	1.72	0.68	0	7.85	9.60	8.93	5.32	8.64	5.78	58.5	9.39
1958	29.8	20.5	7.42	1.90	2.18	4.64	12.6	7.14	8.60	11.8	2.15	1.28	9.22
1959	1.76	2.18	1.15	0	0	7.87	6.97	6.84	5.61	5.32	1.50	1.25	3.18
1960	2.60	.58	.61	.02	0	32.2	84.9	7.32	7.17	1.85	2.31	2.11	11.7

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	-	-	-	-	-	-	7,020	745	630	200	107	179	-
1957	90	272	106	42	0	483	571	549	317	551	356	3,480	6,800
1958	1,830	1,220	456	117	121	285	752	439	512	728	132	76	6,670
1959	108	130	9.5	0	0	484	415	421	346	204	92	75	2,280
1960	160	23	37	1.2	0	1,980	5,050	450	427	114	142	126	8,510

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year			
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet		
		Discharge	Date							
1956	1438	767	Apr. 12, 1956	-	-	-	-	-	-	-
1957	1508	248	Sept. 3, 1957	0	9.39	6,800	13.6	9,840		
1958	1558	56	Oct. 25, 1957	.2	9.22	6,670	4.71	3,410		
1959	1628	a50	Mar. 14-15, 1959	0	3.18	2,280	3.12	2,260		
1960	1708	370	Apr. 5, 1960	0	11.7	8,510	-	-		

a About.

575. Lake Ashtabula at Baldhill Dam, N. Dak.

Location.--Lat 47°02'00", long 98°05'00", in NW¹ sec.18, T.141 N., R.58 W., at Baldhill Dam on Shyenne River, 8 miles northwest of Valley City.

Drainage area (revised).--7,470 sq mi, approximately, of which about 5,560 sq mi is probably noncontributing (includes 3,800 sq mi in closed basins).

Records available.--July 1949 to September 1960.

Gage.--Water-stage recorder. Datum of gage is at mean sea level, datum of 1929.

Extremes.--1949-60: Maximum contents, 91,400 acre-ft May 14, 1950 (elevation, 1,269.46 ft); minimum since reservoir first reached spillway level, 6,660 acre-ft Aug. 11-14, 1950 (elevation, 1,245.13 ft).

Remarks.--Reservoir is formed by an earthfill dam 1,650 ft long; storage began on July 30, 1949; dam completed September 1949. Usable capacity, 69,100 acre-ft between invert of outlet conduit, elevation, 1,238.0 ft, and normal pool level, elevation, 1,266.0 ft. Dead storage below elevation 1,238.0 ft, 1,500 acre-ft. Maximum pool elevation, 1,273.2 ft, capacity, 116,500 acre-ft. Low flows are controlled by two sluice gates 3 ft in diameter. The spillway crest is 120 ft long at elevation 1,252.0 ft, surmounted by three tainter gates, each 15 ft high and 40 ft long. The reservoir is operated for flood control and improvement of low-water flow. Records given herein represent total contents.

Cooperation.--Records furnished by Corps of Engineers.

Contents, in acre-feet, on last day of month

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	8,870	9,150	9,100	8,700	8,450	15,840	27,240	19,200	19,100	18,200	17,640	17,480
1952	15,800	16,200	16,400	15,400	13,820	18,600	52,250	53,600	52,250	58,500	55,500	53,150
1953	51,440	51,660	51,350	50,320	50,760	52,430	56,500	62,580	71,000	69,480	67,240	64,500
1954	62,800	61,700	60,100	57,000	59,000	62,800	64,500	65,000	71,700	70,600	71,700	70,000
1955	69,200	64,780	59,780	55,000	54,000	58,500	72,880	73,160	70,710	59,560	56,750	55,000
1956	54,500	54,180	53,820	54,050	53,870	51,350	75,050	71,570	72,020	70,660	70,150	68,360
1957	68,360	69,090	66,740	63,350	59,560	62,740	69,740	71,740	71,230	72,140	71,340	70,150
1958	71,280	69,700	66,740	62,420	59,880	58,850	65,060	66,120	69,200	70,660	68,640	65,900
1959	63,900	62,525	59,775	56,900	54,750	57,500	64,450	66,960	67,520	65,280	62,525	59,775
1960	60,324	60,324	59,150	58,000	56,950	66,680	72,080	73,080	70,885	70,040	68,640	66,400

580. Sheyenne River below Baldhill Dam, N. Dak.

Location.--Lat 47°01'50", long 98°05'00", in NW¹/₄ sec.18, T.141 N., R.58 W., on right bank 600 ft downstream from Baldhill Dam, 8 miles northwest of Valley City, and at mile 270.5.

Drainage area (revised).--7,470 sq mi, approximately, of which about 5,560 sq mi is probably noncontributing (includes 3,800 sq mi in closed basins).

Records available.--October 1949 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Concrete control. Datum of gage is 1,200.00 ft above mean sea level, datum of 1929.

Average discharge.--11 years (1949-60), 106 cfs (76,740 acre-ft per year), unadjusted; median of yearly mean discharges, 68 cfs (49,200 acre-ft per year), unadjusted.

Extremes.--1949-60: Maximum discharge, 3,150 cfs May 23, 1950 (gage height, 32.52 ft); no flow at times in 1950, 1952-53.

Maximum discharge known, about 4,600 cfs Apr. 27 or 28, 1948.

Remarks.--Flow completely regulated by Lake Ashtabula. Records prior to 1955 do not include releases at Baldhill Dam to the fish-rearing ponds of the Fish and Wildlife Service.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	13.1	26.5	27.5	25.7	23.6	39.6	547	320	89.8	46.9	23.7	28.9	101
1952	50.0	15.0	14.9	24.6	29.0	14.7	2.63	13.6	14.3	13.0	21.6	16.6	19.2
1953	13.6	10.8	14.8	24.1	23.7	8.26	2.07	12.7	77.4	124	8.68	13.4	27.8
1954	19.3	19.9	41.3	60.3	56.3	80.7	132	36.4	166	215	30.9	49.5	75.6
1955	59.4	5.2	105	84.3	32.0	7.81	248	64.0	238	224	12.6	3.81	96.3
1956	1.92	1027	7.64	3.64	7.66	63.5	374	355	275	51.9	12.9	3.89	96.6
1957	7.75	33.9	53.6	57.4	68.4	44.8	17.9	36.9	63.3	39.7	34.1	272	60.3
1958	98.8	120	82.3	80.1	68.1	67.6	41.3	17.9	5.88	75.8	14.3	15.9	57.4
1959	18.0	33.4	43.1	42.1	34.9	26.5	8.95	6.86	7.90	7.28	8.53	9.40	20.5
1960	10.1	17.3	28.0	24.2	22.3	16.8	669	77.2	153	26.3	14.3	14.4	88.4

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	807	1,580	1,680	1,590	1,310	2,440	32,560	19,660	5,340	2,880	1,460	1,720	73,020
1952	3,070	893	914	1,510	1,670	903	156	837	853	799	1,330	988	13,920
1953	857	643	913	1,490	1,320	508	123	782	4,600	7,600	534	795	20,140
1954	1,180	1,190	2,540	3,710	3,330	4,960	7,870	2,240	9,850	13,250	1,900	2,950	54,770
1955	2,420	6,070	6,350	5,180	1,780	480	14,740	3,930	14,160	13,750	776	48	69,680
1956	118	314	469	224	440	3,890	22,280	21,820	16,380	3,190	791	231	70,150
1957	476	2,020	3,300	3,530	3,800	2,750	1,070	2,270	3,760	2,440	2,100	16,180	43,700
1958	6,070	7,140	5,060	4,930	3,780	4,160	2,460	1,100	350	4,660	879	948	41,540
1959	1,110	1,990	2,650	2,590	1,940	1,630	533	422	470	447	524	560	14,870
1960	622	1,030	1,720	1,490	1,280	1,040	39,800	4,740	9,080	1,620	877	855	64,150

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30										Calendar year			
		Observed					Adjusted ^a / _{Per square mile}					Observed		Adjusted ^a / _{Acre-foot}	
		Discharge	Maximum	Minimum	Mean	Acre-feet	Mean	Acre-feet	Mean	Acre-feet	Mean	Acre-feet	Mean	Acre-feet	Acre-feet
		Date		day											
1950	1208	-	-	-	-	-	-	-	-	-	522	378,200	-	-	-
1951	1208	1,270	Apr. 19, 1951	8.3	101	73,020	-	-	-	-	102	73,850	-	-	-
1952	1238	6400	Aug. 29, 1952	0	19.2	13,920	-	-	-	-	15.8	11,440	-	-	-
1953	1278	1,980	July 16, 1953	0	27.8	20,140	-	-	-	-	31.3	22,650	-	-	-
1954	1338	1,270	Mar. 11, 1954	7.3	75.6	54,770	-	-	-	-	89.4	64,700	-	-	-
1955	1388	1,640	Apr. 13, 1955	2	96.3	69,680	96.4	-	69,760	77.0	55,740	78.1	56,540	-	-
1956	1438	2,070	Apr. 26, 1956	1.0	96.6	70,150	98.3	-	71,360	103	75,040	105	76,280	-	-
1957	1508	598	Sept. 3-5, 1957	1.8	60.3	43,700	61.7	-	44,870	77.6	56,170	78.9	57,160	-	-
1958	1558	240	July 17, 1958	4.4	57.4	41,540	59.6	-	42,420	40.1	29,020	41.3	29,880	-	-
1959	1628	190	Nov. 18, 1959	1.8	20.5	14,870	21.8	-	15,780	17.2	12,490	18.5	13,410	-	-
1960	1708	1,570	Apr. 17, 1960	4.9	88.4	64,150	89.7	-	65,120	-	-	-	-	-	-

^a Adjusted for diversion by U.S. Fish and Wildlife Service.

^b About.

585. Sheyenne River at Valley City, N. Dak.

Location.--Lat 46°54'50", long 98°00'30", in SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.28, T.140 N., R.58 W., on left bank 100 ft downstream from College Dam in Valley City, 13 miles downstream from Bald-hill Dam, and at mile 253.0.

Drainage area (revised).--7,810 sq mi, approximately, of which about 5,700 sq mi is probably noncontributing (includes 3,800 sq mi in closed basins).

Records available.--March to August 1919, March to June 1938, August 1938 to September 1960. Records for July 1938, published in WSP 855, have been found to be unreliable and should not be used.

Gage.--Water-stage recorder and concrete control. Datum of gage is 1,199.91 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). March to August 1919, staff gage at site half a mile upstream at different datum. March to Oct. 13, 1928, staff gage at present site and datum.

Average discharge (unadjusted).--22 years (1938-60), 110 cfs (79,640 acre-ft per year); median of yearly mean discharges, 90 cfs (65,200 acre-ft per year).

Extremes.--1919, 1938-60: Maximum discharge, 4,580 cfs Apr. 28, 1948 (gage height, 17.51 ft); no flow during several periods in 1938-41.

Remarks.--Flow regulated by Lake Ashtabula.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	13.2	30.7	26.6	25.9	24.0	73.2	556	325	95.3	47.2	22.3	27.5	105
1952	51.3	14.5	14.7	23.4	28.8	49.2	32.4	19.3	22.0	21.1	24.2	21.1	26.9
1953	15.1	11.9	15.7	23.1	36.2	18.2	3.19	22.2	112	133	9.22	12.3	34.2
1954	19.3	20.1	38.8	58.6	62.6	78.1	138	40.6	175	234	33.6	50.8	79.1
1955	41.7	99.9	98.5	84.3	33.4	23.3	253	69.3	256	230	17.1	2.29	101
1956	1.29	2.19	6.27	2.66	7.17	67.0	357	366	287	54.1	14.5	2.61	97.2
1957	7.19	38.0	52.5	54.7	63.4	45.4	17.0	33.9	64.8	46.5	43.5	289	62.6
1958	103	125	83.8	77.8	73.1	66.1	50.1	20.9	8.49	76.3	13.2	14.5	59.4
1959	17.0	28.4	39.9	38.9	33.7	29.0	9.97	9.77	29.9	14.1	9.84	9.93	22.5
1960	12.4	16.1	26.4	21.4	20.1	75.3	696	82.0	160	26.0	20.7	15.8	96.7

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	810	1,820	1,630	1,590	1,330	4,500	33,080	20,010	5,670	2,900	1,370	1,640	76,350
1952	3,150	861	902	1,440	1,660	3,030	1,930	1,190	1,310	1,300	1,490	1,260	19,520
1953	928	711	845	1,420	2,010	1,120	190	1,366	6,660	8,190	567	734	24,740
1954	1,180	1,200	2,390	3,600	3,480	4,800	8,220	2,500	10,420	14,360	2,070	3,020	57,240
1955	2,560	5,950	6,060	5,180	1,850	1,430	15,080	4,260	15,220	14,110	1,050	176	72,890
1956	80	130	368	184	412	4,120	21,270	22,530	17,070	3,320	891	155	70,530
1957	442	2,260	3,230	3,360	3,520	2,790	1,010	2,090	3,860	2,860	2,670	17,210	45,300
1958	6,320	7,460	5,150	4,760	4,060	4,070	2,980	1,290	505	4,690	809	865	42,980
1959	1,040	1,690	2,450	2,390	1,870	1,780	593	601	1,780	868	605	591	16,260
1960	762	958	1,620	1,320	1,150	4,630	41,390	5,040	9,520	1,600	1,280	938	70,210

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	539	390,200
1951	1208	1,270	Apr. 19, 1951	1.1	105	76,350	106	77,000
1952	1238	650	Mar. 31, 1952	1.2	26.9	19,520	23.5	17,090
1953	1278	1,230	July 17, 1953	.2	34.2	24,740	37.3	27,020
1954	1338	726	July 13, 1954	9.8	79.1	57,240	92.6	67,040
1955	1388	1,490	Apr. 14, 1955	.8	101	72,890	81.4	58,910
1956	1438	1,870	Apr. 28, 1956	.2	97.2	70,530	105	75,860
1957	1508	627	Sept. 4, 1957	.5	62.6	45,300	80.5	58,300
1958	1558	248	July 17, 1958	3.4	59.4	42,980	40.4	29,230
1959	1628	988	June 27, 1959	.4	22.5	16,260	19.9	14,420
1960	1708	1,570	Apr. 17, 1960	6.1	96.7	70,210	-	-

587. Sheyenne River at Lisbon, N. Dak.

Location.--Lat 46°27', long 97°41', on line between secs. 1 and 2, T.134 N., R.56 W., on left bank 150 ft downstream from dam at State fish hatchery at north edge of city of Lisbon, 3 miles upstream from Timber Coulee, and at mile 162.1.

Drainage area (revised).--8,190 sq mi, approximately, of which about 5,700 sq mi is probably noncontributing (includes 3,800 sq mi in closed basins).

Records available.--September 1956 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,066.46 ft above mean sea level, datum of 1929.

Extremes.--1956-60: Maximum discharge, 1,980 cfs Apr. 11, 1960; maximum gage height, 9.85 ft Mar. 29, 1960, backwater from ice; no flow Sept. 19-21, Oct. 23, 24, 1956.

Remarks.--Flow regulated by Lake Ashtabula. Records of chemical analyses for the period August 1956 to September 1960 and water temperatures for the period October 1956 to September 1960 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957	7.66	34.5	49.1	50.6	49.8	68.2	43.1	39.9	65.2	51.5	49.3	323	69.0
1958	109	134	80.9	70.7	95.6	116	98.8	58.4	27.6	72.3	17.2	12.9	72.7
1959	21.1	31.5	36.5	36.0	33.5	48.4	33.2	17.5	40.1	27.7	10.7	5.25	28.4
1960	16.0	12.7	26.0	19.5	21.9	175	838	100	172	35.7	21.0	13.9	120

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957	471	2,050	3,020	3,110	2,770	4,190	2,570	2,460	3,880	3,170	3,030	19,230	49,950
1958	6,720	7,970	4,970	4,350	5,310	7,130	5,880	2,360	1,640	4,440	1,960	767	52,600
1959	1,500	1,870	2,240	2,210	1,860	2,980	1,980	1,080	2,390	1,700	659	313	20,580
1960	983	754	1,600	1,200	1,260	10,780	49,890	6,150	10,220	2,200	1,290	830	87,160

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet	
		Discharge	Date						
1957	1508	612	Sept. 7, 1957	0	69.0	49,950	88.5	64,070	
1958	1558	490	Apr. 7, 1958	5.2	72.7	52,600	53.0	38,350	
1959	1628	451	June 29, 1959	.6	28.4	20,580	25.6	18,510	
1960	1708	1,980	Apr. 11, 1960	2.8	120	87,160	-	-	

590. Sheyenne River near Kindred, N. Dak.

Location.--Lat 46°37'35", long 97°00'05", in NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.5, T.136 N., R.50 W., at Great Northern Railway bridge, $1\frac{1}{2}$ miles southeast of Kindred and at mile 68.1.

Drainage area (revised).--8,800 sq mi, approximately, of which about 5,780 sq mi is probably noncontributing (includes 3,800 sq mi in closed basins).

Records available.--July 1949 to September 1960.

Gage.--Wire-weight gage. Datum of gage is 929 ft above mean sea level (from Great Northern Railway profile).

Average discharge.--11 years (1949-60), 165 cfs (119,500 acre-ft per year); median of yearly mean discharges, 118 cfs (85,400 acre-ft per year).

Extremes.--1949-60: Maximum discharge, 3,210 cfs May 14, 1950 (gage height, 20.50 ft); minimum, 13 cfs Nov. 13, 1955, Aug. 22-24, 1959; minimum gage height, 2.93 ft Aug. 22-24, 1959.

Spring flood in 1947 or 1948 reached a stage of 22.1 ft, from floodmark (discharge, about 3,600 cfs).

Remarks.--Flow regulated by Lake Ashtabula and several smaller reservoirs.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	51.0	64.1	47.6	50.0	50.0	87.3	683	530	184	127	59.0	71.2	167
1952	61.5	86.7	47.4	45.5	59.0	62.1	787	117	73.4	75.9	38.9	41.2	124
1953	42.8	43.5	35.5	34.7	45.6	128	99.3	139	289	268	59.9	33.0	102
1954	40.6	47.7	52.9	67.1	111	133	223	101	113	337	73.4	65.4	114
1955	67.4	109	108	80.8	49.3	71.0	351	107	272	292	111	26.1	137
1956	29.9	22.7	17.6	19.7	21.7	35.1	255	612	299	98.3	49.3	26.0	124
1957	24.6	47.6	59.2	55.6	57.7	113	117	88.4	98.8	93.9	74.1	32.6	96.0
1958	129	171	116	96.5	89.0	209	177	84.7	73.7	105	43.7	30.5	110
1959	38.3	42.8	38.8	41.1	33.8	66.0	97.4	53.7	59.3	62.1	33.1	26.1	49.3
1960	36.0	30.6	41.9	38.0	36.1	69.0	1060	182	213	84.7	36.5	41.3	134

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	3,130	3,810	2,930	3,070	2,780	5,370	40,620	32,620	10,970	7,810	3,630	4,740	121,000
1952	3,780	5,160	2,920	2,800	3,390	3,820	46,860	7,180	4,370	4,670	2,390	2,450	89,790
1953	2,630	2,590	2,180	2,140	2,530	7,890	5,910	8,540	17,180	16,470	3,690	1,960	73,710
1954	2,500	2,840	3,250	4,130	6,190	8,160	15,250	6,200	6,720	20,700	4,510	4,130	82,580
1955	4,140	6,470	6,620	4,970	2,740	4,360	20,870	6,600	16,200	17,940	6,810	1,550	99,270
1956	1,840	1,350	1,080	1,210	1,250	2,160	15,200	37,620	17,780	6,050	3,030	1,550	90,120
1957	1,510	2,830	3,640	3,420	3,200	6,930	6,960	5,450	5,880	5,780	4,560	19,320	69,460
1958	7,940	10,160	7,120	5,930	4,940	12,860	10,520	5,210	4,390	6,430	2,690	1,810	80,000
1959	2,350	2,550	2,390	2,530	1,880	4,060	5,790	3,300	3,530	3,820	2,030	1,490	35,720
1960	2,210	1,820	2,580	2,340	2,070	4,240	63,070	11,170	12,650	5,210	2,240	2,460	112,100

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30				Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean
		Discharge	Date				
1950	-	-	-	-	-	-	637
1951	1208	1,010	May 5, 1951	35	167	121,000	170
1952	1238	2,240	Apr. 8, 1952	28	124	89,790	118
1953	1278	679	July 3, 1953	27	102	73,710	103
1954	1358	651	July 6, 1954	22	114	82,580	126
1955	1388	1,120	Apr. 19, 1955	19	137	99,270	119
1956	1438	1,460	May 4, 1956	13	124	90,120	129
1957	1508	547	Sept. 12, 1957	17	96.0	69,460	120
1958	1558	480	May 5, 1958	23	110	80,000	85.7
1959	1628	2,204	July 3, 1959	13	49.3	35,720	48.4
1960	1708	1,820	Apr. 13, 1960	20	154	112,100	-

a Maximum observed.

595. Sheyenne River at West Fargo, N. Dak.

Location.--Lat 46°53'20", long 96°54'55", in sec.31, T.140 N., R.49 W., on left bank 80 ft downstream from county highway bridge, 1 mile north of West Fargo, 3 miles upstream from Maple River, and at mile 24.5.

Drainage area (revised).--8,870 sq mi, approximately, of which about 5,780 sq mi is probably noncontributing (includes 3,800 sq mi in closed basins).

Records available.--March to November 1902 (gage heights only), April 1903 to October 1905, March to August 1919, September 1929 to September 1960. Published as "at or near Haggart" 1902-7, 1919. Records for March to November 1902 and November 1905 to June 1907, published in WSP 100, 171, 207, and 245, have been found to be unreliable and should not be used. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 877.19 ft above mean sea level, datum of 1929. March 1902 to April 1906 and March to August 1919, staff gage at private bridge three-quarters of a mile upstream at different datum. September 1929 to July 22, 1930, wire-weight gage at present site and datum. July 22, 1930, to June 27, 1933, chain gage at present site and datum.

Average discharge.--33 years (1903-5, 1929-60), 147 cfs (106,400 acre-ft per year); median of yearly mean discharges, 130 cfs (94,100 acre-ft per year).

Extremes.--1902-5, 1919, 1929-60: Maximum discharge, 2,810 cfs May 22, 1950; maximum gage height, 20.61 ft May 11, 1950 (backwater from Maple River); minimum discharge, 2.0 cfs Dec. 14, 1946 (gage height, 1.90 ft).

Remarks.--Flow regulated by Lake Ashtabula beginning in August 1949. Records do not include overbank discharge (about 500 cfs in May 1950) which leaves Sheyenne River in vicinity of Horace and flows into Red River of the North above Fargo during periods of high runoff.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	52.6	65.1	54.4	50.0	50.0	67.7	709	553	192	133	61.8	68.8	171
1952	62.8	92.3	55.2	45.5	57.9	68.0	970	125	74.8	224	43.5	40.1	154
1953	43.6	47.0	35.2	35.5	45.0	129	108	158	475	286	85.6	34.2	122
1954	42.6	54.7	58.8	72.9	112	144	240	117	100	342	41.4	71.3	120
1955	64.3	98.6	92.9	81.0	50.6	58.1	376	110	282	295	134	31.7	140
1956	38.0	24.6	19.4	18.9	18.3	34.0	272	617	305	124	53.5	26.7	130
1957	27.1	43.4	55.8	40.0	42.1	120	143	96.7	115	104	80.5	290	96.4
1958	137	171	131	111	95.4	201	194	97.6	78.4	131	58.7	39.1	121
1959	38.4	44.7	41.2	41.9	36.0	73.8	121	54.0	92.9	77.8	33.3	33.5	57.4
1960	35.6	27.9	42.7	40.2	43.4	58.4	1,072	191	207	85.3	35.7	46.2	156

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	3,240	3,870	3,340	3,070	2,780	4,170	42,180	34,030	11,410	8,150	3,800	4,090	124,100
1952	3,860	5,490	3,390	2,800	3,330	4,180	57,750	7,670	4,450	13,780	2,670	2,380	111,700
1953	2,680	2,800	2,170	2,060	2,390	7,950	6,430	9,690	28,250	17,580	4,030	2,040	88,070
1954	2,620	3,250	3,620	4,480	6,200	8,850	14,280	7,180	5,970	21,000	5,010	4,240	86,700
1955	3,950	5,880	5,710	4,980	2,810	3,570	22,390	6,790	16,750	18,130	8,260	1,690	101,100
1956	2,340	1,460	1,190	1,160	1,050	2,090	16,170	37,960	18,130	7,610	3,290	1,710	94,160
1957	1,670	2,580	3,430	2,460	2,340	7,380	8,530	5,940	6,840	6,380	4,950	17,280	69,780
1958	8,410	10,190	8,030	6,800	5,300	12,360	11,570	6,000	4,670	8,070	3,610	2,330	87,340
1959	2,360	2,660	2,530	2,570	2,000	4,540	7,210	3,320	5,530	4,790	2,050	1,990	41,550
1960	2,190	1,660	2,630	2,470	2,500	3,590	63,780	11,750	12,310	5,240	2,190	2,750	113,100

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30				Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean
		Discharge	Date				
1950	-	-	-	-	-	-	588
1951	1208	1,020	Apr. 5, 1951	40	171	124,100	175
1952	1238	2,510	Apr. 12, 1952	26	154	111,700	147
1953	1278	1,300	June 17, 1953	18	122	88,070	124
1954	1338	565	July 7, 1954	21	120	86,700	128
1955	1388	1,110	Apr. 21, 1955	20	140	101,100	125
1956	1438	1,450	May 8, 1956	12	130	94,160	133
1957	1508	442	Sept. 14, 1957	22	96.4	69,780	123
1958	1558	470	Mar. 7, 1958	28	121	87,340	94.3
1959	1628	246	June 12, 1959	17	57.4	41,550	55.9
1960	1708	1,720	Apr. 14, 1960	20	156	113,100	-

597. Maple River near Enderlin, N. Dak.

Location.--Lat 46°37'10", long 97°34'20", on west line sec.2, T.136 N., R.55 W., on right bank 25 ft downstream from county highway bridge, 1 mile downstream from South Branch, and 1½ miles east of Enderlin.

Drainage area.--843 sq mi (revised), of which about 47 sq mi is probably noncontributing.

Records available.--May 1956 to September 1960.

Gage.--Water-stage recorder. Prior to Sept. 20, 1956, wire-weight gage at site 25 ft upstream.

Extremes.--1956-60: Maximum discharge, 621 cfs Apr. 8, 1960 (gage height, 7.23 ft); minimum, 0.7 cfs Oct. 5, 1956 (gage height, 1.90 ft).

Remarks.--Low flows probably affected by sewage effluent from Enderlin.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	-	-	-	-	-	-	-	-	11.2	1.79	4.37	6.35	-
1957	2.55	3.09	2.35	2.02	1.92	3.06	5.87	3.46	6.64	9.44	13.7	28.1	6.85
1958	7.94	13.3	5.87	2.74	9.18	25.7	45.8	5.22	10.4	15.8	2.73	2.31	12.2
1959	2.15	3.26	3.00	2.03	2.15	3.51	7.59	2.55	2.76	3.38	2.13	1.85	2.62
1960	3.05	2.42	2.02	1.72	1.97	47.6	201	7.58	4.04	2.66	1.75	1.76	22.9

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	-	-	-	-	-	-	-	-	665	110	269	378	-
1957	156	184	145	124	107	188	349	213	395	580	841	1,670	4,950
1958	488	790	361	169	510	1,580	2,720	321	620	974	168	138	8,840
1959	132	194	184	125	119	216	154	157	164	208	131	116	1,900
1960	187	144	124	106	113	2,930	11,930	466	240	164	108	105	16,620

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1956	1508	-	-	-	-	-	-	-
1957	1508, 1708	150	Aug. 13, 1957	1.6	6.85	4,950	-	-
1958	1558, 1708	202	Apr. 6, 1958	2.0	12.2	8,840	8.44	6,110
1959	1628	34	Nov. 18, 1959	1.6	2.62	1,900	2.55	7,710
1960	1708	621	Apr. 8, 1960	1.4	22.9	16,620	-	1,840

600. Maple River near Mapleton, N. Dak.

Location.--Lat 46°51'40", long 97°06'10", in SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.10, T.139 N., R.51 W., on right abutment of dam, 3 miles southwest of Mapleton, 14 miles upstream from mouth.

Drainage area.--1,450 sq mi (revised), of which about 71 sq mi is probably noncontributing. At site used prior to Oct. 1, 1958, 1,453 sq mi (revised).

Records available.--April 1944 to September 1960. Prior to October 1958, published as "at Mapleton."

Gage.--Water-stage recorder and rubble masonry dam. Altitude of gage is about 898 ft (estimated by comparison with gage at former site). Prior to Oct. 1, 1958, wire-weight gage at site 3 miles downstream at different datum.

Average discharge.--16 years (1944-60), 43.8 cfs (31,710 acre-ft per year), median of yearly mean discharges, 25 cfs (18,100 acre-ft per year).

Extremes.--1944-60: Maximum discharge, 4,840 cfs June 17, 1953 (gage height, 18.62 ft, former site and datum); maximum gage height, 18.91 ft Apr. 6, 1952 (former site and datum, backwater from ice); no flow at times in most years.

Remarks.--Some small diversions for irrigation.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Spt.	The year
1951	4.29	3.55	1.36	0.71	0.2	7.37	234	16.1	11.6	11.4	6.02	10.8	25.4
1952	4.61	6.10	6.3	1.45	.36	.34	906	25.7	6.67	18.7	.55	.01	82.7
1953	0	1.75	1.99	1.42	1.47	25.0	21.0	88.5	717	63.4	51.1	1.78	80.7
1954	.80	5.90	5.17	2.5	3.6	38.4	37.1	14.1	6.52	12.9	2.56	3.15	11.1
1955	.79	3.37	3.05	1.5	.25	.18	118	6.30	13.4	63.2	9.47	.28	18.3
1956	.62	1.99	.63	.02	0	0	114	27.3	13.6	2.90	.49	.24	13.4
1957	.02	7.42	1.89	.50	.15	7.10	27.1	13.5	54.3	13.8	15.2	25.5	13.8
1958	10.3	19.4	7.33	2.35	.59	31.6	74.8	16.3	15.7	42.4	30.8	5.11	18.2
1959	1.90	2.46	.31	0	0	10.2	15.9	8.35	113	21.0	1.10	0	14.3
1960	.77	1.84	1.10	.82	.40	70.3	360	15.8	5.82	2.01	0	0	37.9

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Spt.	The year
1951	264	211	84	44	21	453	13,930	992	688	699	370	643	18,390
1952	283	363	389	89	20	15	53,900	1,580	377	2,990	34	.4	60,060
1953	0	104	122	87	82	1,540	1,250	5,440	42,640	3,900	3,140	106	58,410
1954	49	351	318	153	198	2,360	2,210	868	398	791	157	188	8,030
1955	48	201	188	91	14	11	7,020	388	797	3,690	582	17	13,250
1956	38	118	39	1.0	0	0	6,790	1,680	810	179	30	14	9,700
1957	1.2	442	116	31	8.3	436	1,610	828	3,230	851	937	1,520	10,010
1958	636	1,160	451	145	33	1,950	4,450	1,040	932	2,610	190	304	13,900
1959	117	147	19	0	0	650	829	514	6,730	1,290	67	0	10,340
1960	47	110	68	51	23	4,320	21,430	970	547	123	0	0	27,490

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	149	108,200
1951	1208	750	Apr. 7, 1951	0	25.4	18,390	26.1	18,960
1952	1238	3,850	Apr. 6, 1952	0	82.7	60,060	81.6	59,250
1953	1278	4,840	June 17, 1953	0	80.7	58,410	81.4	58,900
1954	1338	200	Mar. 21, 1954	0	11.1	8,030	10.7	7,750
1955	1388	500	Apr. 2, 1955	0	18.3	13,250	18.0	13,010
1956	1438	630	Apr. 14, 1956	0	13.4	9,700	13.6	10,070
1957	1508	430	June 23, 1957	0	13.8	10,010	16.3	11,830
1958	1558	195	Apr. 10, 1958	2	19.2	13,900	16.4	11,940
1959	1628	1,160	June 12, 1959	0	14.3	10,340	14.2	10,280
1960	1708	1,220	Apr. 7, 1960	0	37.9	27,490	-	-

605. Rush River at Amenla, N. Dak.

Location.--Lat 47°00'40", long 97°13'10", on line between secs. 23 and 24, T.141 N., R.52 W., near center of span on upstream side of bridge on county highway, 0.4 mile north of Amenla.

Drainage area.--116 sq mi (revised).

Records available.--July 1946 to September 1960.

Gage.--Wire-weight and crest-stage gages. Datum of gage is about 940 ft above mean sea level, datum of 1929 (from railroad profile). Prior to Oct. 7, 1947, staff gage at site 150 ft downstream at datum 3.00 ft higher. Oct. 7, 1947, to Sept. 30, 1956, wire-weight gage at same site at datum 3.00 ft higher.

Average discharge.--14 years (1946-60), 7.46 cfs (5,400 acre-ft per year); median of yearly mean discharges, 4.8 cfs (3,480 acre-ft per year).

Extremes.--1946-60: Maximum discharge, 1,230 cfs Apr. 14, 1947; maximum gage height observed, 10.96 ft Mar. 27, 1950 (backwater from ice); no flow for some periods in each year.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.15	0.15	0	0	0	29.8	28.2	2.20	3.06	0.63	0	0.26	5.39
1952	.01	.73	.28	0	0	0	76.1	1.68	.08	1.13	.01	0	6.57
1953	0	0	0	0	0	5.30	2.23	5.66	48.9	8.10	.91	0	5.90
1954	0	0	0	0	.16	5.97	9.09	2.09	1.76	.04	0	0	1.59
1955	0	0	0	0	0	6.1	11.5	.12	1.38	0	1.73	0	1.74
1956	0	0	0	0	0	0	25.8	2.79	8.81	.07	0	0	3.08
1957	0	0	0	0	0	3.77	1.72	2.17	16.6	6.65	2.64	1.73	2.94
1958	.90	2.75	.06	0	1.18	1.89	3.40	1.87	3.09	9.72	0	0	2.08
1959	0	0	0	0	0	16.3	1.44	1.23	4.50	.19	0	0	1.99
1960	0	0	0	0	0	27.5	49.0	2.59	.95	11.5	.01	0	7.61

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	9.1	6.9	0	0	0	1,830	1,680	135	182	39	0	16	3,900
1952	6	44	17	0	0	0	4,530	103	5.0	69	.4	0	4,770
1953	0	0	0	0	0	326	133	348	2,190	498	56	0	4,270
1954	0	0	0	0	8.9	367	541	129	105	2.2	0	0	1,150
1955	0	0	0	0	0	377	684	7.3	162	0	107	0	1,260
1956	0	0	0	0	0	0	1,540	171	524	4.2	0	0	†2,240
1957	0	0	0	0	0	252	102	133	987	409	162	103	2,130
1958	55	164	3.8	0	66	116	202	115	184	598	0	0	1,500
1959	0	0	0	0	0	1,000	85	75	268	12	0	0	1,440
1960	0	0	0	0	0	1,690	2,920	159	57	705	.4	0	5,530

† Corrected.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	1208	-	-	-	-	-	27.4	19,840
1951	1208	368	Mar. 28, 1951	0	5.39	3,900	5.45	3,940
1952	1238	†a600	Apr. 1, 1952	0	6.57	4,770	6.48	4,710
1953	1278	1,500	June 16, 1953	0	5.90	4,270	5.90	4,270
1954	1338	120	Apr. 6, 1954	0	1.59	1,150	1.59	1,150
1955	1388	200	Mar. 31, 1955	0	1.74	1,260	1.74	1,260
1956	1438	a250	Apr. 13, 1956	0	3.08	†2,240	3.08	†2,240
1957	1508	115	June 24, 1957	0	2.94	2,130	3.25	2,350
1958	1558	77	July 5, 1958	0	2.08	1,500	1.77	1,280
1959	1628	100	June 10, 1959	0	1.99	1,440	1.99	1,440
1960	1708	437	Apr. 6, 1960	0	7.61	5,530	-	-

† Corrected.

a About.

610. Buffalo River near Hawley, Minn.

Location.--lat 46°51'00", long 96°19'45", near center of SE $\frac{1}{4}$ sec.14, T.139 N., R.45 W., near left downstream end of bridge on farm lane, 2 miles southwest of Hawley.

Drainage area.--322 sq mi.

Records available.--March 1945 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,111.91 ft above mean sea level, datum of 1929. Prior to Jan. 29, 1953, chain gage at bridge 1,800 ft upstream at datum 3.17 ft lower.

Average discharge.--15 years (1945-60), 71.7 cfs (51,910 acre-ft per year).

Extremes.--1945-60: Maximum discharge, 1,590 cfs Aug. 5, 1955 (gage height, 9.31 ft); minimum observed, 6.8 cfs July 28, 1945; minimum gage height, 2.64 ft Oct. 4, 1956. Maximum stage known, about 11.3 ft, present datum, in spring of 1921, from information by local resident.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	14.9	14.1	14.1	13.1	11.1	18.3	341	83.7	81.9	33.6	26.9	26.3	56.3
1952	31.0	29.2	38.0	27.0	27.0	24.9	425	73.8	28.5	291	168	45.6	101
1953	27.0	28.3	20.0	15.5	17.5	127	180	115	200	72.1	164	42.7	84.2
1954	27.0	24.3	25.7	25.9	27.9	60.1	247	161	69.5	28.5	15.5	20.8	61.1
1955	19.7	19.8	13.3	13.5	13.6	23.1	142	53.0	54.1	164	472	46.6	87.0
1956	35.6	29.2	22.6	17.6	20.2	22.6	468	124	55.3	22.2	22.3	16.0	70.6
1957	14.8	23.4	15.4	12.4	14.0	102	147	66.7	146	111	39.2	192	72.7
1958	111	13.8	40.8	30.8	22.6	37.1	61.9	40.2	68.9	75.1	32.1	53.2	55.0
1959	36.9	54.4	30.3	15.2	13.6	101	112	79.2	172	249	73.8	37.9	81.7
1960	40.9	34.1	27.8	23.7	21.9	43.5	356	174	62.4	52.3	40.8	30.7	77.1

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	914	837	868	807	617	1,120	20,270	5,150	4,870	2,070	1,660	1,560	40,740
1952	1,900	1,740	2,340	1,660	1,550	1,530	25,310	4,540	1,700	17,870	10,350	2,720	73,210
1953	1,660	1,680	1,230	952	970	7,780	10,720	7,050	11,680	4,430	10,060	2,540	60,950
1954	1,860	1,440	1,580	1,590	1,550	3,700	14,710	9,890	4,140	1,760	950	1,240	44,210
1955	1,210	1,180	819	829	754	1,420	8,420	3,260	3,220	10,080	29,030	2,770	62,990
1956	2,070	1,740	1,390	1,080	1,160	1,390	27,870	7,600	3,290	1,360	1,370	950	51,270
1957	907	1,510	821	764	778	6,270	8,760	4,100	8,690	6,800	2,350	10,840	52,590
1958	6,850	4,990	2,510	1,890	1,260	2,280	3,690	2,470	4,100	4,620	1,970	3,170	39,800
1959	2,270	3,240	1,860	936	754	6,230	6,660	4,870	10,220	15,300	4,550	2,250	59,130
1960	2,520	2,030	1,710	1,460	1,260	2,660	21,180	10,670	4,910	3,220	2,510	1,830	55,980

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet	
		Discharge	Date						
1950	-	-	-	-	-	-	86.9	62,940	
1951	1208	792	Apr. 7, 1951	10	56.3	40,740	60.9	40,100	
1952	1238	880	Apr. 8, 1952	-	101	73,210	98.9	71,800	
1953	1278	598	June 17, 1953	15	84.2	60,950	84.4	61,060	
1954	1338	630	Apr. 12, 1954	11	61.1	44,210	59.0	42,740	
1955	1388	1,590	Aug. 5, 1955	12	87.0	62,990	89.7	64,980	
1956	1438	1,020	Apr. 11, 1956	13	70.6	51,270	67.9	49,310	
1957	1508	456	Mar. 26, 1957	9.3	72.7	52,590	88.0	63,700	
1958	1558	195	July 5, 1958	18	55.0	39,800	45.3	32,820	
1959	1628	551	July 11, 1959	11	81.7	59,130	80.1	58,020	
1960	1708	660	Apr. 27, 1960	18	77.1	55,980	-	-	

615. South Branch Buffalo River at Sabin, Minn.

Location.--Lat 46°46'20", long 96°37'40", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 9, T.138 N., R.47 W., rear center of span on downstream side of highway bridge, a quarter of a mile downstream from Whiskey Creek and 1 mile east of Sabin.

Drainage area.--522 sq mi.

Records available.--March 1945 to September 1960.

Gage.--Chain gage. Datum of gage is 302.39 ft above mean sea level, datum of 1929 (levels by Soil Conservation Service). Prior to Aug. 17, 1948, at site 1 mile downstream at different datum.

Average discharge.--15 years (1945-60), 47.6 cfs (34,460 acre-ft per year).

Extremes.--1945-60: Maximum discharge, 3,410 cfs May 31, 1953 (gage height, 15.38 ft); no flow for many days in most years.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	3.84	2.89	0.61	0	0	0	383	32.3	60.2	15.7	3.61	8.31	42.1
1952	20.5	10.9	6.66	1.79	1.00	1.51	595	14.3	3.38	18.0	11.1	8.15	70.7
1953	3.97	7.82	2.02	.558	0	86.9	90.6	241	544	21.4	17.6	4.16	84.9
1954	1.24	3.90	1.75	.57	.89	86.6	91.1	50.7	54.5	10.0	4.42	6.01	26.0
1955	19.4	10.5	3.40	.63	0	4.8	164	25.2	42.4	213	9.86	1.49	41.4
1956	2.67	2.64	.14	0	0	.18	412	54.3	21.1	3.12	2.84	1.56	41.2
1957	4.10	5.49	1.73	.24	0	75.1	158	49.4	48.4	35.6	11.8	91.5	40.0
1958	34.1	40.1	6.93	2.21	3.65	19.6	41.7	27.4	45.6	419	12.0	15.4	56.3
1959	10.8	28.4	2.09	0	0	54.6	44.7	55.5	180	90.6	14.5	9.01	40.9
1960	13.7	7.53	4.18	3.24	2.86	27.4	387	68.5	38.6	39.0	7.75	8.73	50.3

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	236	172	38	0	0	0	22,800	1,990	3,580	963	222	484	30,500
1952	1,260	651	410	110	58	93	35,430	879	201	11,050	683	485	51,310
1953	244	465	124	34	0	5,340	5,390	14,820	32,380	1,310	1,080	248	61,440
1954	76	232	108	35	49	5,320	5,420	3,120	3,240	617	272	358	18,850
1955	1,190	625	209	38	0	298	9,780	1,550	2,520	13,100	607	69	30,010
1956	164	157	8.3	0	0	11	24,490	3,340	1,260	192	175	93	29,890
1957	252	327	106	14	0	4,620	9,580	3,040	2,880	2,190	726	5,440	28,980
1958	2,100	2,390	426	136	203	1,200	2,480	1,680	2,720	25,790	740	916	40,780
1959	664	1,690	129	0	0	3,360	2,660	3,420	10,680	5,570	891	536	29,600
1960	844	448	257	199	164	1,690	23,000	4,210	2,300	2,400	476	519	36,510

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	93.8	67,830
1951	1208	1,640	Apr. 6, 1951	0	42.1	30,500	44.7	32,370
1952	1238	3,400	Apr. 8, 1952	.8	70.7	51,310	68.6	49,820
1953	1278	3,410	May 31, 1953	0	84.9	61,440	84.3	61,020
1954	1358	390	Mar. 24, 1954	.4	26.0	18,850	28.3	20,460
1955	1388	862	Apr. 2, 1955	0	41.4	30,010	39.1	28,510
1956	1438	2,410	Apr. 5, 1956	0	41.2	29,890	41.6	30,250
1957	1508	982	Apr. 21, 1957	0	40.0	28,980	45.9	33,220
1958	1558	1,520	July 7, 1958	1.8	56.3	40,780	53.0	38,350
1959	1628	572	June 20, 1959	0	40.9	29,600	39.6	28,670
1960	1708	1,020	Apr. 27, 1960	.2	50.3	36,510	-	-

620. Buffalo River near Dilworth, Minn.

Location.--Lat 46°57'40", long 96°39'40", in SW $\frac{1}{4}$ SE $\frac{1}{4}$ (revised) sec.6, T.140 N., R.47 W., on left bank $4\frac{1}{2}$ miles southeast of Kragnes, $6\frac{1}{2}$ miles northeast of Dilworth, and 9 miles downstream from South Branch.

Drainage area.--1,040 sq mi, approximately.

Records available.--March 1931 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Altitude of gage is 870 ft (from topographic map). Prior to Apr. 5, 1937, chain gage at same site and datum.

Average discharge.--29 years (1931-60), 109 cfs (78,910 acre-ft per year).

Extremes.--1931-60: Maximum discharge, 4,530 cfs Apr. 2, 1943 (gage height, 22.60 ft, from floodmark); no flow at times in 1936.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	19.7	17.3	15.6	13.5	13.8	19.2	800	144	173	51.6	32.9	38.7	111
1952	57.2	44.5	38.6	27.3	26.7	28.8	1,284	120	32.7	508	232	91.7	207
1953	35.8	40.1	25.1	15.7	17.4	202	295	250	956	135	206	55.5	185
1954	29.7	31.1	26.1	22.1	31.9	98.9	358	263	143	45.5	20.3	25.8	91.2
1955	39.0	32.6	18.6	13.0	13.3	14.5	368	89.3	99.5	466	435	55.9	138
1956	44.9	30.6	20.9	16.8	20.1	25.0	1,034	221	98.2	26.0	23.7	14.1	130
1957	19.7	38.9	18.0	13.9	14.2	187	346	145	210	198	65.2	336	133
1958	186	160	51.4	31.6	26.6	60.7	116	77.8	140	653	53.8	79.8	137
1959	51.1	85.0	39.0	16.9	13.6	117	212	171	589	388	87.5	54.2	136
1960	52.0	40.5	35.0	34.3	26.9	62.3	837	356	126	103	42.0	44.2	146

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,210	1,030	958	833	768	1,180	47,630	8,870	10,310	3,170	2,020	2,300	80,280
1952	3,520	2,650	2,370	1,680	1,540	1,770	76,390	7,390	1,940	31,230	14,260	5,450	150,200
1953	2,200	2,380	1,420	966	986	12,440	17,550	15,340	56,870	8,170	12,670	3,180	134,200
1954	1,830	1,850	1,600	1,560	1,770	6,080	21,300	16,190	8,490	2,800	1,250	1,540	66,060
1955	2,400	1,940	1,150	799	740	891	21,890	5,490	5,920	28,660	26,770	3,330	99,980
1956	1,760	1,820	1,290	1,030	1,160	1,540	61,550	13,610	5,850	1,600	1,460	839	94,510
1957	1,210	2,320	1,110	855	787	11,520	20,590	8,920	12,500	12,180	4,010	19,990	95,990
1958	11,450	9,500	3,160	1,940	1,480	3,730	6,890	4,780	8,300	40,160	3,310	4,750	99,450
1959	3,140	5,060	2,400	1,040	754	7,170	12,630	10,540	23,150	23,880	5,380	3,230	98,570
1960	3,200	2,410	2,150	2,110	1,550	3,830	49,810	21,920	7,500	6,330	2,580	2,630	106,000

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet	
		Discharge	Date						
1950	-	-	-	-	-	-	246	177,800	
1951	1208	-	-	-	-	-	118	84,620	
1952	1238	#2,230	Apr. 7, 1951	13	111	80,280	202	147,600	
1953	1278	4,310	Apr. 10, 1952	19	207	150,200	184	133,400	
1954	1338	2,420	June 20, 1953	14	185	134,200	91.5	66,270	
1955	1388	686	Apr. 12, 1954	16	91.2	66,060	138	100,400	
1956	1438	1,260	Apr. 4, 1955	13	138	99,980	128	93,280	
1957	1508	2,410	Apr. 12, 1956	10	130	94,510	158	115,460	
1958	1558	1,080	Apr. 24, 1957	13	133	85,990	119	85,940	
1959	1628	1,540	July 11, 1958	20	137	99,450	132	95,530	
1960	1708	699	June 23, 1959	12	136	98,570	-	-	
		1,390	Apr. 30, 1960	17	146	106,000			

Not previously published.

622. Elm River near Kelso, N. Dak.

Location.--Lat 47°17', long 97°07', on west line of sec.14, T.144 N., R.51 W., on downstream side of highway bridge, 5 miles southwest of Kelso and 14 miles upstream from North Branch.

Drainage area.--194 sq mi (revised).

Records available.--October 1955 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 887.60 ft above mean sea level, datum of 1929, Emerson Crookston supplementary adjustment of 1941. Prior to Mar. 30, 1957, wire-weight gage at same site and datum.

Average discharge.--5 years (1955-60), 112 cfs (811 acre-ft per year).

Extremes.--1955-60: Maximum discharge, 165 cfs Apr. 1, 1960 (gage height, 7.76 ft, back-water from ice); maximum gage height observed, 8.73 ft Apr. 16, 1956 (channel choked by snow); no flow most of time each year.

Maximum stage known since 1925, about 14 ft in 1950, from information by local resident.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	0	0	0	0	0	0	10.2	2.08	2.07	0	0	0	1.18
1957	0	0	0	0	0	0	.12	0	0	0	0	0	.03
1958	0	0	0	0	0	0	0	0	0	0	0	0	0
1959	0	0	0	0	0	0	.71	.19	0	0	0	0	.08
1960	0	0	0	0	0	5.16	46.8	.15	.01	0	0	0	4.29

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	0	0	0	0	0	0	606	128	123	0	0	0	857
1957	0	0	0	0	0	17	6.9	0	0	0	0	0	23.9
1958	0	0	0	0	0	0	0	0	0	0	0	0	0
1959	0	0	0	0	0	44	11	0	0	0	0	0	55
1960	0	0	0	0	0	318	2,790	9.5	.6	0	0	0	3,120

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30				Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean
		Discharge	Date				
1956	1438	a102	June 4, 1956	0	1.18	857	1.18
1957	1508	a3.0	Mar. 24, 1957	0	.03	23.9	.03
1958	1558	0	-	0	0	0	0
1959	1628	3.2	Mar. 20, 1959	0	.08	55	.08
1960	1708	165	Apr. 1, 1960	0	4.29	3,120	-

a Maximum observed.

625. Wild Rice River at Twin Valley, Minn.

Location.--Lat 47°16'00", long 96°14'40", in NE $\frac{1}{4}$ sec.27, T.144 N., R.44 W., on left bank 100 ft upstream from highway bridge, three-quarters of a mile northeast of village of Twin Valley, and 2 miles upstream from small tributary.

Drainage area.--888 sq mi.

Records available.--June 1909 to September 1917, July 1930 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 1,008.16 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark). June 1909 to September 1917 staff gage at site a quarter of a mile downstream at different datum. July 23, 1930, to Nov. 24, 1934, chain gage at highway bridge 100 ft downstream from present site at present datum. Nov. 25, 1934, to Aug. 2, 1950, water-stage recorder 80 ft upstream from present site at present datum.

Average discharge.--38 years (1909-17, 1930-60), 157 cfs (113,700 acre-ft per year).

Extremes.--1909-17, 1930-60: Maximum discharge, 9,200 cfs July 22, 1909 (gage height, 20.0 ft, site and datum then in use), from rating curve extended above 3,300 cfs; minimum, 0.5 cfs Nov. 4, 1939.

Remarks.--Flow slightly regulated by Rice Lake and many other small lakes above station. Diurnal fluctuation caused by operation of mill at Faith, 17 miles above station.

RED RIVER OF THE NORTH BASIN

Monthly and yearly mean discharge, in cubic feet per second, of Wild Rice River at Twin Valley, Minn.

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	123	81.2	73.1	66.3	70.4	92.0	1,104	775	292	88.4	55.6	123	245
1952	132	102	117	95.4	77.3	79.9	908	349	87.5	186	119	53.7	192
1953	32.6	43.9	50.2	37.6	36.0	206	390	390	439	517	199	76.8	202
1954	46.3	51.7	68.1	65.9	72.9	111	655	536	258	97.7	27.0	27.1	168
1955	40.8	50.8	41.1	31.5	33.7	37.9	485	260	231	121	38.8	11.3	115
1956	17.5	18.4	14.3	12.9	16.8	21.2	522	327	160	28.8	16.8	13.3	96.9
1957	14.3	53.4	19.1	16.1	18.9	113	351	269	249	309	81.0	153	136
1958	148	184	66.4	46.3	42.7	98.9	143	76.2	128	139	33.6	23.8	94.3
1959	29.1	57.6	37.9	24.6	22.0	79.1	203	223	172	155	65.7	24.1	91.4
1960	45.4	47.2	45.6	46.4	42.2	64.5	459	315	353	153	77.3	135	148

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	7,540	4,850	4,490	4,070	3,910	5,650	65,710	47,640	17,370	5,430	3,420	7,320	177,400
1952	8,130	6,100	7,180	5,740	4,450	4,910	54,030	21,490	5,210	11,410	7,300	3,200	159,200
1953	2,000	2,610	3,080	2,310	2,000	12,640	23,220	23,970	28,140	31,790	12,250	4,570	146,600
1954	2,840	3,070	4,190	4,050	4,050	6,840	38,950	32,890	15,330	6,010	1,660	1,610	121,600
1955	2,510	3,020	2,530	1,940	1,870	2,530	28,870	15,970	13,730	7,430	2,390	671	83,260
1956	1,080	1,090	877	791	968	1,300	31,050	20,100	9,500	1,770	1,030	791	70,350
1957	879	1,990	1,170	988	1,050	6,920	20,870	16,570	14,800	18,990	4,980	9,100	98,310
1958	9,110	10,950	4,080	2,970	2,370	5,960	8,500	4,680	7,620	8,550	2,070	1,420	68,280
1959	1,790	3,430	2,530	1,510	1,220	4,860	12,090	13,700	10,240	9,510	4,040	1,440	66,160
1960	2,790	2,810	2,800	2,850	2,450	3,960	27,300	19,370	21,010	9,430	4,750	8,050	107,600

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	498	360,800
1951	1208	1,820	Apr. 9, 1951	40	245	177,400	251	181,900
1952	1238	1,810	Apr. 8, 1952	30	192	159,200	173	125,400
1953	1278	1,170	July 4, 1953	18	202	146,600	206	149,000
1954	1338	1,390	Apr. 10, 1954	12	168	121,600	165	119,500
1955	1388	927	Apr. 4, 1955	4.4	115	83,260	108	78,250
1956	1438	1,380	Apr. 12, 1956	6.8	96.9	70,350	98.5	71,470
1957	1508	814	Apr. 21, 1957	8.2	136	98,310	164	118,400
1958	1558	294	July 7, 1958	10	94.3	68,280	71.4	51,690
1959	1628	451	May 6, 1959	10	91.4	66,160	92.6	67,010
1960	1708	716	Apr. 15, 1960	28	148	107,600	-	-

630. Wild Rice River near Ada, Minn.

Location.--Lat 47°15'50", long 96°30'00", in NE $\frac{1}{4}$ sec.28, T.144 N., R.46 W., at left bank on downstream side of bridge abutment on State Highway 82, 2.3 miles south of Ada.

Drainage area.--1,100 sq mi, approximately.

Records available.--April 1948 to November 1953.

Gage.--Staff gage. Datum of gage is 894.36 ft above mean sea level, datum of 1929. Prior to Aug. 24, 1950, chain gage and reference points at same site and datum, used intermittently.

Average discharge.--5 years (1948-53), 125 cfs (90,500 acre-ft per year).

Extremes.--1948-53: Maximum discharge, 1,720 cfs June 26, 1950 (gage height, 10.31 ft, from graph based on gage readings); no flow for many days.

Remarks.--A large part of the high flow is diverted into the Marsh River basin at an overflow section $\frac{1}{2}$ miles upstream in SW $\frac{1}{4}$ sec.18, T.144 N., R.45 W. Another diversion into the Marsh River basin formed in 1947, $\frac{1}{2}$ miles upstream in SW $\frac{1}{4}$ sec.14, T.144 N., R.46 W., and diverted water at all stages. Amounts of diversions not determined.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.11	0.03	0	0	0	3.75	300	135	33.6	0.70	0.01	0.02	39.3
1952	0	7.95	128	88.9	71.4	69.2	725	283	4.41	196	146	52.3	148
1953	28.7	48.3	47.8	34.7	39.8	63.6	368	357	458	467	213	81.6	183
1954	48.2	54.0	-	-	-	-	-	-	-	-	-	-	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	6.9	1.8	0	0	0	230	17,880	8,280	2,000	12,480	0.8	1.4	28,440
1952	0	472	7,880	5,470	4,110	4,250	43,210	16,160	262	12,083	8,990	7,110	106,000
1953	1,770	2,870	2,940	2,130	2,210	3,910	21,980	21,970	26,090	28,720	13,120	8,850	132,500
1954	2,970	3,210	-	-	-	-	-	-	-	-	-	-	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	165	119,700
1951	1208	735	Apr. 6, 1951	0	39.3	28,440	50.8	36,790
1952	1236	1,340	Apr. 9, 1952	0	146	106,000	145	105,200
1953	1278	895	July 4, 1953	25	183	132,500	-	-

* Not previously published.

640. Wild Rice River at Hendrum, Minn.

Location.--Lat 47°16'05" long 96°47'50", in SE $\frac{1}{4}$ sec.19, T.144 N., R.48 W., near center of span on downstream side of highway bridge, half a mile east of Hendrum and 4 miles upstream from mouth.

Drainage area.--1,600 sq mi, approximately.

Records available.--March 1944 to September 1960.

Gage.--Wire-weight gage. Datum of gage is 836.75 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Aug. 2, 1949, chain gage at same site and datum.

Average discharge.--16 years (1944-60), 202 cfs (146,200 acre-ft per year).

Extremes.--1944-60: Maximum discharge, 4,660 cfs Apr. 14, 1956 (gage height, 24.26 ft); maximum gage height observed, 27.70 ft Apr. 15, 1947 (backwater from Red River of the North); no flow for many days in 1948-49.

Remarks.--A large part of the high flow is diverted into Marsh River basin at an overflow section $\frac{3}{4}$ miles east of Ada in SW $\frac{1}{4}$ sec.18, T.144 N., R.45 W. Another diversion into the Marsh River basin formed in 1947, $1\frac{1}{2}$ miles southeast of Ada in SW $\frac{1}{4}$ sec.14, T.144 N., R.46 W. and diverted water at all stages 1947-51, after which it was closed except for small regulated flow diverted at same point. Amount of diversion not known.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	6.19	4.75	3.56	3.03	2.81	8.16	799	197	71.8	8.82	7.76	16.6	93.4
1952	16.6	25.2	152	99.2	83.1	80.6	1,239	296	9.15	273	147	58.1	206
1953	31.7	42.7	48.5	36.9	36.6	198	500	440	888	559	236	89.3	259
1954	49.4	52.3	58.8	61.5	72.8	128	727	596	327	119	33.7	29.1	188
1955	42.4	50.4	29.9	21.9	31.0	33.0	609	283	261	140	171	14.7	141
1956	23.1	19.0	14.6	13.6	18.4	23.5	1,175	418	225	41.3	23.0	19.2	166
1957	16.9	45.7	18.5	14.4	14.4	161	427	322	351	365	346	181	189
1958	21.3	21.1	78.2	49.1	43.0	110	173	101	161	222	43.7	37.4	120
1959	35.8	70.9	43.9	22.3	19.4	119	302	301	268	212	88.4	37.9	127
1960	53.8	55.2	46.8	56.2	46.9	95.4	897	407	428	212	102	167	213

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	381	282	219	186	156	502	47,540	12,090	4,270	542	477	983	67,630
1952	1,020	1,500	9,350	6,100	4,780	4,970	73,750	18,210	544	16,780	9,040	3,460	149,500
1953	1,950	2,540	2,980	2,270	2,030	12,150	29,780	27,040	52,850	34,400	14,530	5,320	187,800
1954	3,040	3,110	3,610	3,780	4,040	7,870	43,270	36,630	19,430	7,300	2,070	1,750	135,900
1955	2,600	3,000	1,840	1,350	1,720	2,030	36,230	17,400	15,550	8,630	10,520	876	101,700
1956	1,420	1,130	899	839	1,060	1,440	69,910	25,680	13,380	2,540	1,420	1,140	120,900
1957	1,040	2,600	1,140	887	799	9,910	25,430	19,820	19,710	22,450	6,880	20,620	131,100
1958	13,080	12,530	4,810	3,020	2,390	6,750	10,270	6,210	9,580	13,650	2,690	2,250	87,210
1959	2,200	4,220	2,700	1,370	1,080	7,300	17,950	19,510	15,960	13,050	5,430	2,260	92,030
1960	3,310	3,280	2,890	3,460	2,700	5,870	53,350	25,030	25,500	13,040	6,250	9,950	154,600

† Corrected.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year			
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet		
		Discharge	Date							
1950	-	-	-	-	-	-	355	256,800		
1951	1208	\$2,570	Apr. 7, 1951	2.6	93.4	67,830	109	79,200		
1952	1238	2,860	Apr. 11, 1952	6.2	206	149,500	200	145,100		
1953	1278	\$1,650	June 18, 1953	23	259	187,800	263	190,100		
1954	1338	1,940	Apr. 12, 1954	16	188	135,900	184	133,600		
1955	1388	1,850	Apr. 5, 1955	9.2	141	101,700	135	97,760		
1956	1438	\$,360	Apr. 14, 1956	6.2	166	120,900	168	122,200		
1957	1508	1,170	Sept. 4, 1957	11	161	131,100	216	156,700		
1958	1558	633	July 7, 1958	18	120	87,210	91.0	65,930		
1959	1628	540	Apr. 6, 1959	11	127	92,030	128	92,380		
1960	1708	1,600	Apr. 8, 1960	15	213	154,600	-	-		

† Not previously published.

RED RIVER OF THE NORTH BASIN

645. Red River of the North at Halstad, Minn.

Location.--Lat 47°21'10", long 96°50'50", on line between secs. 24 and 25, T.145 N., R.49 W., on downstream side of highway bridge, half a mile west of Halstad, 2½ miles downstream from Wild Rice River, and at mile 375.2.

Drainage area.--21,800 sq mi, approximately (includes 3,800 sq mi, revised, in closed basins).

Records available.--April 1936 to June 1937 (no winter records), April 1942 to September 1960 (spring and summer months only).

Gage.--Wire-weight gage. Datum of gage is 826.65 ft above mean sea level, datum of 1929.

Extremes.--1936-37, 1942-60: Maximum discharge, 24,500 cfs Apr. 16, 1947; maximum gage height, 34.00 ft Apr. 17, 1947; minimum discharge observed, 5.4 cfs Oct. 8, 9, 12-14, 1936.

Flood in 1897 reached a stage of about 38.5 ft.

Remarks.--Some regulation by many controlled lakes and reservoirs on tributaries.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	6,387	2,634	1,663	-	-	-	-
1952	-	-	-	-	-	-	12,830	2,926	1,789	2,826	-	-	-
1953	-	-	-	-	-	-	1,761	2,000	7,684	2,934	1,572	-	-
1954	-	-	-	-	-	-	2,568	1,988	1,820	1,323	-	-	-
1955	-	-	-	-	-	-	2,368	886	960	1,646	1,205	-	-
1956	-	-	-	-	-	-	4,179	2,189	1,563	541	383	-	-
1957	-	-	-	-	-	-	1,027	1,592	2,136	1,762	897	-	-
1958	-	-	-	-	-	-	1,446	757	615	2,039	435	363	-
1959	-	-	-	-	-	-	1,184	925	1,901	1,466	464	324	-
1960	-	-	-	-	-	-	5,288	2,125	1,682	1,032	386	403	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	380,000	162,000	98,980	-	-	-	-
1952	-	-	-	-	-	-	763,500	179,900	106,500	173,800	-	-	-
1953	-	-	-	-	-	-	104,800	123,000	457,200	180,400	96,650	-	-
1954	-	-	-	-	-	-	152,800	122,200	108,300	81,370	-	-	-
1955	-	-	-	-	-	-	140,900	54,470	57,100	101,200	74,110	-	-
1956	-	-	-	-	-	-	248,700	134,600	92,990	33,290	23,580	-	-
1957	-	-	-	-	-	-	108,700	97,900	127,100	108,300	54,540	-	-
1958	-	-	-	-	-	-	86,060	46,520	36,610	125,400	26,770	21,600	-
1959	-	-	-	-	-	-	70,440	56,860	115,100	90,130	28,540	19,250	-
1960	-	-	-	-	-	-	314,600	130,700	100,100	63,430	23,730	23,970	-

Yearly discharge, in cubic feet per second

Year	MSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	-	-
1951	1206	12,900	Apr. 10, 1951	-	-	-	-	-
1952	1238	20,700	Apr. 18, 1952	-	-	-	-	-
1953	1278	13,600	June 22, 1953	-	-	-	-	-
1954	1338	4,660	Apr. 13, 1954	-	-	-	-	-
1955	1388	7,200	Apr. 6, 1955	-	-	-	-	-
1956	1438	12,900	Apr. 15, 1956	-	-	-	-	-
1957	1508	4,980	June 24, 1957	-	-	-	-	-
1958	1558	4,420	July 8, 1958	-	-	-	-	-
1959	1628	3,780	June 13, 1959	-	-	-	-	-
1960	1708	8,600	Apr. 10, 1960	-	-	-	-	-

650. Beaver Creek near Hatton, N. Dak.

Location.--Lat 47°37', long 97°40', on line between secs. 27 and 28, T.148 N., R.55 W., on downstream end of right abutment of county highway bridge, 10 miles southwest of Hatton and 15 miles upstream from mouth.

Drainage area.--162 sq mi (revised), of which about 90 sq mi is probably noncontributing.

Records available.--May 1954 to July 1957.

Gage.--Staff gage.

Extremes.--1954-57: Maximum discharge, 220 cfs June 7, 1956 (gage height, 5.82 ft), from rating curve extended above 30 cfs; maximum gage height, 7.21 ft Mar. 31, 1955 (backwater from ice); no flow at times during each year.
Maximum stage known since 1905, about 8 ft in June 1916, from information by local residents.

Remarks.--Most of low flow diverted into Golden Lake beginning in 1957.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1954	-	-	-	-	-	-	-	0.62	0.85	0.20	1.35	0.26	-
1955	0.32	0.46	0.28	0.10	0.09	12.6	10.3	.86	3.42	.37	.20	.18	2.43
1956	.35	.09	0	0	0	0	27.6	3.75	8.40	.52	.32	.32	3.40
1957	.21	.17	.06	0	.01	.28	.50	.46	.88	-	-	-	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1954	-	-	-	-	-	-	-	38	50	12	83	16	-
1955	19	28	17	6.1	5.2	772	611	53	204	23	12	11	1,760
1956	22	5.4	0	0	0	0	1,640	230	500	32	20	19	2,470
1957	13	9.9	3.6	0	.4	17	30	29	53	-	-	-	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1954	-	-	-	-	-	-	-	-
1955	1388	200	Mar. 31, 1955	0	2.43	1,760	2.38	1,720
1956	1438	220	June 7, 1956	0	3.40	2,470	3.40	2,470
1957	1508	6.3	June 22, 1957	0	-	-	-	-

RED RIVER OF THE NORTH BASIN

655. Goose River near Portland, N. Dak.

Location.--Lat 47°32', long 97°27', in SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.19, T.147 N., R.53 W., on left bank 75 ft upstream from bridge on State Highway 18, 1 $\frac{1}{4}$ miles upstream from unnamed tributary, 4 miles downstream from Beaver Creek, and 5 miles northwest of Portland.

Drainage area.--517 sq mi (revised), of which about 110 sq mi is probably noncontributing. At site used prior to Oct. 1, 1956, 515 sq mi (revised).

Records available.--October 1939 to September 1960.

Gage.--Water-stage recorder and wooden control. Prior to Oct. 1, 1956, wire-weight or chain gage at site 2 miles upstream, at datum 978.76 ft above mean sea level, datum of 1929.

Average discharge.--21 years (1939-60), 24.0 cfs (17,380 acre-ft per year); median of yearly mean discharges, 12 cfs (8,690 acre-ft per year).

Extremes.--1939-60: Maximum discharge, 8,090 cfs May 9, 1950; maximum gage height, 22.98 ft Apr. 18, May 9, 1950, former site and datum; no flow for several months each year.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.14	0.61	0.78	0.57	0.40	54.4	94	6.09	1.90	0.14	0	0	13.2
1952	0	0	0	0	0	2.5	122	1.03	0	52.5	.52	0	14.8
1953	0	0	0	0	0	10.1	2.58	4.86	55.8	43.1	.08	.95	9.81
1954	0	0	0	0	3.8	12.0	14.8	4.55	4.63	.24	0	0	3.31
1955	0	0	0	0	0	3.3	92.4	1.38	30.7	.85	.02	0	10.6
1956	0	0	0	0	0	0	117	26.7	22.2	1.18	0	0	13.8
1957	0	0	0	0	0	6.71	2.72	.15	2.21	3.74	.01	29.9	3.76
1958	6.06	4.86	1.32	0	0	.05	3.30	.19	.23	5.07	.34	0	1.80
1959	0	0	0	0	0	9.20	12.4	.76	1.72	0	0	0	2.01
1960	0	0	0	0	0	35.2	170	3.87	.96	.02	0	0	17.4

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	8.5	36	48	35	22	3,340	5,590	374	113	8.3	0	0	9,570
1952	0	0	0	0	0	151	7,250	63	0	3,230	32	0	10,750
1953	0	0	0	0	0	618	154	299	3,320	2,650	5.0	56	7,100
1954	0	0	0	0	208	736	883	280	276	15	0	0	2,400
1955	0	0	0	0	0	202	5,500	85	1,850	53	1.2	0	7,670
1956	0	0	0	0	0	0	6,960	1,640	1,320	72	0	0	9,990
1957	0	0	0	0	0	413	162	9.1	152	230	.4	1,780	2,750
1958	372	289	81	0	0	3.2	196	12	13	312	21	0	1,300
1959	0	0	0	0	0	566	740	47	103	0	0	0	1,460
1960	0	0	0	0	0	2,170	10,150	238	57	1.2	0	0	12,620

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	214	155,200
1951	1208	650	Mar. 30, 1951	0	13.2	9,570	13.1	9,480
1952	1238	600	Apr. 3, 1952	0	14.8	10,730	14.8	10,730
1953	1278	367	July 4, 1953	0	9.81	7,100	9.81	7,100
1954	1338	858	June 15, 1954	0	3.31	2,400	3.31	2,400
1955	1388	600	Mar. 31, 1955	0	10.6	7,670	10.6	7,670
1956	1438	550	Apr. 16, 1956	0	13.8	9,990	13.8	9,990
1957	1508	134	Sept. 5, 1957	0	3.76	2,730	4.73	3,470
1958	1558	95	July 27, 1958	0	1.80	1,300	.77	557
1959	1628	72	Apr. 3, 1959	0	2.01	1,460	2.01	1,460
1960	1708	924	Apr. 8, 1960	0	17.4	12,620	-	-

a Maximum observed.

665. Goose River at Hillsboro, N. Dak.

Location.--Lat 47°24'20", long 97°03'40", in NW $\frac{1}{4}$ sec. 5, T.14S N., R.50 W., on left bank 50 ft upstream from Foogman Dam in Hillsboro and 22 miles upstream from mouth.

Drainage area.--1,203 sq mi (revised), of which about 110 sq mi is probably noncontributing.

Records available.--March 1931 to September 1960 (no winter records 1932-34). Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder and masonry dam. Datum of gage is 879.52 ft above mean sea level, datum of 1929. Chain gages at sites 1,000 ft downstream Mar. 17, 1931, to Mar. 20, 1935, and 600 ft downstream Mar. 21, 1935, to Mar. 28, 1940, at datum 11.45 ft lower. Mar. 29, 1940, to Sept. 25, 1941, staff gage at present site and datum.

Average discharge.--27 years (1931-32, 1934-60), 45.6 cfs (33,010 acre-ft per year); median of yearly mean discharges, 25 cfs (18,100 acre-ft per year).

Extremes.--1931-60: Maximum discharge, 9,420 cfs Apr. 19, 1950; maximum gage height, 14.94 ft Apr. 19, 1950; no flow at times.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	6.08	7.68	7.35	6.27	5.81	92.1	289	27.4	14.4	5.61	1.58	4.29	38.7
1952	2.64	4.43	1.86	0	1.84	14.2	328	11.2	1.43	131	9.13	1.41	42.1
1953	1.08	2.05	2.73	1.88	1.92	28.4	21.8	28.6	136	102	2.17	2.86	27.6
1954	.76	2.45	2.96	2.55	16.1	57.8	61.2	19.3	41.2	4.69	.70	.35	17.4
1955	.20	.26	.30	.57	.70	.98	215	6.35	61.7	5.66	2.58	.16	24.2
1956	.20	.48	.84	.58	.50	.71	282	55.4	57.3	6.05	.99	.97	33.4
1957	.38	1.82	1.43	.99	.74	18.3	17.8	7.88	10.5	5.30	.11	53.0	9.81
1958	16.5	14.8	4.20	.96	.81	1.57	15.8	4.87	3.15	29.0	3.52	.46	8.03
1959	.32	.05	0	0	0	33.6	37.2	6.70	6.81	.48	1.33	.29	7.24
1960	.34	.67	.91	.88	.80	71.8	436	15.0	12.7	10.2	4.13	1.61	45.7

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	374	469	452	385	323	5,660	17,210	1,690	856	222	97	255	27,990
1952	162	263	114	0	106	873	19,520	689	85	8,080	562	84	30,540
1953	66	122	168	116	107	1,750	1,300	1,760	8,080	6,250	133	170	20,020
1954	47	146	182	157	896	3,560	3,640	1,190	2,450	288	43	21	12,620
1955	12	15	18	35	39	60	12,770	390	3,670	348	159	9.7	17,530
1956	12	29	39	36	29	43	16,760	3,410	3,410	372	61	58	24,260
1957	24	108	88	61	41	1,120	1,060	484	623	326	6.5	5,150	7,090
1958	1,020	880	258	59	45	97	942	300	187	1,780	216	27	5,810
1959	20	3.0	0	0	0	2,060	2,210	412	405	30	82	17	5,240
1960	21	40	56	54	46	4,420	25,920	925	754	627	254	96	33,210

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet	
		Discharge	Date						
1950	-	-	-	-	-	-	395	-	288,000
1951	1208	al, 130	Mar. 31, 1951	0	38.7	27,990	37.6	-	27,240
1952	1238	al, 500	Apr. 4, 1952	0	42.1	30,540	41.8	-	30,360
1953	1278	408	July 6, 1953	.2	27.6	20,020	27.7	-	20,040
1954	1338	231	June 15, 1954	.2	17.4	12,620	17.0	-	12,290
1955	1388	1,220	Apr. 3, 1955	.1	24.2	17,530	24.3	-	17,560
1956	1438	1,390	Apr. 19, 1956	-	33.4	24,260	33.6	-	24,400
1957	1508	200	Sept. 7, 1957	0	9.81	7,090	12.5	-	9,030
1958	1558	88	July 3, 1958	.2	8.03	5,810	5.09	-	3,680
1959	1628	143	Apr. 5, 1959	0	7.24	5,240	7.37	-	5,330
1960	1708	1,360	Apr. 9, 1960	0	45.7	33,210	-	-	-

a Maximum observed.

670. Marsh River below Ada, Minn.

Location.--Lat 47°17'50", long 96°33'50", in NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.18, T.144 N., R.46 W., on downstream side of bridge on farm lane, 1.9 miles west of Ada.

Records available.--April 1948 to September 1952.

Gage.--Chain gage. Datum of gage is 877.08 ft above mean sea level, datum of 1929.

Extremes.--1948-52: Maximum discharge, 1,850 cfs June 27, 1950 (gage height, 14.57 ft, from floodmark); minimum observed, 0.1 cfs Sept. 26-30, 1952; minimum gage height observed, 1.57 ft Sept. 30, 1952.

Remarks.--A large part of the flow at this station is water diverted from Wild Rice River which enters the Marsh River basin $7\frac{1}{2}$ miles upstream near center of sec.15, T.144 N., R.46 W. Flow at times is diverted around station via Marsh ditch. Amounts of diversions not determined.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	118	82.2	76.2	69.5	70.4	88.8	753	570	284	97.3	59.4	124	199
1952	136	96.3	12.5	12.0	10.4	14.1	146	22.3	.73	12.8	5.09	.29	39.0

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	7,290	4,890	4,680	4,280	3,910	5,460	44,830	35,030	16,930	5,980	3,650	7,370	144,300
1952	8,390	5,730	767	740	599	865	8,700	1,370	44	789	313	17	28,320

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	329	238,400
1951	1208	1,630	Apr. 8, 1951	30	199	144,300	197	142,300
1952	1238	438	Apr. 17, 1952	.1	39.0	28,320	-	-

675. Marsh River near Shelly, Minn.

Location.--Lat 47°24'45", long 96°45'50", in NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.3, T.14S N., R.48 W., near center of span on downstream truss of bridge, 3 $\frac{1}{2}$ miles southeast of Shelly and 10 miles upstream from mouth.

Drainage area.--151 sq mi.

Records available.--March 1944 to September 1960.

Gage.--Chain gage. Datum of gage is 844.14 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Average discharge.--16 years (1944-60), 105 cfs (76,020 acre-ft per year).

Extremes.--1944-60: Maximum discharge, 4,660 cfs May 11, 1950 (gage height, 18.96 ft, from floodmark); no flow for many days in most years.

Remarks.--Large part of high flow of Wild Rice River diverted into Marsh River basin at overflow section 3 $\frac{1}{2}$ miles (revised) east of Ada. Another diversion from Wild Rice River formed 1 mile southeast of Ada supplemented flow at all stages 1947-51, after which it was closed except for small regulated flow diverted at same point for abatement of pollution from Ada sewage plant effluent.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	118	85.7	77.1	64.5	62.1	107	1,190	714	301	102	60.7	12 $\frac{1}{2}$	250
1952	130	102	13.1	12.4	10.8	14.8	391	125	90.3	202	54.3	3.80	95.7
1953	1.30	.88	.68	.17	.13	52.1	46.5	38.5	100	119	6.81	1.64	30.9
1954	.04	.23	.74	.21	.05	6.64	135	60.2	22.4	2.21	.11	C	19.0
1955	0	.05	.11	0	0	.5	69.5	9.39	14.9	17.6	11.2	C	10.2
1956	0	0	0	0	0	.01	317	37.5	23.6	1.02	.04	.09	31.2
1957	0	0	0	0	0	40.5	35.5	10.3	41.6	17.2	.91	5.17	12.6
1958	3.01	7.03	.95	0	.34	1.33	4.13	1.35	3.00	15.5	.25	C	3.09
1959	0	0	0	0	.01	18.3	19.9	6.75	4.96	1.27	0	C	4.28
1960	0	0	0	0	0	23.7	109	10.6	12.6	8.27	.28	3.47	13.9

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	7,280	5,100	4,740	3,970	3,450	6,580	70,790	43,930	17,910	6,300	3,730	7,290	181,100
1952	7,980	6,060	805	764	623	908	23,250	7,700	5,370	12,420	3,340	22 $\frac{1}{2}$	69,450
1953	80	52	42	11	7.3	3,200	2,770	2,370	5,980	7,340	406	98	22,360
1954	2.4	13	46	13	2.8	408	8,050	3,700	1,330	136	6.5	0	13,710
1955	0	3.2	6.5	0	0	30	4,140	577	885	1,080	688	0	7,410
1956	0	0	0	0	0	.6	18,880	2,310	1,410	63	2.2	5.4	22,670
1957	0	0	0	0	0	2,490	2,110	636	2,480	1,060	56	30 $\frac{1}{2}$	9,140
1958	185	418	58	0	19	82	246	83	179	955	16	0	2,240
1959	0	0	0	0	1.4	1,130	1,190	415	295	78	0	0	3,110
1960	0	0	0	0	0	1,460	6,480	651	752	509	17	20 $\frac{1}{2}$	10,080

† Corrected.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30				Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean
		Discharge	Date				
1950	-	-	-	-	-	-	551
1951	1208	2,100	Apr. 8, 1951	42	250	181,100	247
1952	1238	979	July 21, 1952	2.2	95.7	69,450	75.4
1953	1278	389	June 17, 1953	.1	30.9	22,360	30.7
1954	1338	376	Apr. 13, 1954	0	19.0	13,710	18.9
1955	1388	289	Apr. 5, 1955	0	10.2	7,410	10.2
1956	1438	1,960	Apr. 13, 1956	0	31.2	22,670	31.2
1957	1508	304	June 23, 1957	0	12.6	9,140	13.5
1958	1558	47	July 10, 1958	0	3.09	2,240	2.18
1959	1628	86	Mar. 31, 1959	0	4.28	3,110	4.28
1960	1708	492	Apr. 7, 1960	0	13.9	10,080	-

RED RIVER OF THE NORTH BASIN

680. Sandhill River at Beltrami, Minn.

Location.--Lat 47°32'50", long 96°32'00", in NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.16, T.147 N., R.46 W., on upstream side of bridge abutment on U.S. Highway 75 in Beltrami, 150 ft upstream from Great Northern Railway bridge and a quarter of a mile north of post office.

Drainage area.--324 sq mi (includes that of Sandhill ditch, as the two are crossconnected).

Records available.--April to November 1943, March 1944 to September 1958. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Staff gage. Datum of gage is 896.80 ft above mean sea level, adjustment of 1912 (levels by Corps of Engineers). Prior to Aug. 28, 1944, reference point at same site and datum.

Average discharge.--14 years (1944-58), 5.04 cfs (3,650 acre-ft per year).

Extremes.--1943-58: Maximum discharge, 291 cfs Apr. 19, 1950 (gage height, 5.97 ft, from floodmark); no flow for many days in most years.

Remarks.--Diversion through Sandhill ditch (see following page) from point 5 miles above station, returns to river 4 miles below station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	3.40	2.47	*1.1	*0.7	*0.6	*0.5	32.4	11.1	4.38	0.89	1.81	2.26	*5.11
1952	1.02	.80	*.7	*.6	*.5	*.7	25.3	3.33	.82	11.4	2.24	1.03	*4.02
1953	1.61	2.85	1.06	.16	0	4.71	13.7	7.13	11.3	3.28	2.77	.48	4.09
1954	1.30	1.22	1.10	.81	.74	1.10	12.0	6.51	9.72	1.77	.64	.45	3.10
1955	.65	.93	.43	.08	0	0	11.7	3.70	8.93	1.72	.22	0	2.35
1956	.44	.50	.15	0	0	.02	10.9	28.5	13.0	1.44	.73	1.93	4.82
1957	.07	.66	0	0	0	1.00	1.77	.39	3.62	.23	0	.44	.68
1958	.25	.79	0	0	.06	.21	.10	.11	.86	2.00	0	0	.37
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

* Not previously published; estimated on basis of weather records and records for nearby streams.

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	209	147	*68	*43	*33	*31	1,930	680	261	55	111	134	*3,700
1952	63	47	*43	*37	*29	*43	1,510	205	49	698	137	61	*2,920
1953	99	170	65	9.7	0	290	816	438	674	202	170	29	2,960
1954	80	72	67	50	41	68	715	400	579	109	39	27	2,250
1955	40	56	27	5.0	0	0	698	228	531	106	13	0	1,700
1956	27	30	9.3	0	0	1.2	650	1,750	776	88	45	115	3,490
1957	4.4	39	0	0	0	61	105	24	215	14	0	26	488
1958	15	47	0	0	3.4	13	6.1	6.9	51	123	0	0	265
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

* Not previously published; see footnote on preceding table.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30				Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean
		Discharge	Date				
1950	-	-	-	-	-	-	*13.1
1951	1208	71	Apr. 8, 1951	-	*5.11	*3,700	*4.74
1952	1238	46	Apr. 9, 1952	-	*4.02	*2,920	*4.27
1953	1278	62	June 17, 1953	0	4.09	2,960	3.93
1954	1358	49	June 16, 1954	.2	3.10	2,250	2.97
1955	1389	54	Apr. 4, 1955	0	2.35	1,700	2.27
1956	1438	105	May 13, 14, 1956	0	4.82	3,490	4.78
1957	1508	50	June 23, 1957	0	.68	488	.70
1958	1558	22	July 5, 1958	0	.37	265	-
1959	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-

* Not previously published.

685. Sandhill ditch at Beltrami, Minn.

Location.--Lat 47°32'10", long 96°32'00", in SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.21, T.147 N., R.46 W., near center of span on downstream side of bridge on U.S. Highway 75, 150 ft upstream from Great Northern Railway bridge and a quarter of a mile south of post office in Beltrami.

Records available.--March 1943 to September 1958. Winter records incomplete some years. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Chain gage. Datum of gage is 883.50 ft above mean sea level, adjustment of 1912 (levels by Corps of Engineers). Prior to Aug. 26, 1944, reference point and Aug. 26, 1944, to Nov. 21, 1948, chain gage, at same site at datum 12.62 ft higher. Nov. 22, 1948, to Sept. 30, 1956, chain gage at same site at datum 10.00 ft higher.

Average discharge.--10 years (1946-50, 1952-58), 46.2 cfs (33,450 acre-ft per year).

Extremes.--1943-58: Maximum discharge, 2,460 cfs Apr. 20, 1950 (gage height, 20.99 ft, present datum); maximum gage height, 21.59 ft, present datum, Apr. 19, 1950, from floodmark (backwater from ice); no flow at times.

Remarks.--Ditch diverts from Sandhill River 4 $\frac{1}{2}$ miles above station and returns to river at point 3 $\frac{1}{2}$ miles below station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	24.9	18.6	-	-	-	-	361	110	38.6	14.1	11.8	20.6	-
1952	19.9	17.7	-	-	-	-	168	42.5	20.6	28.5	14.8	11.7	-
1953	14.9	18.0	11.7	6.69	7.51	57.5	59.4	45.9	58.1	40.9	22.8	14.9	30.0
1954	11.5	13.0	12.0	10.6	12.0	13.5	105	49.3	45.4	23.8	9.92	8.49	25.8
1955	9.57	14.5	9.5	8.0	8.4	17.0	119	28.8	26.0	14.4	8.97	8.97	22.6
1956	10.5	8.43	5.09	5.21	6.30	7.23	116	58.2	47.2	14.6	11.0	9.40	24.8
1957	15.1	21.8	10.5	9.15	8.73	53.7	97.7	34.9	88.2	111	22.9	39.5	42.9
1958	29.0	41.7	18.6	12.1	14.4	24.8	27.5	23.4	25.6	45.1	11.0	11.3	23.7
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,530	1,110	-	-	-	-	21,460	6,770	2,300	868	728	1,220	-
1952	1,230	1,060	-	-	-	-	9,990	2,610	1,220	1,760	910	699	-
1953	919	1,070	720	412	417	3,540	3,530	2,820	3,460	2,520	1,400	885	21,690
1954	709	772	740	655	555	853	6,120	3,030	2,700	1,470	610	505	18,700
1955	588	863	581	492	468	1,050	7,070	1,770	1,550	885	552	534	16,400
1956	644	502	313	320	362	444	6,890	3,580	2,810	899	678	560	18,000
1957	928	1,300	643	582	485	3,300	5,810	2,150	5,250	6,850	1,410	2,350	31,040
1958	1,790	2,480	1,140	742	799	1,520	1,630	1,440	1,520	2,770	674	670	17,180
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	-	-
1951	1208	823	Apr. 9, 1951	-	-	-	-	-
1952	1238	8315	Apr. 12, 1952	-	-	-	-	-
1953	1278	8190	Mar. 29, 1953	6.4	30.0	21,690	29.3	21,200
1954	1338	278	Apr. 14, 1954	6.2	25.8	18,700	25.6	18,510
1955	1388	551	Apr. 7, 1955	5.2	22.6	16,400	21.9	15,830
1956	1438	480	Apr. 19, 1956	4.5	24.8	18,000	26.7	19,410
1957	1508	370	June 28, 1957	8.4	42.9	31,040	46.4	33,580
1958	1558	95	July 5, 1958	8.3	23.7	17,180	-	-
1959	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-

a Maximum daily discharge.

690. Sandhill River at Climax, Minn.

Location.--Lat 47°36'10", long 96°47'40", in SE¹SE¹ sec.29, T.148 N., R.48 W., near center of span on upstream side of highway bridge, 1 mile southeast of Climax and 4 miles upstream from mouth.

Drainage area.--405 sq mi, approximately.

Records available.--March 1943 to September 1960 (winter records incomplete in some years). Monthly discharge only for some periods, published in WSP 1308.

Gage.--Chain gage. Datum of gage is 833.69 ft above mean sea level, adjustment of 1912 (levels by Corps of Engineers).

Average discharge.--14 years (1946-60), 58.8 cfs (42,570 acre-ft per year).

Extremes.--1943-60: Maximum discharge, 3,040 cfs Apr. 22, 1950 (gage height, 16.31 ft, from floodmark); minimum not determined.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	32.5	21.8	*16.0	*14.0	*12.0	*10.8	429	131	44.6	20.3	18.4	25.6	*64.4
1952	21.1	20.7	*14.0	*12.0	*11.0	*15.0	222	46.7	21.5	52.9	18.6	14.6	*39.0
1953	18.8	20.7	13.3	7.90	10.8	68.4	99.2	65.9	80.3	49.7	28.6	16.3	40.1
1954	12.5	13.5	10.9	5.3	6.44	20.1	144	57.0	81.6	29.3	10.9	7.99	33.2
1955	10.8	12.9	8.3	6.8	7.4	7.4	150	31.5	34.4	15.6	12.4	6.49	25.2
1956	10.4	8.64	6.1	5.2	5.4	7.4	317	105	60.2	16.0	11.5	11.5	46.7
1957	13.6	20.4	10.4	8.5	7.54	48.6	120	41.1	118	130	23.6	52.0	49.6
1958	31.4	45.0	17.4	13.9	12.4	22.2	50.7	25.7	25.6	62.9	17.9	11.3	26.1
1959	12.9	17.5	7.24	4.81	3.64	56.9	78.6	68.2	27.5	16.5	14.3	7.89	24.8
1960	18.7	11.8	12.2	12.0	9.76	16.3	162	39.3	47.0	41.7	16.1	14.5	33.3

* Not previously published; estimated on basis of weather records and records for nearby streams.

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2,000	1,300	*984	*861	*666	*666	25,510	8,080	2,660	1,250	1,130	1,520	*46,630
1952	1,300	1,230	*861	*738	*633	*922	13,200	2,880	1,280	3,250	1,140	869	*28,300
1953	1,150	1,230	815	486	601	4,200	5,900	4,050	4,780	3,050	1,760	972	28,990
1954	766	804	670	325	358	1,230	8,570	5,500	4,860	1,800	667	475	24,020
1955	662	766	512	419	409	456	8,940	1,940	2,050	960	764	386	18,260
1956	640	514	377	321	311	456	18,840	6,480	3,580	984	710	686	33,900
1957	837	1,210	637	524	419	2,990	7,160	2,520	7,050	8,020	1,450	3,090	35,910
1958	1,930	2,560	1,070	857	690	1,360	1,830	1,460	1,530	3,870	1,100	673	18,930
1959	794	1,040	445	296	213	2,270	4,680	4,200	1,640	1,010	880	469	17,940
1960	1,150	701	751	736	563	1,010	9,650	2,420	2,900	2,560	990	861	24,130

* Not previously published; see footnote to preceding table.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	*204	*147,500
1951	-	-	-	-	-	-	*63.2	*45,730
1952	1208	*1,250	Apr. 11, 1951	-	*64.4	*46,630	*38.7	*28,110
1953	1258	544	Apr. 12, 1952	-	*39.0	*28,300	38.7	28,040
1954	1278	*219	Mar. 29, 1953	7.5	40.1	28,990	32.8	23,720
1955	1358	489	June 15, 1954	4	35.2	24,020	24.7	17,860
1956	1388	842	Apr. 8, 1955	3.8	25.2	18,260	-	-
1957	1438	1,370	Apr. 20, 1956	5	46.7	33,900	48.3	35,050
1958	1508	481	June 29, 1957	5.8	48.6	35,910	53.6	39,780
1959	1558	168	July 5, 1958	8.0	26.1	18,930	21.6	15,650
1959	1628	310	Apr. 2, 1959	3.4	24.8	17,940	25.2	18,260
1960	1708	460	Apr. 6, 1960	7.0	35.3	24,130	-	-

* Revised.

* Not previously published.

745. Red Lake River near Red Lake, Minn.

Location.--Lat 47°57', long 95°17', in NW¼ sec.28, T.152 N., R.36 W., on left bank 50 ft downstream from dam at outlet of Lower Red Lake and 13 miles northwest of village of Red Lake.

Drainage area.--1,950 sq mi, approximately.

Records available.--May 1933 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,167.00 ft above mean sea level, adjustment of 1912 (levels by Corps of Engineers). Prior to Sept. 7, 1934, staff gage at site 50 ft upstream at datum 2.00 ft higher. Sept. 7, 1934, to Nov. 26, 1951, water-stage recorder at present site at datum 2.00 ft higher.

Average discharge.--27 years (1933-60), 398 cfs (288,100 acre-ft per year).

Extremes.--1933-60: Maximum discharge, 3,600 cfs June 25, 1950 (gage height, 11.19 ft, present datum, affected by seiches and backwater from aquatic vegetation), from rating curve extended above 1,400 cfs; no flow at times.

Remarks.--Flow completely regulated by outlet dam on Lower Red Lake.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2,071	1,649	1,498	1,418	1,342	1,396	1,199	1,569	1,484	1,014	410	447	1,292
1952	449	579	803	1,037	1,026	969	693	1,261	1,410	1,081	547	490	862
1953	350	267	308	313	328	265	81.5	162	288	287	300	273	268
1954	232	190	206	202	208	196	210	318	512	557	337	267	287
1955	250	329	328	312	305	342	251	244	234	243	237	219	274
1956	180	145	145	143	146	146	152	136	165	186	171	154	156
1957	222	229	209	170	159	262	24.9	9.9	315	1,464	1,178	1,09*	447
1958	1,265	1,083	547	739	662	845	630	277	308	341	172	46.8	576
1959	46.0	44.3	44.1	49.1	46.4	50.3	42.7	38.0	37.7	45.8	50.4	37.3	44.4
1960	153	160	148	118	116	113	104	32.4	18.2	24.1	31.3	14.9	86.1

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	127,400	98,140	92,090	87,190	74,580	85,860	71,370	96,460	88,280	62,340	25,200	26,210	935,100
1952	27,580	34,450	49,400	63,790	59,030	59,600	41,250	77,530	83,920	66,440	33,610	29,140	625,700
1953	21,500	15,910	18,950	19,240	18,190	16,280	4,850	9,960	17,140	17,670	18,460	16,230	194,400
1954	14,280	11,280	12,640	12,430	11,570	12,060	12,480	19,580	30,470	34,230	20,750	15,900	207,600
1955	15,370	19,550	20,190	19,210	16,960	21,020	14,920	14,980	15,910	14,940	14,560	13,060	198,700
1956	11,080	8,650	8,930	8,790	8,420	8,950	9,020	8,340	9,790	11,440	10,480	9,160	113,000
1957	13,630	13,650	12,860	10,450	8,610	16,140	1,480	609	18,740	90,020	72,420	65,080	323,900
1958	77,790	64,420	33,660	45,450	36,770	51,950	37,480	17,040	18,340	20,960	10,570	2,780	417,200
1959	2,830	2,640	2,710	3,020	2,570	3,090	2,540	2,340	2,240	2,820	3,100	2,220	32,120
1960	9,430	9,540	9,070	7,280	6,680	6,920	6,200	1,990	1,080	1,480	1,930	889	62,490

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	1,349	976,900
1951	1208	2,320	Oct. 6, 1950	395	1,292	935,100	1,007	728,900
1952	1238	1,610	May 17-19, 1952	150	862	625,700	786	570,700
1953	1278	492	June 15, 1953	54	268	194,400	243	176,200
1954	1338	725	June 29, 1954	12	287	207,600	310	224,600
1955	1388	384	Apr. 5, 1955	30	274	198,700	238	172,200
1956	1438	252	Oct. 12, 1955	116	156	113,000	172	124,500
1957	1508	1,870	July 20-23, 1957	7.5	447	323,900	635	459,600
1958	1558	1,360	Oct. 12, 1957	35	576	417,200	345	249,900
1959	1628	468	Nov. 18, 1957	2.0	44.4	32,120	71.8	51,980
1960	1708	162	Nov. 19-24, 1959	5.0	86.1	62,490	-	-

* Not previously published.

750. Red Lake River at High Landing, near Goodridge, Minn.

Location.--Lat 48°03', long 95°48', on line between secs. 28 and 29, T.153 N., R.40 W., on left bank at upstream side of highway bridge at High Landing, 7 miles south of Goodridge and 33 miles upstream from Thief River.

Drainage area.--2,300 sq mi, approximately.

Records available.--September 1929 to September 1960. Prior to October 1930, published as "at Kratka."

Gage.--Water-stage recorder. Datum of gage is 1,141.57 ft above mean sea level, adjustment of 1912 (levels by Corps of Engineers). Prior to Oct. 1, 1930, staff gage at site 10 miles downstream at different datum. Oct. 1, 1930, to Sept. 30, 1932, staff gage at datum 5.00 ft higher and Oct. 1, 1932, to Dec. 8, 1938, staff gage at datum 4.00 ft higher at site 50 ft downstream. Dec. 9, 1938, to Sept. 30, 1949, water-stage recorder at present site at datum 4.00 ft higher.

Average discharge.--31 years (1929-60), 412 cfs (298,300 acre-ft per year).

Extremes.--1929-60: Maximum discharge, 3,720 cfs May 11, 1950 (gage height, 13.42 ft); no flow at times 1931-37.

Remarks.--Flow regulated by outlet dam on Lower Red Lake.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	S'pt.	The year
1951	1,955	1,730	1,539	1,424	1,366	1,453	1,980	1,791	1,573	1,158	453	464	1,407
1952	464	600	857	1,072	1,068	1,055	948	1,354	1,433	1,253	621	533	938
1953	372	286	310	311	328	331	164	259	406	289	306	290	304
1954	250	204	226	217	227	230	389	421	586	569	368	269	350
1955	252	327	325	274	297	328	549	308	278	277	261	232	309
1956	197	149	145	148	150	153	556	371	195	171	186	189	217
1957	237	245	208	184	146	228	326	98.2	671	1,252	1,180	1,140	495
1958	1,467	1,304	659	669	654	878	722	312	334	441	254	56.7	645
1959	43.6	36.0	38.5	47.1	45.9	66.4	120	45.5	36.4	43.4	49.1	38.8	50.9
1960	149	143	147	136	126	158	229	40.1	49.9	42.3	38.7	18.3	105

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	S'pt.	The year
1951	120,200	102,900	94,610	87,570	75,890	89,340	117,800	110,100	93,620	71,210	27,860	27,600	1,019,000
1952	28,540	35,720	52,680	65,890	61,430	64,900	56,420	83,250	85,270	77,070	38,210	31,720	681,100
1953	22,900	16,990	19,050	19,120	18,240	20,360	9,750	15,900	24,150	17,750	18,800	17,280	220,300
1954	15,370	12,160	13,900	13,340	12,600	14,110	23,150	25,870	34,850	34,990	22,650	15,980	239,000
1955	15,500	19,440	20,000	16,820	16,520	20,150	32,680	18,910	16,570	17,020	16,060	13,800	223,500
1956	12,110	8,850	8,920	9,120	8,640	9,430	33,100	22,790	11,610	10,490	11,460	11,250	157,800
1957	14,550	14,600	12,770	11,340	8,120	13,990	19,370	6,040	39,940	76,980	72,540	67,860	358,100
1958	90,190	77,570	40,510	41,140	36,290	54,010	42,970	19,200	19,860	27,130	14,370	3,370	466,600
1959	2,680	2,140	2,370	2,890	2,550	4,080	7,140	2,800	2,170	2,670	3,020	2,310	36,820
1960	9,190	8,500	9,030	8,360	7,270	8,510	13,640	2,470	2,970	2,600	2,380	1,090	76,010

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	1,559	1,129,000
1951	1208	2,170	Apr. 29, 1951	405	1,407	1,019,000	1,130	817,900
1952	1238	1,730	May 19, 1952	220	938	681,100	858	623,100
1953	1278	670	June 9, 1953	108	304	220,300	280	202,800
1954	1338	742	June 23, 1954	154	350	239,000	349	252,500
1955	1388	1,240	Apr. 8, 1955	70	309	223,500	274	198,400
1956	1438	1,530	Apr. 20, 1956	98	217	157,800	234	169,800
1957	1508	1,960	June 28, 1957	16	495	358,100	724	524,400
1958	1558	1,520	Oct. 17, 1957	33	645	466,600	367	265,500
1959	1628	326	Apr. 3, 1959	1.5	50.9	36,820	77.8	56,350
1960	1708	530	Apr. 6, 1960	4.6	105	76,010	-	-

755. Thief River near Gatzke, Minn.

Location.--Lat 48°26'30", long 95°58'00", in sec.8, T.157 N., R.41 W., on right bank 3½ miles downstream from dam at outlet of Thief Lake and 7½ miles west of Gatzke.

Records available.--October 1953 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 1,145 ft (from topographic map).

Extremes.--1953-56: Maximum discharge, 519 cfs July 5, 1956 (gage height, 7.86 ft); no flow for many days.

Remarks.--Some regulation by Thief Lake. Records of chemical analyses for periods September 1953, April to August 1955, with water temperatures October 1953 to September 1954, are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1954	0	0.02	0	0	0	2.00	87.5	180	121	16.5	0.68	0.03	34.1
1955	0	.02	.02	0	0	0	33.4	44.5	95.5	22.7	1.08	0	16.4
1956	.01	.12	0	0	0	0	133	316	109	154	*16.0	*292	*84.9

* Not previously published; estimated on the basis of records for Thief River near Thief River Falls, Minn.

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1954	0	1.0	0	0	0	123	5,210	11,080	7,230	1,020	42	1.8	24,710
1955	0	1.0	1.0	0	0	0	1,990	2,730	5,680	1,400	66	0	11,870
1956	.6	6.9	0	0	0	0	7,890	19,440	6,480	9,440	*984	*12380	*61,620

* Not previously published; see footnote to preceding table.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1954	1338	280	June 7, 1954	0	34.1	24,710	34.1	24,710
1955	1388	158	June 11, 1955	0	16.4	11,870	16.4	11,870
1956	1438	519	July 5, 1956	0	*84.9	*61,620	-	-

* Not previously published.

760. Thief River near Thief River Falls, Minn.

Location.--Lat 48°11', long 96°10', in sec.3, T.154 N., R.43 W., on right bank a quarter of a mile upstream from highway bridge, 5 miles north of city of Thief River Falls, 7 miles upstream from mouth, and 9 miles downstream from Mud Lake National Wild Life Refuge.

Drainage area.--959 sq mi.

Records available.--July 1909 to September 1917, April 1920 to September 1931, October 1922 to September 1924, October 1928 to September 1960. Monthly discharge only for some periods, annual maximums for water years 1919, 1922, 1925, 1926, published in WSP 1308.

Gage.--Water-stage recorder and control of grouted boulders. Datum of gage is 1,112.33 ft above mean sea level, datum of 1929 (levels by Minnesota Highway Department). Prior to May 4, 1939, staff or chain gage at same site and datum.

Average discharge.--43 years (1909-17, 1920-21, 1922-24, 1928-60), 117 cfs (84,700 acre-ft per year).

Extremes.--1909-17, 1919-26, 1928-60: Maximum discharge, 5,610 cfs May 13, 1950 (gage height, 17.38 ft); no flow in fall and winter of many years.

Remarks.--Some regulation by Thief and Mud Lakes.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	142	4.37	0.86	0.55	8.08	71.2	956	942	110	11.5	5.9	48.8	192
1952	6.14	5.92	4.52	0.18	0.02	85	580	111	24.9	75.4	25.0	1.05	67.4
1953	0	0	0	0	0	39.0	75.9	157	203	48.7	4.45	2.51	44.5
1954	2.53	3.01	0.33	0.08	0.01	0.18	160	367	214	18.2	1.69	1.39	64.2
1955	.19	.59	.15	0	0	0	256	91.1	374	42.6	5.24	0	63.6
1956	0	.35	.10	0	0	2.05	619	896	275	584	49.6	666	258
1957	60.2	226	153	.94	0	169	805	607	498	640	150	647	314
1958	536	258	41.7	33.6	21.3	11.0	34.6	50.7	30.8	453	7.01	.003	124
1959	.13	1.34	.19	0	0	26.9	514	286	65.8	117	30.2	24.0	88.8
1960	7.66	5.02	.90	.15	0	.68	651	356	149	89.6	5.58	1.52	105

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	8,710	260	53	34	449	4,380	56,870	57,900	6,550	706	364	2,900	139,200
1952	378	352	278	13	1.0	52	33,320	6,850	1,480	4,640	1,540	3.0	48,910
1953	0	0	0	0	0	2,400	4,520	9,680	12,420	2,990	108	149	32,190
1954	156	179	22	5.0	0.6	11	9,520	22,570	12,710	1,120	104	83	46,480
1955	12	35	8.9	0	0	0	15,230	5,600	22,240	2,620	322	0	46,070
1956	0	21	6.0	0	0	126	36,820	55,100	16,390	35,900	3,050	3,630	187,000
1957	3,700	13,460	9,390	58	0	10,420	36,010	37,300	29,650	39,320	9,220	29,510	227,000
1958	32,950	15,340	2,560	2,070	1,180	678	2,060	3,120	1,830	27,850	431	.2	90,070
1959	7.7	80	12	0	0	1,680	30,580	17,570	3,920	7,190	1,860	1,430	64,310
1960	471	299	55	9.5	0	42	38,740	21,890	8,870	5,510	343	90	76,310

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet	
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	1208	-	May 2, 1951	0	192	139,200	602	435,600	
1952	1238	1,500	Apr. 8, 1952	0	67.4	48,910	66.0	131,200	
1953	1278	429	June 2, 3, 1953	0	44.5	32,190	44.9	47,900	
1954	1338	624	Apr. 12, 1954	0	64.2	46,480	63.8	32,540	
1955	1388	958	Apr. 8, 1955	0	63.6	46,070	63.6	46,180	
1956	1438	1,840	Apr. 21, 1956	0	258	187,000	294	46,040	
1957	1508	1,630	Sept. 3, 1957	0	314	227,000	347	213,600	
1958	1558	828	Oct. 17, 1957	0	124	90,070	54.3	251,300	
1959	1628	950	Apr. 5, 1959	0	88.8	64,310	89.8	39,320	
1960	1708	1,100	Apr. 6, 1960	0	105	76,310	-	65,040	

780. Clearwater River at Plummer, Minn.

Location.--Lat 47°55', long 96°03', in SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 4, T.151 N., R.42 W., on right bank 200 ft downstream from Soo Line Railroad bridge, 300 ft downstream from bridge on U.S. Highway 59, 0.9 mile northwest of railroad depot in Plummer, and 8 miles upstream from Hill River.

Drainage area.--512 sq mi.

Records available.--April 1939 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,099.12 ft above mean sea level, adjustment of 1912 (levels by Corps of Engineers). Prior to Nov. 10, 1939, staff gage at site 100 ft upstream at same datum.

Average discharge.--21 years (1939-60), 166 cfs (120,200 acre-ft per year).

Extremes.--1939-60: Maximum discharge, 3,630 cfs May 6, 1950 (gage height, 11.33 ft); maximum gage height, 11.84 ft June 27, 1957; minimum discharge, 7.9 cfs July 8, 1940.

Remarks.--Slight regulation by Clearwater Lake.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	159	127	80.0	76.0	68.0	72.1	607	715	158	56.2	59.4	187	197
1952	152	107	101	90.1	76.9	122	724	273	113	414	104	55.5	194
1953	45.2	59.3	54.9	47.5	48.0	156	313	332	344	344	103	66.6	160
1954	54.8	66.6	80.0	69.6	78.4	103	639	289	186	65.2	54.8	66.1	145
1955	63.5	62.3	54.5	44.0	37.4	44.1	578	159	182	71.4	30.9	23.6	112
1956	47.9	44.8	46.3	47.1	45.4	46.2	533	328	130	55.2	60.1	96.4	123
1957	43.7	90.2	39.9	37.2	40.5	112	704	213	917	356	48.0	138	227
1958	115	136	60.2	45.6	42.4	69.7	81.5	74.7	169	259	37.3	33.3	93.9
1959	49.9	49.8	38.5	35.5	31.0	63.1	224	201	216	97.4	46.3	39.1	91.0
1960	49.0	40.1	41.1	39.2	33.8	37.4	317	122	175	75.5	36.9	54.5	84.7

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	9,810	7,530	4,920	4,670	3,780	4,430	36,140	43,970	9,370	3,450	3,650	10,830	142,600
1952	9,350	6,350	6,200	5,540	4,420	7,490	43,080	16,820	6,740	25,440	6,410	3,370	141,100
1953	2,780	3,530	3,370	2,920	2,660	9,620	18,600	20,430	20,490	21,170	6,360	3,610	115,500
1954	3,370	3,960	4,920	4,280	4,350	6,340	38,040	17,740	11,070	4,010	3,370	3,530	105,000
1955	3,910	3,710	3,350	2,710	2,080	2,710	34,420	9,750	10,850	4,390	1,900	1,400	81,180
1956	2,950	2,670	2,840	2,900	2,610	2,840	31,740	20,200	7,720	3,390	3,690	5,830	89,400
1957	2,690	5,370	2,480	2,280	2,250	6,870	41,900	13,120	54,540	21,900	2,950	8,230	164,600
1958	7,060	8,090	3,700	2,800	2,350	4,280	4,850	4,590	10,050	15,940	2,290	1,900	67,980
1959	3,070	2,960	2,370	2,180	1,720	3,880	13,310	12,360	12,840	5,990	2,850	2,330	65,860
1960	3,010	2,390	2,520	2,410	1,940	2,300	18,870	7,520	10,390	4,650	2,270	3,240	61,510

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	359	259,700
1951	1208	1,110	May 3, 1951	46	197	142,600	196	142,200
1952	1238	1,440	Apr. 15, 1952	38	194	141,100	178	128,900
1953	1278	854	July 5, 1953	35	160	115,500	163	118,100
1954	1338	1,640	Apr. 13, 1954	34	145	105,000	143	103,800
1955	1388	1,800	Apr. 6, 1955	12	112	81,180	109	78,670
1956	1438	2,240	Apr. 21, 1956	26	123	89,400	126	91,460
1957	1508	3,570	June 27, 1957	34	227	164,600	239	172,900
1958	1558	822	July 6, 1958	22	93.9	67,980	79.5	57,530
1959	1628	702	Apr. 6, 1959	29	91.0	65,860	90.3	65,380
1960	1708	710	Apr. 7, 1960	21	84.7	61,510	-	-

785. Clearwater River at Red Lake Falls, Minn.

Location.--Lat 47°53'15", long 96°16'25", in NW¼ sec.22, T.151 N., R.44 W., on left bank 40 ft downstream from Great Northern Railroad bridge in Red Lake Falls, 1.4 miles upstream from mouth, and 3 miles downstream from Badger Creek.

Drainage area.--1,370 sq mi, approximately.

Records available.--June 1909 to September 1917, October 1934 to September 1960. Monthly discharge only for October, November 1934, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 949.49 ft above mean sea level, adjustment of 1912 (levels by Corps of Engineers). Prior to Sept. 12, 1911, staff gage at site half a mile upstream and Sept. 12, 1911, to Sept. 30, 1917, staff gage at site 40 ft upstream at different datum.

Average discharge.--34 years (1909-17, 1934-60), 277 cfs (200,500 acre-ft per year).

Extremes.--1909-17, 1934-60: Maximum discharge, 9,310 cfs May 6, 1950 (gage height, 11.28 ft); maximum gage height observed, 17.5 ft Apr. 5, 1913, site and datum then in use (backwater from ice); no flow Sept. 15, 1936, Sept. 14, 1939, Aug. 19-22, 1940.

Remarks.--Slight regulation by Clearwater Lake and several smaller lakes.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	239	168	103	89.7	82.9	98.2	1,891	1,339	241	75.6	78.9	259	389
1952	179	139	120	109	97.4	143	1,454	450	226	825	153	78.0	331
1953	66.4	51.1	56.5	65.6	65.8	251	552	564	550	628	147	92.3	258
1954	81.3	87.5	87.9	79.2	88.3	135	1,118	505	326	94.9	72.5	72.5	228
1955	72.2	69.8	58.1	46.8	39.3	48.0	1,108	258	367	115	41.8	25.5	186
1956	49.1	47.9	51.9	49.5	47.7	48.5	1,318	754	253	74.8	71.4	182	245
1957	56.1	148	57.5	42.6	39.9	253	1,271	430	1,584	1,015	88.0	354	444
1958	215	258	83.8	61.6	54.3	107	146	135	245	469	48.2	55.2	155
1959	63.4	72.2	44.3	41.7	35.5	132	463	340	372	175	86.8	55.2	167
1960	70.9	54.1	54.3	43.4	37.6	53.5	741	280	520	179	41.9	64.2	177

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	14,670	9,990	6,360	5,510	4,600	6,040	112,500	82,330	14,360	4,650	4,850	15,430	281,300
1952	11,030	8,290	7,350	6,680	5,600	8,780	56,500	27,630	13,460	50,600	9,400	4,640	240,000
1953	4,080	3,040	3,480	3,910	3,660	15,460	32,820	34,650	32,730	58,510	9,050	5,490	186,900
1954	5,000	5,200	5,400	4,870	4,900	8,290	66,520	51,080	19,410	5,840	4,460	4,320	165,300
1955	4,440	4,160	3,570	2,880	2,180	2,950	65,960	15,840	21,850	7,050	2,570	1,520	135,000
1956	3,020	2,850	3,190	3,040	2,740	2,980	78,410	46,390	15,060	4,600	4,390	17,850	177,500
1957	3,450	8,830	3,540	2,620	2,210	15,580	75,620	26,450	94,260	62,430	5,410	21,030	321,400
1958	13,210	15,360	5,150	3,790	3,010	6,580	8,760	8,200	14,590	28,840	2,960	2,100	112,500
1959	3,900	4,290	2,720	2,560	1,970	8,120	27,540	20,920	22,140	10,740	5,340	3,290	113,500
1960	4,360	3,220	3,340	2,870	2,160	3,290	44,100	17,220	30,970	11,030	2,580	3,820	128,800

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	86?	623,900
1951	1208	2,880	Apr. 10, 1951	-	389	281,300	383	276,900
1952	1239	2,550	Apr. 16, 1952	55	331	240,000	303	224,000
1953	1278	1,120	July 5, 1953	42	258	186,900	265	191,900
1954	1338	2,540	Apr. 14, 1954	44	228	165,300	224	161,900
1955	1388	3,660	Apr. 8, 1955	9.6	186	135,000	18?	131,900
1956	1438	5,560	Apr. 21, 1956	30	245	177,500	254	184,300
1957	1508	8,840	June 28, 1957	39	444	321,400	463	339,300
1958	1558	1,320	July 7, 1958	26	155	112,500	124	89,650
1959	1628	1,960	Apr. 4, 1959	34	157	113,500	15?	113,500
1960	1708	4,010	Apr. 6, 1960	24	177	128,800	-	-

790. Red Lake River at Crookston, Minn.

Location.--Lat 47°46'32" long 96°36'33" in SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.30, T.150 N., R.46 W., on right bank at downstream side of highway bridge in Crookston, 0.3 mile downstream from Interstate Power Co.'s dam and 0.6 mile downstream from bridge on State Highway #1.

Drainage area.--5,280 sq mi, approximately.

Records available.--May 1901 to September 1960. Monthly discharge only for some periods, published in WSP 1308. Figures of daily discharge for Apr. 3-30, 1904, published in WSP 130, have been found unreliable and should not be used.

Gage.--Water-stage recorder. Datum of gage is 832.72 ft above mean sea level, datum of 1929. May 18, 1901, to June 30, 1909, chain gage at bridge 300 ft upstream at same datum. July 1, 1909, to Sept. 25, 1911, chain gage, Sept. 26, 1911, to Sept. 30, 1919, water-stage recorder, and Oct. 1, 1919, to Sept. 30, 1930, chain gage, at present site and datum.

Average discharge.--59 years (1901-60), 977 cfs (707,300 acre-ft per year).

Extremes.--1901-60: Maximum discharge, 27,400 cfs May 7, 1950 (gage height, 25.70 ft); no flow part of July 13, 1960.

Remarks.--Diurnal fluctuation caused by powerplant upstream.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2,352	1,778	1,763	1,663	1,464	1,631	5,573	4,265	1,947	1,216	523	729	2,076
1952	682	685	1,049	1,140	1,210	1,178	3,236	1,942	1,707	2,326	859	600	1,384
1953	416	372	359	367	376	841	890	1,033	1,252	1,037	452	393	650
1954	356	343	328	294	303	413	1,860	1,305	1,209	674	434	359	656
1955	347	407	389	322	337	366	2,593	707	1,118	487	271	258	631
1956	262	178	189	226	231	230	3,408	2,489	848	874	301	1,232	875
1957	360	612	355	231	118	669	2,510	1,272	2,797	3,333	1,374	2,188	1,321
1958	2,295	1,806	783	827	776	1,001	981	485	604	1,532	364	104	966
1959	97.4	118	74.5	73.9	83.8	298	1,522	685	481	318	183	129	338
1960	220	211	201	185	177	191	2,280	756	943	421	70.5	85.1	476

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	144,600	105,800	108,400	102,200	81,320	100,300	331,600	262,300	115,900	74,790	32,140	43,400	1,503,000
1952	41,960	40,780	64,520	70,100	69,600	72,440	192,600	119,400	101,800	145,000	52,800	35,680	1,004,000
1953	25,560	22,130	22,090	22,590	20,870	51,710	52,970	63,530	74,470	63,760	27,820	23,370	470,900
1954	21,890	20,390	19,170	18,060	16,820	25,370	110,700	80,270	71,970	41,430	26,670	21,330	474,000
1955	21,350	24,240	23,940	19,780	18,740	22,480	154,300	43,450	66,540	29,950	16,640	15,380	456,800
1956	16,090	10,620	11,630	13,900	13,270	14,150	202,800	153,100	50,440	53,770	18,520	76,890	635,100
1957	22,160	36,400	21,840	14,210	6,580	41,150	149,300	78,240	166,500	205,000	84,520	130,200	956,100
1958	141,100	107,500	48,150	50,850	43,100	61,580	58,370	29,840	35,920	94,200	22,400	6,180	699,200
1959	5,990	7,000	4,580	4,540	4,650	18,350	90,580	42,150	28,630	19,540	11,230	7,670	244,900
1960	13,510	12,580	12,360	11,350	10,160	11,740	135,700	46,480	56,090	28,870	4,330	5,060	347,200

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	3,430	2,483,000
1951	1208	12,600	Apr. 7, 1951	392	2,076	1,503,000	1,783	1,291,000
1952	1238	6,320	Apr. 11, 1952	241	1,384	1,004,000	1,277	927,000
1953	1278	2,560	Mar. 24, 1953	156	650	470,900	640	471,500
1954	1338	5,330	Apr. 12, 1954	262	656	474,000	666	482,100
1955	1388	12,400	Apr. 8, 1955	190	631	456,800	588	425,600
1956	1438	14,000	Apr. 20, 1956	149	875	635,100	933	677,200
1957	1508	11,800	June 29, 1957	78	1,321	956,100	1,619	1,172,000
1958	1558	3,370	July 7, 1958	56	966	699,200	580	420,000
1959	1628	5,630	Apr. 5, 1959	48	338	244,900	367	265,800
1960	1708	5,520	Apr. 6, 1960	35	476	347,200	-	-

825. Red River of the North at Grand Forks, N. Dak.

Location.--Lat 47°56'26", long 97°02'47", in SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.33, T.152 N., R.50 W., on left bank 500 ft downstream from dam at Riverside Park in Grand Forks, 2 miles downstream from Red Lake River, and at mile 296.0.

Drainage area.--30,100 sq mi, approximately (includes 3,800 sq mi revised, in closed basins).

Records available.--April 1882 to September 1960. Monthly discharge only prior to May 1901, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 778.35 ft above mean sea level, datum of 1929. 1882-32, gages near site of Northern Pacific Railway bridge, $1\frac{1}{2}$ miles upstream (history not available, datum apparently the same as following gage). 1892 to Oct. 15, 1926, staff and chain gages on Northern Pacific Railway bridge, at datum about $5\frac{1}{2}$ ft higher, but published at datum only half a foot higher than present datum. Oct. 16, 1926, to Nov. 2, 1933, staff gages near present site, at datum 5 ft higher than present datum but published at present datum.

Average discharge.--78 years (1882-1960), 2,286 cfs (1,655,000 acre-ft per year).

Extremes.--1882-1960: Maximum discharge, about 80,000 cfs Apr. 10, 1897 (gage height, 50.2 ft, site and datum then in use) from rating curve extended above 54,000 cfs; minimum, 2.4 cfs Feb. 3-5, 12, 14, 16-19, 1937 (caused by unusual regulation during repair of dam at Grand Forks).

Remarks.--Flow partly regulated by many lakes and reservoirs on tributaries. Records of chemical analyses and water temperatures for the period October 1956 to September 1960 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2,722	1,987	2,037	1,929	1,821	2,269	14,380	8,193	4,087	2,249	1,113	1,427	3,680
1952	1,314	1,270	1,850	1,747	1,869	1,968	16,630	5,318	3,493	5,622	1,838	1,261	3,670
1953	872	764	672	575	607	1,306	3,152	3,071	8,945	4,526	2,036	1,220	2,364
1954	865	936	847	813	885	1,616	4,809	3,516	5,287	2,090	868	694	1,766
1955	640	697	681	725	666	684	5,598	1,708	2,237	2,153	1,576	779	1,510
1956	752	526	376	434	470	540	8,327	5,054	2,755	1,407	699	1,451	1,941
1957	495	786	516	416	429	1,552	4,416	3,084	4,251	5,760	2,471	4,266	2,374
1958	3,245	2,809	1,511	1,327	1,272	1,928	2,606	1,357	1,282	3,647	824	444	1,860
1959	398	464	325	376	375	923	2,995	1,605	2,432	1,850	646	475	1,072
1960	496	446	434	477	481	556	8,764	3,115	2,599	1,780	461	560	1,675

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	167,400	118,300	125,300	118,600	101,200	139,500	855,700	503,700	243,200	138,300	68,450	84,890	2,665,000
1952	80,770	75,550	113,800	107,400	107,500	121,000	989,700	327,000	207,800	345,700	113,000	75,030	2,664,000
1953	53,610	45,460	41,340	35,390	33,700	117,200	187,500	188,800	532,200	278,300	125,200	72,580	1,711,000
1954	53,170	55,670	52,060	49,980	47,370	99,370	286,100	216,200	195,600	128,500	53,390	41,310	1,279,000
1955	39,320	41,500	41,850	44,590	37,010	42,030	333,100	105,000	133,100	132,400	96,890	46,360	1,093,000
1956	46,230	31,270	23,130	26,680	27,050	33,220	531,200	310,700	163,900	86,520	42,980	86,360	1,409,000
1957	30,420	46,800	31,700	25,590	23,820	95,440	262,800	189,600	252,900	354,100	151,900	33,800	1,719,000
1958	199,500	167,100	92,930	81,580	70,670	118,600	155,100	83,420	76,270	224,300	50,690	26,400	1,347,000
1959	24,450	27,620	19,950	23,110	20,810	56,770	178,200	98,700	144,700	113,800	39,720	28,240	776,100
1960	30,530	26,530	26,670	30,730	27,690	34,200	521,500	191,500	154,700	109,200	29,560	33,350	1,216,000

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30				Calendar year			
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet	
		Discharge	Date						
1950	1208	-	-	-	-	-	7,872	5,699,000	
1951	1208	23,600	Apr. 12, 1951	950	3,680	2,665,000	3,486	2,524,000	
1952	1238	23,800	Apr. 19-20, 1952	800	3,670	2,664,000	3,491	2,535,000	
1953	1278	14,600	June 25, 1953	540	2,364	1,711,000	2,392	1,732,000	
1954	1358	9,620	Apr. 15, 1954	491	1,766	1,279,000	1,714	1,240,000	
1955	1388	15,400	Apr. 10, 1955	362	1,510	1,093,000	1,479	1,071,000	
1956	1438	21,400	Apr. 23, 1956	312	1,941	1,409,000	1,953	1,418,000	
1957	1508	14,700	July 2, 1957	350	2,374	1,719,000	2,859	2,069,000	
1958	1558	7,500	July 9, 1958	389	1,880	1,347,000	1,325	959,000	
1959	1628	6,300	Apr. 6, 1959	220	1,072	776,100	1,038	787,800	
1960	1708	17,200	Apr. 12, 1960	265	1,675	1,216,000	-	-	

830. Turtle River at Marvel, N. Dak.

Location.--Lat 48°05', long 97°11', in SE $\frac{1}{4}$ sec.10, T.153 N., R.51 W., on downstream side of bridge on State Highway 33, 0.3 mile west of Marvel and 10 miles upstream from mouth.

Drainage area.--613 sq mi (revised).

Records available.--October 1945 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 799.28 ft above mean sea level, datum of 1929. Prior to June 29, 1959, chain gage at same site and datum.

Average discharge.--15 years (1945-60), 48.9 cfs (35,400 acre-ft per year); median of yearly mean discharges, 27 cfs (19,500 acre-ft per year).

Extremes.--1945-60: Maximum discharge, 28,000 cfs Apr. 19, 1950 (gage height, 21.5 ft, from floodmarks), from rating curve extended above 4,300 cfs on basis of contracted-opening measurement of peak flow; no flow in fall or winter of some years.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	16.7	13.7	4.5	5.1	2.0	41.2	211	24.1	14.1	3.95	12.0	41.5	32.3
1952	7.47	8.2	5.5	.74	.10	1.79	167	14.8	7.00	41.0	3.70	.70	21.4
1953	1.82	9.24	3.73	1.15	.80	18.1	27.2	26.3	89.7	42.5	4.07	1.08	18.7
1954	2.61	3.11	2.35	.28	1.22	26.6	45.3	16.5	20.4	11.3	2.06	1.56	11.1
1955	3.17	6.55	2.73	1.08	.67	.05	225	18.9	110	10.5	3.63	.69	31.6
1956	3.63	3.73	.66	.35	.47	.67	323	62.6	42.8	7.00	2.16	4.50	37.2
1957	.96	8.40	3.92	2.89	.64	45.2	40.6	16.2	13.9	1.64	7.09	215	29.5
1958	37.4	24.9	7.39	2.26	4.21	12.2	23.2	14.2	13.9	19.6	1.09	.31	13.4
1959	1.45	5.11	1.28	.02	0	38.4	59.5	16.5	11.2	7.82	2.89	.18	12.0
1960	9.67	5.81	3.30	2.43	1.63	37.3	429	24.4	17.7	7.10	2.02	1.22	44.7

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,030	817	278	313	111	2,530	12,560	1,480	842	243	737	2,470	23,410
1952	459	488	339	46	5.8	110	9,940	912	416	2,520	227	41	15,500
1953	50	550	229	71	44	1120	1,620	5,340	2,820	251	62		13,580
1954	161	185	145	17	68	1,640	2,700	1,020	1,210	693	127	93	8,060
1955	195	390	168	66	37	3.0	13,390	1,160	6,550	648	223	41	22,870
1956	223	222	40	21	27	41	19,230	3,850	2,540	430	133	263	27,020
1957	59	500	223	178	36	2,780	2,420	997	825	101	434	12,810	21,360
1958	2,300	1,480	454	139	234	751	1,380	871	829	1,210	67	18	9,730
1959	69	304	79	1.2	0	2,380	5,540	1,010	667	481	178	11	8,720
1960	595	346	203	150	106	2,290	25,560	1,500	1,050	436	124	73	32,430

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet	
		Discharge	Date						
1950	-	-	-	-	-	-	300	-	-
1951	1208	940	Apr. 6, 1951	-	32.3	23,410	31.2	-	217,130
1952	1238	a800	Apr. 7, 1952	0	21.4	15,500	20.7	-	15,050
1953	1278	b219	June 22, 1953	0	18.7	13,580	18.3	-	13,240
1954	1338	c100	Apr. 11, 1954	0	11.1	8,060	11.5	-	8,320
1955	1368	1,460	Apr. 5, 1955	0	31.6	22,870	31.2	-	22,600
1956	1438	1,500	Apr. 20, 1956	.2	37.2	27,020	37.6	-	27,320
1957	1508	900	Sept. 5, 1957	0	29.5	21,360	34.3	-	24,820
1958	1558	135	Oct. 9, 1957	0	13.4	9,730	8.24	-	5,970
1959	1628	370	Mar. 30, 1959	0	12.0	8,720	13.0	-	9,390
1960	1708	1,080	Apr. 7, 1960	0	44.7	32,430	-	-	-

a About.

b Maximum observed.

c Maximum daily.

835. Red River of the North at Oslo, Minn.

Location.--Lat 48°11'40", long 97°08'30", in sec.6, T.154 N., R.50 W., near center of span on downstream side of interstate highway bridge in Oslo, at mile 271.2.

Drainage area.--31,200 sq mi, approximately (includes 3,800 sq mi, revised, in closed basins).

Records available.--April 1936 to June 1937, April 1941 to April 1943, March 1945 to September 1960 (high-water periods only). Records for April to June 1944, published in WSP 1022, have been found to be unreliable and should not be used. Records prior to 1945 do not include flow in bypass channel.

Gage.--Wire-weight gage. Datum of gage is 772.65 ft above mean sea level, datum of 1929. Prior to Apr. 2, 1948, staff gage on railroad bridge 200 ft upstream and Apr. 3, 1948, to Sept. 8, 1959, wire-weight gage at bridge 620 ft downstream at datum 5.00 ft higher.

Extremes.--1936-37, 1941-60: Maximum discharge, 63,000 cfs May 10, 1950 (gage height, 31.83 ft, site and datum then in use); minimum not determined. Maximum stage known, about 37.5 ft in 1897, present datum.

Remarks.--Some regulation by lakes and reservoirs on tributaries. Since 1945, for stages above 18 ft, discharge includes flow in bypass channel $\frac{1}{4}$ miles west of Oslo. Records of chemical analyses for the period April to July 1954 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	15,340	8,444	4,310	-	-	-	-
1952	-	-	-	-	-	-	17,280	5,556	3,604	5,762	2,033	-	-
1953	-	-	-	-	-	-	3,266	3,068	9,069	4,738	2,124	-	-
1954	-	-	-	-	-	-	4,967	3,583	3,336	2,167	-	-	-
1955	-	-	-	-	-	-	6,010	1,826	2,424	2,219	1,625	-	-
1956	-	-	-	-	-	-	9,280	5,602	2,979	1,479	763	-	-
1957	-	-	-	-	-	-	4,573	3,271	4,363	6,140	2,470	-	-
1958	-	-	-	-	-	-	2,686	1,433	1,359	3,739	915	428	-
1959	-	-	-	-	-	-	3,496	1,686	2,530	1,972	724	499	-
1960	-	-	-	-	-	-	9,288	3,328	2,699	1,954	541	607	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	912,600	519,200	256,500	-	-	-	-
1952	-	-	-	-	-	-	1,027,000	341,800	214,500	354,300	125,000	-	-
1953	-	-	-	-	-	-	194,300	189,700	533,700	291,300	150,600	-	-
1954	-	-	-	-	-	-	295,500	220,300	198,500	135,500	-	-	-
1955	-	-	-	-	-	-	357,600	112,300	144,200	136,500	99,890	-	-
1956	-	-	-	-	-	-	552,200	344,400	177,300	90,920	46,920	-	-
1957	-	-	-	-	-	-	272,100	201,100	259,600	377,500	151,900	-	-
1958	-	-	-	-	-	-	159,800	88,120	80,890	229,900	56,280	25,460	-
1959	-	-	-	-	-	-	206,000	104,300	150,500	121,200	44,520	29,710	-
1960	-	-	-	-	-	-	552,700	204,600	160,600	120,200	35,270	36,120	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30				Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean
		Discharge	Date				
1950	-	-	-	-	-	-	-
1951	1208	24,600	Apr. 12, 1951	-	-	-	-
1952	1238	24,800	Apr. 20-22, 1952	-	-	-	-
1953	1278	14,900	June 25, 1953	-	-	-	-
1954	1338	9,790	Apr. 15, 1954	-	-	-	-
1955	1388	16,400	Apr. 10, 1955	-	-	-	-
1956	1438	22,500	Apr. 24, 1956	-	-	-	-
1957	1508	14,900	July 2, 1957	-	-	-	-
1958	1558	7,890	July 10, 1958	-	-	-	-
1959	1628	7,200	Apr. 7, 1959	-	-	-	-
1960	1708	17,100	Apr. 12, 1960	-	-	-	-

840. Forest River near Fordville, N. Dak.

Location.--Lat 48°12', long 97°44', on line between secs. 32 and 33, T.155 N., R.55 W., on right bank 50 ft upstream from highway bridge, half a mile downstream from South Branch, and 3 miles southeast of Fordville.

Drainage area.--456 sq mi (revised), of which about 120 sq mi is probably noncontributing.

Records available.--April 1940 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,040 ft (by barometer). Prior to July 21, 1951, chain gage at site 50 ft downstream at same datum.

Average discharge.--20 years (1940-60), 36.1 cfs (26,140 acre-ft per year); median of yearly mean discharges, 18 cfs (13,000 acre-ft per year).

Extremes.--1940-60: Maximum discharge, 16,400 cfs Apr. 18, 1950 (gage height, 14.48 ft, from floodmark), from rating curve extended above 5,600 cfs on basis of contracted-opening and slope-area measurements of peak flow; no flow Apr. 1-13, Sept. 3, 1940.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	8.3	8.7	8.4	7.8	7.3	57.1	104	13.8	10.5	5.2	6.7	5.8	20.3
1952	6.5	6.4	5.7	6.3	7.5	19.2	61	9.2	6.1	30.5	4.28	4.45	14.1
1953	4.87	5.74	5.17	4.92	6.0	7.59	9.59	17.4	17.8	6.26	3.67	4.45	7.77
1954	5.76	6.18	4.37	3.46	8.18	27.5	26.8	12	46	5.87	11.4	7.33	13.7
1955	5.78	6.75	6.48	4.93	5.11	92.8	166	14.7	64.1	5.59	3.88	3.96	31.6
1956	6.03	6.04	3.2	5.0	5.3	6.3	393	59.2	144	22.5	6.49	11.0	55.0
1957	11.4	12.5	7.1	5.3	6.4	50.3	14.0	14.5	11.9	5.21	6.48	13.6	15.3
1958	10.3	9.42	7.70	7.26	7.03	9.12	10.2	10.2	9.92	8.33	3.92	3.66	6.08
1959	6.31	5.72	4.79	4.40	5.37	20.5	66.9	14.4	7.29	3.76	2.40	3.36	12.1
1960	6.02	5.51	5.46	5.33	4.77	34.5	447	17.7	8.24	5.99	4.82	4.40	45.3

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	510	516	514	478	405	3,500	6,190	851	623	321	415	345	14,670
1952	401	498	353	389	438	1,180	3,630	567	365	1,880	263	265	10,230
1953	287	341	318	302	333	1,467	570	1,070	1,060	365	226	267	5,630
1954	354	368	269	213	454	1,690	1,890	738	2,740	361	700	436	9,910
1955	355	402	398	303	284	5,710	9,890	906	3,820	344	239	237	22,890
1956	371	300	194	305	307	389	23,400	3,640	8,600	1,380	399	655	39,940
1957	698	742	438	325	357	3,090	838	891	707	364	398	806	9,650
1958	631	560	474	446	391	561	605	626	590	512	235	219	5,850
1959	388	340	294	271	298	1,260	3,980	683	454	231	148	202	8,730
1960	370	328	336	328	274	2,120	26,620	1,090	490	369	296	262	32,680

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	193	140,000
1951	1208	a500	Mar. 29, 1951	4	20.3	14,670	19.9	14,380
1952	1238	826	July 2, 1952	2.9	14.1	10,230	13.7	9,920
1953	1278	130	May 30, 1953	2.6	7.77	5,630	7.84	5,670
1954	1338	1,020	June 15, 1954	12.9	13.7	9,910	13.9	10,080
1955	1388	3,000	Mar. 31, 1955	2.8	31.6	22,890	31.2	22,600
1956	1438	3,370	June 6, 1956	-	55.0	39,940	56.4	40,950
1957	1508	356	Mar. 23, 1957	3.2	13.3	9,650	13.0	9,440
1958	1558	17	July 4, 1958	3.0	8.08	5,850	7.19	5,210
1959	1628	321	Apr. 4, 1959	1.1	12.1	8,730	12.1	8,740
1960	1708	2,610	Apr. 7, 1960	2.1	45.3	32,680	-	-

† Corrected.

a About.

850. Forest River at Minto, N. Dak.

Location.--Lat 48°16'10", long 97°22'10", in SE $\frac{1}{4}$ sec.31, T.156 N., R.52 W., on right bank 30 ft upstream from dam in Minto, 150 ft upstream from Great Northern Railway bridge, and 2 blocks east of U.S. Highway 81.

Drainage area (revised).--740 sq mi, of which about 120 sq mi is probably noncontributing.

Records available.--April 1944 to September 1960.

Gage.--Water-stage recorder and concrete control. Datum of gage is 806.55 ft above mean sea level, datum of 1929. Prior to July 15, 1954, wire-weight gage at site 400 ft upstream at same datum.

Average discharge.--16 years (1944-60), 47.7 cfs (34,530 acre-ft per year); median of yearly mean discharges, 21 cfs (15,200 acre-ft per year).

Extremes.--1944-60: Maximum discharge, 16,600 cfs Apr. 18, 1950 (gage height, 11.80 ft, from floodmarks), from rating curve extended above 7,200 cfs on basis of contracted-opening measurement of peak flow; no flow at times each year 1945-47, 1953-55, 1959-60.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	8.41	9.24	4.6	3.6	4.5	31.2	199	27.4	15.5	6.48	9.32	8.42	27.1
1952	6.38	6.71	4.1	1.10	.69	3.57	96	16.4	7.57	29.1	5.35	3.01	14.9
1953	2.21	4.19	1.97	.57	.08	2.98	21.9	16.5	51.4	10.1	2.14	.27	9.50
1954	1.80	4.57	2.42	.28	.23	24.7	39.8	18.3	43.8	10.0	11.1	6.43	13.6
1955	7.01	6.57	4.00	1.51	.51	.03	291	22.1	92.4	11.2	2.85	1.69	36.3
1956	5.16	5.31	1.96	0.53	.48	.58	511	87.9	209	28.7	11.0	14.0	72.0
1957	9.96	15.8	6.44	4.47	1.53	47.1	25.8	20.4	14.9	6.45	7.78	56.6	18.1
1958	12.8	14.2	6.85	2.62	.84	6.00	24.9	16.3	40.9	12.8	3.80	2.07	12.0
1959	7.73	6.53	.71	.27	.10	10.8	107	18.4	11.0	5.71	2.15	.44	14.2
1960	5.57	4.57	3.71	1.87	.99	20.6	606	30.7	15.2	4.63	1.90	.94	57.3

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	517	550	282	224	250	1,920	11,820	1,680	924	398	573	501	19,640
1952	392	399	252	67	39	220	5,710	1,010	451	1,790	329	179	10,480
1953	136	249	121	35	4.4	183	1,300	1,020	3,060	621	137	16	6,880
1954	110	272	149	17	13	1,520	2,370	1,120	2,610	615	681	383	9,860
1955	451	391	246	80	29	2.0	17,320	1,360	5,500	686	175	100	26,320
1956	317	316	121	32	27	36	30,420	5,410	12,430	1,640	674	831	52,250
1957	612	938	396	275	85	2,900	1,530	1,250	887	396	477	3,370	13,120
1958	764	844	421	161	47	369	1,480	1,000	2,430	785	234	123	8,680
1959	475	388	44	16	5.6	665	6,380	1,130	655	351	137	26	10,270
1960	342	272	228	115	57	1,270	36,050	1,890	906	285	117	56	41,590

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	268	194,200
1951	1208	900	Apr. 5, 1951	3	27.1	19,640	26.7	19,330
1952	1238	a370	Apr. 2, 1952	.5	14.9	10,840	14.2	10,300
1953	1278	a910	June 4, 1953	0	9.50	6,880	9.53	6,900
1954	1358	391	June 16, 1954	0	13.6	9,860	14.4	10,400
1955	1388	b4,200	Apr. 2, 1955	0	36.3	26,320	35.9	26,010
1956	1458	2,930	Apr. 21, 1956	.4	72.0	52,250	73.6	53,450
1957	1508	461	Mar. 23, 1957	.7	18.1	13,120	18.3	13,220
1958	1558	463	June 10, 1958	.4	12.0	8,680	10.4	7,540
1959	1628	338	Apr. 2, 1959	0	14.2	10,270	14.1	10,200
1960	1708	2,050	Apr. 6, 1960	0	57.3	41,590	-	-

a Maximum observed.

b About.

855. Snake River at Warren, Minn.

Location.--Lat 48°11'50", long 96°46'45", in SE $\frac{1}{4}$ sec.36, T.155 N., R.48 W., on right bank 15 ft upstream from bridge on Minnesota Street in Warren.

Drainage area.--260 sq mi, approximately.

Records available.--March to September 1945, October 1953 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 835.0 ft above mean sea level, datum of 1929 (surveyed by Topographic Division). Mar. 15 to Sept. 30, 1945, chain gage at same site and datum.

Extremes.--1945, 1953-56: Maximum discharge, 754 cfs Mar. 28, 1945 (gage height, 12.79 ft, from graph based on gage readings); no flow during several months in most years. Maximum discharge known, 3,510 cfs during period May 4-6, 1950 (gage height, 18.42 ft, from floodmark), on basis of contracted-opening measurement of peak flow. Maximum stage known, 19.02 ft Apr. 21, 1950, from floodmark (backwater from ice).

Remarks.--Records of chemical analyses for the period September 1953 to September 1955 and water temperatures for the period October 1953 to September 1954, are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1954	0	0	0	0	0	0	8.36	6.63	4.52	0.21	0	0	1.64
1955	0	0	0	0	0	0	.01	40.7	4.38	31.1	.99	0	6.36
1956	0	0	0	0	0	0	46.9	45.5	10.8	19.5	#1.7	#1.5	#10.5

* Not previously published; estimated on basis of records for South Branch Two Rivers at Lake Bronson and Middle River at Argyle.

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1954	0	0	0	0	0	0	497	408	269	13	0	0	1,190
1955	0	0	0	0	0	0	.6	2,420	269	1,850	61	0	4,600
1956	0	0	0	0	0	0	2,790	2,800	641	1,200	#105	#89	#7,620

* Not previously published; see footnote to preceding table.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year			
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet		
		Discharge	Date							
1954	1338	50	Apr. 12, 1954	0	1.64	1,190	1.64	1,190		
1955	1388	280	Apr. 9, 1955	0	6.36	4,600	6.36	4,600		
1956	1438	230	Apr. 21, 1956	0	#10.5	#7,600	-	-		

* Not previously published.

860. Snake River at Alvarado, Minn.

Location.--Lat 48°11'50", long 97°00'20", in SW $\frac{1}{4}$ sec.31, T.155 N., R.49 W., on right bank 20 ft downstream from bridge on State Highway 1 on west edge of Alvarado and 22 miles upstream from mouth.

Drainage area.--309 sq mi, approximately.

Records available.--March to September 1945, October 1953 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 792.2 ft above mean sea level, datum of 1929 (surveyed by Topographic Division). Mar. 15 to Sept. 30, 1945, chain gage at same site and datum.

Extremes.--1945, 1953-56: Maximum discharge, 642 cfs Mar. 30, 1945 (gage height, 10.72 ft); no flow for many days in 1953-56. Maximum discharge known, 3,260 cfs in May 1950 (gage height, 17.6 ft, from floodmark), by contracted-opening measurement.

Remarks.--Records of chemical analyses for the period April 1954 to September 1955 are published in report of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1954	0	0	0	0	0	0	13.3	6.71	4.32	0.47	0	0	2.06
1955	0	0	0	0	0	0	49.2	4.83	32.2	1.63	.04	0	7.24
1956	0	0	0	0	0	0	35.0	64.5	13.8	18.4	#2.2	#1.6	#11.3

* Not previously published; estimated on basis of weather records and records for Snake River at Warren and South Branch Two Rivers at Lake Bronson.

RED RIVER OF THE NORTH BASIN

Monthly and yearly discharge, in acre-feet, of Snake River at Alvarado, Minn.

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1954	0	0	0	0	0	0	793	413	257	29	0	0	1,490
1955	0	0	0	0	0	0	2,930	297	1,920	100	2.4	0	5,250
1956	0	0	0	0	0	0	2,080	3,960	822	1,130	*135	*95	*8,220

* Not previously published; see footnote to preceding table.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1954	1338	92	Apr. 14, 1954	0	2.06	1,490	2.06	1,490
1955	1388	330	Apr. 12, 1955	0	7.24	5,250	7.24	5,250
1956	1438	220	Apr. 25, 1956	0	*11.3	*8,220	-	-

* Not previously published.

870. Middle River near Strandquist, Minn.

Location.--Lat 48°22'01", long 96°33'53", in NW¼NW¼ sec.3, T.156 N., R.46 W., on right bank half a mile north of entrance to Old Mill State Park and 9½ miles southwest of Strandquist.

Records available.--October 1953 to September 1956.

Gage.--Water-stage recorder.

Extremes.--1953-56: Maximum discharge, 1,330 cfs July 9, 1956 (gage height, 8.00 ft); no flow at times in 1954-55.

Flood in spring of 1950 reached a stage of 14 ft, from information by local resident (discharge not determined).

Remarks.--Records of chemical analyses for the period April 1954 to September 1955 are published in report of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1954	0.16	0.21	0.20	0.25	0.20	0.31	58.4	37.6	47.7	1.62	0.12	0.02	12.2
1955	.12	.12	.17	.20	.20	.20	75.0	19.5	148	6.11	.18	.01	20.6
1956	.11	.24	.22	.16	.12	.25	138	115	20.2	323	*5.2	*5.0	*51.1

* Not previously published; estimated on basis of records for station at Argyle.

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1954	9.7	13	12	15	11	19	3,470	2,310	2,840	100	7.5	1.4	8,810
1955	7.5	7.1	10	12	11	12	4,460	1,200	8,820	376	11	.8	14,930
1956	6.7	14	13	9.7	7.1	15	8,210	7,100	1,200	19,880	*320	*298	*37,070

* Not previously published; see footnote to preceding table.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1954	1338	154	Apr. 11, 1954	0	12.2	8,810	12.2	8,800
1955	1388	633	June 7, 1955	0	20.6	14,930	20.6	14,940
1956	1438	1,330	July 9, 1956	-	*51.1	*37,070	-	-

* Not previously published.

875. Middle River at Argyle, Minn.

Location.--Lat 48°20'27", long 96°49'02", in SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.10, T.156 N., R.48 W., on left bank 20 ft upstream from bridge on U.S. Highway 75 in Argyle and 14 miles upstream from mouth.

Drainage area.--265 sq mi.

Records available.--March to September 1945, October 1950 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 828.53 ft above mean sea level, datum of 1929. Prior to Nov. 8, 1951, chain or wire-weight gage at bridge 20 ft upstream at datum 1.0 ft higher. Nov. 8, 1951, to Sept. 18, 1952, water-stage recorder at present site at datum 1.0 ft higher.

Average discharge.--10 years (1950-60), 27.9 cfs (20,200 acre-ft per year).

Extremes.--1945, 1950-60: Maximum discharge, 1,390 cfs July 11, 1956 (gage height, 13.18 ft); no flow at times most years.
Maximum stage known, 15.25 ft in April 1950, present datum, from floodmarks (discharge, 2,790 cfs).

Remarks.--Records of chemical analyses and water temperatures for the period October 1953 to September 1955 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	#11	#7.79	5.11	3.21	2.75	4.16	337	72.0	7.18	1.53	3.03	27.5	#39.9
1952	11.9	4.9	3.6	1.0	1.9	3.4	177	19.6	3.50	6.03	.39	0	19.3
1953	.04	.50	.05	0	0	15.7	33.2	22.0	16.9	3.45	.25	0	7.68
1954	0	0	0	0	0	0	51.8	39.8	50.7	6.26	.19	0	12.4
1955	.05	.14	.09	.03	0	0	70.7	23.9	137	8.82	.37	0	19.9
1956	.44	.01	.13	.05	0	0	132	132	26.9	313	11.8	7.3 $\frac{1}{2}$	52.3
1957	1.79	33.4	5.50	1.94	1.56	39.8	68.6	42.0	64.7	87.6	3.77	163	42.7
1958	40.6	23.5	7.41	2.50	1.70	3.76	12.2	5.32	4.85	187	5.28	.15	24.8
1959	.27	.55	.65	.20	0	1.6	209	29.9	15.7	9.97	4.36	2.43	22.7
1960	12.5	10.4	4.31	2.10	1.11	1.68	307	49.9	49.2	10.4	.89	.22	37.1

* Not previously published; estimated on basis of weather records and records for Sandhill River at Climax, Sandhill River at Beltrami, and Clearwater River at Red Lake Falls.

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	#676	#464	314	197	153	256	20,040	4,430	427	94	186	1,640	#28,800
1952	734	294	222	64	111	210	10,560	1,210	208	371	24	0	14,010
1953	2.2	30	3.2	0	0	964	1,980	1,350	1,010	212	15	0	5,570
1954	0	0	0	0	0	0	3,080	2,450	3,020	385	12	0	8,950
1955	3.2	8.5	5.8	1.6	0	0	4,200	1,470	6,180	542	23	0	14,430
1956	27	1.4	7.9	2.8	0	0	7,870	8,100	1,600	19,220	727	436	37,990
1957	110	1,990	338	119	87	2,450	4,080	2,580	3,850	5,390	232	9,720	30,950
1958	2,500	1,400	456	154	94	231	726	327	289	11,480	325	9.1	17,990
1959	17	33	40	12	0	99	12,430	1,840	936	613	268	145	16,430
1960	770	622	265	129	64	103	18,270	3,070	2,930	639	55	13	26,930

† Corrected.

* Not previously published; see footnote to preceding table.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30				Calendar year		
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	-	-
1951	1208	1,220	Apr. 9, 1951	-	#39.9	#28,880	39.6	28,670
1952	1238	612	Apr. 11, 1952	0	19.3	14,010	17.6	12,790
1953	1278	112	Mar. 31, 1953	0	7.68	5,570	7.63	5,530
1954	1358	128	June 18, 1954	0	12.4	8,950	12.4	8,960
1955	1388	527	June 9, 1955	0	19.9	14,430	20.0	14,450
1956	1438	1,390	July 11, 1956	0	52.3	37,990	55.6	40,390
1957	1508	734	Sept. 7, 1957	.6	42.7	30,950	45.4	32,860
1958	1558	846	July 9, 1958	0	24.8	17,990	19.0	13,730
1959	1628	570	Apr. 5, 1959	0	22.7	16,430	24.9	18,000
1960	1708	903	Apr. 10, 1960	0	37.1	26,930	-	-

* Not previously published.

885. Homme Reservoir near Park River, N. Dak.

Location.--Lat 48°24'20", long 97°47'10", in SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.19, T.157 N., R.55 W., at Homme Dam on South Branch Park River, 2 miles west of town of Park River.

Drainage area.--226 sq mi (revised).

Records available.--September 1949 to September 1960.

Gage.--Water-stage recorder. Datum of gage is at mean sea level, datum of 1929.

Extremes.--1949-60: Maximum contents, 4,330 acre-ft Apr. 12, 1960 (elevation, 1,083.00 ft); minimum since first reaching spillway level, 184 acre-ft Feb. 8, 1952 (elevation, 1,051.22 ft).

Remarks.--Reservoir is formed by an earthfill dam, 865 ft long; storage began September 1949; dam completed in October 1950. Usable capacity between invert of outlet, elevation 1,048.0 ft, and crest of spillway, elevation 1,080.0 ft, is 3,550 acre-ft. Dead storage, 100 acre-ft. Low flows are controlled by two sluice gates 3 by 5 ft. The spillway, which is 150 ft long, is uncontrolled. The records herein represent total contents. The reservoir is operated for flood control, water supply, and pollution abatement during low-flow periods.

Cooperation.--Records furnished by Corps of Engineers.

Contents, in acre-feet, on last day of month

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	102	141	141	141	141	1,100	3,736	3,660	3,622	3,593	3,652	1,325
1952	258	262	278	188	196	197	2,984	2,701	2,672	2,644	2,567	1,173
1953	1,170	1,159	1,070	895	742	695	826	900	1,075	1,084	1,011	900
1954	881	867	851	735	672	1,325	2,883	3,409	3,643	3,491	3,251	3,005
1955	2,739	2,653	2,611	2,543	2,433	4,174	3,670	2,953	2,900	2,896	2,748	2,033
1956	2,045	2,077	2,048	2,052	2,072	367	3,876	3,692	3,694	3,645	3,660	3,626
1957	3,432	3,324	3,335	3,352	2,720	3,736	3,698	3,671	3,660	3,652	3,649	3,428
1958	3,498	3,576	3,365	3,238	3,128	3,067	3,194	3,229	3,198	3,212	3,054	2,944
1959	2,729	2,784	2,234	2,198	2,240	3,394	3,688	3,670	3,650	3,346	3,303	3,255
1960	3,326	3,337	3,379	3,014	3,033	2,900	3,696	3,685	3,660	3,526	3,489	3,128

890. South Branch Park River below Homme Dam, N. Dak.

Location.--Lat 48°24', long 97°47', in SE $\frac{1}{4}$ sec.19, T.157 N., R.55 W., on right bank half a mile downstream from Homme Dam and 2 miles west of town of Park River.

Drainage area.--226 sq mi (revised).

Records available.--October 1949 to September 1960. Monthly discharge only for October and November 1949, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 1,000.00 ft above mean sea level, datum of 1929.

Average discharge.--11 years (1949-60), 25.8 cfs (18,680 acre-ft per year); median of yearly mean discharges, 12.0 cfs (8,690 acre-ft per year).

Extremes.--1949-60: Maximum discharge, 13,000 cfs Apr. 24, 1950 (gage height, 37.52 ft), from rating curve extended above 5,500 cfs, result of failure of emergency embankment at site of Homme Dam; no flow for most of period Oct. 1 to Dec. 3, 1949.

Remarks.--Flow regulated by Homme Reservoir (see preceding page).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1.37	2.86	1.86	1.6	1.6	8.13	93.7	9.76	3.42	0.96	1.00	36.2	13.4
1952	20.4	2.01	2.0	2.60	1.47	.30	1.30	5.96	1.05	1.79	1.24	23.5	5.30
1953	.68	2.36	4.07	4.58	4.41	2.96	1.73	.85	2.42	.71	1.63	3.27	2.46
1954	1.78	1.53	1.75	3.78	2.27	2.79	2.46	3.52	70.8	9.67	5.36	6.03	9.25
1955	5.90	3.46	2.00	2.04	2.45	8.58	159	19.6	18.6	6.01	2.31	16.5	20.4
1956	.73	.74	1.86	1.25	1.74	28.8	341	137	68.5	10.8	1.79	1.74	49.4
1957	4.44	5.43	1.47	1.20	12.5	29.0	15.5	9.85	4.30	1.43	4.84	20.2	9.13
1958	1.87	1.37	5.52	3.09	3.56	3.55	2.94	1.18	2.21	1.71	2.16	1.51	2.55
1959	4.49	.66	10.5	1.48	.68	1.02	84.2	11.7	3.30	6.12	1.28	.97	10.5
1960	1.08	2.36	.54	5.19	3.77	7.68	392	16.2	7.75	2.02	1.71	6.33	36.7

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	.84	170	115	98	89	500	5,580	600	203	59	61	2,160	9,720
1952	1,260	120	123	160	84	18	77	367	63	110	76	1,400	3,860
1953	42	140	250	282	245	182	103	52	144	43	100	194	1,780
1954	109	91	108	233	126	171	146	216	4,210	594	330	359	6,690
1955	363	206	123	125	136	528	9,470	1,200	1,110	369	142	981	14,750
1956	45	44	114	77	100	1,770	20,310	8,440	4,070	665	110	104	35,850
1957	273	323	90	74	692	1,780	920	606	256	88	297	1,200	6,600
1958	115	82	340	190	198	218	175	72	132	105	133	90	1,850
1959	276	39	643	91	38	63	5,010	719	196	376	79	54	7,590
1960	66	141	33	319	217	472	23,320	998	461	124	105	377	26,630

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	125	90,150
1951	1208	a900	Apr. 4, 1951	0.4	13.4	9,270	15.0	10,850
1952	1238	106	Sept. 10, 1952	-	5.30	3,860	3.83	2,790
1953	1278	17	Aug. 28, 1953	.2	2.46	1,780	2.28	1,650
1954	1358	386	June 14, 1954	1.2	9.25	6,690	9.78	7,080
1955	1388	1,600	Apr. 1, 1955	.6	20.4	14,750	19.7	14,260
1956	1438	2,000	Apr. 25, 1956	.2	49.4	35,850	50.1	36,330
1957	1508	324	Mar. 23, 1957	.4	9.13	6,600	8.92	6,450
1958	1558	58	Mar. 21, 1958	.1	2.55	1,850	3.14	2,270
1959	1628	368	Apr. 3, 1959	.1	10.5	7,590	9.49	6,870
1960	1708	2,580	Apr. 12, 1960	.5	36.7	26,630	-	-

a. About.

895. Cart Creek at Mountain, N. Dak.

Location.--Lat 48°41', long 97°51', in SW $\frac{1}{4}$ sec.15, T.160 N., R.56 W., on right bank 50 ft downstream from bridge on State Highway 32 and 0.7 mile south of Mountain.

Drainage area.--16.9 sq mi.

Records available.--June 1954 to September 1960.

Gage.--Water-stage recorder and wooden control. Altitude of gage is 1,020 f' by barometer).

Average discharge.--6 years (1954-60), 2.30 cfs (1,670 acre-ft per year).

Extremes.--1954-60: Maximum discharge, 570 cfs Apr. 11, 1960 (gage height, 7.42 ft); no flow most of time each year.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	-	-	-	-	-	-	-	-	-	0.57	0.06	0.26	-
1955	0.45	0.40	0.14	0	0	5.89	21.3	1.86	1.52	.28	0	0	2.64
1956	.35	.14	.19	.23	.26	.11	32.7	16.9	3.37	1.46	.81	.86	4.75
1957	.64	1.04	.24	.05	0	6.54	2.07	2.35	1.55	.46	.06	2.86	1.50
1958	.62	.57	.58	0	.08	.46	1.19	.53	.35	.82	0	0	.42
1959	0	.01	0	0	0	1.26	14.6	2.60	.53	.05	0	0	1.57
1960	0	0	0	0	0	.68	32.2	2.39	.62	.02	0	0	2.95

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	-	-	-	-	-	-	-	-	-	35	4.0	15	-
1955	27	24	8.5	0	0.2	362	1,270	115	90	17	0	0	1,910
1956	21	8.3	12	14	15	6.5	1,950	1,040	200	90	50	51	3,460
1957	41	62	14	3.2	0	402	123	144	92	28	3.6	170	1,080
1958	38	34	24	0	4.4	29	71	32	21	50	0	0	303
1959	0	.8	0	0	0	78	866	160	31	3.2	0	0	1,140
1960	0	0	0	0	0	42	1,920	147	37	1.2	0	0	2,150

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-
1954	1388	-	-	-	-	-	-	-
1955	1388	392	Apr. 1, 1955	0	2.64	1,910	2.61	1,900
1956	1458	340	Apr. 26, 1956	0	4.75	3,460	4.86	3,530
1957	1508	146	Sept. 2, 1957	0	1.50	1,080	1.47	1,080
1958	1555	27	July 4, 1958	0	.42	303	.29	208
1959	1628	160	Apr. 2, 1959	0	1.57	1,140	1.57	1,140
1960	1708	570	Apr. 11, 1960	0	2.95	2,150	-	-

a. About.

900. Park River at Grafton, N. Dak.

Location.--Lat 48°25', long 97°24', in NE $\frac{1}{4}$ sec.13, T.157 N., R.53 W., on right bank 30 ft upstream from Wakeman Avenue Bridge in Grafton and 3.5 miles downstream from South Branch.

Drainage area.--695 sq mi (revised).

Records available.--April 1931 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 807.39 ft above mean sea level, datum of 1929. Prior to Sept. 30, 1940, chain gage at site 30 ft downstream at same datum. Oct. 1, 1940, to Sept. 17, 1946, staff gage at site 2 miles downstream above masonry dam at same datum. Sept. 18, 1946, to July 25, 1952, wire-weight gage at site 30 ft downstream at same datum.

Average discharge (unadjusted).--29 years (1931-60), 49.7 cfs (35,980 acre-ft per year); median of yearly mean discharges, 24 cfs (17,400 acre-ft per year).

Extremes.--1931-60: Maximum discharge, 12,600 cfs Apr. 19, 1950 (gage height, 20.13 ft), from rating curve extended above 9,000 cfs; no flow at times in most years.

Remarks.--Flow regulated by Homme Reservoir and several small reservoirs. Diversion by city of Grafton started in October 1955.

Monthly and yearly mean discharge, in cubic feet per second (observed)

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2.18	1.61	2.11	1.10	0.57	12.1	331	33.8	6.43	0.71	2.98	41.3	36.0
1952	34.1	1.33	.57	.10	0	.20	46.9	8.24	.59	1.23	0	22.1	9.48
1953	0	.03	.81	.21	0	2.22	8.09	5.20	10.1	1.15	.05	.20	2.34
1954	.06	.69	.17	.02	1.49	5.90	16.1	13.6	13.1	19.0	6.04	4.87	16.5
1955	4.87	3.92	1.17	.20	.20	.80	445	46.4	76.8	10.5	1.30	11.8	49.8
1956	.44	0	0	0	0	11.9	1,014	447	164	19.6	3.38	7.50	138
1957	7.23	8.14	3.09	1.58	5.45	57.5	48.0	22.8	10.4	1.88	4.66	151	26.7
1958	6.90	7.16	4.33	1.69	1.36	3.63	18.0	3.96	2.68	2.85	.08	0	4.38
1959	1.26	0	.19	.40	0	.66	243	27.0	5.85	3.28	.03	.01	23.2
1960	0	.07	.06	.05	.01	1.04	942	34.2	11.3	1.05	.03	.42	81.3

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	134	96	130	68	32	744	19,700	2,080	383	43	183	2,460	26,050
1952	2,100	79	35	6.0	0	12	2,790	507	23	14	0	1,320	6,890
1953	0	1.6	50	13	0	136	482	324	600	70	3.0	12	1,690
1954	4.0	41	11	1.0	85	363	957	838	7,790	1,170	371	290	11,920
1955	300	233	72	12	11	49	26,500	2,850	4,570	645	80	704	36,030
1956	27	0	0	0	0	754	60,310	27,480	9,770	1,210	208	446	100,200
1957	444	484	190	97	303	3,530	2,860	1,400	619	115	287	9,000	19,330
1958	424	426	266	104	76	223	1,070	243	159	176	4.8	0	3,170
1959	78	0	12	25	0	41	14,480	1,660	348	202	2.0	.4	16,830
1960	0	4.2	4.0	2.8	.8	64	56,050	2,100	671	65	1.8	25	58,990

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30										Calendar year			
		Observed						Adjusted a/		Observed		Adjusted a/			
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Per square mile	Acre-feet	Mean	Acre-feet	Mean	Acre-feet		
		Discharge	Date												
1950	-	-	-	-	-	-	-	-	-	353	255,700	-	-		
1951	1208	1,640	Apr. 6, 1951	0	36.0	26,050	-	-	-	38.5	27,910	-	-		
1952	1238	b180	Apr. 5, 1952	0	9.48	6,890	-	-	-	6.51	4,720	-	-		
1953	1278	125	June 5, 1953	0	2.34	1,690	-	-	-	2.34	1,700	-	-		
1954	1338	478	June 16, 1954	0	16.5	11,920	-	-	-	17.3	12,470	-	-		
1955	1388	2,100	Apr. 3, 1955	0	49.8	36,030	-	-	-	49.0	35,450	49.1	35,530		
1956	1438	b4,200	Apr. 22, 1956	0	138	100,200	139	-	100,600	140	101,300	140	101,700		
1957	1508	1,300	Sept. 3, 1957	0	26.7	19,330	27.2	-	19,690	26.7	19,330	27.3	19,690		
1958	1508	41	Apr. 7, 1958	0	4.38	3,170	4.91	-	3,550	2.96	2,150	3.52	2,540		
1959	1628	b1,200	Apr. 6, 1959	0	23.2	16,830	24.1	-	17,260	23.1	16,750	23.9	17,140		
1960	1708	2,770	Apr. 15, 1960	0	81.3	58,990	83.3	-	59,580	-	-	-	-		

a Adjusted for diversion by city of Grafton.

b About.

RED RIVER OF THE NORTH BASIN

905. Tamarac River near Strandquist, Minn.

Location.--Lat 48°25'30", long 96°37'40", in NE $\frac{1}{4}$ sec.18, T.157 N., R.46 W., on left bank 350 ft downstream from highway bridge, 1.2 miles south of Florian, and 9 miles southwest of Strandquist.

Records available.--October 1953 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 920 ft (from topographic map).

Extremes.--1953-56: Maximum discharge, 1,160 cfs July 9, 1956 (gage height, 13.24 ft); no flow for several days in 1955.

Remarks.--Records of chemical analyses for the period April 1954 to September 1955 are published in report of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1954	0.26	0.29	0.22	0.20	0.23	0.85	58.7	52.1	59.2	2.03	0.68	0.38	14.5
1955	.55	.63	.53	.19	.45	.31	39.2	14.4	111	3.37	.19	.07	14.1
1956	.18	.60	.46	.44	.52	.62	91.8	98.1	36.9	435	#11	#8.4	#57.6

* Not previously published; estimated on basis of records for Middle River at A-gyle and South Branch Two Rivers at Lake Bronson.

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1954	16	17	13	12	13	52	3,490	3,200	3,520	125	42	23	10,520
1955	34	37	33	12	25	19	2,340	885	6,590	207	12	4.0	10,200
1956	11	36	28	27	30	38	5,460	6,030	2,200	26,760	#676	#500	#41,800

* Not previously published; see footnote to preceding table.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30				Calendar year			
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet	
		Discharge	Date						
1954	1338	243	June 17, 1954	-	14.5	10,520	14.6	10,580	
1955	1388	367	June 8, 1955	0	14.1	10,200	14.0	10,170	
1956	1438	1,160	July 9, 1956	-	#57.6	#41,800	-	-	

* Not previously published.

915. Tamarac River near Stephen, Minn.

Location.--Lat 48°29'30", long 96°57'20", in E $\frac{1}{2}$ sec.22, T.158 N., R.49 W., on left bank $\frac{1}{2}$ miles northwest of Stephen and 8 miles upstream from mouth.

Drainage area.--320 sq mi, approximately.

Records available.--March to September 1945, October 1953 to September 1955.

Gage.--Water-stage recorder. Datum of gage is 798.3 ft above mean sea level, datum of 1929 (surveyed by Topographic Division). Mar. 19 to Sept. 30, 1945, chain gage at bridge 150 ft upstream at different datum.

Extremes.--1945, 1953-55: Maximum discharge, 1,080 cfs Mar. 29, 1945 (gage height, 14.39 ft), from rating curve extended above 490 cfs on basis of contracted-opening measurement at gage height 19.1 ft; maximum gage height, 14.99 ft Apr. 6, 1955 (backwater from ice); no flow for several months in most years.

Maximum stage known, 19.1 ft in May 1950, from floodmarks (discharge, 6,620 cfs, on basis of contracted-opening measurement of peak flow).

Remarks.--Records of chemical analyses and water temperatures for the period October 1953 to September 1955 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1954	0	0	0	0	0	0	45.7	57.3	61.5	2.90	0	0	+13.9
1955	0	0	0	0	0	0	80.5	15.0	127	4.77	.23	0	18.8

† Corrected.

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1954	0	0	0	0	0	0	2,720	3,520	3,660	178	0	0	+10,080
1955	0	0	0	0	0	0	4,790	920	7,570	293	14	0	13,590

† Corrected.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30				Calendar year			
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet	
		Discharge	Date						
1954	1338	210	June 21, 1954	0	+13.9	+10,080	13.9	10,080	
1955	1388	602	Apr. 9, 1955	0	18.8	13,590	-	-	

† Corrected.

920. Red River of the North at Drayton, N. Dak.

Location.--Lat 48°34'20", long 97°08'50", on line between secs. 24 and 25, T.159 N., R.51 W., on downstream end of east pier of interstate highway bridge, $1\frac{1}{2}$ miles north-east of Drayton and at mile 207.

Drainage area.--34,800 sq mi, approximately (includes 3,800 sq mi, revised, in closed basins).

Records available.--April 1936 to June 1937, April 1941 to September 1960 (fragmentary prior to April 1949).

Gage.--Water-stage recorder. Datum of gage is 755.00 ft above mean sea level, datum of 1929 (Minnesota highway bench mark). Prior to Nov. 30, 1954, wire-weight gage at site $1\frac{1}{2}$ miles upstream at datum 1.59 ft higher.

Average discharge.--11 years (1949-60), 3,215 cfs (2,328,000 acre-ft per year); median of yearly mean discharge, 2,370 cfs (1,720,000 acre-ft per year).

Extremes.--1936-37, 1941-60: Maximum discharge, 86,500 cfs May 12, 1950 (gage height, 41.58 ft, site and datum then in use); minimum observed, 7.7 cfs Oct. 16, 1936 (gage height, 1.75 ft, site and datum then in use).
Maximum discharge known since 1860, that of May 12, 1950. Flood in April 1897 reached a stage of about 41 ft, at site and datum in use prior to Nov. 30, 1954.

Remarks.--Some regulation by reservoirs on tributaries. Records of chemical analyses for the period June 1954 to September 1955 and water temperatures for the period December 1956 to September 1960 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2,954	1,987	2,013	1,974	1,830	2,281	17,170	9,022	4,466	2,441	1,245	1,711	4,085
1952	1,360	1,285	1,742	1,639	1,876	1,989	16,590	6,534	3,559	5,676	2,121	1,322	3,797
1953	906	812	695	600	619	1,669	3,643	8,068	8,839	5,236	2,229	1,320	2,472
1954	864	928	894	810	845	1,597	5,472	3,862	3,693	2,237	981	692	1,906
1955	658	751	683	723	652	661	7,273	2,084	3,016	2,271	1,684	865	1,771
1956	848	607	431	424	451	524	10,930	8,233	3,963	2,503	908	1,616	2,613
1957	599	1,080	563	441	427	1,320	4,856	3,728	3,833	6,863	2,614	5,392	2,649
1958	3,625	3,324	1,632	1,356	1,286	1,894	2,986	1,527	1,476	3,990	977	490	2,052
1959	416	498	362	368	383	776	5,005	1,769	2,587	2,132	777	546	1,300
1960	548	550	465	573	563	545	13,490	3,778	2,807	2,151	564	684	2,212

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	181,600	118,200	123,800	121,400	101,700	40,200	222,000	54,700	26,500	15,000	76,560	101,800	2,858,000
1952	85,600	76,460	107,100	100,800	107,900	22,300	987,000	401,800	211,800	349,000	130,400	78,640	2,757,000
1953	55,740	48,330	42,760	36,870	34,390	102,600	216,800	188,700	526,000	322,000	137,000	78,550	1,790,000
1954	53,130	55,230	54,980	49,790	46,950	98,200	325,600	237,500	219,700	137,600	60,340	41,150	1,380,000
1955	40,480	43,480	42,010	44,430	36,240	40,640	432,800	128,200	179,500	139,600	103,500	51,340	1,282,000
1956	52,210	36,130	26,500	26,040	25,940	32,210	650,300	506,200	235,800	153,900	55,830	96,170	1,897,000
1957	36,840	64,270	34,610	27,110	23,700	81,160	293,000	229,200	228,100	422,000	160,700	502,900	1,918,000
1958	222,900	197,800	100,400	85,400	71,400	116,400	171,700	35,980	37,610	245,300	60,070	28,550	1,486,000
1959	25,580	29,640	22,270	22,650	21,260	47,700	297,800	108,800	53,900	131,100	47,750	32,590	941,000
1960	33,670	32,740	28,600	35,230	32,410	33,500	802,600	232,300	167,000	132,200	34,660	40,700	1,605,000

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	10,800	7,822,000
1951	1208	24,600	Apr. 15, 1951	1,010	4,085	2,958,000	3,860	2,795,000
1952	1258	23,900	Apr. 24, 25, 1952	950	3,797	2,757,000	3,630	2,636,000
1953	1278	14,700	June 26, 1953	560	2,472	1,790,000	2,495	1,806,000
1954	1338	11,100	Apr. 15, 1954	528	1,906	1,380,000	1,855	1,343,000
1955	1388	18,000	Apr. 11, 1955	490	1,771	1,282,000	1,756	1,271,000
1956	1438	28,000	Apr. 27, 1956	370	2,613	1,897,000	2,642	1,918,000
1957	1508	14,100	July 4, 1957	370	2,649	1,918,000	3,181	2,303,000
1958	1558	7,850	July 12, 1958	456	2,052	1,486,000	1,458	1,042,000
1959	1628	11,200	Apr. 8, 1959	240	1,300	941,000	1,324	958,600
1960	1708	24,700	Apr. 14, 1960	272	2,212	1,605,000	-	-

930. South Branch Two Rivers at Pelan, Minn.

Location.--Lat 48°38'45", long 96°23'15", in NW $\frac{1}{4}$ sec.31, T.160 N., R.44 W., on left bank 40 ft downstream from bridge on State Highway 11 and a quarter of a mile west of Pelan.

Drainage area.--281 sq mi.

Records available.--August 1928 to September 1938, October 1953 to November 1956. Monthly discharge only for some periods, published in WSP 1308. Published as South Fork Two Rivers at Pelan 1928-38.

Gage.--Water-stage recorder. Datum of gage is 1,028.23 ft above mean sea level, datum of 1929. Prior to Mar. 24, 1936, chain gage at site 500 ft upstream at same datum. Mar. 24, 1936, to Sept. 30, 1938, chain gage at site 40 ft upstream at same datum.

Average discharge.--13 years (1928-38, 1953-56), 22.5 cfs (16,290 acre-ft per year).

Extremes.--1928-38, 1953-56: Maximum discharge, 2,040 cfs July 10, 1956 (gage height, 10.90 ft); no flow at times each year.

Remarks.--Records of chemical analyses for the period September 1953 to September 1955 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1954	0.80	0.47	0.10	0	0	0	97.9	73.4	82.9	4.15	0.91	0.17	21.6
1955	0	.05	.02	0	0	0	76.9	32.3	243	5.54	.05	.02	29.5
1956	.02	.11	.02	0	0	0	345	167	56.7	699	18.2	43.5	111
1957	3.25	54.9	-	-	-	-	-	-	-	-	-	-	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1954	49	28	6.1	0	0	0	5,820	4,510	4,930	255	56	10	15,660
1955	0	2.8	1.4	0	0	0	4,580	1,980	14,480	340	3.0	1.2	21,390
1956	1.2	6.7	1.0	0	0	0	20,530	10,280	3,370	42,980	1,120	2,590	80,880
1957	200	3,260	-	-	-	-	-	-	-	-	-	-	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1954	1338	266	June 18, 1954	0	21.6	15,660	21.5	15,590
1955	1388	1,040	June 7, 1955	0	29.5	21,390	29.6	21,390
1956	1438	2,040	July 10, 1956	0	111	80,880	-	-
1957	1438	-	-	-	-	-	-	-

940. South Branch Two Rivers at Lake Bronson, Minn.

Location.--Lat 48°43'50", long 96°39'50", in SW¹/₄SW¹/₄ sec.30, T.161 N., R.46 W., on left bank 100 ft upstream from bridge on U.S. Highway 59 at town of Lake Bronson and 2 miles downstream from dam at outlet of Bronson Lake.

Drainage area.--444 sq mi.

Records available.--September 1928 to November 1936, April to September 1937, April 1941 to October 1943, April to December 1944, April 1945 to September 1947, October 1953 to September 1960. Monthly discharge only for some periods, published in WSP 1308. Published as South Fork Two Rivers at Bronson prior to 1941.

Gage.--Water-stage recorder. Datum of gage is 930.46 ft above mean sea level, adjustment of 1928 (levels by Geodetic Survey of Canada). Prior to Nov. 23, 1953, chain gage at bridge 100 ft downstream at same datum.

Average discharge.--19 years (1928-36, 1941-43, 1945-47, 1953-60), 65.6 cfs (47,490 acre-ft per year).

Extremes.--1928-37, 1941-47, 1953-60: Maximum discharge, 2,650 cfs Apr. 24, 1956 (gage height, 10.79 ft); no flow at times in 1937, 1941, 1960.

Remarks.--Flow partly regulated since 1937 by Bronson Lake (usable capacity, 3,700 acre-ft). Records of chemical analyses and water temperatures for the period April 1954 to September 1955 are published in report of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	5.32	0.87	1.16	2.45	6.36	2.80	208	135	168	9.79	5.51	3.97	45.6
1955	4.94	4.00	2.98	2.72	2.46	14.9	257	70.0	370	24.9	4.53	5.06	63.0
1956	8.25	3.78	3.30	3.58	3.88	34.2	712	445	192	1,136	40.6	97.6	224
1957	10.6	87.5	9.9	7.4	5.51	159	265	109	254	725	117	525	188
1958	153	77.0	15.8	8.5	2.12	2.16	47.7	14.8	6.74	98.7	4.77	9.68	36.9
1959	1.74	1.12	.55	.26	.22	26.3	373	74.4	42.6	11.7	2.31	6.24	44.7
1960	22.4	11.3	4.30	3.78	4.79	4.95	534	55.2	53.5	13.1	3.86	1.33	58.8

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	327	52	71	151	353	172	12,400	8,310	9,980	602	339	256	32,990
1955	304	238	183	167	137	917	15,280	4,300	21,990	1,530	279	301	45,630
1956	508	225	203	220	223	2,100	42,360	27,380	11,450	69,860	2,490	5,810	162,800
1957	649	5,200	607	456	306	9,760	15,670	6,680	13,890	44,590	7,180	31,210	136,200
1958	9,410	4,580	849	522	118	133	2,840	910	401	6,070	295	576	26,700
1959	107	57	34	16	12	1,620	22,180	4,570	2,540	722	142	371	32,380
1960	1,380	670	264	294	276	304	31,790	3,400	3,190	805	238	79	42,690

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-
1954	1388	567	June 16, 1954	0.8	45.6	32,990	46.0	33,270
1955	1388	1,020	June 9, 1955	2.4	63.0	45,630	63.3	45,840
1956	1438	2,650	Apr. 24, 1956	3.0	188	162,800	232	168,300
1957	1508	1,810	July 8, 1957	4.0	188	136,200	200	144,600
1958	1558	355	Sept. 23, 1958	.8	36.9	26,700	16.7	12,070
1959	1628	1,110	Apr. 8, 1959	.2	44.7	32,380	47.6	34,490
1960	1708	1,270	Apr. 11, 1960	0	58.8	42,690	-	-

955. Two Rivers below Hallock, Minn.

Location.--Lat 48°46'50", long 97°02'25", in NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.7, T.161 N., R.49 W., on downstream side of highway bridge, 4 miles west of Hallock and 5 miles upstream from North Branch Two Rivers.

Drainage area.--644 sq mi.

Records available.--March 1945 to September 1955.

Gage.--Chain gage. Altitude of gage is 780 ft (from topographic map).

Average discharge.--10 years (1945-55), 103 cfs (74,570 acre-ft per year).

Extremes.--1945-55: Maximum discharge, 3,690 cfs May 13, 1950 (gage height, 25.78 ft, from graph based on gage readings, backwater from Red River of the North); no flow at times in many years.

Remarks.--Some regulation of low flow by Bronson Lake (usable capacity, 3,700 acre-ft). Records of chemical analyses and water temperatures for the period April 1954 to September 1955 are published in report of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	168	25.2	11.4	8.40	5.41	10.6	900	400	52.6	5.34	2.18	2.63	132
1952	25.1	10.6	1.03	.34	2.02	3.76	124	6.79	4.42	.91	.91	0	14.9
1953	.42	4.09	.37	.05	6.6	6.7	30.0	22.2	70.2	4.03	1.94	1.41	12.2
1954	3.51	.57	.26	.10	.57	4.25	210	158	218	14.0	7.14	5.77	51.6
1955	1.38	2.77	1.34	.21	.21	.45	442	91.0	412	57.9	4.99	8.70	84.5

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	10,350	1,500	701	517	300	652	53,520	24,590	3,130	328	134	157	95,880
1952	1,543	628	63	21	116	231	7,400	417	263	56	56	0	10,790
1953	26	243	23	3.0	367	411	1,790	1,360	4,170	248	119	84	8,840
1954	216	34	16	6.1	32	262	12,480	9,720	12,960	863	439	343	37,370
1955	85	165	82	13	12	28	26,280	5,600	24,530	3,560	307	518	61,180

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	391	283,300
1951	1208	1,350	Apr. 17, 1951	0.7	132	95,880	118	85,560
1952	1238	592	Apr. 14, 1952	0	14.9	10,790	12.2	8,850
1953	1278	146	June 8, 1953	0	12.2	8,840	12.2	8,820
1954	1358	553	June 19, 1954	.1	51.6	37,370	51.7	37,440
1955	1388	902	June 13, 1955	.1	84.5	61,180	-	-

960. North Branch Two Rivers near Lancaster, Minn.

Location.--Lat 48°53'21", long 96°40'01", in NE $\frac{1}{4}$ sec.1, T.162 N., R.47 W., on downstream side of highway bridge, half a mile upstream from State ditch 85 and 7 miles northeast of Lancaster.

Drainage area.--32 sq mi, approximately.

Records available.--April 1929 to September 1938, April 1941 to September 1955. Prior to 1941, published as North Fork Two Rivers near Lancaster.

Gage.--Staff gage. Datum of gage is 963.69 ft above mean sea level, adjustment of 1912 (levels by Corps of Engineers).

Average discharge.--23 years (1929-38, 1941-55), 8.52 cfs (6,170 acre-ft per year).

Extremes.--1929-38, 1941-55: Maximum discharge, 912 cfs May 20, 1950 (gage height, 6.25 ft); no flow during several months each year.

Remarks.--During periods of high flow some water has entered this stream from Roseau River basin. Records of chemical analyses for the period October 1953 to September 1955 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	12.8	2.21	0.25	0	0	0	90.8	70.3	3.60	0.03	0.21	0.26	15.1
1952	.26	.09	.04	0	0	0	4.96	.11	.07	0	0	0	.45
1953	0	0	0	0	0	.03	.10	.14	1.07	.34	.04	0	.14
1954	0	0	0	0	0	0	5.41	6.34	11.4	.43	.07	.08	1.97
1955	.11	.10	.02	0	0	0	59.2	7.34	12.5	10.3	.27	.32	7.46

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	790	132	15	0	0	0	5,400	4,320	214	1.6	13	15	10,900
1952	16	5.4	2.2	0	0	0	295	6.5	4.2	0	0	0	329
1953	0	0	0	0	0	2.0	8.0	8.3	65	21	2.4	0	103
1954	0	0	0	0	0	0	322	390	678	26	4.2	4.8	1,420
1955	6.7	6.0	1.0	0	0	0	3,520	451	742	633	16	19	5,390

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet	
		Discharge	Date						
1950	-	-	-	-	-	-	89.4	64,690	
1951	1208	173	Apr. 30, 1951	0	15.1	10,900	13.8	9,950	
1952	1238	21	Apr. 8, 1952	0	.45	329	.42	306	
1953	1278	3.6	June 29, 1953	0	.14	103	.14	103	
1954	1338	50	June 15, 1954	0	1.97	1,420	1.99	1,440	
1955	1388	151	Apr. 22, 1955	0	7.46	5,390	-	-	

965. State ditch 85 near Lancaster, Minn.

Location.--Lat 48°52'02", long 96°40'01", in southwest corner of sec. 6, T.162 N., R.46 W., on left bank at upstream side of highway bridge, 1 mile upstream from North Franch Two Rivers and 7 miles northeast of Lancaster.

Drainage area.--95 sq mi, approximately.

Records available.--April 1929 to September 1938, March 1942 to September 1955.

Gage.--Staff gage. Datum of gage is 969.28 ft above mean sea level, adjustment of 1912 (levels by Corps of Engineers).

Average discharge.--22 years (1929-38, 1942-55), 17.1 cfs (12,380 acre-ft per year).

Extremes.--1929-38, 1942-55: Maximum discharge, 1,480 cfs May 20, 1950 (gage height, 5.90 ft); maximum gage height observed, 6.30 ft Mar. 29, 1942 (backwater from ice); no flow for several months each year.

Remarks.--During periods of high flow some water enters ditch from Roseau River basin and some water is diverted from ditch above station to Two Rivers. Records of chemical analyses for the period October 1953 to September 1955 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	43.5	6.32	0.37	0	0	0	195	198	41.6	0.04	0.11	0.03	40.6
1952	.17	.007	0	0	0	0	13.8	.22	.11	.01	0	0	1.17
1953	0	0	0	0	0	0	.27	.22	15.1	1.70	.07	0	1.43
1954	0	0	0	0	0	0	33.2	47.2	51.3	2.32	.56	.99	11.3
1955	.61	.66	.07	0	0	0	117	35.2	60.3	12.3	.41	3.06	19.0

RED RIVER OF THE NORTH BASIN

Monthly and yearly discharge, in acre-feet, of State ditch 85 near Lancaster, Minn.

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2,680	376	23	0	0	0	11,620	12,190	2,480	2.4	6.9	2.0	29,380
1952	10	.40	0	0	0	0	820	14	6.3	.8	0	0	852
1953	0	0	0	0	0	0	16	14	899	104	4.2	0	1,040
1954	0	0	0	0	0	0	1,970	2,900	3,050	143	35	59	8,160
1955	37	39	4.2	0	0	0	6,950	2,160	3,590	757	25	182	13,740

Yearly discharge, in cubic feet per second

Yearly discharge, in cubic feet per second								
Year	WSP	Water year ending Sept. 30				Calendar year		
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	115	82,900
1951	1208	250	Apr.30, May 1, 1951	0	40.6	29,380	36.3	†26,310
1952	1258	57	Apr. 8, 1952	0	1.17	852	1.16	841
1953	1278	56	June 7, 1953	0	1.43	1,040	1.43	1,040
1954	1358	124	June 17, 1954	0	11.3	8,160	11.4	8,240
1955	1388	211	Apr. 24, 1955	0	19.0	13,740	-	-

† Corrected.

970. North Branch Two Rivers at Lancaster, Minn.

Location.--Lat 48°51'44", long 96°48'58", in NW $\frac{1}{4}$ sec. 13, T. 162 N., R. 48 W. (revised), on right bank 900 ft upstream from bridge on U.S. Highway 59, at Lancaster, and 7 $\frac{1}{2}$ miles downstream from State ditch 85.

Drainage area.--209 sq mi.

Records available.--April 1941 to September 1942, October 1953 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 867.45 ft above mean sea level, adjustment of 1912 (Corps of Engineers bench mark). Apr. 1, 1941, to Sept. 30, 1942, chain gage at bridge 900 ft downstream at datum 2.13 ft lower.

Extremes.--1941-42, 1953-56: Maximum discharge, 1,000 cfs Apr. 21, 1956 (gage height, 7.44 ft); maximum gage height observed, 8.84 ft Mar. 26, 1942 (backwater from ice, site and datum then in use); no flow for many days.

Remarks.--During periods of high flow some water enters this stream from the Roseau River basin. Records of chemical analyses for the period September 1953 to September 1955 and water temperatures for the periods April to July 1954 and April to September 1955 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1954	0.10	0.13	0.19	0.10	0.10	0.47	47.4	65.5	91.0	5.87	2.52	2.34	17.9
1955	2.44	2.47	1.82	1.11	.61	.20	261	71.1	114	36.1	2.38	3.54	41.1
1956	6.50	3.95	1.96	1.26	1.08	.92	321	367	180	164	†31	†35	†92.8

* Not previously published; estimated on basis of records for Middle River near Argyle and South Branch Two Rivers at Pelan.

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1954	6.1	7.9	12	6.1	5.6	29	2,820	4,030	5,410	361	155	139	†12,980
1955	150	147	112	68	34	12	15,510	4,370	6,810	2,220	146	211	29,790
1956	400	235	120	77	62	56	19,120	22,540	10,690	10,060	†1,910	†2,080	†67,350

† Corrected.

* Not previously published; see footnote to preceding table.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1954	1358	233	June 16, 1954	-	17.9	†12,980	18.5	13,360
1955	1388	524	Apr. 22, 1955	0.1	41.1	29,790	41.6	30,140
1956	1438	1,000	Apr. 21, 1956	-	†92.8	†67,350	-	-

† Corrected.

* Not previously published.

975. North Branch Two Rivers near Northcote, Minn.

Location.--Lat 48°49'06", long 97°03'11", in NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 31, T.162 N., R.49 W., at downstream side of highway bridge, 3 miles southwest of Northcote and 3.8 miles upstream from mouth.

Drainage area.--386 sq mi.

Records available.--March 1941 to September 1942, March 1945 to November 1951.

Gage.--Staff gage. Datum of gage is 769.03 ft above mean sea level, adjustment of 1912 (levels by Corps of Engineers).

Average discharge.--7 years (1941-42, 1945-51), 113 cfs (81,810 acre-ft per year).

Extremes.--1941-42, 1945-51: Maximum daily discharge, 2,600 cfs May 13-17, 1950; maximum gage height observed, 26.54 ft May 13, 1950 (backwater from Red River of the North); no flow at times in each year.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	98.7	16.8	3.13	0	0.43	0.46	662	337	62.8	3.93	0.53	0.33	98.7
1952	.44	.21	-	-	-	-	-	-	-	-	-	-	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	6,070	998	192	0	24	29	39,360	20,750	3,740	242	32	20	71,460
1952	27	12	-	-	-	-	-	-	-	-	-	-	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	333	†240,900
1951	1208	1,190	Apr. 18, 1951	0	98.7	71,460	-	-
1952	1208	-	-	-	-	-	-	-

† Corrected.

990. Pembina River near Manitou, Manitoba

Location.--Lat 49°08'50", long 98°33'40", in NE $\frac{1}{4}$ sec.23, T.2, R.9 W., on bridge near Lea's farm, 7 miles south of Manitou.

Drainage area.--2,300 sq mi (revised).

Records available.--April 1921 to September 1957 (no winter records prior to 1957).
Monthly discharge only for some periods, published in WSP 1308.

Gage.--Tape gage. Datum of gage is 1,245.0 ft above mean sea level, datum of 1929, by Geodetic Survey of Canada. Prior to Apr. 1, 1956, chain gage at datum 89.07 ft lower.

Extremes.--1921-57: Maximum discharge observed, 5,030 cfs Apr. 17, 1949 (gage height, 101.68 ft, datum then in use); no flow at times in some years.

Cooperation.--Records furnished by Engineering and Water Resources Branch, Department of Northern Affairs and National Resources, Canada.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	107	*50	-	-	-	-	475	399	194	79	36.4	18.9	-
1952	7.3	-	-	-	-	-	205	160	82	28.7	7.1	.6	-
1953	.8	.3	-	-	-	-	44.3	20.4	93.9	56.6	23.9	6.1	-
1954	2.37	2.17	-	-	-	-	37.3	24.1	318	627	293	136	-
1955	72.5	41.5	-	-	-	11.0	1,070	616	321	181	59.9	22.2	-
1956	15.3	-	-	-	-	-	480	1,590	530	233	130	94	-
1957	78	26.3	4.0	3.2	1.3	91	212	124	69	21.1	41.3	93	63.8
1958	-	-	-	-	-	-	-	-	-	-	-	-	-
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

* Not previously published; records estimated or partly estimated on basis of available gage-height record, weather records, and records for station at Neche.

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	6,750	*2,980	-	-	-	-	28,260	24,530	11,560	4,860	2,240	1,130	-
1952	448	-	-	-	-	-	12,200	9,810	4,900	1,770	434	38	-
1953	52	2	-	-	-	-	2,640	1,250	5,590	3,480	1,470	365	-
1954	146	129	-	-	-	-	2,220	1,480	18,920	38,560	18,000	8,120	-
1955	4,460	2,470	-	-	-	676	63,450	37,870	19,130	11,130	3,680	1,320	-
1956	943	-	-	-	-	-	28,550	97,850	31,520	14,350	7,980	5,590	-
1957	4,800	1,560	248	196	73	5,610	12,590	7,620	4,130	1,300	2,540	5,520	46,170
1958	-	-	-	-	-	-	-	-	-	-	-	-	-
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

* Not previously published; see footnote to preceding table.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30				Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean
		Discharge	Date				
1950	-	-	-	-	-	-	-
1951	1208	642	Apr. 5, 1951	-	-	-	-
1952	1238	556	Apr. 1, 1952	0	-	-	-
1953	1278	286	June 5, 1953	0	-	-	-
1954	1338	955	July 1, 1954	-	-	-	-
1955	1388	1,660	Apr. 3, 1955	-	-	-	-
1956	1438	2,480	May 1, 1956	-	-	-	-
1957	1508	450	Mar. 23, 1957	0.7	63.8	46,170	-
1958	-	-	-	-	-	-	-
1959	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-

992. Pembina River near Kaleida, Manitoba

Location.--Lat 49°03'30", long 98°27'50", in NW $\frac{1}{4}$ sec.22, T.1 R.8, at bridge 4 $\frac{1}{2}$ miles south of Kaleida.

Drainage area.--2,880 sq mi (revised).

Records available.--October 1957 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,115 ft (from topographic map). Prior to Oct. 1, 1959, at datum 79.00 ft lower.

Extremes.--1957-60: Maximum discharge, 2,660 cfs Apr. 24, 1960 (gage height, 9.22 ft); no flow Jan. 19 to Mar. 22, 1959.

Cooperation.--Records furnished by Water Resources Branch, Department of Northern Affairs and National Resources, Canada.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1958	138	61	72	35.6	17.0	19.3	154	80	19.3	11.2	0.9	0.3	51
1959	.5	9.0	3.6	.6	0	9.3	193	75	41.5	9.2	7.0	4.2	29.3
1960	33.6	99	108	55	43.7	20.4	1,640	1,170	366	148	70	31.5	315

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1958	8,510	3,640	4,430	2,190	944	1,190	9,180	4,910	1,150	691	57	18	36,910
1959	28	538	222	36	0	571	11,480	4,590	2,470	564	430	248	21,180
1960	2,060	5,910	6,650	3,370	2,520	1,250	97,540	72,230	21,800	9,100	4,330	1,870	228,600

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1958	1558	3,503	Apr. 6, 1958	0.2	51	36,910	29.2	21,120
1959	1628	528	Apr. 5, 1959	0	29.3	21,180	48.4	35,010
1960	1708	2,660	Apr. 24, 1960	5.9	315	228,600	-	-

a Maximum daily.

994. Little Pembina River near Walhalla, N. Dak.

Location.--Lat 48°52', long 98°01', in SW $\frac{1}{4}$ sec.10, T.162 N., R.57 W., on right bank 25 ft upstream from county bridge, 3 $\frac{1}{2}$ miles above mouth, and 6 miles southwest of Walhalla.

Drainage area.--182 sq mi (revised), of which about 10 sq mi is noncontributing.

Records available.--April 1956 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,099.48 ft above mean sea level, datum of 1929. Prior to Sept. 10, 1956, wire-weight gage at bridge 25 ft downstream at same datum.

Extremes.--1956-60: Maximum discharge, 4,160 cfs Apr. 11, 1960 (gage height, 13.28 ft); no flow Jan. 4 to Feb. 22, 1958; minimum gage height, 4.91 ft Sept. 7, 1960.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	-	-	-	-	-	-	404	137	21.7	6.46	2.08	2.42	-
1957	1.46	2.86	1.00	0.65	0.20	41.4	11.4	7.78	4.99	2.38	21.6	10.2	8.91
1958	2.75	1.62	.78	.02	.29	3.20	6.05	2.34	4.44	3.46	.16	.18	1.78
1959	.35	.36	.31	.38	.41	32.0	100	14.6	15.9	2.53	.30	.24	13.9
1960	1.76	1.57	.74	.68	.60	.74	308	18.2	4.46	.82	.27	.11	27.8

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	-	-	-	-	-	-	24,060	8,450	1,290	397	128	144	-
1957	90	170	61	40	11	2,550	677	478	297	146	1,330	606	6,460
1958	169	96	48	1.0	16	197	360	144	26	213	10	11	1,290
1959	21	22	19	23	23	1,970	5,960	897	948	156	18	14	10,070
1960	108	93	45	42	35	45	18,320	1,120	265	50	16	6.3	29,150

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1956	1438	2,800	Apr. 21, 1956	-	-	-	-	-
1957	1508	447	Aug. 1, 1957	0.1	8.91	6,460	8.90	6,450
1958	1558	20	July 5, 1958	0	1.78	1,290	1.44	1,040
1959	1628	996	Apr. 3, 1959	.1	13.9	10,070	14.2	10,260
1960	1708	4,160	Apr. 11, 1960	.1	27.8	20,150	-	-

995. Pembina River near Walhalla, N. Dak.

Location.--Lat 48°53'32", long 97°59'09", in SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.35, T.163 N., R.57 W., on left bank $1\frac{1}{2}$ miles downstream from Little Pembina River and $3\frac{1}{2}$ miles southwest of Walhalla.

Drainage area.--3,330 sq mi, approximately (revised).

Records available.--October 1939 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 970 ft (by barometer). Prior to Oct. 24, 1941, staff gage and Oct. 24, 1941, to Nov. 10, 1943, chain gage, at same site and datum.

Average discharge.--21 years (1939-60), 211 cfs (152,800 acre-ft per year); median of yearly mean discharges, 180 cfs (130,000 acre-ft per year).

Extremes.--1939-60: Maximum discharge, 20,400 cfs Apr. 18, 1950 (gage height, 19.2 ft), from rating curve extended above 7,000 cfs on basis of contracted-opening measurement of peak flow; no flow at times in 1940-41, 1947, 1953, 1959.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	129	74.8	26.1	24.7	21.6	81.4	817	470	256	104	53.5	31.4	174
1952	19.2	11.9	5.58	3.39	3.01	19.0	281	183	105	51.9	14.1	.82	58.0
1953	.58	3.22	1.11	0	0	1.9	65.5	50.6	148	76.6	49.5	8.35	33.8
1954	2.91	5.42	3.15	.33	.90	13.2	83.2	62.5	426	697	547	175	152
1955	114	61.9	27.3	15.2	16.6	22.7	1,584	763	511	247	75.0	39.0	289
1956	37.5	20.0	7.6	6.1	8.7	9.4	1,332	2,348	722	327	156	118	429
1957	91.4	51.3	10.1	6.7	1.1	171	260	175	108	44.2	67.2	114	92.0
1958	160	87.9	62.3	35.9	24.8	39.4	179	97.2	29.0	18.4	.58	.24	61.4
1959	.35	2.48	2.12	1.01	.32	47.2	416	125	91.9	20.5	9.92	3.43	59.8
1960	32.0	65.5	85.7	51.2	30.2	18.6	1,976	1,188	438	175	71.0	30.0	345

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	7,940	4,450	1,610	1,520	1,200	5,000	48,590	28,910	15,230	6,400	3,290	1,870	126,000
1952	1,180	706	343	208	173	1,170	16,700	11,260	6,240	3,190	865	49	42,080
1953	36	192	68	0	0	115	3,900	3,110	8,820	4,710	3,040	497	24,490
1954	179	523	194	20	50.2	814	4,950	3,840	25,320	42,850	21,340	17,420	110,300
1955	7,020	3,690	1,680	932	920	1,400	94,270	46,930	30,410	15,210	4,610	2,320	209,400
1956	2,310	1,190	470	377	498	579	79,250	144,400	45,920	20,120	9,570	7,000	311,700
1957	5,620	3,050	619	415	60	10,500	15,490	10,760	6,450	2,720	4,130	6,780	66,590
1958	9,850	5,230	3,830	2,210	1,380	2,420	10,630	5,980	1,720	1,130	36	14	44,430
1959	22	147	130	62	18	2,900	24,760	7,700	5,470	1,260	610	204	43,280
1960	1,970	3,900	5,150	3,150	1,740	1,150	117,600	73,020	26,090	10,740	4,370	1,790	250,700

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30				Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean
		Discharge	Date				
1950	-	-	-	-	-	-	648
1951	1208	2,310	Apr. 5, 1951	20	174	126,000	158
1952	1238	5,500	Apr. 1, 1952	.2	58.0	42,080	55.3
1953	1278	642	June 3, 1953	0	33.8	24,490	34.4
1954	1338	1,160	July 6, 1954	.2	152	110,300	169
1955	1388	3,400	Apr. 2, 1955	10	289	209,400	278
1956	1438	5,990	Apr. 25, 1956	5	429	311,700	437
1957	1508	725	Mar. 23, 1957	1	92.0	66,590	105
1958	1558	b500	Apr. 6, 1958	.2	61.4	44,430	35.7
1959	1628	b2,000	Apr. 3, 1959	0	59.8	43,280	74.6
1960	1708	5,690	Apr. 12, 1960	3.4	345	250,700	-

a Maximum daily.

b About.

1000. Pembina River at Neche, N. Dak.

(International gaging station)

Location.--Lat 48°59'20", long 97°33'05", in SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.31, T.164 N., R.53., on right bank 4 blocks (revised) east of State Highway 18, at north edge of Neche.

Drainage area.--3,410 sq mi, approximately (revised).

Records available.--May 1903 to September 1908, June 1909 to September 1915, April 1919 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 805 ft (from topographic map). Prior to May 24, 1932, staff gage at Great Northern Railway bridge 1 mile upstream, at same datum. May 25, 1932, to Apr. 17, 1939, chain gage on bridge on State Highway 18, 500 ft downstream from railway bridge, at same datum.

Average discharge.--52 years (1903-8, 1909-15, 1919-60), 164 cfs (118,700 acre-ft per year); median of yearly mean discharges, 120 cfs (86,900 acre-ft per year).

Extremes.--1903-15, 1919-60: Maximum discharge, 10,700 cfs Apr. 20, 1950 (gage height, 21.58 ft, backwater from ice), from rating curve extended above 5,300 cfs; no flow at times in each year 1932-41, 1953, 1960.

Cooperation.--This station is maintained by the United States under agreement with Canada.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	152	87.8	37.4	31.5	25.0	38.4	845	513	266	120	67.3	48.6	186
1952	28.9	15.7	7.3	1.3	1.0	1.28	284	204	123	70.5	20.6	4.52	63.4
1953	3.58	6.05	1.36	.22	.10	.93	71.1	46.5	158	90.8	64.0	14.7	38.1
1954	8.82	9.57	3.65	1.06	.32	9.25	94.6	80.6	390	687	401	206	159
1955	144	76.5	28.0	10.5	16.1	15.6	1,511	854	579	304	109	57.0	308
1956	53.3	25.0	14.5	8.8	8.6	12.1	1,180	2,264	881	377	183	140	430
1957	100	63.2	20.0	15.7	7.7	118	275	202	135	63.9	77.6	117	99.8
1958	165	86.7	61.5	35.1	21.1	24.2	206	125	38.8	31.9	5.19	2.31	67.1
1959	5.34	3.82	.53	.15	.10	.75	500	166	140	39.8	18.0	10.8	73.4
1960	31.9	61.7	100	66.0	39.7	23.1	1,833	1,252	480	203	94.3	44.0	351

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	9,340	5,220	2,300	1,940	1,390	2,360	50,250	31,520	15,800	7,390	4,140	2,890	134,500
1952	1,780	935	448	79	58	79	16,870	12,570	7,320	4,330	1,270	269	46,010
1953	220	360	84	13	5.6	57	4,230	2,860	9,380	5,590	3,940	873	27,610
1954	542	569	224	65	18	568	5,630	4,950	23,200	42,220	24,670	12,240	114,900
1955	8,850	4,550	1,720	643	897	839	89,890	52,540	34,470	18,670	6,710	3,390	223,200
1956	3,270	1,490	889	543	492	748	70,210	139,200	52,430	23,190	11,220	8,317	312,000
1957	6,150	3,760	1,230	968	426	7,280	16,390	12,420	8,030	3,930	4,770	6,930	72,280
1958	10,160	5,160	3,780	2,160	1,170	1,490	12,230	7,720	2,310	1,960	319	138	48,600
1959	328	227	20	8.9	5.6	46	29,770	10,230	8,330	2,450	1,110	644	53,170
1960	1,960	3,670	6,170	4,060	2,280	1,420	109,100	76,990	28,590	12,500	5,800	2,620	255,200

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	622	450,400
1951	1208	2,000	Apr. 7, 1951	23	186	134,500	167	120,800
1952	1238	a550	Apr. 3, 1952	1	63.4	46,010	59.9	43,510
1953	1278	250	June 10, Aug. 3	0	38.1	27,610	39.1	28,280
1954	1338	846	July 7, 1954	.3	159	114,900	178	128,700
1955	1398	2,700	Apr. 5, 1955	8	308	223,200	295	213,700
1956	1438	5,200	Apr. 27, 1956	7	430	312,000	437	317,500
1957	1508	661	Mar. 27, 1957	5	99.8	72,280	111	80,240
1958	1558	442	Apr. 7, 1958	.8	67.1	48,600	41.5	30,070
1959	1628	1,800	Apr. 5, 1959	.1	73.4	53,170	88.9	64,390
1960	1708	4,040	Apr. 14, 1960	0	351	255,200	-	-

a About.

1005. Herzog Creek near Concrete, N. Dak.

Location.--Lat 48°45', long 97°54', in SW $\frac{1}{4}$ sec.21, T.161 N., R.56 W., on right bank $1\frac{1}{2}$ miles northeast of Concrete and $1\frac{1}{2}$ miles upstream from mouth.

Drainage area.--18.9 sq mi.

Records available.--June 1954 to September 1960.

Gage.--Water-stage recorder and wooden control. Datum of gage is 1,108.95 ft above mean sea level, datum of 1929, Emerson-Crookston supplementary adjustment of 1941 (levels by Soil Conservation Service)..

Average discharge.--6 years (1954-60), 2.81 cfs (2,030 acre-ft per year).

Extremes.--1954-60: Maximum discharge, 260 cfs Apr. 2, 1955 (gage height, 9.74 ft, from floodmarks, backwater from ice); no flow most of time each year.

Remarks.--Flood flow affected by temporary retention in four retarding basins above station. The farthest downstream retarding basin, located 1 mile above station, is used to regulate summer flow.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	-	-	-	-	-	-	-	-	-	-	-	-	-
1955	0.35	0.11	0.10	0	0	0.27	31.6	1.78	3.69	0.33 4.25	0.68	2.37 0	3.49
1956	2.42	.21	.10	.12	.18	.11	47.9	31.7	5.06	.87	.30	.29	7.41
1957	.20	.88	.10	.01	.18	7.6	3.01	1.83	1.22	.12	0	.01	1.26
1958	0	0	.32	.01	.34	2.76	1.20	.11	.12	.54	.02	0	.45
1959	.05	.06	0	0	0	.47	10.9	4.29	1.41	.51	0	0	1.47
1960	0	.02	0	0	0	.01	31.0	2.50	.11	0	0	0	2.76

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	-	-	-	-	-	-	-	-	-	-	-	-	-
1955	21	6.5	6.3	0	0	17	1,880	110	220	262	42	141	2,520
1956	149	12	6.1	7.5	11	6.5	2,850	1,950	301	53	19	17	5,380
1957	12	52	6.3	.6	.4	468	179	112	73	7.5	0	.6	911
1958	0	0	20	.4	19	170	71	6.5	7.3	33	1.0	0	328
1959	3.2	3.6	0	0	0	29	650	264	84	31	0	0	1,060
1960	0	1.4	0	0	0	.4	1,840	154	6.3	0	0	0	2,000

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-
1954	1368	-	-	-	-	-	-	-
1955	1368	260	Apr. 2, 1955	0	3.49	2,520	3.67	2,660
1956	1438	243	Apr. 25, 1956	0	7.41	5,380	7.28	5,290
1957	1508	90	Mar. 21, 1957	0	1.26	911	1.19	861
1958	1558	a20	Mar. 26, 1958	0	.45	328	.44	315
1959	1628	35	Apr. 6, 1959	0	1.47	1,060	1.46	1,060
1960	1708	100	Apr. 13, 1960	0	2.76	2,000	-	-

a About.

1010. Tongue River at Akra, N. Dak.

Location.--Lat 48°46'40", long 97°42'55", in SE $\frac{1}{4}$ sec.11, T.161 N., R.55 W., on right bank 0.6 mile east of Akra and 4.2 miles west of Cavalier.

Drainage area.--162 sq mi (revised).

Records available.--April to June 1950 (in WSP 1137-B), October 1951 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 920.90 ft above mean sea level, datum of 1929 (levels by Soil Conservation Service). Prior to July 10, 1954, chain gage $\frac{1}{2}$ miles upstream at datum 20.90 ft lower.

Average discharge.--9 years (1951-60), 16.4 cfs (11,870 acre-ft per year).

Extremes.--1950-60: Maximum discharge, 11,800 cfs Apr. 18, 1950 (gage height, 48.7 ft, from floodmarks, site and datum then in use), from rating curve extended above 1,500 cfs on basis of contracted-opening measurement of peak flow; no flow Dec. 1-27, 1952. Flood of Apr. 18, 1950, is the highest known since settlement of the region (about 1860).

Remarks.--Flood flow affected by temporary retention in eight retarding basins above station (combined capacity, 10,000 acre-ft).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	3.54	2.81	2.07	1.25	1.00	4.57	46.8	5.90	1.91	1.24	0.54	0.58	5.97
1953	1.25	3.88	0.06	51.	24	2.05	9.84	18.9	15.5	2.41	4.64	1.68	4.84
1954	2.59	2.52	1.24	.64	1.09	7.06	36.0	18.5	51.7	4.13	3.09	7.32	11.3
1955	5.54	4.68	1.92	1.23	1.60	1.61	168	18.1	22.5	34.9	2.01	1.95	21.8
1956	17.4	4.39	3.03	3.40	4.23	3.92	294	209	32.7	13.9	4.69	11.8	50.1
1957	5.77	15.8	5.9	2.88	1.50	40.1	28.5	2.15	13.2	6.25	7.78	20.6	14.2
1958	6.21	5.53	3.34	2.21	2.38	9.41	15.6	6.38	3.95	11.9	1.12	.95	5.77
1959	2.70	2.21	1.70	2.10	1.86	5.54	100	20.2	7.91	2.65	.99	2.45	12.4
1960	3.71	3.06	3.37	2.64	2.03	1.85	197	38.2	6.22	2.23	1.09	1.00	21.6

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	218	167	128	77	58	281	2,780	363	114	76	33	35	4,330
1953	77	52	4.0	31	13	125	585	1,160	922	148	285	100	3,500
1954	159	150	76	39	60	454	2,140	1,140	3,080	254	190	456	8,160
1955	341	278	118	75	89	99	9,970	1,110	1,340	2,150	123	116	15,810
1956	1,070	261	186	209	244	241	17,510	12,840	1,950	853	288	702	36,350
1957	355	942	363	177	83	2,470	1,700	1,320	788	384	478	1,230	10,290
1958	382	329	205	136	132	579	928	392	235	732	69	57	4,180
1959	166	132	105	129	103	341	5,950	1,240	471	163	61	146	9,010
1960	228	182	207	162	117	113	11,700	2,350	370	137	67	60	15,690

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-
1952	1258	a260	Apr. 1, 1952	0.4	5.97	4,330	5.44	3,960
1953	1278	a178	May 31, 1953	0.4	4.84	3,500	5.13	3,750
1954	1358	187	June 12, 1954	.6	11.3	8,160	11.7	8,510
1955	1388	700	Apr. 2, 1955	.7	21.8	15,810	22.9	16,590
1956	1458	1,350	Apr. 19, 1956	2.0	50.1	36,350	50.3	36,500
1957	1508	340	Mar. 22, 1957	1.3	14.2	10,290	13.2	9,550
1958	1558	78	July 5, 1958	.8	5.77	4,180	5.06	3,660
1959	1628	485	Apr. 5, 1959	.4	12.4	9,010	12.7	9,220
1960	1708	654	Apr. 14, 1960	.6	21.6	15,690	-	-

a Maximum observed.

1015. Tongue River at Cavalier, N. Dak.

Location.--Lat 48°47'55", long 97°37'35", in SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.4, T.161 N., R.54 W., on left abutment of dam half a mile upstream from State Highway 5 in Cavalier.

Drainage area.--167 sq mi (revised).

Records available.--October 1938 to October 1951.

Gage.--Staff gage and concrete control. Datum of gage is 880.98 ft above mean sea level, datum of 1929, Emerson-Crookston supplementary adjustment of 1941. Prior to July 21, 1946 (revised), wire-weight or chain gage at site 0.5 mile downstream at datum 11.74 ft lower.

Average discharge.--13 years (1938-51), 21.3 cfs (15.420 acre-ft per year); median of yearly mean discharges, 19.5 cfs (14,100 acre-ft per year).

Extremes.--1938-51: Maximum discharge (not including bypass flow), 1,340 cfs May 8, 1950 (gage height, 4.58 ft); no flow for several months in some years. During the floods of April and May 1950 large amounts of water bypassed the gage. Maximum discharge including bypass flow, 11,800 cfs Apr. 18, 1950, on basis of contracted-opening measurement of peak flow at site about 5 miles upstream.

Remarks.--During the floods of April and May 1950 and probably during the flood of April 1948, large amounts of water bypassed the gage and are not included in the records.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	5.28	3.92	2.28	1.60	1.00	27.0	106	19.5	7.65	1.97	3.96	2.54	15.2
1952	3.05	-	-	-	-	-	-	-	-	-	-	-	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	325	233	140	99	56	1,660	6,310	1,200	455	121	244	151	10,990
1952	187	-	-	-	-	-	-	-	-	-	-	-	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30				Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean
		Discharge	Date				
1950	-	-	-	-	-	-	55.7
1951	1208	420	Apr. 5, 1951	0.4	15.2	10,990	-
							40,310

1025. Red River of the North at Emerson, Manitoba

(International gaging station)

Location.--Lat 49°00'30", long 97°13'00", in sec.2, T.1, R.2 E., on right bank 1,500 ft downstream from Canadian National Railway bridge in Emerson, three-quarters of a mile downstream from international boundary, 3.6 miles downstream from Pembina River, and at mile 154.3.

Drainage area.--40,200 sq mi, approximately, includes 3,800 sq mi (revised) in closed basins.

Records available.--March to November 1902 (gage heights only), May 1912 to September 1929 (monthly discharge only, published in WSP 1308), October 1929 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 700.00 ft above mean sea level, datum of 1929, by Geodetic Survey of Canada. Prior to 1912, staff gage at different datum. May 3, 1912, to Apr. 10, 1953, chain gage and/or staff gage on Canadian National Railway bridge, 1,500 ft upstream. May 3, 1912, to Sept. 30, 1923, at datum 2.55 ft lower than present datum; Oct. 1, 1923, to Sept. 30, 1925, at datum 1.14 ft lower than present datum; Oct. 1, 1925, to Sept. 30, 1947, at datum 0.57 ft higher than present datum; and Oct. 1, 1947, to Sept. 30, 1948, at datum 0.21 ft higher than present datum.

Average discharge.--48 years (1912-60), 2,711 cfs (1,963,000 acre-ft per year); median of yearly mean discharges, 2,320 cfs (1,680,000 acre-ft per year).

Extremes.--1912-60: Maximum discharge, 95,500 cfs May 13, 1950 (gage height, 90.87 ft); minimum observed, 0.9 cfs Feb. 6-8, 1937 (gage height, 44.00 ft).

Cooperation.--This station is one of the international gaging stations maintained by Canada under agreement with the United States.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	3,330	2,070	2,160	2,050	1,800	2,290	19,700	10,900	4,940	2,740	1,480	1,980	4,800
1952	1,580	1,410	1,910	1,790	1,910	2,010	17,200	7,660	3,810	5,880	2,280	1,380	4,060
1953	945	864	698	610	611	1,370	4,060	3,150	8,890	5,530	2,500	1,320	2,530
1954	893	961	936	834	847	1,380	5,820	4,230	4,280	2,960	1,440	895	2,124
1955	816	829	717	732	652	653	10,600	3,230	4,290	2,740	1,820	942	2,330
1956	942	604	450	432	455	509	12,800	14,600	5,430	4,090	1,160	2,030	3,620
1957	682	1,330	614	443	408	1,450	5,880	4,540	4,200	9,280	2,880	6,390	3,180
1958	3,780	3,390	1,710	1,380	1,310	1,870	3,330	1,650	1,420	4,050	1,000	459	2,120
1959	430	489	358	348	343	633	6,050	2,110	2,750	2,070	759	544	1,400
1960	564	588	627	818	557	471	16,500	5,210	3,110	2,280	588	613	2,630

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	204,800	123,400	132,800	126,200	99,950	140,600	1,168,000	667,900	294,000	168,600	89,830	116,300	3,333,000
1952	97,230	84,080	117,200	109,900	110,100	123,600	1,021,000	471,200	227,000	361,400	140,500	81,880	2,945,000
1953	58,130	51,400	42,910	37,480	33,910	83,950	241,800	193,700	229,000	361,100	141,500	78,350	1,832,000
1954	54,900	57,190	57,530	51,320	47,060	84,600	346,400	260,100	254,900	181,900	88,280	53,280	1,537,000
1955	50,260	49,330	44,140	44,990	36,220	40,180	630,600	198,400	255,000	168,500	111,600	56,050	1,685,000
1956	57,920	35,950	27,660	26,540	26,200	31,320	758,900	895,000	322,900	251,600	71,100	120,600	2,626,000
1957	41,940	78,850	37,730	27,220	22,640	88,880	350,000	279,000	250,000	570,800	177,100	380,100	2,304,000
1958	232,200	201,200	105,400	85,030	72,500	114,800	196,200	101,300	84,750	249,300	61,770	27,300	1,534,000
1959	26,440	29,080	22,020	21,410	19,030	38,910	360,100	129,800	163,500	127,100	46,640	32,360	1,016,000
1960	34,660	34,970	38,580	37,990	32,020	28,960	965,500	320,100	185,100	140,300	36,240	36,840	1,909,000

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	12,440	9,006,000
1951	1208	a26,600	Apr. 15, 1951	1,200	4,600	3,333,000	4,380	3,171,000
1952	1258	a24,267	Apr. 24, 1952	1,120	4,060	2,945,000	3,855	2,799,000
1953	1278	a14,500	June 28, 1953	575	2,530	1,832,000	2,555	1,849,000
1954	1338	a11,500	Apr. 17, 1954	733	2,124	1,537,000	2,090	1,512,000
1955	1388	24,000	Apr. 10, 1955	569	2,330	1,685,000	2,290	1,663,000
1956	1438	33,800	Apr. 27, 1956	373	3,620	2,626,000	3,680	2,663,000
1957	1508	15,300	July 5, 1957	360	3,180	2,304,000	3,710	2,685,000
1958	1558	7,940	July 12, 1958	409	2,120	1,534,000	1,480	1,072,000
1959	1628	a15,720	Apr. 10, 1959	204	1,400	1,016,000	1,450	1,047,000
1960	1708	30,500	Apr. 13, 1960	349	2,630	1,909,000	-	-

a Maximum daily discharge.

1045. Roseau River below South Fork near Malung, Minn.

Location--Lat 48°47'30", long 95°44'40", in SW $\frac{1}{4}$ sec.6, T.161 N., R.39 W., on left bank a quarter of a mile downstream from South Fork and $1\frac{1}{2}$ miles northwest of Malung.

Drainage area--573 sq mi.

Records available--October 1946 to September 1960.

Gage--Water-stage recorder and concrete control. Datum of gage is 1,029.67 ft above mean sea level, adjustment of 1912.

Average discharge--14 years (1946-60), 125 cfs (90,500 acre-ft per year).

Extremes--1946-60: Maximum discharge, 3,650 cfs Apr. 24, 1950 (gage height, 22.51 ft); no flow for part of Jan. 15, 1952 (caused by construction of concrete control); minimum daily discharge, 0.1 cfs Mar. 3-8, 1947.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	212	67.6	37.3	17.4	9.93	13.9	1,433	351	60.6	20.8	11.7	73.2	191
1952	60.5	20.0	9.83	5.78	4.92	5.81	264	58.0	32.0	163	26.5	6.60	54.5
1953	5.15	8.48	3.66	3.0	2.92	68.0	124	153	146	62.6	11.6	42.0	52.6
1954	39.5	29.8	13.2	7.3	7.7	7.7	442	357	216	17.1	5.09	2.29	95.3
1955	4.04	6.51	2.80	3.00	2.97	3.19	229	115	258	27.5	3.17	4.61	52.9
1956	27.6	17.0	6.75	4.87	5.30	5.56	755	595	119	359	51.7	398	195
1957	27.3	229	19.3	6.67	4.15	139	339	190	351	690	56.0	710	230
1958	318	292	26.7	5.72	11.3	26.5	51.7	32.0	39.9	283	21.2	2.24	84.7
1959	17.1	44.9	31.3	14.0	6.04	45.9	558	225	102	85.5	19.6	21.1	97.1
1960	49.7	34.2	11.5	8.14	4.13	1.68	482	124	154	38.1	12.7	2.02	76.2

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	13,020	4,020	2,290	1,070	552	857	85,250	21,570	3,610	1,280	722	4,350	138,600
1952	3,720	1,190	604	356	283	234	15,690	3,570	1,910	10,030	1,630	393	39,610
1953	317	504	225	184	162	4,180	7,380	9,410	8,670	5,850	712	2,500	38,090
1954	2,430	1,780	811	446	426	474	26,310	21,970	12,850	1,050	313	136	68,980
1955	248	387	172	184	165	196	13,610	7,040	14,160	1,690	195	275	38,320
1956	1,700	1,010	415	299	305	342	44,930	36,590	7,080	22,070	3,180	23,670	141,600
1957	1,680	13,640	1,190	410	230	8,520	20,160	11,700	20,870	42,410	3,440	42,280	166,500
1958	19,440	11,410	1,640	351	629	1,630	3,060	1,970	2,370	17,390	1,300	133	61,340
1959	1,050	2,670	1,920	858	335	2,820	53,190	13,690	6,100	5,260	1,160	1,260	70,310
1960	3,060	2,030	707	501	238	104	28,690	7,620	9,140	2,340	778	120	55,330

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	326	236,100
1951	1208	2,440	Apr. 9, 1951	3.0	191	139,600	172	122,800
1952	1258	500	Apr. 10, 1952	2.0	54.5	39,610	49.4	35,140
1953	1278	395	May 14, 1953	2.5	52.6	38,090	58.1	42,070
1954	1338	798	Apr. 14, 1954	1.4	95.3	68,980	89.4	64,760
1955	1388	887	June 4, 1955	.2	52.9	38,320	56.2	40,640
1956	1438	2,040	Apr. 24, 1956	4.6	195	141,600	213	155,000
1957	1508	2,130	Sept. 6, 1957	3.8	230	165,500	252	182,500
1958	1558	668	July 9, 1958	.4	84.7	61,340	47.7	34,490
1959	1628	1,200	Apr. 5, 1959	.7	97.1	70,310	97.3	70,470
1960	1708	984	Apr. 15, 1960	.6	76.2	55,330	-	-

1060. Sprague Creek near Sprague, Manitoba

(International gaging station)

Location.--Lat 48°59'33", long 95°39'43", in NE $\frac{1}{4}$ sec.34, T.164 N., R.39 W., on left bank half a mile south of international boundary, $\frac{3}{4}$ miles south of Sprague, Manitoba, 8 miles upstream from mouth, and 14 miles northeast of Roseau, Minn.

Drainage area.--169 sq mi. Prior to October 1958, 151 sq mi; change due to construction of drainage ditch within basin.

Records available.--September 1928 to September 1960 (winter records incomplete prior to 1941). Prior to September 1951, published as Mud Creek near Sprague.

Gage.--Water-stage recorder and concrete control. Datum of gage is 1,038.4 ft above mean sea level, adjustment of 1928 by Geodetic Survey of Canada. Prior to Mar. 15, 1929, staff gage at same site and datum.

Average discharge.--21 years (1928-29, 1940-60), 58.5 cfs (42,350 acre-ft per year).

Extremes.--1928-60: Maximum discharge, 2,070 cfs Sept. 1, 1942 (gage height, 15.31 ft), from rating curve extended above 960 cfs; no flow at times in some years.

Cooperation.--This station is maintained by the United States under agreement with Canada.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	132	25.0	5.47	3.37	3.51	6.79	226	174	27.5	2.10	5.96	18.7	52.6
1952	22.2	10.9	1.32	.55	1.49	2.48	33.5	11.9	13.1	22.3	3.68	.98	10.4
1953	.95	1.80	.89	.94	.86	7.68	28.1	50.3	106	35.5	3.82	7.84	20.4
1954	7.35	5.82	4.01	3.99	1.62	3.62	180	201	127	11.7	3.80	9.58	44.9
1955	5.56	5.25	3.69	2.03	1.76	1.70	197	97.8	232	34.8	3.12	12.0	49.5
1956	35.8	15.0	3.90	1.94	2.18	3.86	252	270	73.7	224	48.2	104	86.4
1957	28.1	108	5.7	1.50	1.67	41.6	126	165	214	134	15.1	24.7	72.2
1958	37.4	26.8	3.07	1.66	4.27	10.5	13.8	11.1	8.38	93.2	10.2	3.57	18.8
1959	14.6	29.4	8.07	3.72	1.64	7.26	147	219	169	40.5	16.9	15.0	56.1
1960	96.8	23.0	6.56	2.83	1.77	1.58	243	109	76.9	31.2	11.0	3.34	50.4

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	8,120	1,490	356	207	195	418	13,420	10,690	1,630	129	367	1,110	38,110
1952	1,360	651	81	34	86	152	1,990	733	780	1,370	226	58	7,520
1953	59	107	55	58	48	472	1,670	3,090	6,330	2,180	235	466	14,770
1954	452	347	246	245	90	222	9,490	12,350	7,560	720	234	570	32,530
1955	342	312	227	125	98	105	11,750	6,020	13,790	2,140	192	713	35,810
1956	2,200	894	240	119	125	237	14,970	16,600	4,390	13,770	2,960	6,190	62,700
1957	1,730	6,440	351	92	93	2,560	7,470	10,160	12,720	8,250	928	1,470	52,260
1958	2,300	1,590	189	102	237	645	818	681	498	5,730	629	212	13,630
1959	897	1,750	496	228	91	447	8,760	13,440	10,080	2,490	1,040	895	40,610
1960	5,950	1,370	404	174	102	97	14,450	6,680	4,580	1,920	674	199	36,600

Yearly discharge, in cubic feet per second

Year	MSP	Water year ending Sept. 30				Calendar year			
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet	
		Discharge	Date						
1950	-	-	-	-	-	-	127	-	92,100
1951	1208	389	May 1-2, 1951	1.3	52.6	38,110	41.8	-	30,260
1952	1238	69	July 4, 1952	.5	10.4	7,520	7.79	-	5,650
1953	1278	235	June 3, 1953	.6	20.4	14,770	21.5	-	15,590
1954	1338	514	Apr. 30, 1954	1.1	44.9	32,530	44.7	-	32,360
1955	1368	557	June 6, 1955	.4	49.5	35,810	52.8	-	38,270
1956	1438	862	July 5-6, 1956	1.5	86.4	62,700	93.5	-	67,880
1957	1508	422	June 15, 1957	.8	72.2	52,260	66.1	-	47,820
1958	1558	165	July 10, 1958	1.0	18.8	13,630	17.5	-	12,700
1959	1628	595	May 7, 1959	1.1	56.1	40,610	62.4	-	45,200
1960	1708	708	Apr. 15, 1960	1.4	50.4	36,600	-	-	-

1070. Pine Creek near Pine Creek, Minn.

(International gaging station)

Location.--Lat 48°59'35", long 95°55'04", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.26, T.164 N., R.41 W., on right bank half a mile south of international boundary, 2 miles northeast of village of Pine Creek, and 6 miles upstream from mouth.

Drainage area.--74.6 sq mi.

Records available.--August 1928 to September 1953; winter records incomplete 1930-40.

Gage.--Water-stage recorder. Datum of gage is 1,038.42 ft above mean sea level, adjustment of 1928 by Geodetic Survey of Canada. Prior to Mar. 13, 1929, staff gage and Mar. 13, 1929, to Aug. 29, 1940, water-stage recorder, at site 50 ft downstream at same datum.

Average discharge.--25 years (1928-53), 26.3 cfs (19,000 acre-ft per year).

Extremes.--1928-53: Maximum discharge, 706 cfs Sept. 25, 1941, from rating curve extended above 450 cfs; maximum gage height, 10.18 ft Apr. 24, 1950; no flow Jan. 5-14, 1942, Aug. 19-28, 1953.

Remarks.--Diversion above station to Roseau River Game Refuge began June 17, 1953.

Cooperation.--This station was maintained by the United States under agreement with Canada.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	58.1	19.3	10.9	9.30	8.13	7.38	114	63.5	16.1	7.85	25.1	29.5	30.8
1952	22.1	11.0	7.15	5.37	5.16	6.84	33.6	23.6	24.5	29.5	8.39	5.49	15.2
1953	8.48	11.5	7.68	6.77	6.75	14.0	36.2	53.9	47.0	4.85	1.00	3.73	16.8

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	3,570	1,150	668	572	451	454	6,790	3,910	956	483	1,540	1,740	22,280
1952	1,360	656	439	330	297	420	2,000	1,450	1,460	1,810	516	327	11,060
1953	521	683	472	417	375	860	2,160	3,310	2,800	299	62	222	12,180

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	59.1	42,810
1951	1208	*272	Apr. 6, 1951	4.9	30.8	22,280	26.7	19,350
1952	1238	98	July 5, 1952	4.6	15.2	11,060	14.2	10,290
1953	1278	129	May 13, 1953	0	16.8	12,180	-	-

* Not previously published.

1075. Roseau River at Ross, Minn.

Location.--Lat 48°54'37", long 95°55'18", in SE $\frac{1}{4}$ sec.27, T.163 N., R.41 W., on left bank 300 ft downstream from highway bridge, a quarter of a mile north of Ross, and 2.3 miles (revised) downstream from Pine Creek.

Drainage area.--1,220 sq mi, approximately.

Records available.--July 1928 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,018.44 ft above mean sea level, adjustment of 1928 by Geodetic Survey of Canada. Prior to Mar. 13, 1929, staff gage at same site and datum.

Average discharge.--32 years (1928-60), 227 cfs (164,300 acre-ft per year).

Extremes.--1928-60: Maximum discharge, 6,560 cfs May 12, 1950 (gage height, 18.25 ft); minimum recorded, 1.0 cfs Sept. 30, 1960 (gage height, 0.22 ft).

Maximum stage known, about 19 ft in 1896. Other outstanding floods reached the following stages (from information by local residents): flood in July 1919, 17.5 ft; flood in 1927, about 16 ft.

Remarks.--High flow regulated by natural storage in Roseau Lake.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	593	171	75.0	41.0	27.2	31.3	1,911	1,572	137	25.0	53.8	138	399
1952	122	51.6	27.3	12.3	12.6	14.4	494	125	86.0	264	47.2	16.0	106
1953	15.5	26.5	13.8	10.7	7.1	120	234	297	361	116	16.9	53.1	106
1954	51.1	42.1	22.5	11.5	11.1	13.0	638	835	502	42.5	14.4	17.9	183
1955	15.7	15.7	13.8	7.52	6.55	5.79	579	325	679	111	12.4	30.1	149
1956	91.0	47.1	25.5	14.6	11.1	13.3	844	1,700	487	830	161	638	406
1957	83.2	512	43.7	15.9	12.9	213	700	617	669	1,234	156	889	429
1958	497	512	48.5	13.1	20.4	57.3	88.2	55.1	87.7	526	48.6	8.69	293
1959	34.8	81.8	22.0	8.92	28.8	1,051	633	365	139	42.7	43.6		429
1960	169	85.5	20.1	15.0	10.2	5.61	1,023	439	296	87.3	17.5	7.06	180

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	36,490	10,200	4,610	2,520	1,510	1,920	113,700	96,690	8,140	1,540	3,310	8,210	288,800
1952	7,500	3,070	1,680	758	724	885	29,380	7,670	5,120	16,260	2,900	952	76,900
1953	952	1,580	851	659	393	7,370	13,950	18,260	21,500	7,160	1,040	3,160	76,860
1954	3,140	2,500	1,380	706	617	799	37,940	51,350	29,840	2,610	884	1,060	132,800
1955	968	932	851	462	354	358	34,460	19,960	40,390	6,800	763	1,790	108,100
1956	5,600	2,800	1,570	899	639	817	50,220	104,500	28,970	51,040	9,890	37,980	294,900
1957	5,110	30,500	2,690	976	716	13,110	41,670	37,940	39,810	75,890	9,600	52,890	310,900
1958	30,570	18,590	2,980	803	1,130	3,520	5,250	3,260	4,030	32,360	2,860	517	105,900
1959	2,140	4,870	3,690	1,350	495	1,770	62,560	38,920	21,710	8,530	2,530	2,590	151,300
1960	10,390	5,090	1,230	925	588	343	60,890	26,980	17,610	5,370	1,080	420	130,900

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	776	562,200
1951	1208	2,580	Apr. 20, 1951	6.6	399	288,800	345	249,800
1952	1208	750	Apr. 10, 1952	10	106	76,900	95.7	68,030
1953	1278	640	June 4, 1953	4.4	106	76,860	111	80,490
1954	1358	1,140	May 8, 1954	8.0	183	132,800	178	128,600
1955	1388	980	June 10, 1955	2.1	149	108,100	159	115,300
1956	1438	2,150	Apr. 29, 1956	11	406	294,900	445	323,300
1957	1508	1,600	July 16, 1957	3.2	429	310,900	449	324,700
1958	1558	786	July 18, 1958	12	146	105,900	89.0	84,430
1959	1628	1,530	Apr. 10, 1959	4.0	209	151,300	217	157,300
1960	1708	1,560	Apr. 18, 1960	1.1	180	130,900	-	-

a Maximum daily discharge.

1120. Roseau River below State ditch 51, near Caribou, Minn.

(International gaging station)

Location--Lat 48°58'54", long 96°27'46", in SE¹/₄SW¹/₄ sec.34, T.164 N., R.45 W., on left bank 400 ft downstream from State ditch 51 (known locally as Caribou cutoff ditch) and 0.6 mile west of Caribou.

Drainage area--1,570 sq mi, approximately.

Records available--April 1 to October 1917, April 1920 to September 1960 (some winter records incomplete). Published as "at Caribou" prior to April 1929; as "below Cutoff ditch, near Caribou" April 1929 to September 1936. Records published for both sites April 1929 to September 1930.

Gage--Water-stage recorder. Datum of gage is 1,002.14 ft above mean sea level, adjustment of 1928, by Geodetic Survey of Canada. Prior to Apr. 1, 1929, chain gage at site at Caribou 0.6 mile upstream at datum 0.95 ft lower.

Average discharge--15 years (1920-30, 1932-33, 1936-37, 1940-43), 298 cfs (215,700 acre-ft per year).

Extremes--1917, 1920-60: Maximum discharge, 4,080 cfs May 19, 1950 (gage height, 11.81 ft); no flow Aug. 13, 1936.

Flood in 1916 is reported to have reached a stage of about 15.5 ft at former site and datum.

Remarks--Occasionally, at high stages, there is some natural diversion of flow above station to headwaters of Two Rivers.

Cooperation--This station is maintained by the United States under agreement with Canada.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	792	-	-	-	-	-	1,449	1,827	259	41.6	60.9	149	-
1952	135	-	-	-	-	-	553	127	82.6	263	58.5	17.9	-
1953	*14.3	-	-	-	-	-	283	292	429	137	22.2	51.7	-
1954	64.1	-	-	-	-	-	611	977	701	74.1	16.3	17.9	-
1955	17.2	-	-	-	-	-	750	585	867	188	23.4	26.1	-
1956	91.6	-	-	-	-	-	805	1,944	860	994	26.0	755	-
1957	*88.9	-	-	-	-	-	1,034	970	822	1,606	389	915	-
1958	533	*374	-	-	-	-	176	86.6	63.1	581	72.9	12.9	-
1959	43.5	-	-	-	-	-	1,171	909	527	178	51.6	59.5	-
1960	197	-	-	-	-	-	1,017	850	419	169	31.4	13.9	-

* Not previously published; estimated on basis of records of stations below South Fork near Malung and at Ross.

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	48,710	-	-	-	-	-	66,220	112,400	15,400	2,560	3,740	8,850	-
1952	8,310	-	-	-	-	-	32,880	7,840	4,920	16,170	3,590	1,060	-
1953	*877	-	-	-	-	-	16,820	17,940	25,550	8,430	1,360	3,080	-
1954	3,940	-	-	-	-	-	36,340	60,090	41,700	4,560	1,000	1,070	-
1955	1,060	-	-	-	-	-	44,650	35,990	51,620	11,550	1,440	1,550	-
1956	5,630	-	-	-	-	-	47,920	119,500	51,200	61,140	15,990	44,900	-
1957	*5,464	-	-	-	-	-	61,520	59,820	48,940	98,780	23,920	54,420	-
1958	32,770	*22,230	-	-	-	-	10,480	5,340	3,760	35,730	4,460	770	-
1959	2,670	-	-	-	-	-	69,660	55,910	31,370	10,940	3,170	3,540	-
1960	12,110	-	-	-	-	-	60,510	52,240	24,960	10,390	1,920	826	-

* Not previously published; see footnote to preceding table.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	-	-
1951	1208	2,200	May 2, 1951	-	-	-	-	-
1952	1238	21,070	Apr. 12, 1952	-	-	-	-	-
1953	1278	797	June 5, 1953	-	-	-	-	-
1954	1338	1,160	May 9,12,13, 1954	-	-	-	-	-
1955	1388	1,080	June 13,14,1955	-	-	-	-	-
1956	1438	2,300	May 2, 1956	-	-	-	-	-
1957	1508	1,790	July 12, 1957	-	-	-	-	-
1958	1558	877	July 20, 1958	-	-	-	-	-
1959	1628	1,570	Apr. 19-21,1959	-	-	-	-	-
1960	1708	1,650	Apr. 27-28,1960	-	-	-	-	-

a Estimated maximum daily discharge.

1133.6. Long Creek at western crossing of international boundary

(International gaging station)

Location.--Lat 49°00'01", long 103°21'08", in SE $\frac{1}{4}$ sec.1, T.11, R.11 W., second meridian on right bank, 10 miles south of Outram, Saskatchewan.

Drainage area.--2,020 sq mi, of which about 1,270 sq mi is probably noncontributing.

Records available.--March 1959 to September 1960.

Gage.--Water-stage recorder and artificial control. Datum of gage is 1,894.00 ft above mean sea level, international boundary survey.

Extremes.--1958-60: Maximum daily discharge, 1,330 cfs Mar. 27, 1960 (gage height, 8.61 ft, backwater from ice); no flow at times.

Cooperation.--This station is one of the international gaging stations maintained by Canada under agreement with the United States.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1959	-	-	-	-	-	10.0	0.7	0	30.5	9.1	0	0	-
1960	0	0	0	0	0	236	172	5.2	8.1	1.3	0	0	35.3

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1959	-	-	-	-	-	617	39	0	1,820	557	0	0	-
1960	0	0	0	0	0	14,500	10,260	321	481	82	0	0	25,640

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1959	1708	a400	June 30, 1959	0	-	-	-	-
1960	1708	b1,330	Mar. 27, 1960	0	35.3	25,640	-	-

a Estimated.

b Maximum discharge.

1135. Long Creek near Crosby, N. Dak.

Location.--Lat 48°58'30", long 103°16'04", in NW¼ sec.3, T.163 N., R.97 W., on right bank at downstream side of county highway bridge, 1 mile downstream from small tributary, and 5 miles northeast of Crosby.

Drainage area (revised).--2,080 sq mi, approximately, of which about 1,300 sq mi is probably noncontributing.

Records available.--March to April 1943, April 1944 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,870 ft (from topographic map). Prior to June 21, 1952, wire-weight gage at same site and datum.

Average discharge.--16 years (1944-60), 27.8 cfs (20,130 acre-ft per year); median of yearly mean discharges, 21 cfs (15,200 acre-ft per year).

Extremes.--1943-60: Maximum discharge, 6,240 cfs Apr. 23, 1948 (gage height, 16.10 ft); maximum gage height, 16.10 ft Apr. 22, 23, 1948 (backwater from ice Apr. 22); no flow during part of each year.

Maximum stage known, that of Apr. 22, 23, 1948. Flood in 1904 reached about the same stage from information by local residents.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0	0	0	0	0	0	521	175	7.71	0.37	0	2.25	58.5
1952	0	0	0	0	0	11.9	191	5.59	0	0	0	0	16.9
1953	0	0	0	0	0	11.5	4.0	19.2	298	130	6.5	.5	39.1
1954	0	0	0	0	18.6	10.1	7.31	19.01	11.8	3.19	.35	.1	4.93
1955	.04	.34	1.15	.55	0	50.6	302	174	16.1	1.11	.31	0	45.5
1956	0	0	0	0	0	33.4	124	15.5	1.15	.02	0	0	14.4
1957	0	0	0	0	.04	4.43	.2	0	0	0	0	0	.39
1958	0	0	0	0	0	34.1	113	.68	0	0	0	0	12.2
1959	0	0	0	0	0	14.0	.09	0	51.5	12.7	0	0	4.86
1960	0	0	0	0	0	260	202	6.16	5.60	1.28	0	0	39.6

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0	0	0	0	0	0	31,010	10,760	459	23	0	134	42,390
1952	0	0	0	0	0	0	734	11,340	221	0	0	0	12,300
1953	0	0	0	0	0	0	704	240	1,180	17,760	8,010	401	28,330
1954	0	0	0	0	1,030	621	435	554	703	196	22	7.9	5,570
1955	3.0	20	70	34	0	3,110	17,940	10,690	957	68	19	0	32,910
1956	0	0	0	0	0	2,050	7,400	951	68	1.2	0	0	10,470
1957	0	0	0	0	2.0	272	.39	0	0	0	0	0	284
1958	0	0	0	0	0	2,090	6,700	42	0	0	0	0	8,830
1959	0	0	0	0	0	860	5.6	0	1,870	781	0	0	3,520
1960	0	0	0	0	0	15,970	11,990	379	333	79	0	0	28,570

Yearly discharge, in cubic feet per second

Year	WSF	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	31.4	22,710
1951	1208	1,250	Apr. 18, 1951	0	58.5	42,390	53.5	42,390
1952	1238	550	Apr. 2, 1952	0	16.9	12,300	16.9	12,300
1953	1278	912	June 10, 1953	0	39.1	28,330	31.1	28,330
1954	1338	121	Feb. 24, 1954	0	4.93	3,570	5.06	3,660
1955	1388	850	Mar. 30, 1955	0	45.5	32,910	45.5	32,910
1956	1438	300	Apr. 11, 1956	0	14.4	10,470	14.4	10,470
1957	1508	a40	Mar. 28, 1957	0	.39	284	.39	284
1958	1558	984	Mar. 31, 1958	0	12.2	8,830	12.2	8,830
1959	1628	554	June 29, 1959	0	4.86	3,520	4.86	3,520
1960	1708	1,650	Mar. 27, 1960	0	39.6	28,570	-	-

a about.

1136. Long Creek near Noonan, N. Dak.

Location.--Lat 48°58'52", long 103°04'34", on south line of SE $\frac{1}{4}$ sec.36, T.164 N., R.96 W., on right bank 150 ft upstream from county highway bridge, 1.5 miles upstream from international boundary, and 7 miles northwest of Noonan.

Drainage area (revised).--2,500 sq mi, of which about 1,620 sq mi is probably noncontributing.

Records available.--October 1959 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,840 ft (from topographic map). Prior to Aug. 18, 1960, wire-weight gage at same site.

Extremes.--1959-60: Maximum discharge, 3,200 cfs Mar. 27, 1960 (gage height, 14.4 ft, from high-water mark, backwater from ice); no flow during several months.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1960	0	0.47	0.63	0.16	0.14	294	262	8.02	5.03	3.60	0	0	47.9

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1960	0	28	39	10	8.3	18,060	15,610	493	299	221	0	0	34,770

1138. Short Creek below international boundary near Roche Percee, Saskatchewan

(International gaging station)

Location.--Lat 49°01'42", long 102°51'00", in NW $\frac{1}{4}$ sec.11, T.1, T.7 W., second meridian, 4 miles southwest of Roche Percee and 5 miles upstream from mouth.

Drainage area.--480 sq mi (revised).

Records available.--March to September 1960.

Gage.--Water-stage recorder.

Extremes.--1959-60: Maximum discharge, 1,360 cfs Mar. 28, 1960 (gage height, 14.39 ft); no flow for many days.

Cooperation.--This station is one of the international gaging stations maintained by Canada under agreement with the United States.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1960	-	-	-	-	-	122	108	3.4	1.7	0.4	3.4	0.04	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1960	-	-	-	-	-	7,510	6,420	210	103	25	210	3	-

1140. Souris River near Sherwood, N. Dak.

(International gaging station)

Location.--Lat 48°59'24", long 101°57'28", in NW¹SE¹NE¹ sec.33, T.164 N., R.87 W., on right bank 0.8 mile downstream from international boundary and 16 miles northwest of Sherwood.

Drainage area (revised).--9,650 sq mi, approximately, of which about 6,400 sq mi is probably noncontributing.

Records available.--March 1930 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder and concrete control. Datum of gage is 1,604.00 ft above mean sea level, datum of 1929. Prior to Apr. 8, 1935, staff gage at same site and datum.

Average discharge.--30 years (1930-60), 106 cfs (76,740 acre-ft per year); median of yearly mean discharges, 72 cfs (52,100 acre-ft per year).

Extremes.--1930-60: Maximum discharge, 7,400 cfs Apr. 28, 1948 (gage height, 23.80 ft); no flow for periods in each year 1930-42, 1946, 1959.
Maximum stage known, that of Apr. 28, 1948. Flood in 1927 reached a stage of about 22 ft, from information by local residents.

Remarks.--Regulation by reservoirs in Canada. Some small diversions for irrigation and municipal and industrial supply.

Cooperation.--This station is maintained by the United States under agreement with Canada.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	9.03	8.78	5.5	6.1	5.2	6.5	1,197	1,453	153	38.2	21.1	14.3	244
1952	21.0	18.5	8.5	2.67	3.50	37.2	7.15	97.8	24.2	6.41	8.37		79.9
1953	5.24	6.39	3.76	2.96	2.85	85.6	341	144	954	1,050	179	36.7	235
1954	12.9	17.9	13.2	8.58	26.0	107	150	128	399	158	31.1	42.5	90.9
1955	57.3	65.4	26.7	8.65	6.83	6.42	2,133	1,206	399	157	50.3	25.4	345
1956	32.7	21.0	7.73	3.13	2.49	139	1,756	570	158	238	64.9	16.2	248
1957	20.6	20.9	8.33	3.98	1.05	115	299	111	44.1	15.2	19.7	11.4	55.9
1958	4.93	10.6	4.49	1.63	1.74	124	410	44.2	10.9	3.95	1.03	.75	51.4
1959	1.48	1.69	.14	0	0	164	41.2	11.0	12.0	4.15	.90	1.08	20.0
1960	28.4	14.2	4.45	2.98	1.42	103	1,188	147	34.6	12.6	9.07	1.56	128

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	555	523	339	375	292	397	71,210	89,320	9,100	2,390	1,300	850	176,700
1952	1,290	1,100	524	164	201	2,290	42,570	6,020	1,600	1,490	394	379	58,020
1953	322	380	231	182	158	5,260	20,300	8,870	56,770	64,570	10,990	2,180	170,200
1954	795	1,060	813	527	1,440	6,600	8,940	7,740	23,740	9,710	1,910	2,530	65,900
1955	3,520	3,890	1,640	532	379	595	126,900	74,150	23,720	9,640	3,090	1,510	249,400
1956	2,010	1,250	475	193	143	8,530	103,300	35,050	9,390	14,650	3,990	964	179,900
1957	1,270	1,240	512	245	59	7,100	17,810	6,820	2,620	935	1,210	678	40,500
1958	303	650	276	112	96	7,630	24,410	2,720	651	243	66	45	37,180
1959	91	101	8.7	0	0	10,090	2,450	677	712	255	55	64	14,500
1960	1,740	843	274	183	82	6,310	70,690	9,070	2,060	777	558	93	92,680

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	128	92,680
1951	1208	2,680	May 10, 1951	4	244	176,700	246	178,100
1952	1258	1,200	Apr. 3, 1952	-	79.9	58,020	77.2	56,040
1953	1278	1,780	July 9, 1953	2.4	235	170,200	238	171,900
1954	1338	811	June 18, 1954	7.5	90.9	65,800	99.7	72,190
1955	1388	5,210	Apr. 5, 1955	4.2	345	249,400	337	244,100
1956	1458	3,560	Apr. 16, 1956	2.0	248	179,900	247	179,200
1957	1508	750	Mar. 25, 1957	.9	55.9	40,500	53.4	38,690
1958	1558	1,380	Apr. 2, 1958	.1	51.4	37,180	50.0	36,170
1959	1628	740	Mar. 23, 1959	0	20.0	14,500	23.7	17,160
1960	1708	2,670	Apr. 8, 1960	.2	128	92,680	-	-

1155. Lake Darling near Foxholm, N. Dak.

Location.--Lat 48°27'27", long 101°35'14", in NE¼NE¼ sec.1, T.157 N., R.85 W., on control structure of Lake Darling Dam, reservoir of Fish and Wildlife Service, on Souris River about 6 miles north of Foxholm and at mile 82.9 downstream from Canadian border (Geological Survey river plan and profile).

Drainage area (revised).--10,200 sq mi, approximately, of which about 6,700 sq mi is probably noncontributing.

Records available.--April 1936 to September 1960 (no winter records 1936-39).

Gage.--Staff gage. Datum of gage is 1,577.00 ft above mean sea level, datum of 1929 (Fish and Wildlife Service bench mark).

Extremes.--1937-60: Maximum contents observed, 130,000 acre-ft Apr. 23, 24, 1943 (gage height, 22.83 ft); minimum observed since April 1943 when reservoir was first filled to spillway level, 37,500 acre-ft Sept. 15, 16, 1959 (gage height, 11.50 ft).

Remarks.--Reservoir is formed by earth dam; storage began in April 1936; dam completed in July 1936. Usable capacity, 108,500 acre-ft between gage heights 0.0 ft (sill of control gates) and 21.0 ft (crest of spillway). Dead storage, 3,500 acre-ft. Figures given herein represent total contents. Water is used during periods of low flow at wildlife refuges downstream.

Contents, in acre-feet, on last day of month

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	a84,900	a80,600	a75,200	a65,200	a63,800	59,900	a93,900	88,100	87,200	a83,600	a83,200	a81,900
1952	78,900	73,500	65,200	59,100	56,300	60,300	94,200	86,700	85,400	83,400	a79,800	76,500
1953	a72,400	a71,300	a71,700	a71,200	69,400	74,300	a89,400	a96,300	112,000	106,600	a103,000	a96,200
1954	89,800	a84,700	a79,200	a73,000	a71,400	74,300	76,400	a79,300	a96,500	a88,500	a85,900	82,100
1955	80,400	79,600	77,400	75,800	73,000	75,900	121,700	108,000	102,500	a93,900	81,800	a72,100
1956	68,400	67,700	66,800	65,900	64,300	71,000	111,200	93,900	89,000	92,800	a85,800	79,400
1957	74,500	73,100	a71,800	69,600	68,000	72,800	a83,200	83,800	84,200	a78,600	a69,600	63,700
1958	a63,600	a62,200	a60,200	a58,800	57,500	63,600	a82,000	79,900	a74,700	a71,200	a63,200	58,900
1959	56,800	55,800	54,500	53,400	a51,300	59,000	51,900	49,700	a46,900	43,000	38,900	39,000
1960	40,300	41,800	41,600	a41,800	41,900	47,900	97,200	91,800	86,400	81,500	76,200	a69,000

a Interpolated.

1160. Souris River near Foxholm, N. Dak.

Location.--Lat 48°22'20", long 101°30'18", in SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.34, T.157 N., R.84 W., on left bank 30 ft upstream from county highway bridge, 3 miles east of Foxholm, 19 miles upstream from Des Lacs River, and at mile 98.3 downstream from Canadian border (Geological Survey river plan and profile).

Drainage area (revised).--10,200 sq mi, approximately, of which about 6,700 sq mi is probably noncontributing.

Records available.--June 1904 to November 1905, March to July 1906 (gage heights only), October 1936 to September 1960. Monthly discharge only for some periods, published in WSP 1308. Published as Mouse River near Foxholm, 1904-6.

Gage.--Water-stage recorder and concrete control. Datum of gage is 1,560.73 ft above mean sea level, datum of 1929. June 23, 1904, to July 31, 1906, staff gage at site 3.2 miles upstream at different datum. Apr. 1, 1937, to Mar. 25, 1938, staff gage at site 600 ft downstream, at datum about half a foot higher.

Average discharge.--25 years (1904-5, 1936-60), 109 cfs, unadjusted (78,910 acre-ft per year); median of yearly mean discharges, 61 cfs (44,200 acre-ft per year).

Extremes.--1904-6, 1936-60: Maximum discharge, 3,040 cfs May 16, 1948 (gage height, 14.79 ft); maximum reverse flow, 25 cfs Apr. 4, 1949, caused by backwater from Des Lacs River; no flow at times in many years.

Remarks.--Flow completely regulated since 1936 by Lake Darling and several smaller reservoirs (combined capacity, about 180,000 acre-ft, revised). Some small diversions for irrigation and municipal supply.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	9.20	122	134	131	33.2	90.9	629	1,652	168	23.9	21.8	6.55	254
1952	81.3	137	108	111	58.0	17.3	145	172	13.4	8.89	15.1	14.9	73.4
1953	17.5	17.4	14.7	17.8	15.2	16.2	98.7	30.1	702	1,238	170	100	204
1954	89.8	80.0	118	110	107	109	149	45.3	147	255	71.5	69.9	112
1955	66.5	54.7	53.4	51.7	45.9	58.9	1,361	1,497	548	250	217	162	365
1956	27.1	41.4	25.8	27.5	30.6	87.5	1,075	942	254	147	117	92.9	239
1957	87.2	43.5	44.5	36.5	35.8	41.1	119	56.5	54.8	47.1	93.5	60.4	60.1
1958	12.3	26.5	27.8	29.4	26.2	27.3	150	32.0	28.8	26.5	25.3	21.0	35.9
1959	22.2	24.8	24.8	25.2	16.2	15.5	138	31.2	14.0	23.5	28.7	19.7	31.9
1960	17.8	11.9	14.0	10.3	11.0	10.5	316	256	49.3	40.0	43.0	27.6	67.2

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	566	7,250	8,270	8,060	1,840	5,590	37,450	101,500	10,010	1,470	1,340	390	183,700
1952	5,000	8,130	6,610	6,810	3,340	1,060	8,640	10,560	797	547	966	889	53,510
1953	1,080	1,030	903	1,100	846	994	5,870	1,850	41,800	76,120	10,450	5,960	149,000
1954	5,520	4,760	7,230	6,780	5,930	6,690	8,690	2,790	8,760	15,690	4,390	4,160	81,590
1955	4,090	3,250	3,280	3,180	2,550	3,620	80,990	92,030	32,620	15,380	13,340	9,620	264,000
1956	1,670	2,460	1,590	1,690	1,760	5,380	63,970	57,920	15,110	9,070	7,200	5,530	173,400
1957	5,360	2,590	2,740	2,240	1,990	2,520	7,090	3,470	3,260	2,890	5,750	3,600	43,500
1958	757	1,580	1,710	1,800	1,460	1,680	8,920	1,970	1,710	1,630	1,570	1,250	26,020
1959	1,360	1,480	1,530	1,550	899	953	8,220	1,920	831	1,430	1,760	1,170	23,100
1960	1,090	709	863	636	636	643	18,800	15,720	2,940	2,460	2,650	1,650	48,800

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	126	91,600
1951	1208	2,120	May 14, 1951	1.0	254	183,700	239	187,400
1952	1238	325	Apr. 24, 1952	2.0	73.4	53,510	50.4	36,580
1953	1278	1,480	July 13, 14, 1953	8.1	204	148,000	224	162,500
1954	1338	444	June 24, 1954	2.7	112	81,590	103	74,708
1955	1388	2,330	Apr. 21, 1955	12	365	264,000	358	259,000
1956	1438	1,890	Apr. 22, 1956	21	239	173,400	246	178,300
1957	1508	187	Oct. 15, 1956	1.4	60.1	43,500	50.9	36,860
1958	1558	368	Apr. 30, 1958	1.2	35.9	26,020	36.4	26,340
1959	1628	329	Apr. 22, 1959	1.2	31.9	23,100	23.6	21,400
1960	1708	926	Apr. 14, 1960	.3	67.2	48,800	-	-

1165. Des Lacs River at Foxholm, N. Dak.

Location.--Lat 48°22'14", long 101°34'11", in NW1/4NE1/4 sec.2, T.156 N., R.85 W., on left bank 200 ft upstream from county highway bridge in Foxholm.

Drainage area (revised).--939 sq mi, of which about 400 sq mi is probably noncontributing.

Records available.--June 1904 to September 1906, October 1945 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 1,632.98 ft above mean sea level, datum of 1929. 1904-6, staff gage at about same site and datum as following gage. Oct. 1, 1945, to Aug. 30, 1948, staff gage at former bridge over former channel, 500 ft south-west of present site, at present datum. Aug. 31, 1948, to June 7, 1955, water-stage recorder at site 10 ft downstream from former bridge, at same datum. June 14 to Oct. 23, 1955, wire-weight gage at site 200 ft downstream from present gage at same datum.

Average discharge.--17 years (1904-6, 1945-60), 23.6 cfs (17,090 acre-ft per year); median of yearly mean discharges, 19 cfs (13,800 acre-ft per year).

Extremes.--1904-6, 1945-60: Maximum discharge, 2,000 cfs Apr. 4, 1949 (gage height, 18.04 ft, backwater from ice); no flow at times in some years.

Maximum stage known since 1886, about 18.8 ft in spring of 1939, from information by local residents.

Remarks.--Some regulation at low flow by a series of wildfowl refuge ponds, combined capacity about 64,000 acre-ft. Some small diversions for irrigation above station. Records of periodic chemical analyses for the period July 1946 to July 1951 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	19.2	9.6	9.1	8.1	4.4	2.4	412	158	55.7	33.5	21	23.2	62.8
1952	19.7	19.2	12.4	3.9	2.4	40.5	18.1	7.14	6.68	3.62	.44	.29	23.0
1953	30	65	1.81	.34	.21	11.6	5.53	8.63	99.1	89.0	25.6	18.9	21.8
1954	13.6	4.28	1.31	1.77	25.0	29.7	55.2	11.3	18.8	5.44	14.1	25.3	16.9
1955	24.6	11.2	2.29	1.27	.62	58.0	147	50.6	64.5	64.2	48.3	16.2	40.8
1956	23.1	4.75	.05	0	0	38.1	157	71.2	91.8	71.6	45.8	17.9	43.4
1957	6.55	3.28	2.90	1.43	.66	25.6	13.1	3.57	2.37	.30	1.85	2.24	5.37
1958	.91	1.03	.67	0	.66	53.6	24.8	1.66	.66	.54	.03	0	7.12
1959	.16	.24	0	0	0	13.2	5.00	.60	5.57	1.25	.14	1.26	2.29
1960	3.38	1.84	1.03	.47	.24	136	182	21.9	4.74	3.01	.55	.05	29.6

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,180	571	559	498	242	149	24,510	9,690	3,310	2,080	1,290	1,380	45,440
1952	1,210	1,140	760	242	141	2,490	9,570	439	397	223	27	17	16,660
1953	19	38	50	21	12	714	329	531	5,680	5,470	1,570	1,130	15,770
1954	834	254	80	48	1,390	1,830	3,280	693	1,120	334	864	1,500	12,330
1955	1,510	666	141	78	35	3,570	8,730	3,110	3,840	3,950	2,970	965	29,560
1956	1,420	282	3.4	0	0	2,340	9,340	4,380	5,460	4,400	2,820	1,070	31,520
1957	403	195	179	88	37	1,580	780	220	141	18	114	133	3,890
1958	56	61	41	0	37	3,300	1,480	114	39	33	8.3	0	5,160
1959	9.9	14	0	0	0	810	297	37	332	77	6.3	75	1,660
1960	208	110	63	29	14	8,340	10,840	1,340	282	185	34	3.2	21,450

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year			
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet		
		Discharge	Date							
1950	-	-	-	-	-	-	49.3	35,720	-	-
1951	1208	1,800	Apr. 6, 1951	0	62.8	45,440	63.9	45,440	-	-
1952	1238	850	Apr. 1, 1952	.1	23.0	16,660	18.8	13,650	-	-
1953	1278	775	July 2, 1953	.1	21.8	15,770	23.3	16,840	-	-
1954	1338	205	Apr. 6, 1954	.2	16.9	12,330	18.5	13,580	-	-
1955	1388	900	Mar. 31, 1955	.2	40.8	29,560	40.0	28,950	-	-
1956	1438	696	Apr. 12, 1956	0	43.4	31,520	42.1	30,590	-	-
1957	1508	150	Mar. 22, 1957	0	5.37	3,890	4.51	3,270	-	-
1958	1558	430	Mar. 29, 1958	0	7.12	5,160	6.94	5,030	-	-
1959	1628	105	June 28, 1959	0	2.29	1,660	2.79	2,020	-	-
1960	1708	1,020	Mar. 27, 1960	0	29.6	21,450	-	-	-	-

1175. Souris River above Minot, N. Dak.

Location.--Lat 48°14'45", long 101°22'15", NW $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 17, T.155 N., R.83 W., on right bank 180 ft downstream from county highway bridge, $3\frac{1}{2}$ miles west of Minot, 7 miles downstream from Des Lacs River, and at mile 124.1 downstream from Canadian border (Geological Survey river plan and profile).

Drainage area.--11,300 sq mi, approximately, of which about 7,100 sq mi is probably noncontributing.

Records available.--May 1903 to September 1960. Monthly discharge only for some periods, published in WSP 1308. Published as Mouse River at Minot, 1903-24; Souris River at Minot, 1927-28, 1929-34, and Souris River near Minot, 1928-29.

Gage.--Water-stage recorder and concrete control since Oct. 1, 1934. Datum of gage is 1,545.75 ft above mean sea level, datum of 1929. May 5, 1903, to Sept. 30, 1928, Oct. 1, 1929, to Sept. 30, 1934, staff or chain gage at mile 135.0 in Minot, at datum 12.5 ft lower. Oct. 1, 1928, to Sept. 30, 1929, staff or wire-weight gage at Saugstad Bridge at mile 145.8, 5 miles southeast of Minot at datum 19.2 ft lower than present datum. Records equivalent except those for periods of extreme low flow, as some industrial and sanitary waste enters river between the sites.

Average discharge.--57 years (1903-60), 145 cfs unadjusted (105,000 acre-ft per year); median of yearly mean discharges, 95 cfs (68,800 acre-ft per year).

Extremes.--1903-60: Maximum discharge, 12,000 cfs Apr. 20, 1904 (gage height, 21.9 ft, at site in Minot), from rating curve extended above 8,100 cfs; no flow at times in some years.

Maximum stage known at present site, about 23 ft in April 1904. Maximum stage known in Minot, at least 3 ft higher than 1904 peak, in 1881, according to Apr. 20, 1904, issue of Minot Daily Optic.

Remarks.--Flow almost completely regulated by Lake Darling and several smaller reservoirs (combined capacity, about 240,000 acre ft, revised) since 1936. Some small diversions for irrigation and municipal supply.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	28.5	125	140	137	46.2	74.8	117.3	1,816	285	65.2	44.7	31.2	332
1952	96.6	159	123	110	69.8	61.3	388	181	17.6	12.5	14.9	13.1	104
1953	17.7	18.1	14.9	17.4	14.5	32.6	99.2	70.6	778	1,393	203	114	233
1954	107	85.9	119	111	143	147	204	73.9	176	257	87.2	98.2	134
1955	89.7	67.4	54.6	52.1	46.5	124	1,482	1,586	656	307	268	178	410
1956	52.8	50.0	29.9	26.3	30.1	133	1,176	1,063	350	230	166	110	285
1957	89.2	48.9	48.4	39.4	34.4	68.5	141	60.2	58.7	46.9	91.6	66.4	66.2
1958	12.5	28.7	28.9	28.9	26.8	114	178	40.2	24.4	25.9	21.8	23.3	46.1
1959	23.6	22.5	24.9	25.3	17.8	36.4	140	45.0	22.9	16.2	34.9	19.5	35.6
1960	19.0	13.1	18.0	12.7	11.1	189	525	253	52.7	36.1	46.4	28.3	100

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,750	7,460	8,590	8,410	2,570	4,600	69,790	111,600	16,960	4,010	2,750	1,860	240,400
1952	5,940	9,440	7,570	6,760	4,020	3,770	23,100	11,120	1,050	768	917	780	75,240
1953	1,090	1,080	918	1,070	805	2,010	5,900	4,340	46,290	85,630	12,500	6,760	168,400
1954	6,580	5,110	7,330	6,800	7,830	9,060	12,150	4,550	10,500	15,800	5,360	5,850	96,920
1955	5,520	4,010	3,360	3,200	2,580	7,600	88,190	97,530	39,010	18,900	16,460	10,570	296,900
1956	3,250	2,980	1,840	1,620	1,730	8,190	69,980	65,390	20,810	14,110	10,200	6,570	206,700
1957	5,480	2,910	2,970	2,420	1,910	4,210	8,370	3,700	3,490	2,890	5,630	3,950	47,930
1958	771	1,710	1,780	1,780	1,490	7,010	10,620	2,470	1,450	1,590	1,340	1,380	33,390
1959	1,450	1,340	1,530	1,560	988	2,240	8,340	2,650	1,360	997	2,140	1,160	25,760
1960	1,170	778	1,100	783	641	11,610	31,220	15,570	3,140	2,220	2,850	1,680	72,760

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year			
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean		Acre-feet	
		Discharge	Date							
1950	-	-	-	-	-	-	-	-	-	133,200
1951	1208	2,280	May 16, 1951	10	332	240,400	14	339	245,500	
1952	1238	1,080	Apr. 1, 1952	2.7	104	75,240	76.3	35	55,370	
1953	1278	2,320	July 2, 1953	7	233	168,400	255	184	184,300	
1954	1358	468	June 27, 1954	6.8	134	96,920	175	96	90,790	
1955	1388	2,220	Apr. 22, 1955	40	410	296,900	43	292	292,100	
1956	1438	1,930	Apr. 23, 1956	18	285	206,700	219	210	210,000	
1957	1508	210	Mar. 24, 1957	3.1	66.2	47,930	56.4	40	40,850	
1958	1558	625	Mar. 30, 1958	2.2	46.1	33,390	46.2	33	33,450	
1959	1628	321	Mar. 24, 1959	4.7	35.6	25,760	33.8	24	24,480	
1960	1708	1,000	Mar. 29, 1960	4	100	72,760	-	-	-	

1200. Souris River near Verendrye, N. Dak.

Location.--Lat 48°09'35", long 100°43'45", in NW¼SW¼ sec.17, T.154 N., R.78 W., on left bank 2.7 miles north of Verendrye, 7½ miles southwest of (19 miles upstream from) mouth of Wintering River, and at mile 210.5 downstream from Canadian border (Geological Survey river plan and profile).

Drainage area (revised).--12,000 sq mi, approximately, of which about 7,400 sq mi is probably noncontributing.

Records available.--February to June 1933 (gage heights only), April 1937 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 1,464.87 ft above mean sea level, datum of 1929. February to June 1933, chain gage at site 4 miles upstream at datum 1.65 ft higher. Apr. 1, 1937, to Mar. 3, 1938, staff gage at present site, at datum 1.97 ft higher.

Average discharge.--23 years (1937-60), 168 cfs (121,600 acre-ft per year); median of yearly mean discharges, 130 cfs (94,100 acre-ft per year).

Extremes.--1937-60: Maximum discharge, about 4,200 cfs Apr. 8, 1949 (gage height, 17.7 ft, from high-water mark, backwater from ice); minimum discharge recorded, 0.3 cfs Aug. 11-19, 1937, Oct. 10-21, 1939.

Remarks.--Flow regulated by reservoirs in Canada and by Fish and Wildlife Service reservoirs on Souris and Des Lacs Rivers (combined capacity, about 240,000 acre-ft, revised). Some small diversions for irrigation and municipal supply. Records of chemical analyses for the periods October 1949 to August 1951, August 1952 to September 1960 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	39.2	118	147	139	74.1	66.0	1,461	1,590	726	126	67.6	43.9	383
1952	94.9	162	139	116	101	55.2	769	235	68.5	77.4	38.6	27.4	156
1953	21.6	35.4	19.5	17.4	16.0	107	149	174	790	1,599	299	130	282
1954	140	91.7	125	98.0	271	200	274	149	227	310	120	141	178
1955	119	92.5	70.6	70.0	57.2	156	1,426	1,607	855	351	289	208	443
1956	72.2	63.9	43.6	34.9	39.4	205	1,055	1,253	420	265	177	123	313
1957	107	75.8	56.0	43.2	34.3	79.9	187	89.2	88.0	49.7	98.2	87.1	83.1
1958	23.0	37.3	32.2	33.6	29.6	135	280	106	31.7	42.9	18.4	18.9	65.8
1959	26.0	29.1	21.7	25.2	21.9	87.8	121	80.0	25.5	23.6	24.1	22.3	42.4
1960	33.5	19.8	18.4	16.0	12.3	294	706	302	82.0	43.9	53.0	26.4	134

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2,410	6,990	9,060	8,550	4,110	4,060	86,930	97,770	43,200	7,740	4,160	2,610	277,600
1952	5,840	9,650	8,530	7,130	5,810	3,390	45,730	14,500	4,080	4,760	2,370	1,630	113,400
1953	1,330	2,100	1,200	1,070	891	6,590	8,860	10,720	47,020	98,320	18,360	7,720	204,200
1954	8,640	5,460	7,880	6,020	15,030	12,280	16,330	9,140	13,510	19,050	7,370	8,360	128,900
1955	7,310	5,510	4,340	4,300	3,180	9,580	84,870	8,800	50,850	21,590	17,740	12,360	320,400
1956	4,440	3,800	2,680	2,150	2,270	12,610	62,670	77,030	25,020	16,270	10,900	7,300	227,100
1957	6,570	4,510	3,440	2,660	1,900	4,920	11,150	5,490	5,240	3,050	6,040	5,180	60,150
1958	1,420	2,220	1,980	2,070	1,640	8,320	16,630	6,550	1,880	2,640	1,130	1,120	47,600
1959	1,600	1,730	1,340	1,550	1,220	5,400	7,200	4,920	1,520	1,450	1,480	1,320	30,730
1960	2,060	1,180	1,130	984	710	18,060	42,010	18,540	4,860	2,700	3,260	1,570	97,100

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	241	174,300
1951	1208	2,710	Apr. 12, 1951	18	383	277,600	391	283,200
1952	1238	2,050	Apr. 6, 1952	16	156	113,400	130	94,030
1953	1278	2,150	July 7, 1953	12	282	204,200	306	221,300
1954	1338	572	June 30, 1954	35	178	128,900	172	124,300
1955	1388	1,970	Apr. 26, 27, 1955	50	443	320,400	434	314,200
1956	1438	1,800	Apr. 30, 1956	30	313	227,100	318	230,700
1957	1508	386	Apr. 17, 1957	24	83.1	60,150	70.8	51,250
1958	1558	960	Apr. 2, 1958	11	65.8	47,600	64.4	46,650
1959	1628	302	May 1, 1959	7.6	42.4	30,730	42.0	30,430
1960	1708	1,180	Apr. 2, 1960	9	134	97,100	-	-

1202. Wintering River near Bergen, N. Dak.

Location.--Lat 47°55'50", long 100°40'15", on west line of sec.4, T.151 N., R.78 W., on left downstream wingwall of bridge, 6 miles southeast of Bergen.

Drainage area (revised).--176 sq mi, of which about 50 sq mi is probably noncontributing.

Records available.--October 1956 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,590 ft, from topographic map.

Extremes.--1956-60: Maximum discharge, 360 cfs Mar. 27, 1960 (gage height, 4.71 ft); no flow during several months each year.

Remarks.--Some regulation by Fish and Wildlife Service dams on Cottonwood and Wintering Lakes (controlled capacity, about 850 acre-ft). Records of chemical analyses for the period April 1957 to September 1960 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957	0	0	0	0	0	2.38	0.40	0	0	0.03	0.003	0	0.24
1958	0	0	0	0	0	5.70	2.99	.02	.03	23.5	0	0	2.73
1959	0	0	0	0	0	6.25	.15	0	10.7	.35	0	0	1.45
1960	.44	0	0	0	0	48.4	15.0	11.8	6.79	.03	.05	.14	6.93

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957	0	0	0	0	0	146	24	0	0	1.6	0.2	0	172
1958	0	0	0	0	0	351	178	1.0	1.6	1,450	0	0	1,980
1959	0	0	0	0	0	365	9.1	0	635	21	0	0	1,030
1960	27	0	0	0	0	2,970	890	723	404	1.8	3.4	8.3	5,030

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet	
		Discharge	Date						
1957	1508	15	Mar. 21, 1957	0	0.24	172	0.24	172	
1958	1558	121	July 2, 1958	0	2.73	1,980	2.73	1,980	
1959	1628	225	June 27, 1959	0	1.45	1,050	1.49	1,080	
1960	1708	360	Mar. 27, 1960	0	6.93	5,030	-	-	

1205. Wintering River near Karlsruhe, N. Dak.

Location--Lat 48°10'14", long 100°32'20", on line between secs. 10 and 11, T.154 N., R.77 W., on left bank 30 ft upstream from highway bridge, 4 miles upstream from mouth, and 7 miles northeast of Karlsruhe.

Drainage area (revised)--705 sq mi, of which about 420 sq mi is probably noncontributing.

Records available--March 1937 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage--Water-stage recorder. Altitude of gage is 1,480 ft (from river-profile map).

Average discharge--23 years (1937-60), 12.4 cfs (8,980 acre-ft per year); median of yearly mean discharges, 11 cfs (7,960 acre-ft per year).

Extremes--1937-60: Maximum discharge, 3,000 cfs Apr. 7, 1949, by velocity-area studies; maximum gage height, 12.0 ft Apr. 7, 1949 (channel choked by packed snow); no flow at times in many years.
Maximum stage known, that of Apr. 7, 1949.

Remarks--Flow regulated by Fish and Wildlife Service dams on Cottonwood and Wintering Lakes (combined capacity, about 850 acre-ft). Low flows affected by diversions for irrigation.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	5.72	3.85	2.7	2.6	0.62	0	11.0	56.7	26.8	11.2	4.49	5.25	17.4
1952	5.07	4.0	1.9	0	0	0	102	11.9	8.53	24.1	11.9	29.7	16.4
1953	12.1	7.97	4.27	3.42	3.56	26.0	56.9	47.5	32.7	28.0	7.81	4.38	19.6
1954	5.56	6.09	5.75	3.88	5.60	18.7	24.8	15.0	92.4	46.9	14.1	13.7	21.0
1955	11.4	8.27	6.32	3.00	.96	4.1	66.9	20.6	15.9	7.11	3.38	3.94	12.6
1956	4.65	3.62	1.61	.25	0	.33	69.6	18.7	8.41	4.89	1.60	3.62	9.70
1957	3.90	5.04	1.55	.74	.10	5.26	9.44	6.97	4.56	1.96	1.89	2.47	3.67
1958	2.92	4.15	2.45	1.01	.97	4.92	9.96	3.14	1.57	8.52	4.77	1.48	3.84
1959	2.03	1.76	.29	.13	0	8.46	6.72	4.45	3.16	2.00	.03	.35	2.46
1960	2.89	2.87	1.96	1.08	1.01	18.3	64.6	8.99	14.7	3.29	2.85	.75	10.2

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	352	229	167	159	35	0	6,560	2,260	1,590	691	276	312	12,630
1952	312	238	119	0	0	0	6,050	731	508	1,480	734	1,770	11,940
1953	742	474	262	210	198	1,600	3,380	2,920	1,950	1,720	480	261	14,200
1954	342	362	353	239	311	1,150	1,470	922	5,500	2,880	869	814	15,210
1955	701	492	389	184	54	250	3,980	1,270	947	437	208	234	9,150
1956	286	216	99	15	0	20	4,140	1,150	501	300	99	215	7,040
1957	240	300	95	45	5.6	324	562	429	271	121	116	147	2,680
1958	179	247	151	62	54	302	593	193	93	524	294	88	2,780
1959	125	105	18	7.9	0	520	400	274	188	123	1.8	21	1,780
1960	178	171	120	66	58	1,120	3,850	553	876	202	175	45	7,410

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet	
		Discharge	Date						
1950	-	-	-	-	-	-	26.3	-	19,010
1951	1208	450	Apr. 9, 1951	0	17.4	12,630	17.3	-	12,550
1952	1238	350	Apr. 7, 1952	0	16.4	11,940	17.6	-	12,750
1953	1278	141	Apr. 3, 1953	3	19.6	14,200	19.0	-	13,780
1954	1358	199	June 23, 1954	3.2	21.0	15,210	21.7	-	15,740
1955	1388	176	Apr. 5, 1955	0	12.6	9,150	11.3	-	8,160
1956	1438	200	Apr. 6, 1956	0	9.70	7,040	9.75	-	7,080
1957	1508	22	June 8, 1957	0	3.67	2,680	3.59	-	2,600
1958	1558	28	July 2, 1958	.1	3.84	2,780	3.38	-	2,450
1959	1628	21	Apr. 1, 1959	0	2.46	1,780	2.77	-	2,000
1960	1708	260	Apr. 1, 1960	0	10.2	7,410	-	-	-

1220. Souris River near Bantry, N. Dak.

Location.--Lat 48°30'20", long 100°26'04", in SE $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.14, T.158 N., R.76 W., on left bank 200 ft upstream from Nelson Bridge, 8 miles east of Bantry, 18 miles upstream from Willow Creek, and at mile 284.8 downstream from Canadian border (Geological Survey river plan and profile).

Drainage area (revised).--13,000 sq mi, approximately, of which about 8,100 sq mi is probably noncontributing.

Records available.--March 1937 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 1,427.56 ft above mean sea level, datum of 1929, Emerson Crookston supplementary adjustment of 1941. Prior to Mar. 16, 1938, staff gage at same site, at datum 0.17 ft lower.

Average discharge.--23 years (1937-60), 187 cfs (135,400 acre-ft per year); median of yearly mean discharges, 155 cfs (112,000 acre-ft per year).

Extremes.--1937-60: Maximum discharge, 4,760 cfs Apr. 13, 1949 (gage height, 13.76 ft, from floodmark); no flow at times in each year 1937-40.

Remarks.--Flow regulated by reservoirs in Canada and by Fish and Wildlife Service reservoirs on Souris, Des Lacs, and Wintaring Rivers (total capacity, about 240,000 acre-ft, revised). Diversions for irrigation of about 7,600 acres at Eaton Dam about 42 miles above station, and other small diversions for irrigation and municipal supply.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	55.7	112	143	142	88.4	45.6	1,238	1,444	1,277	200	88.8	71.5	409
1952	89.6	170	149	118	108	57.7	809	320	82.7	155	40.9	87.0	181
1953	59.5	47.9	27.6	23.5	27.2	68.3	132	406	797	1,616	547	141	326
1954	159	102	148	110	212	272	289	241	462	495	167	180	256
1955	160	141	84.7	65.0	55.7	120	1,148	1,594	1,117	451	325	232	459
1956	106	81.0	47.1	36.5	35.2	126	914	1,409	579	299	191	128	350
1957	110	111	60.8	47.7	36.8	95.1	108	155	145	52.1	97.9	102	93.7
1958	33.0	47.1	38.4	29.4	29.6	46.3	185	154	69.5	69.7	24.7	17.0	62.1
1959	26.3	33.0	20.0	23.5	22.1	94.3	58.4	43.8	110	39.3	18.6	23.0	42.7
1960	43.1	22.7	21.4	19.3	13.6	55.5	759	444	149	50.5	47.3	28.9	137

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	3,430	6,680	8,810	8,750	4,910	2,810	73,660	88,800	76,000	12,280	5,460	4,250	295,800
1952	5,510	10,100	9,160	7,260	6,230	3,550	48,170	19,660	4,920	9,500	2,510	5,180	131,800
1953	2,430	2,850	1,700	1,440	1,510	4,200	7,850	24,980	47,430	99,350	33,530	8,400	235,800
1954	9,790	6,040	9,130	6,770	11,750	16,740	17,190	14,800	27,490	30,300	10,590	10,730	171,000
1955	9,820	8,400	5,210	4,000	3,090	7,360	68,340	98,000	66,480	27,750	19,980	13,830	332,300
1956	6,510	4,820	2,900	2,250	2,030	7,770	54,410	86,650	34,470	18,380	11,730	7,620	239,500
1957	6,750	6,620	3,740	2,930	2,040	5,850	6,430	9,560	8,630	3,200	6,020	6,070	67,840
1958	2,030	2,600	2,360	1,800	1,640	2,850	11,020	9,480	4,130	4,290	1,520	1,010	44,930
1959	1,610	1,970	1,230	1,440	1,230	5,800	3,480	2,690	6,550	2,410	1,140	1,370	30,920
1960	2,650	1,350	1,320	1,180	781	3,410	45,180	27,310	8,890	3,110	2,510	1,720	99,810

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	286	207,000
1951	1208	2,220	Apr. 23, 1951	30	409	295,800	417	301,700
1952	1238	1,550	Apr. 14, 1952	30	181	131,800	157	114,000
1953	1278	1,770	July 17, 1953	22	326	255,800	351	253,800
1954	1358	750	July 4, 1954	65	236	171,000	234	169,500
1955	1388	1,920	May 4, 1955	50	459	332,300	446	323,100
1956	1458	1,700	May 10, 1956	26	330	239,500	334	242,400
1957	1508	390	May 24, 1957	28	93.7	67,840	80.0	57,920
1958	1558	400	Apr. 6, 1958	13	62.1	44,930	58.8	42,550
1959	1628	289	May 31, 1959	7.8	42.7	30,920	43.4	31,430
1960	1708	1,120	Apr. 9, 1960	9	137	99,810	-	-

1225. Willow Creek at Dunseith, N. Dak.

Location.--Lat 48°49'12", long 100°03'45", in NE¼NW¼ sec.36, T.162 N., R.73 W., on right downstream wingwall of county road bridge, 0.4 mile northwest of railway station in Dunseith.

Drainage area.--142 sq mi, of which about 51 sq mi is probably noncontributing.

Records available.--September 1953 to September 1960.

Gage.--Water-stage recorder. Prior to July 16, 1957, wire-weight gage at same site. Datum of gage is 1,700.00 ft above mean sea level, datum of 1929, Emerson-Crookston supplementary adjustment of 1941.

Average discharge.--7 years (1953-60), 23.0 cfs (16,650 acre-ft per year).

Extremes.--1953-60: Maximum discharge, 410 cfs Apr. 17, 1960 (gage height, 14.6 ft); maximum gage height, 15.30 ft Apr. 5, 1955; no flow for some days each year except 1955-56.

Remarks.--Occasional minor regulation from changes in stoplogs at Willow Lake Outlet.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	0	-	-
1954	0.03	0.10	0.06	0	0.18	0.33	1.03	0.68	113	103	7.51	9.39	19.6
1955	12.4	5.66	10.7	6.4	.28	9.0	226	88.8	69.9	142	17.7	2.83	49.4
1956	2.27	1.69	1.03	.26	2.80	.28	86.7	173	61.9	58.0	15.1	2.78	34.0
1957	.31	.36	.05	.09	0	4.4	28.8	17.2	8.39	.95	1.17	.14	5.14
1958	6.74	2.03	.85	.06	.24	3.82	40.0	7.38	.27	.18	0	0	5.11
1959	.129	.097	.05	.03	0	.30	.75	.56	4.28	.042	.305	.575	.272
1960	23.6	109	23.9	8.9	5.8	3.9	177	115	91.1	15.6	2.99	.23	47.8

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	0	-	0
1954	2.0	5.9	4.0	0	9.7	20	61	42	6,720	6,330	462	559	14,220
1955	764	337	657	391	16	555	13,420	5,460	4,160	8,750	1,090	168	35,770
1956	140	101	63	16	161	17	5,160	10,650	3,680	3,570	930	185	24,650
1957	19	21	3.2	5.6	0	270	1,700	1,080	499	59	72	8.5	3,720
1958	414	121	52	3.8	13	235	2,380	454	16	11	0	0	5,700
1959	8.0	5.8	3.1	1.8	0	18	44	34	25	2.6	19	34	1,195
1960	1,450	6,490	1,470	547	331	238	10,510	7,070	5,420	968	184	14	34,690

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-
1954	1338	254	June 30, 1954	0	19.6	14,220	22.0	15,960
1955	1388	366	Apr. 5, 1955	0	49.4	35,770	47.4	34,310
1956	1438	350	Apr. 24, 1956	-	34.0	24,650	33.6	24,390
1957	1508	50	Apr. 10, 1957	0	5.14	3,720	5.89	4,260
1958	1558	80	Apr. 7, 1958	0	5.11	3,700	4.33	3,130
1959	1628	33	Aug. 22, 1959	0	.272	195	13.3	9,590
1960	1708	410	Apr. 17, 1960	0	47.8	34,690	-	-

1231. Oak Creek at Lake Metigoshe Outlet near Bottineau, N. Dak.

Location.--Lat 48°57'56", long 100°21'47", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.3, T.163 N., R.75 W., at outlet of Lake Metigoshe, 10 miles northeast of Bottineau.

Drainage area.--59.0 sq mi (revised).

Records available.--October 1953 to September 1960.

Gage.--Water-stage recorder and concrete control. Datum of gage is 2,150.00 ft above mean sea level, datum of 1929, Emerson-Crookston supplementary adjustment of 1941. Prior to Jan. 20, 1955, staff gage at same site and datum. Gage is located 1 $\frac{1}{2}$ miles northeast of outlet of lake and is same as that used for station on Lake Metigoshe.

Average discharge.--7 years (1953-60), 5.16 cfs (3,740 acre-ft per year).

Extremes.--1953-60: Maximum daily discharge, 85 cfs May 7-10, 1955; maximum gage height, 9.01 ft May 30, 1960; no flow at times in each year.

Remarks.--Since 1959, some regulation due to a dam and control works on the outlet of Sharp Lake located on the principal tributary in Manitoba.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	0	0	0	0	0	0	0	0	24.8	15.2	1.69	3.41	3.75
1955	5.6	4.55	4.6	4.45	4.24	5.13	55.5	61.8	34.5	24.9	2.46	.03	17.4
1956	0	0	0	0	0	.12	8.92	27.6	17.9	20.5	4.13	.10	6.64
1957	0	0	0	0	.18	.61	5.50	7.63	4.41	1.69	.50	0	1.69
1958	0	0	0	0	0	0	0	0	0	0	0	0	0
1959	0	0	0	0	0	0	0	0	0	0	0	0	0
1960	0	0	0	0	0	0	28.8	28.1	21.7	.94	.82	.02	6.66

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	0	0	0	0	0	0	0	0	1,470	935	174	203	2,710
1955	345	271	284	274	235	315	3,300	3,800	2,050	1,530	151	2.0	12,560
1956	0	0	0	0	0	7.5	531	1,700	1,060	1,260	254	6.0	4,820
1957	0	0	0	0	1.0	37	327	469	263	104	18	0	1,220
1958	0	0	0	0	0	0	0	0	0	0	0	0	0
1959	0	0	0	0	0	0	0	0	0	0	0	0	0
1960	0	0	0	0	0	0	1,710	1,730	1,290	58	50	1.2	4,840

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-
1954	1438	57	June 19, 1954	0	3.75	2,710	4.99	3,610
1955	1438	a85	May 7-10, 1955	0	17.4	12,560	61.1	11,660
1956	1438	37	June 25, 26, 1956	0	6.64	4,820	6.64	4,820
1957	1508	12	Apr. 28, 1957	0	1.69	1,220	1.69	1,220
1958	1558	0	-	0	0	0	0	0
1959	1628	0	-	0	0	0	0	0
1960	1708	74	May 30, 1960	0	6.66	4,840	-	-

a Maximum daily discharge.

1234. Willow Creek near Willow City, N. Dak.

Location.--Lat 48°35'20", long 100°26'30", in NE¼NW¼ sec.23, T.159 N., R.76 W., on left bank 50 ft downstream from bridge on county road, 1½ miles upstream from Snake Creek, and 7 miles west of Willow City.

Drainage area.--1,160 sq mi, approximately, of which about 430 sq mi is probably noncontributing.

Records available.--August 1956 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,430 ft (from topographic map). Prior to Oct. 5, 1956, wire-weight gage at site 50 ft upstream at same datum.

Extremes.--1956-60: Maximum discharge, 1,190 cfs Apr. 9, 1960 (gage height, 14.03 ft); no flow at times each year.

A discharge of 1,340 cfs occurred Apr. 20, 1956, at a site 1 mile downstream below Snake Creek (computed from rating curve extended above 1,220 cfs).

Remarks.--Records of periodic chemical analyses for the period August 1955 to June 1956 are published in report of the Geological Survey for a site about 1 mile downstream as Willow Creek near Upham.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	-	-	-	-	-	-	-	-	-	-	-	1.84	-
1957	0	0	0	0	0.4	15.2	48.6	31.5	12.0	3.90	0	0	9.32
1958	0	0	0	0	0	11.0	38.3	8.31	.24	0	0	0	4.80
1959	0	0	0	0	0	0	2.41	0	0	.08	0	0	.20
1960	12.4	39.6	24.8	4.39	2.53	.84	475	195	162	30.4	2.20	.02	78.6

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	-	-	-	-	-	-	-	-	-	-	-	110	-
1957	0	0	0	0	24	936	2,890	1,940	716	240	0	0	6,750
1958	0	0	0	0	0	674	2,280	511	14	0	0	0	3,480
1959	0	0	0	0	0	0	143	0	0	5.0	0	0	148
1960	762	2,350	1,520	270	146	52	28,250	12,020	9,660	1,870	135	1.0	57,040

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1956	-	-	-	-	-	-	-	-
1957	1508	103	Mar. 29, 1957	0	9.32	6,750	9.32	6,750
1958	1558	114	Mar. 31, 1958	0	4.80	3,480	4.80	3,480
1959	1628	25	Apr. 2, 1959	0	.20	148	6.61	4,780
1960	1708	1,190	Apr. 9, 1960	0	78.6	57,040	-	-

1235.1. Deep River near Upham, N. Dak.

Location.--Lat 48°35'03", long 100°51'44", in SW¼ sec.22, T.159 N., R.79 W., 0.8 mile downstream from Little Deep River and 6.3 miles west of Upham.

Drainage area (revised).--975 sq mi, of which about 605 sq mi is probably noncontributing.

Records available.--September 1957 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,430 ft (from topographic map).

Extremes.--1957-60: Maximum discharge, 580 cfs Apr. 5, 1960 (gage height, 10.90 ft); no flow for part or all of each year.

Flood in April 1951 reached a stage of about 16 ft, from information by a local resident.

Remarks.--Records of periodic chemical analyses for the period June 1954 to June 1956 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957	-	-	-	-	-	-	-	-	-	-	-	0	-
1958	0	0	0	0	0	0.87	7.70	0.26	0	0	0	0	0.73
1959	0	0	0	0	0	0	0	0	0	0	0	0	0
1960	0	0	0	0	0	17.9	113	1.59	.02	0	0	0	10.9

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957	-	-	-	-	-	-	-	-	-	-	-	0	-
1958	0	0	0	0	0	54	458	16	0	0	0	0	528
1959	0	0	0	0	0	0	0	0	0	0	0	0	0
1960	0	0	0	0	0	1,100	6,700	98	1.4	0	0	0	7,900

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet	
		Discharge	Date						
1957	-	-	-	-	-	-	-	-	-
1958	1558	26	Apr. 6, 1958	0	0.73	528	0.73	528	0
1959	1628	0	-	0	0	0	0	0	0
1960	1708	580	Apr. 5, 1960	0	10.9	7,900	-	-	-

1236. Egg Creek near Granville, N. Dak.

Location.--Lat 48°21'18", long 100°49'19", on west line of sec.10, T.156 N., R.79 W., on right downstream wingwall of bridge, 2 miles downstream from Hay Coulee, 3.5 miles upstream from North Lake, and 6 miles northeast of Granville.

Drainage area (revised).--289 sq mi, of which about 150 sq mi is probably noncontributing.

Records available.--October 1956 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,478.14 ft above mean sea level, datum of 1929 (levels by Bureau of Reclamation).

Extremes.--1956-60: Maximum discharge, 258 cfs Mar. 28, 1960 (gage height, 5.44 ft); no flow most of time.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957	0	0	0	0	0	0	0	0	0	0	0	0	0
1958	0	0	0	0	0	10.2	9.11	0	0	0	0	0	1.61
1959	0	0	0	0	0	0	0	0	0	0	0	0	0
1960	0	0	0	0	0	23.5	15.1	.05	0	0	0	0	3.23

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957	0	0	0	0	0	0	0	0	0	0	0	0	0
1958	0	0	0	0	0	625	542	0	0	0	0	0	1,170
1959	0	0	0	0	0	0	0	0	0	0	0	0	0
1960	0	0	0	0	0	1,440	897	3.4	0	0	0	0	2,340

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet	
		Discharge	Date						
1957	1508	-	-	0	0	0	0	0	0
1958	1558	99	Mar. 28, 1958	0	1.61	1,170	1.61	1,170	0
1959	1628	0	-	0	0	0	0	0	0
1960	1708	258	Mar. 28, 1960	0	3.23	2,340	-	-	-

1237. Cut Bank Creek at North Lake Outlet near Granville, N. Dak.

Location.--Lat 48°23'10", long 100°46'00", on south line of sec.29, T.157 N., R.78 W., on right downstream wingwall of bridge, 9 miles northeast of Granville and 13.5 miles east of Deering.

Drainage area (revised).--534 sq mi, of which about 290 sq mi is probably noncontributing.

Records available.--October 1956 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,477.25 ft above mean sea level, datum of 1929 (levels by Bureau of Reclamation).

Extremes.--1959-60: Maximum discharge, 1.0 cfs Apr. 13, 1960 (gage height, 0.62 ft); no flow most of time.

Remarks.--The only flow during the entire period of record occurred Apr. 8-23, 1960.

April 1960: Mean discharge, 0.22 cfs; runoff, 13 acre-ft.

Water year 1959-60: Mean discharge, 0.02 cfs; runoff, 13 acre-ft.

1239. Boundary Creek near Landa, N. Dak.

Location.--Lat 48°48'46", long 100°51'46", at west line of sec.36, T.182 N., R.79 W., on right bank 80 ft downstream from bridge on county road, 5 miles upstream from mouth, and 6 miles southeast of Landa.

Drainage area (revised).--230 sq mi, of which about 60 sq mi is probably noncontributing.

Records available.--September 1957 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,420.03 ft above mean sea level, datum of 1929.

Extremes.--1957-60: Maximum discharge, 660 cfs Mar. 30, 1960 (gage height, 10.22 ft); no flow for several months each year.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957	-	-	-	-	-	-	-	-	-	-	-	-	-
1958	0	0	0	0	0.14	6.67	6.80	0	0.04	0	0	0	1.14
1959	0	0	0	0	0	1.4	1.43	0	0	0	36.2	6.98	3.89
1960	46.3	11.1	0	0	0	50.0	177	21.0	19.9	0	0	0	27.0

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957	-	-	-	-	-	-	-	-	-	-	-	-	-
1958	0	0	0	0	7.9	410	405	0	2.2	0	0	0	825
1959	0	0	0	0	0	87	85	0	0	0	2,230	415	2,820
1960	2,840	662	0	0	0	3,070	10,550	1,290	1,180	0	0	0	19,590

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1957	-	-	-	-	-	-	-	-
1958	1558	87	Mar. 28, 1958	0	1.14	825	1.14	825
1959	1628	408	Aug. 23, 1959	0	3.89	2,820	8.73	6,320
1960	1708	660	Mar. 30, 1960	0	27.0	19,590	-	-

1240. Souris River near Westhope, N. Dak.

(International gaging station)

Location.--Lat 48°59'47", long 100°57'29", in SW 1/4 sec. 30, T.164 N., R.79 W., on left bank 1,200 ft upstream from second crossing of international boundary, 1 mile downstream from Fish and Wildlife Service Dam 357, 7 miles northeast of Westhope, 11 miles downstream from Boundary Creek, and at mile 358.2 downstream from international boundary (Geological Survey river plan and profile).

Drainage area.--17,600 sq mi, approximately. of which about 10,700 sq mi is probably noncontributing.

Records available.--July to October 1929, April 1930 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder and concrete control. Datum of gage is 1,402.52 ft above mean sea level, datum of 1929. Prior to Mar. 28, 1938, chain gage at site 6.3 miles upstream at datum 2.52 ft higher.

Average discharge.--30 years (1930-60), 185 cfs, unadjusted (133,900 acre-ft per year); median of yearly mean discharges, 97 cfs (70,200 acre-ft per year).

Extremes.--1929-60: Maximum discharge, 6,400 cfs Apr. 18, 1949; maximum gage height, 16.9 ft Apr. 20, 1949 (from floodmark); maximum daily reverse flow, 35 cfs Apr. 8, 1943, caused by backwater from downstream tributary inflow; no flow at times in some years.

Remarks.--Flow regulated by reservoirs in Canada and by Fish and Wildlife Service dams on Souris, Des Lacs, and Wintaring Rivers, and Willow Creek (combined capacity, about 300,000 acre-ft, revised). Diversion at Eaton Dam for irrigation of about 7,600 acres; and other small diversions for irrigation and municipal supply above station. Records of chemical analyses for the period June 1954 to September 1959; water temperatures for the period October 1954 to September 1960; and suspended-sediment loads for the period August 1956 to August 1959, are published in reports of the Geological Survey.

Cooperation.--This station is maintained by the United States under agreement with Canada.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	27.9	13.3	47.4	121	173	97.4	1,844	2,494	1,520	241	26.6	145	562
1952	73.0	65.3	162	39.4	27.8	119	784	540	983	935.9	76.1	13.7	167
1953	3.39	24.6	42.5	16.8	15.7	24.9	194	471	795	1,211	1,014	144	332
1954	155	176	105	140	135	152	347	238	789	1,561	389	71.2	357
1955	450	183	101	67.9	69.2	71.6	2,111	2,029	1,499	621	281	122	635
1956	132	7.29	2.8	12.6	15.0	52.6	1,028	2,384	1,021	340	163	141	443
1957	114	186	55.0	44.7	26.6	37.9	17.7	139	188	72.8	26.5	23.1	77.8
1958	22.3	118	51.1	17.7	14.1	38	7.00	621	85.7	52.8	28.7	21.3	38.4
1959	14.7	1.03	1	1	0.5	95	28	74	24.9	19.2	16.4		8.59
1960	20.2	64.3	14.6	19.8	20.0	58.4	1,631	843	453	20.7	13.7	33.0	264

† Corrected.

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,720	791	2,910	7,450	9,590	5,990	109,700	153,300	90,460	14,800	1,647	8,650	407,000
1952	4,490	3,880	9,980	2,420	1,600	7,290	46,680	33,230	585	5,790	4,680	812	121,400
1953	208	1,470	2,610	1,030	759	1,530	10,930	28,990	47,280	74,480	62,330	8,590	240,200
1954	9,560	10,480	6,480	8,520	7,520	9,370	20,670	14,640	46,950	95,960	23,920	4,230	258,400
1955	27,670	10,870	6,190	4,180	3,940	4,410	125,600	124,700	89,200	38,210	17,270	7,250	459,400
1956	8,140	434	171	774	863	3,230	61,190	146,600	60,740	20,930	9,990	8,390	321,500
1957	6,990	11,100	3,380	2,750	1,480	2,330	1,050	8,550	11,180	4,480	1,630	1,380	56,300
1958	1,370	7,010	3,140	1,090	784	23	417	3,820	5,100	2,020	1,770	1,270	27,810
1959	906	61	6.1	6.1	2.8	58	17	46	1,480	1,480	1,180	978	6,220
1960	1,240	3,830	899	1,220	1,150	3,590	97,070	51,850	26,960	1,270	843	1,970	191,900

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet	
		Discharge	Date						
1950	-	-	-	-	-	-	401	290,200	
1951	1208	3,100	Apr. 29 to May 1	2.2	562	407,000	580	419,900	
1952	1238	1,420	Apr. 24, 26, 27	-	167	121,400	148	107,400	
1953	1278	1,550	Aug. 13, 1953	1.9	332	240,200	363	262,400	
1954	1338	1,780	July 13, 1954	7	357	258,400	382	276,600	
1955	1398	3,500	Apr. 14, 1955	25	635	459,400	585	423,400	
1956	1438	3,040	May 21, 1956	1	443	321,500	460	334,200	
1957	1508	367	Nov. 9, 1956	3.5	77.8	56,300	64.0	46,350	
1958	1558	563	May 12, 1958	0	38.4	27,810	23.8	17,270	
1959	1628	187	June 3, 1959	-	8.59	6,220	15.5	11,220	
1960	1708	2,120	Apr. 23, 1960	6.3	264	191,900	-		

1245. Isabella River near Isabella, Minn.

Location.--Lat 47°48'00", long 91°31'15", in NW¼NE¼ sec.6, T.61 N., R.9 W., on left bank 200 ft upstream from Bald Eagle Lake, half a mile upstream from Snake River, and 14½ miles northwest of Isabella.

Drainage area.--341 sq mi.

Records available.--October 1952 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,453.10 ft above mean sea level, datum of 1929.

Average discharge.--8 years (1952-60), 286 cfs.

Extremes.--1952-60: Maximum discharge, 3,550 cfs May 4, 1954 (gage height, 9.31 ft); minimum, 42 cfs Sept. 23, 1960 (gage height, 3.14 ft).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	150	172	136	101	91.4	104	484	918	815	348	343	423	341
1954	172	106	101	79.7	79.7	71.0	869	1,794	714	218	81.0	88.2	566
1955	110	1126	98.6	71.3	60.9	59.9	591	415	446	97.2	166	74.3	192
1956	150	226	161	92.2	70.6	61.0	391	1,715	483	251	202	222	337
1957	103	194	142	106	83.6	81.8	926	886	675	528	121	90.8	329
1958	88.7	176	112	71.4	68.7	63.1	334	236	182	128	166	456	173
1959	227	293	170	83.5	55.3	52.8	155	580	582	186	252	504	262
1960	362	236	138	111	86.8	65.9	665	1,197	430	95.0	68.4	48.0	292

† Corrected.

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	0.51	0.56	0.46	0.34	0.28	0.35	1.58	3.10	2.67	1.18	1.16	1.36	13.57
1954	.58	.35	.34	.27	.24	.24	2.84	6.07	2.33	.74	.27	.28	14.56
1955	.37	.41	.33	.24	.19	.20	1.90	1.40	1.46	.33	.56	.24	7.63
1956	.51	.74	.55	.31	.22	.21	1.28	5.80	1.58	.85	.88	.73	13.46
1957	.35	.63	.48	.36	.26	.28	3.05	3.00	2.21	1.79	.41	.36	13.10
1958	.30	.58	.38	.24	.21	.21	1.09	.80	.60	.43	.56	1.48	6.89
1959	.77	.96	.57	.28	.17	.18	.51	1.96	1.90	.63	.85	1.65	10.43
1960	1.22	.77	.47	.38	.27	.22	2.18	4.05	1.41	.32	.23	.16	11.68

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-
1953	1278	1,580	June 3, 1953	75	341	1.00	13.57	335	13.31
1954	1338	3,550	May 4, 1954	52	366	1.07	14.56	362	14.40
1955	1388	1,020	June 12, 1955	46	192	.563	7.63	269	8.32
1956	1438	2,720	May 16, 1956	54	337	.988	13.46	329	13.12
1957	1508	3,360	Apr. 27, 1957	52	329	.965	13.10	323	12.90
1958	1558	731	Sept. 4, 1958	48	173	.507	6.89	159	7.93
1959	1628	1,270	Aug. 29, 1959	45	262	.768	10.43	266	10.59
1960	1708	2,190	Apr. 29, 1960	43	292	.856	11.68	-	-

1250. South Kawishiwi River near Ely, Minn.

Location.--Lat 47°50'24", long 91°41'43", in NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.23, T.62 N., R.11 W., on left bank 5 miles upstream from Birch Lake and 9 miles southeast of Ely.

Records available.--October 1951 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,430 ft (from topographic map prepared by Minnesota Power and Light Co.).

Average discharge.--9 years (1951-60), 454 cfs.

Extremes.--1951-60: Maximum discharge, 5,130 cfs May 4, 1954 (gage height, 7.25 ft); minimum, 37 cfs Sept. 28, 1960 (gage height, 1.50 ft).

Remarks.--Records of chemical analyses for the periods September 1955 to September 1957 and April 1958 to September 1959 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	933	708	456	274	155	123	705	1,056	414	885	1,125	694	631
1953	308	229	210	160	152	150	513	1,352	1,308	534	435	718	507
1954	312	186	177	170	150	131	998	3,141	1,262	510	191	98.8	614
1955	145	162	165	136	112	114	674	741	672	238	202	104	289
1956	170	242	255	192	156	124	412	2,550	878	385	299	320	501
1957	189	212	252	234	179	150	1,090	1,670	844	811	278	148	506
1958	140	206	205	146	146	118	298	379	290	152	225	500	233
1959	357	337	284	193	136	117	189	688	782	330	164	754	362
1960	456	405	241	191	147	101	692	1,848	764	241	129	58.4	441

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-
1952	1238	2,130	Apr. 26, 1952	115	631	-	517	-
1953	1278	1,900	June 5, 1953	143	507	-	561	-
1954	1338	5,130	May 4, 1954	84	614	-	567	-
1955	1388	1,270	June 14-15, 1955	89	289	-	365	-
1956	1438	3,780	May 18, 1956	101	501	-	560	-
1957	1508	4,380	Apr. 29, 1957	130	506	-	488	-
1958	1558	666	Sept. 11, 1958	113	233	-	269	-
1959	1628	1,130	Sept. 7-8, 9, 1959	114	362	-	372	-
1960	1708	2,670	May 8, 1960	40	441	-	-	-

1255. Stony River near Isabella, Minn.

Location.--Lat 47°41'10", long 91°38'20", in NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.17, T.60 N., R.10 W., on left bank 275 ft downstream from Slate Lake and bridge on State Highway 1, 11 miles upstream from Birch Lake, and 12 $\frac{1}{2}$ miles northwest of Isabella.

Drainage area.--180 sq mi.

Records available.--October 1952 to September 1960. Prior to October 1958, published as Stony River near Isabella.

Gage.--Water-stage recorder. Datum of gage is 1,632.45 ft above mean sea level, datum of 1929.

Average discharge.--8 years (1952-60), 138 cfs.

Extremes.--1952-60: Maximum discharge, 2,040 cfs Apr. 27, 1957 (gage height, 10.60 ft); minimum, 9.0 cfs Aug. 19, 24, 1959, Sept. 26, 27, 28, 1960; minimum gage height, 7.40 ft Sept. 26, 27, 28, 1960.

Remarks.--Records of chemical analyses for the periods September 1955 to September 1957 and April 1958 to September 1959 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	55.3	54.6	40.7	31.0	30.6	40.0	240	440	464	183	228	170	165
1954	65.5	43.8	46.5	32.3	27.6	21.8	466	945	350	112	31.8	23.7	181
1955	54.7	69.4	42.0	24.9	22.7	20.4	302	193	234	54.5	142	99.0	105
1956	133	99.3	60.0	32.9	27.3	25.3	175	864	151	68.3	67.3	168	157
1957	55.4	126	61.2	35.9	22.5	21.9	503	458	355	252	62.0	32.3	166
1958	53.6	110	57.5	27.8	27.1	25.5	137	120	169	86.9	127	294	103
1959	113	138	60.8	37.4	21.6	20.6	85.7	296	273	65.5	30.3	176	112
1960	144	74.9	34.3	27.5	19.9	12.8	278	502	139	55.5	42.2	12.7	112

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	0.35	0.34	0.26	0.20	0.18	0.26	1.49	2.82	2.88	1.17	1.46	1.05	12.46
1954	.42	.27	.30	.21	.16	.14	2.89	6.05	2.17	.71	.20	.15	13.67
1955	.35	.43	.27	.16	.13	.13	1.87	1.24	1.45	.35	.91	.61	7.90
1956	.85	.62	.38	.21	.16	.16	1.09	5.54	.93	.44	.43	1.04	11.85
1957	.35	.78	.39	.23	.13	.14	3.12	2.93	2.18	1.61	.40	.20	12.46
1958	.34	.68	.37	.18	.16	.16	.85	.77	1.05	.56	.81	1.82	7.75
1959	.72	.85	.52	.24	.13	.13	.53	1.90	1.69	.42	.19	1.09	8.41
1960	.82	.46	.22	.18	.12	.08	1.72	3.21	.86	.36	.27	.08	8.48

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-
1953	1278	786	June 3, 1953	28	165	0.917	12.46	163	12.50
1954	1358	1,750	May 4, 1954	17	181	1.01	13.67	182	13.73
1955	1388	553	Apr. 18, 1955	18	105	.583	7.90	115	8.70
1956	1438	1,410	May 16, 1956	22	157	.872	11.85	152	11.52
1957	1508	2,040	Apr. 27, 1957	18	166	.922	12.46	164	12.33
1958	1558	449	Sept. 9, 1958	23	103	.572	7.75	112	8.45
1959	1628	472	May 24, 1959	10	112	.622	8.41	105	7.92
1960	1708	980	Apr. 23, 1960	10	112	.622	8.48	-	-

1260. Dunka River near Babbitt, Minn.

Location.--Lat 47°41'55", long 91°52'05", in NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 9, T.60 N., R.12 W., on left bank 1.8 miles upstream from Birch Lake and 2 $\frac{1}{2}$ miles northeast of Babbitt.

Drainage area.--53.0 sq mi.

Records available.--October 1951 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,488.98 ft above mean sea level, datum of 1929.

Average discharge.--9 years (1951-60), 37.4 cfs.

Extremes.--1951-60: Maximum discharge, 691 cfs Apr. 16, 1954 (gage height, 7.84 ft); minimum, 0.7 cfs sometime during period Sept. 12-22, 1960 (gage height, 3.72 ft, from recorded range in stage).

Remarks.--Records of chemical analyses for the periods September 1955 to September 1957 and April 1957 to September 1959 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	42.0	40.0	20.2	4.67	3.57	2.43	133	54.8	42.4	57.5	46.8	45.7	41.2
1953	11.1	17.2	11.2	6.26	4.71	18.0	120	99.1	102	44.8	57.2	80.5	47.7
1954	18.7	12.1	8.79	4.22	3.87	4.09	217	251	144	15.4	5.54	5.68	57.5
1955	13.9	14.4	5.95	3.12	2.46	2.72	118	56.5	47.9	12.4	14.2	14.2	25.4
1956	16.3	17.7	7.99	5.81	3.32	3.35	112	182	17.3	24.0	13.2	17.3	33.5
1957	9.05	22.0	7.77	4.22	1.93	5.28	190	62.8	88.0	57.4	6.03	13.7	38.9
1958	12.3	28.1	9.53	4.31	3.23	5.71	56.4	33.5	29.3	51.7	21.2	104	28.2
1959	44.3	49.0	13.2	4.61	2.17	5.94	37.0	81.4	70.0	17.8	20.2	59.3	33.8
1960	36.5	15.4	6.35	4.80	2.58	2.94	98.6	122	43.1	20.1	9.08	2.23	30.4

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	0.91	0.84	0.44	0.10	0.07	0.05	2.80	1.19	0.89	1.25	1.02	0.96	10.52
1953	.24	.36	.24	.14	.09	.39	2.52	2.16	2.16	.98	1.24	1.70	12.22
1954	.41	.25	.19	.09	.08	.09	4.56	5.46	3.02	.34	.12	.12	14.73
1955	.30	.30	.13	.07	.05	.06	2.49	1.23	1.01	.27	.31	.30	6.52
1956	.35	.37	.17	.13	.07	.07	2.36	3.53	.36	.52	.29	.36	8.58
1957	.20	.46	.17	.09	.04	.11	3.99	1.37	1.85	1.25	.13	.29	9.95
1958	.27	.59	.23	.09	.06	.12	1.19	1.73	.62	.69	.46	2.19	7.22
1959	.96	1.03	.29	.10	.04	.13	.78	1.77	1.47	.39	.44	1.25	8.65
1960	.79	.32	.14	.10	.05	.06	2.08	2.65	.91	.44	.20	.05	7.79

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-
1952	1238	379	Apr. 22, 1952	2.1	41.2	0.777	10.52	35.8	9.17
1953	1278	261	Sept. 4, 1953	3.8	47.7	.900	12.22	47.7	12.23
1954	1338	691	Apr. 16, 1954	3.4	57.5	1.08	14.73	57.1	14.61
1955	1388	281	Apr. 13, 1955	1.9	25.4	.479	6.52	26.1	6.68
1956	1438	272	May 7, 1956	2.7	33.5	.632	8.58	33.2	8.52
1957	1508	641	Apr. 22, 1957	1.8	39.9	.754	9.95	39.8	10.19
1958	1558	185	Sept. 26, 1958	1.7	28.2	.532	7.22	32.9	8.43
1959	1628	192	June 13, 1959	1.8	33.8	.638	8.65	20.8	7.62
1960	1708	363	Apr. 26, 1960	.9	30.4	.574	7.79	-	-

1265. Bear Island River near Ely, Minn.

Location.--Lat 47°49'50", long 91°50'20", in SW $\frac{1}{4}$ sec.23, T.62 N., R.12 W., on right bank 10 ft downstream from State Highway 1 and 6 miles southeast of Ely.

Drainage area.--68.5 sq mi.

Records available.--October 1952 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,388.86 ft above mean sea level, datum of 1929.

Average discharge.--8 years (1952-60), 41.0 cfs.

Extremes.--1952-60: Maximum discharge, 423 cfs May 3, 1954 (gage height, 7.00 ft); maximum gage height recorded, 7.12 ft Apr. 3, 1955 (backwater from ice); minimum discharge, 0.6 cfs Sept. 15, 16, 1955 (gage height, 4.33 ft).

Remarks.--Flow regulated by several lakes. Records of chemical analyses for the periods September 1955 to September 1957 and April 1958 to September 1959 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	24.5	19.0	16.6	9.73	10.2	15.4	108	107	138	58.4	47.2	108	55.1
1954	39.9	20.9	17.7	14.8	12.1	10.7	170	309	138	55.1	13.0	5.10	67.4
1955	8.57	11.2	12.1	9.17	10.3	12.0	87.9	80.9	53.6	25.8	10.2	3.63	27.1
1956	7.81	20.1	23.2	15.9	12.0	10.8	119	197	48.6	26.9	21.0	21.8	43.7
1957	9.10	23.2	21.1	16.6	14.2	13.5	148	127	65.0	90.6	30.3	11.7	47.7
1958	6.51	20.4	27.9	19.7	12.7	12.5	36.1	33.6	29.9	23.6	7.9	9.6	20.0
1959	10.7	19.8	23.6	12.4	7.13	8.31	24.7	79.2	63.3	26.9	5.84	47.9	27.5
1960	43.3	26.0	15.9	13.6	9.42	6.55	64.2	152	102	22.0	10.5	3.75	39.1

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	0.41	0.31	0.28	0.16	0.16	0.26	1.76	1.80	2.25	0.98	0.79	1.75	10.92
1954	.67	.34	.30	.25	.18	.18	2.77	5.20	2.24	.93	.22	.08	13.36
1955	.14	.18	.20	.15	.16	.20	1.43	1.36	.87	.43	.17	.06	5.35
1956	.13	.33	.39	.27	.19	.18	1.93	3.32	.79	.45	.35	.36	8.69
1957	.15	.38	.36	.28	.22	.23	2.41	2.14	1.06	1.52	.51	.19	9.45
1958	.11	.33	.47	.33	.19	.21	.59	.57	.49	.40	.13	.16	3.98
1959	.18	.32	.40	.21	.11	.14	.40	1.33	1.03	.45	.10	.78	5.45
1960	.72	.42	.27	.23	.15	.11	1.04	2.55	1.66	.37	.18	.06	7.76

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-
1953	1278	182	June 1, 1953	8.8	55.1	0.804	10.92	56.7	11.23
1954	1338	423	May 3, 1954	4.5	67.4	.984	13.36	63.5	12.57
1955	1388	138	Apr. 20, 1955	.6	27.1	.396	5.35	28.7	5.68
1956	1438	264	May 5, 1956	3.6	43.7	.638	8.69	44.0	8.73
1957	1508	358	Apr. 24, 1957	3.8	47.7	.696	9.45	47.8	9.47
1958	1658	52	Apr. 28, 1958	3.0	20.0	.292	3.98	20.0	3.97
1959	1628	116	May 25, 1959	1.5	27.5	.401	5.45	30.2	5.96
1960	1708	228	May 6, 1960	1.4	39.1	.571	7.76	-	-

1270. Kawishiwi River near Winton, Minn.

Location--Lat 47°56'05", long 91°45'50", in NE¹/₄ NW¹/₄ sec. 20, T. 63 N., R. 11 W., at powerplant of Minnesota Power and Light Co., just upstream from Fall Lake, 1.8 miles east of Winton.

Drainage area--1,200 sq mi, approximately.

Records available--June 1905 to June 1907, October 1912 to September 1919 (fragmentary), September 1923 to September 1960.

Gage--Discharge computed from powerplant records. October 1912 to September 1919, water-stage recorder at same site, datum not determined.

Average discharge--41 years (1905-6, 1915-17, 1918-19, 1923-60), 969 cfs (unadjusted).

Extremes--1905-7, 1912-19, 1923-60: Maximum daily discharge, 16,000 cfs May 18, 1950; no flow at times.

Remarks--Flow regulated by powerplant and by Camp Six, Bald Eagle, Gabbro, Little Gabbro, Birch, White Iron, South Farm, Farm, and Garden Lakes. Records of chemical analyses for the period June to September 1959 are published in report of the Geological Survey.

Cooperation--Records for 1905-7 furnished by Minnesota Canal and Power Co., and 1923-60 furnished by Minnesota Power and Light Co.

Monthly and yearly mean discharge, in cubic feet per second (observed)

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,186	745	891	446	303	420	1,312	5,061	2,564	1,394	537	594	1,296
1952	1,627	1,343	908	762	413	289	1,479	2,238	766	2,245	2,473	1,394	1,338
1953	524	475	510	476	330	401	1,250	2,597	3,197	1,155	1,093	1,790	1,151
1954	746	549	498	388	319	378	2,194	7,518	3,025	1,174	517	296	1,476
1955	241	295	412	308	224	256	1,497	1,680	1,253	586	404	340	624
1956	429	490	644	489	309	242	1,121	5,341	1,646	767	591	665	1,066
1957	510	474	529	523	301	371	1,851	3,987	1,948	1,869	574	383	1,116
1958	297	408	504	428	272	331	288	647	773	373	427	1,302	504
1959	780	692	829	705	294	231	268	1,425	1,639	646	267	1,398	766
1960	927	760	565	465	355	352	912	3,947	1,482	373	388	228	900

Monthly and yearly runoff, in inches (adjusted) ^a/₁

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1.21	0.68	0.56	0.32	0.25	0.31	1.45	5.07	2.35	1.40	0.35	0.77	14.72
1952	1.58	1.22	0.85	0.41	0.25	0.23	1.74	2.31	777	2.01	2.46	1.29	15.12
1953	46	41	35	30	20	41	1.37	2.73	2.97	1.08	1.09	1.67	13.04
1954	59	35	37	27	25	27	2.46	7.31	2.86	1.07	30	12	16.22
1955	27	34	29	22	18	22	1.62	1.70	1.38	45	36	22	7.25
1956	42	52	49	32	22	20	1.20	5.40	1.65	72	58	61	12.33
1957	30	46	44	32	20	28	2.43	3.76	1.71	1.92	40	23	12.43
1958	24	48	37	24	18	21	71	81	65	39	43	1.19	5.90
1959	70	77	65	34	17	20	49	1.63	1.57	50	29	1.38	8.69
1960	89	66	39	33	20	16	1.25	3.93	1.43	36	18	05	9.83

^a Adjusted for change in contents in Camp Six, Bald Eagle, Gabbro, Little Gabbro, Birch, White Iron, South Farm, Farm, and Garden Lakes.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year				
		Observed				Adjusted ^a / ₁			Observed		Adjusted ^a / ₁		
		Maximum day		Minimum day	Mean	Mean	Per square mile	Runoff in inches	Mean	Mean	Runoff in inches		
		Discharge	Date										
1950	-	-	-	-	-	-	-	-	-	-	-	-	-
1951	1208	8,010	May 9, 1951	104	1,296	1,305	1.09	14.72	1,858	1,840	20.82		
1952	1258	4,530	Apr. 29, 1952	8	1,338	1,334	1.12	15.12	1,380	1,405	15.92		
1953	1278	4,160	June 9, 1953	0	1,151	1,153	.961	13.04	1,136	1,117	12.69		
1954	1358	10,100	May 7, 8, 1954	65	1,476	1,435	1.20	16.22	1,175	1,161	13.13		
1955	1398	2,640	Apr. 27, 1955	32	824	641	.534	7.25	1,405	1,398	15.81		
									876	688	7.78		
1956	1438	7,730	May 16, 1956	159	1,066	1,086	.905	12.33	1,062	1,067	12.10		
1957	1508	8,520	May 2, 1957	97	1,116	1,102	.918	12.43	1,091	1,092	12.32		
1958	1558	1,830	Sept. 16, 1958	61	504	523	.436	5.90	596	614	6.93		
1959	1628	2,900	June 11, 1959	32	766	769	.641	8.69	761	753	8.51		
1960	1708	5,780	May 8, 1960	65	900	865	.721	9.83	-	-	-		

^a Adjusted for change in contents in lakes listed in footnote to preceding table.

1275. Basswood River near Winton, Minn.

(International gaging station)

Location.--Lat 48°04'55", long 91°39'10", in sec.30, T.65 N., R.10 W., on Jackfish Bay of Basswood Lake, used to determine discharge at outlet (lat 48°06', long 91°39', in sec.19, T.65 N., R.10 W., on international boundary 14 miles northeast of Winton).

Drainage area.--1,740 sq mi, approximately (above outlet of Basswood Lake).

Records available.--March to June 1924, September 1925 to March 1928, January 1930 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 1,299.80 ft above mean sea level, adjustment of 1928, by Geodetic Survey of Canada. Prior to June 2, 1938, staff gages at several sites on Jackfish Bay at same datum. June 2 to Oct. 27, 1938, staff gage at Williams Island half a mile northeast of present gage at same datum.

Average discharge.--32 years (1925-27, 1930-60), 1,330 cfs.

Extremes.--1924, 1925-27, 1930-60: Maximum discharge, 15,600 cfs May 24, 1950 (gage height, 6.94 ft); minimum, 73 cfs Dec. 5, 1948.

Remarks.--Flow affected by storage on Kawishiwi River.

Cooperation.--This station is maintained by the United States under agreement with Canada.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,359	1,126	1,087	819	568	611	1,410	5,361	3,413	2,139	980	731	1,633
1952	1,625	1,898	1,524	1,091	822	563	1,195	3,015	1,350	1,988	3,332	2,242	1,726
1953	976	588	621	595	543	466	1,295	2,636	4,172	2,072	1,425	2,035	1,455
1954	1,110	734	659	637	526	556	1,549	8,275	4,190	2,434	915	540	1,856
1955	350	302	407	422	353	393	1,143	2,296	1,640	944	585	428	774
1956	485	584	774	741	618	425	1,061	4,854	3,258	1,370	1,039	813	1,338
1957	624	541	616	630	525	469	1,331	4,809	2,378	2,677	1,102	605	1,367
1958	420	428	570	579	476	479	465	512	834	601	443	877	557
1959	1,017	754	959	841	550	357	426	1,024	1,961	1,169	508	1,035	886
1960	1,022	930	725	671	520	551	614	3,890	2,617	938	535	392	1,120

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.90	0.72	0.72	0.54	0.34	0.40	0.90	3.55	2.19	1.42	0.58	0.47	12.73
1952	1.08	1.22	1.01	.72	.51	.37	.77	2.00	.87	1.32	2.21	1.44	13.52
1953	.65	.38	.41	.39	.32	.31	.83	1.75	2.68	1.37	.94	1.32	11.55
1954	.74	.47	.44	.42	.31	.37	.99	5.48	2.69	1.61	.61	.35	14.48
1955	.23	.19	.27	.28	.21	.26	.73	1.52	1.05	.63	.39	.27	6.03
1956	.32	.37	.51	.49	.38	.28	.68	3.22	2.09	.91	.69	.52	10.46
1957	.41	.35	.41	.42	.31	.31	.85	3.19	1.52	1.77	.73	.39	10.66
1958	.28	.27	.38	.38	.29	.32	.30	.34	.53	.40	.29	.56	4.34
1959	.67	.48	.64	.56	.33	.24	.27	.68	1.26	.77	.34	.68	6.92
1960	.68	.60	.48	.44	.32	.36	.39	2.58	1.68	.62	.35	.25	8.75

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	2,564	20.01
1951	1208	6,730	May 13-17, 1951	510	1,633	0.939	12.73	1,757	13.70
1952	1238	3,830	May 8, 1952	503	1,728	.992	13.52	1,487	11.65
1953	1278	4,740	June 13, 1953	427	1,455	.836	11.35	1,481	11.56
1954	1338	10,200	May 25, 1954	431	1,858	1.07	14.48	1,734	13.52
1955	1368	2,720	May 9, 1955	266	774	.445	6.03	840	6.54
1956	1438	6,550	May 26, 1956	388	1,338	.789	10.46	1,333	10.43
1957	1508	6,660	May 9, 1957	418	1,367	.786	10.66	1,337	10.42
1958	1558	1,220	Sept. 30, 1958	359	557	.320	4.34	667	5.20
1959	1628	2,320	June 3, 1959	324	886	.509	6.92	881	6.89
1960	1708	4,920	May 14, 1960	295	1,120	.644	8.75	-	-

1280. Namakan River at outlet of Lac la Croix, Ontario

(International gaging station)

Location.--Lat 48°21'20", long 92°12'50", at Campbell's Camp, 2½ miles west of outlet of Lac la Croix.Drainage area.--5,165 sq mi.Records available.--September 1921 to February 1922, April 1922 to September 1960, in reports of Geological Survey. Monthly discharge only for some periods, published in WSP 1308. August 1921 to September 1960 in reports of Canada Department of Northern Affairs and National Resources.Gage.--Staff gage. Gage readings have been reduced to elevations above mean sea level, United States and Canada Boundary Survey datum. Prior to October 1933, staff gages at various sites on Lac la Croix.Average discharge.--38 years (1922-60), 3,552 cfs.Extremes.--1921-60: Maximum discharge, 28,200 cfs May 31 to June 2, 1950 (elevation, 1,193.30 ft); minimum, 535 cfs at times in February, March, and April 1924 (elevation, 1,181.50 ft).Cooperation.--This station is one of the international gaging stations maintained by Canada under agreement with the United States.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	4,270	3,810	3,530	2,950	2,660	2,140	3,880	12,600	11,600	6,800	3,820	3,290	5,130
1952	4,020	5,360	5,130	4,160	3,200	2,390	3,820	7,210	5,810	5,200	6,690	5,540	4,880
1953	3,500	2,050	1,750	1,560	1,500	1,490	2,060	5,340	11,000	9,090	6,160	4,200	4,160
1954	3,670	2,730	2,460	2,070	1,700	1,490	2,600	14,900	13,800	8,210	4,040	2,400	5,010
1955	1,670	1,280	1,200	1,180	1,180	1,180	2,180	5,240	4,240	3,410	2,230	1,440	2,210
1956	1,940	2,520	2,890	2,700	2,380	1,960	2,410	8,840	10,300	5,820	4,100	2,480	4,030
1957	1,680	1,360	1,300	1,380	1,400	1,320	1,980	9,370	6,880	7,830	4,790	2,610	3,510
1958	1,980	1,660	2,090	2,030	1,850	1,560	1,530	1,890	2,000	2,060	1,500	1,300	1,790
1959	1,720	1,620	1,810	1,810	1,650	1,250	1,180	2,610	5,080	4,140	2,820	2,980	2,590
1960	5,340	2,780	2,570	2,010	1,830	1,600	1,730	5,890	7,870	3,950	2,240	1,840	3,140

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.96	0.83	0.78	0.66	0.54	0.48	0.84	2.81	2.51	1.52	0.85	0.71	13.49
1952	.90	1.16	1.14	.93	.67	.53	.83	1.61	1.25	1.16	1.50	1.19	12.87
1953	.78	.45	.39	.35	.30	.33	.45	1.19	2.38	2.03	1.37	.90	10.92
1954	.82	.59	.55	.46	.34	.33	.56	3.32	2.93	1.83	.90	.51	13.14
1955	.37	.28	.27	.26	.24	.27	.47	1.16	.91	.76	.50	.31	5.81
1956	.44	.55	.65	.60	.50	.44	.52	1.97	2.22	1.30	.91	.54	10.64
1957	.38	.29	.29	.31	.28	.30	.42	2.09	1.48	1.75	1.07	.57	9.23
1958	.44	.36	.46	.45	.38	.35	.34	.43	.44	.46	.33	.28	4.72
1959	.38	.35	.40	.40	.33	.28	.26	.59	1.09	.92	.63	.65	6.28
1960	.75	.60	.58	.45	.38	.36	.37	1.31	1.70	.88	.50	.40	8.28

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean
		Discharge	Date					
1950	-	-	-	-	-	-	-	7,430
1951	1208	14,700	May 22, 23, 1951	1,940	5,130	0.99	13.49	5,370
1952	1238	7,900	May 10-12, 1952	2,180	4,880	.94	12.87	4,280
1953	1278	12,200	June 19-21, 1953	1,490	4,160	.81	10.92	4,290
1954	1338	19,800	May 22, 27, 1954	1,490	5,010	.97	13.14	4,620
1955	1388	5,570	May 12-19, 1955	1,110	2,210	.43	5.81	2,480
1956	1438	12,900	June 1-3, 1956	1,610	4,030	.78	10.64	3,780
1957	1508	11,000	May 15, 16, 1957	1,260	3,510	.68	9.23	3,630
1958	1558	2,240	July 8, 9, 1958	1,180	1,790	.35	4.72	1,740
1959	1628	5,440	June 15, 16, 1959	1,120	2,390	.46	6.28	2,150
1960	1708	9,050	June 10, 1960	1,500	3,140	.61	8.28	-

1285. Pike River near Embarrass, Minn.

Location.--Lat 47°39'36", long 92°18'54", in NE $\frac{1}{4}$ sec.25, T.60 N., R.16 W., on left bank 75 ft downstream from bridge on County Road 373, 5.4 miles west of Embarrass, and 8.5 miles downstream from Sandy River.

Drainage area.--115 sq mi.

Records available.--October 1953 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,410.27 ft above mean sea level, datum of 1929.

Average discharge.--7 years (1953-60), 78.2 cfs.

Extremes.--1953-60: Maximum discharge, 1,750 cfs Apr. 17, 1954 (gage height, 10.28 ft); minimum daily, 3.2 cfs Feb. 24-26, 1955; minimum gage height, 3.19 ft Sept. 3, 4, 1954, Aug. 3, 1956.

Flood in May 1950 reached a stage of approximately 11.3 ft, from information by local residents (discharge, 2,400 cfs).

Remarks.--Records of chemical analyses for the periods September 1955 to September 1957 and April 1958 to September 1959 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	36.7	27.7	22.1	11.8	12.1	22.4	566	443	95.4	11.7	6.60	7.09	105
1955	16.8	16.1	10.2	5.15	3.57	5.15	296	116	123	53.7	41.2	59.3	62.0
1956	54.1	50.2	28.6	16.9	17.2	15.8	423	259	25.7	8.34	13.2	14.1	77.0
1957	14.4	36.6	11.8	7.36	5.39	7.07	414	148	125	181	24.4	23.3	83.2
1958	37.7	55.4	17.7	9.07	8.24	16.8	94.7	48.2	134	140	28.2	55.2	53.8
1959	48.4	95.6	25.6	8.47	5.95	12.5	125	292	159	57.1	37.3	166	86.2
1960	98.3	45.0	24.2	17.0	9.50	6.45	249	263	159	49.6	28.1	15.8	80.4

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	0.37	0.27	0.22	0.12	0.11	0.22	5.49	4.44	0.93	0.12	0.07	0.07	12.43
1955	.17	.16	.10	.05	.03	.05	2.88	1.16	1.19	.54	.41	.57	7.31
1956	.54	.49	.29	.17	.16	.16	4.11	2.60	.25	.08	.13	.14	9.12
1957	.14	.35	.12	.07	.05	.07	4.02	1.48	1.22	1.81	.24	.22	9.79
1958	.38	.54	.18	.09	.07	.17	.92	.48	1.30	1.41	.28	.54	6.36
1959	.49	.93	.26	.08	.05	.12	1.22	2.93	1.54	.57	.37	1.61	10.17
1960	.99	.44	.24	.17	.09	.06	2.41	2.64	1.54	.50	.28	.15	9.51

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-
1954	1338	1,750	Apr. 17, 1954	4.7	105	0.913	12.43	102	12.00
1955	1388	687	Apr. 14, 1955	3.2	62.0	.539	7.31	69.5	8.20
1956	1438	890	Apr. 21, 1956	4.4	77.0	.670	9.12	71.1	8.41
1957	1508	1,250	Apr. 22, 1957	5.2	83.2	.723	9.79	87.2	10.28
1958	1558	337	July 5, 1958	7.5	53.8	.468	6.56	58.7	6.94
1959	1628	491	May 7, 1959	5.4	86.2	.750	10.17	86.2	10.16
1960	1708	574	Apr. 27, 1960	6.3	80.4	.699	9.51	-	-

1290. Vermilion River below Vermilion Lake, near Tower, Minn.

Location.--Lat 47°57'41", long 92°28'33", in SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.2, T.6S N., R.17 W., on left bank 200 ft downstream from dam at outlet of Vermilion Lake, 4.4 miles upstream from Twomile Creek, and 14.2 miles northwest of Tower.

Drainage area.--483 sq mi.

Records available.--May 1911 to September 1917, June 1928 to September 1967.

Gage.--Water-stage recorder. Datum of gage is 1,350.36 ft above mean sea level, datum of 1929. May 17, 1911, to Sept. 30, 1917, and July 9, 1931, to Apr. 11, 1939, staff gage at same site and datum. June 26, 1928, to July 8, 1931, staff gage at datum 0.05 ft higher.

Average discharge.--38 years (1911-17, 1928-60), 303 cfs.

Extremes.--1911-17, 1928-60: Maximum discharge, 2,710 cfs May 23, 1950 (gage height, 4.68 ft); no flow Oct. 25-29, 1955, caused by temporary storage behind new concrete dam at outlet of Vermilion Lake; minimum unregulated discharge, 20 cfs Oct. 6, 8, 1956 (gage height, -1.00 ft).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	216	170	162	135	117	141	301	905	539	315	188	241	287
1952	347	436	367	272	195	148	342	557	288	308	476	281	334
1953	129	85.7	86.0	91.4	92	105	230	495	695	529	348	426	282
1954	269	156	152	147	139	138	517	1,608	1,066	535	231	125	425
1955	75.8	44.3	53.2	54.2	61.8	76.4	223	384	391	255	139	65.9	152
1956	59.4	35.3	79.1	96.2	106	93.1	354	984	551	249	148	61.5	235
1957	17.3	127.1	60.3	69.8	73.4	98.0	356	793	519	518	303	125	245
1958	101	129	141	114	99.6	97.6	147	164	210	308	168	113	150
1959	82.7	96.8	115	121	99.9	85.7	133	378	465	407	204	328	214
1960	286	241	183	154	108	80.4	220	705	761	314	142	50.1	271

† Corrected.

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.52	0.39	0.39	0.32	0.25	0.34	0.70	2.16	1.25	0.75	0.45	0.56	8.08
1952	.83	1.01	.88	.65	.44	.35	.79	1.28	.66	.74	1.14	.65	9.42
1953	.31	.20	.21	.22	.20	.25	.67	1.18	1.61	1.26	.83	.98	7.92
1954	.64	.36	.36	.35	.30	.33	1.19	3.84	2.46	1.28	.55	.29	11.95
1955	.18	.10	.13	.13	.13	.18	.52	.92	.90	.61	.33	.15	4.28
1956	.14	.08	.19	.23	.24	.22	.82	2.35	1.27	.60	.35	.14	6.63
1957	.04	.06	.14	.17	.16	.21	.78	1.89	1.18	1.24	.72	.29	6.88
1958	.24	.30	.34	.27	.21	.23	.34	.39	.49	.73	.40	.26	4.20
1959	.20	.23	.39	.29	.21	.20	.31	.90	1.07	.97	.49	.75	6.01
1960	.68	.56	.44	.37	.24	.19	.51	1.68	1.76	.75	.34	.12	7.64

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	550	15.47
1951	1208	1,100	May 9, 1951	109	287	0.594	8.08	357	9.50
1952	1238	727	May 4, 1952	136	354	.692	9.42	283	7.42
1953	1278	972	June 20, 1953	75	282	.584	7.92	305	8.56
1954	1338	1,840	May 15, 1954	89	425	.880	11.95	391	11.00
1955	1388	537	May 4, 1955	38	152	.315	4.28	153	4.28
1956	1438	1,310	May 11, 1956	0	235	.486	6.63	†229	6.46
1957	1508	1,080	May 2, 1957	7.8	245	.507	6.88	267	7.52
1958	1558	418	July 13, 1958	77	150	.311	4.20	148	4.14
1959	1628	657	June 9, 1959	52	214	.443	6.01	245	6.87
1960	1708	1,030	June 2, 1960	23	271	.561	7.64	-	-

† Corrected.

1295. Rainy River at International Falls, Minn.

Location.--Lat 48°36'30", long 93°24'10", in sec. 34, T.71 N., R.24 W., at dam of Minnesota and Ontario Paper Co., at outlet of Rainy Lake at International Falls, Minn., and Fort Frances, Ontario.

Drainage area.--14,900 sq mi.

Records available.--October 1905 to September 1960. Monthly discharge only for most of period, published in WSP 1308.

Gage.--Recording headwater gage at Fort Frances, Ontario. Datum of gage is at mean sea level (United States and Canadian Boundary Survey). Prior to Jan. 1, 1950, staff gage 3 miles northeast of Ranier, Minn., at same datum.

Average discharge.--55 years (1905-60), 9,107 cfs (unadjusted).

Extremes.--1905-60: Maximum daily discharge, 47,900 cfs July 7, 1950; minimum daily, 40 cfs Apr. 20, 1941 (corrected).

Remarks.--Since March 1909, flow completely regulated except at extreme high flows by Rainy and Namakan Lakes. Discharge computed from power output records of Minnesota Ontario Paper Co. plus computed discharge through sluices of dam. Runoff adjusted for change in contents in Rainy Lake.

Cooperation.--Records furnished by Department of Northern Affairs and National Resources, Canada.

Correction.--In WSP 1308, several figures were listed in error; the figures given here-with supersede those published in WSP 1308.

The maximum daily discharge for water year 1931 is 7,550 cfs Nov. 5, 1930, and for water year 1936 is 10,600 cfs June 2, 1936. The minimum daily discharges, in cubic feet per second, for water years 1934-36, 1940-42 are as follows:

1934.....	1,190	1940.....	510
1935.....	1,220	1941.....	40
1936.....	495	1942.....	5,170

Corrected figures of monthly mean discharge in water years 1925 and 1938 are as follows:

May 1925.....	5,980
August 1925.....	5,980
June 1938.....	33,600

Monthly and yearly mean discharge, in cubic feet per second (observed)

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	15,500	10,800	14,400	13,000	10,700	10,600	10,900	20,200	22,000	12,500	7,320	10,200	13,200
1952	11,700	11,600	16,200	15,200	12,800	11,500	9,840	5,680	5,690	20,400	11,800	12,300	12,100
1953	7,630	6,680	6,440	7,280	6,060	7,660	7,340	5,280	12,200	17,400	11,100	10,700	8,830
1954	10,300	9,200	8,880	9,010	9,230	9,830	8,550	25,600	38,900	18,300	9,050	8,510	13,800
1955	7,760	5,250	6,300	7,330	7,710	7,940	9,510	7,390	5,920	12,600	9,240	5,160	7,690
1956	5,070	6,490	8,620	10,100	10,000	10,700	13,600	17,700	19,800	12,800	10,000	8,700	11,200
1957	5,090	4,120	4,250	7,370	7,070	7,430	8,280	10,900	16,100	20,700	9,220	8,400	9,100
1958	8,690	8,440	8,540	9,300	8,780	8,790	6,250	3,210	3,290	5,020	3,790	3,660	6,470
1959	4,110	3,980	4,090	6,490	6,560	7,630	6,690	5,920	7,240	8,090	7,840	8,780	6,450
1960	9,300	9,590	9,330	9,470	8,220	7,600	6,380	4,480	13,500	9,310	7,280	6,690	8,420

Monthly and yearly runoff, in inches (adjusted) a/

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1.03	0.87	0.88	0.74	0.55	0.60	1.23	2.11	1.65	0.93	0.62	0.71	11.92
1952	.91	.92	1.07	.90	.66	.59	.86	.86	.80	1.61	1.05	.68	10.92
1953	.54	.51	.42	.40	.28	.37	.48	.50	1.72	1.36	.75	.75	8.08
1954	.76	.60	.61	.54	.45	.43	1.00	2.81	2.82	1.26	.62	.46	12.36
1955	.45	.46	.42	.43	.44	.44	.99	.70	.90	.90	.33	.30	6.76
1956	.56	.70	.67	.56	.50	.52	1.24	2.01	1.58	.91	.61	.38	10.25
1957	.29	.31	.42	.39	.36	.39	1.08	1.24	1.40	1.45	.63	.50	8.46
1958	.47	.69	.60	.54	.44	.45	.37	.22	.32	.48	.36	.27	5.21
1959	.37	.50	.50	.42	.35	.42	.47	.65	.97	.80	.59	.64	6.68
1960	.76	.66	.60	.51	.44	.39	.50	.70	1.43	.67	.44	.31	7.41

a Adjusted for change in contents in Rainy Lake.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year		
		Observed				Adjusted a/			Observed		Adjusted a/
		Momentary maximum		Minimum day	Mean	Mean	Per square mile	Runoff in inches	Mean	Mean	Runoff in inches
		Discharge	Date								
1950	(b)	-	-	-	-	-	-	-	21,600	21,500	19.68
1951	(b)	30,900	May 29, 31, 1951	3,230	13,200	13,100	0.88	11.92	13,100	13,200	12.04
1952	(b)	28,200	July 19, 22, 1952	2,850	12,100	11,900	.80	10.92	10,500	10,400	9.49
1953	(b)	32,800	July 3, 1953	2,730	8,830	8,850	.59	8.08	9,450	9,400	8.58
1954	(b)	40,100	June 10, 1954	3,040	13,800	13,600	.91	12.36	13,000	12,900	11.72
1955	(b)	27,200	July 4, 1955	1,860	7,690	7,440	.50	6.76	7,750	8,120	7.36
1956	(b)	28,300	June 10, 1956	3,580	11,200	11,200	.75	10.25	10,600	10,200	9.34
1957	(b)	34,200	July 1, 1957	1,320	9,100	9,290	.62	8.46	10,100	10,200	9.20
1958	(b)	10,800	Oct. 25, 1957	505	6,470	5,790	.39	5.21	5,350	5,280	4.82
1959	(b)	10,700	(c)	2,280	6,450	7,290	.49	6.68	7,790	8,000	7.33
1960	(b)	18,600	June 24, 25, 1960	1,690	8,420	8,120	.54	7.41	-	-	-

a Adjusted for change in contents in Rainy Lake.

b From reports of Department of Northern Affairs and National Resources, Canada.

c July 21, 23, Sept. 3, 9, 12, 1959.

1305. Sturgeon River near Chisholm, Minn.

Location.--Lat 47°40'25", long 92°54'00", in NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 20, T.60 N., R.20 W., on left bank 1,000 ft upstream from highway bridge, 0.6 mile (revised) downstream from East Branch Sturgeon River, and 11 $\frac{1}{2}$ miles north of Chisholm.

Drainage area.--187 sq mi.

Records available.--August 1942 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,306.7 ft above mean sea level, datum of 1929. Prior to Aug. 24, 1944, staff gage at site 1,000 ft downstream at different datum.

Average discharge.--18 years (1942-60), 120 cfs.

Extremes.--1942-60: Maximum discharge, 3,630 cfs May 7, 1950 (gage height, 6.41 ft), from rating curve extended above 1,600 cfs on basis of slope-area measurement of peak flow; minimum daily, 6.0 cfs Feb. 18-27, 1944; minimum gage height, 0.15 ft Oct. 5, 6, 1948.

Remarks.--Records of chemical analyses for the period July 1958 to September 1959 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	51.8	30.2	22.6	18.9	20.5	27.2	424	344	117	36.6	37.1	98.5	102
1952	167	135	72.1	34.0	29.0	22.2	411	139	62.3	154	221	50.6	125
1953	22.6	28.9	19.6	14.9	15.1	48.2	258	252	189	78.4	66.4	214	100
1954	72.7	50.4	39.6	29.9	32.9	44.9	653	517	171	49.4	22.8	23.2	142
1955	20.8	21.2	16.3	12.1	11.7	11.8	301	152	176	107	57.3	41.5	77.3
1956	51.2	44.2	34.0	20.7	18.8	18.9	456	288	57.2	18.4	25.2	14.2	87.0
1957	13.3	24.6	15.2	10.6	9.76	10.0	466	193	151	181	36.5	40.8	95.9
1958	63.2	64.7	34.1	20.5	17.9	25.0	87.4	48.5	173	137	32.3	58.2	63.5
1959	55.9	84.6	35.1	19.5	12.0	22.0	119	287	175	162	59.6	230	107
1960	151	77.5	49.5	36.2	23.7	16.4	324	310	211	68.8	42.2	25.6	111

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.32	0.18	0.14	0.12	0.11	0.17	2.53	2.12	0.70	0.23	0.23	0.59	7.44
1952	1.03	.80	.44	.21	.17	.14	2.45	.86	.37	.95	1.36	.30	9.08
1953	.14	.16	.11	.09	.08	.30	1.54	1.55	1.13	.48	.41	1.28	7.27
1954	.45	.30	.24	.18	.19	.28	3.90	3.19	1.02	.30	.14	.14	10.32
1955	.13	.13	.10	.07	.07	.07	1.79	.94	1.05	.66	.35	.25	5.61
1956	.32	.26	.21	.13	.11	.12	2.72	1.78	.34	.11	.16	.08	6.34
1957	.08	.15	.09	.07	.05	.06	2.78	1.19	.90	1.12	.22	.24	6.95
1958	.39	.39	.21	.13	.10	.15	.52	.30	1.03	.84	.20	.35	4.61
1959	.33	.50	.22	.12	.07	.14	.71	1.77	1.04	1.13	.37	1.37	7.77
1960	.95	.46	.31	.22	.14	.10	1.93	1.91	1.26	.42	.26	.15	8.09

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	194	14.08
1951	1208	-	-	-	102	-	7.04	125	9.07
1952	1238	1,420	Apr. 29, 1951	20	125	0.545	9.69	99.2	7.22
1953	1278	750	Sept. 5, 1953	14	100	.534	7.27	108	7.85
1954	1338	2,360	Apr. 16, 1954	17	142	.759	10.32	134	9.69
1955	1398	826	Apr. 13, 1955	11	77.3	.413	5.61	83.2	6.04
1956	1438	972	Apr. 22, 1956	8.5	87.0	.465	6.34	80.6	5.87
1957	1508	1,840	Apr. 21, 1957	7.8	95.9	.513	6.95	105	7.62
1958	1559	459	July 1, 1958	15	63.5	.340	4.61	64.4	4.67
1959	1628	648	July 11, 1959	11	107	.572	7.77	116	8.42
1960	1708	740	Apr. 15, 1960	15	111	.594	8.09	-	-

1310. Dark River near Chisholm, Minn.

Location.--Lat 47°41'27", long 92°49'15", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 12, T.60 N., R.20 W., on right bank 50 ft downstream from remains of abandoned highway bridge, 3 $\frac{1}{2}$ miles upstream from mouth, and 12 $\frac{1}{4}$ miles northeast of Chisholm.

Drainage area.--50.6 sq mi.

Records available.--August 1942 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,316.8 ft above mean sea level, datum of 1929 (surveyed by Topographic Division). Prior to Aug. 24, 1944, staff gage at site 50 ft upstream at same datum.

Average discharge.--18 years (1942-60), 36.5 cfs.

Extremes.--1942-60: Maximum discharge, 1,170 cfs May 7, 1950 (gage height, 7.10 ft); minimum, 0.3 cfs Aug. 3, 1956; minimum gage height, 0.87 ft Mar. 22, 23, 1949.

Remarks.--Records of chemical analyses for the periods September 1955 to September 1957 and April 1958 to September 1959 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	20.4	13.4	12.0	7.21	6.84	10.6	127	111	35.0	14.7	14.3	32.6	35.8
1952	57.5	41.4	18.0	9.91	9.38	9.61	115	32.2	18.0	72.8	64.8	14.0	58.6
1953	9.56	12.2	9.50	6.85	6.46	21.4	91.0	82.2	59.4	29.1	27.7	65.1	35.0
1954	15.7	13.8	9.27	8.00	12.1	17.6	198	152	37.1	11.5	7.65	10.1	41.0
1955	10.4	10.3	9.08	6.74	5.30	6.35	89.2	42.8	42.7	31.4	17.3	14.7	23.8
1956	18.4	16.8	10.0	8.14	6.32	8.57	117	94.3	14.5	7.02	13.1	6.78	26.7
1957	7.01	11.8	6.81	5.27	4.36	5.70	134	45.5	34.9	55.8	13.4	15.4	28.3
1958	18.7	18.2	8.27	6.38	5.41	7.26	29.5	16.3	47.3	61.1	14.8	23.1	21.3
1959	18.8	28.8	11.6	5.59	6.21	7.75	39.6	89.9	58.0	52.1	22.0	77.6	34.9
1960	39.2	21.2	13.5	8.36	6.78	7.67	92.9	95.3	64.6	33.9	22.1	10.8	34.7

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.44	0.28	0.26	0.15	0.13	0.23	2.63	2.38	0.72	0.31	0.31	0.67	8.51
1952	1.23	.85	.38	.21	.19	.21	2.38	.69	.37	1.55	1.38	1.28	9.73
1953	.20	.25	.20	.15	.12	.46	1.88	1.75	1.23	.62	.59	1.35	8.80
1954	.34	.29	.20	.17	.23	.38	4.08	3.25	.77	.25	.16	.21	10.35
1955	.22	.21	.19	.14	.10	.14	1.84	.91	.88	.67	.37	.35	5.97
1956	.39	.35	.21	.17	.13	.18	2.41	2.01	.30	.15	.28	.14	6.72
1957	.15	.24	.15	.11	.08	.12	2.77	.97	.72	1.19	.29	.32	7.11
1958	.40	.38	.18	.14	.07	.16	.61	.35	.98	1.30	.32	.48	5.37
1959	.43	.63	.26	.13	.13	.18	.87	2.05	1.28	1.19	.50	1.71	9.36
1960	.89	.47	.31	.19	.14	.17	2.05	2.17	1.42	.77	.50	.24	9.32

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	58.2	14.64
1951	1208	527	Apr. 30, 1951	5.5	35.8	0.626	8.51	39.8	9.99
1952	1238	308	Apr. 19, 1952	9.1	35.6	.715	9.73	31.5	7.92
1953	1278	218	Sept. 5, 1953	6.2	35.0	.648	8.80	35.7	8.98
1954	1338	782	Apr. 16, 1954	5.8	41.0	.759	10.33	40.2	10.12
1955	1388	208	Apr. 14, 1955	4.2	23.8	.441	5.97	25.1	6.30
1956	1438	255	Apr. 21, 1956	.6	26.7	.494	6.72	25.1	6.31
1957	1508	542	Apr. 21, 1957	4.0	28.3	.524	7.11	30.0	7.53
1958	1558	89	July 1, 1958	1.6	21.3	.394	5.37	22.4	5.75
1959	1628	*a180	July 10, 1959	4.2	34.9	.690	9.36	36.2	9.71
1960	1708	202	June 1, 1960	6.3	34.7	.686	9.32	-	-

* Revised.

a Maximum daily discharge.

1315. Little Pork River at Little Fork, Minn.

Location.--Lat 48°24', long 93°34', in NW $\frac{1}{4}$ sec.9, T.68 N., R.25 W., on left bank 100 ft downstream from bridge on State Highway 65 at town of Little Fork, $1\frac{1}{2}$ miles upstream from Beaver Creek, and 18 miles upstream from mouth.

Drainage area.--1,730 sq mi, approximately.

Records available.--June to November 1909, April to November 1910, April 1911 to June 1917, September 1917, October 1917 to March 1919 (gage heights only). June 1928 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,073.06 ft above mean sea level, datum of 1929. June 28, 1909, to Mar. 4, 1917, staff gage at same site and datum. Mar. 5 to Sept. 30, 1917, June 22, 1928, to June 21, 1936, chain gage and June 22, 1936, to July 20, 1937, wire-weight gage, at site 100 ft upstream at same datum.

Average discharge.--37 years (1911-16, 1928-60), 961 cfs.

Extremes.--1909-17, 1928-60: Maximum discharge, 25,000 cfs Apr. 18, 1916, May 11, 1950 (gage height, 37.00 ft); minimum observed, 21 cfs Aug. 26, 27, 1936.

Remarks.--Flow partly regulated by several small lakes above station. Stage-discharge relation affected at times by backwater from Rainy River.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	681	322	210	131	107	156	4,208	4,265	761	254	364	1,930	1,117
1952	1,910	1,415	602	185	147	130	3,243	1,043	318	1,047	1,107	247	950
1953	133	176	142	108	92.5	161	1,965	2,440	2,950	1,050	436	1,250	908
1954	393	288	248	128	119	205	5,971	5,129	1,569	316	148	170	1,224
1955	166	198	155	88.1	67.5	88.3	3,113	1,196	1,832	315	214	132	628
1956	362	320	211	133	104	105	3,960	3,440	840	348	188	128	844
1957	117	186	100	69.4	64.8	79.1	4,607	1,790	2,150	1,458	230	630	954
1958	716	905	266	105	77.6	124	674	468	1,030	1,331	212	190	510
1959	258	443	219	78.3	54.9	78.2	891	2,527	1,313	1,342	225	1,589	754
1960	972	512	256	154	88.3	50.2	2,242	2,014	1,990	414	235	258	764

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.45	0.21	0.14	0.09	0.06	0.10	2.71	2.84	0.49	0.17	0.24	1.24	8.74
1952	1.27	.91	.40	.12	.09	.09	2.09	.69	.20	.70	.74	.16	7.46
1953	.09	.11	.09	.07	.06	.11	1.27	1.62	1.91	.70	.29	.81	7.13
1954	.26	.19	.16	.09	.07	.14	3.85	3.42	1.01	.21	.10	.11	9.61
1955	.11	.13	.10	.06	.04	.06	2.01	.80	1.18	.21	.14	.09	4.93
1956	.24	.21	.14	.09	.06	.07	2.55	2.30	.54	.23	.13	.08	6.64
1957	.08	.12	.07	.05	.04	.05	2.97	1.19	1.39	.97	.15	.41	7.49
1958	.48	.58	.18	.07	.05	.08	.43	.31	.66	.89	.14	.12	3.99
1959	.17	.29	.15	.05	.03	.05	.57	1.58	.85	.89	.15	1.02	5.90
1960	.65	.33	.17	.10	.06	.03	1.45	1.34	1.28	.28	.16	.17	6.02

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	1,794	14.08
1951	1208	14,400	May 1, 1951	95	1,117	0.646	8.74	1,344	10.52
1952	1238	10,300	Apr. 17, 1952	115	950	.549	7.46	659	5.17
1953	1278	6,930	June 17, 1953	86	908	.525	7.13	949	7.45
1954	1338	16,700	Apr. 19, 1954	100	1,224	.708	9.61	1,190	9.34
1955	1388	7,740	Apr. 11, 1955	65	628	.363	4.93	659	5.18
1956	1438	9,410	Apr. 21, 1956	98	844	.489	6.64	803	6.32
1957	1508	15,600	Apr. 24, 1957	63	954	.551	7.49	1,078	8.46
1958	1558	3,160	July 5, 1958	70	510	.295	3.99	429	3.36
1959	1628	5,140	July 10, 1959	52	754	.436	5.90	823	6.44
1960	1708	8,500	Apr. 17, 1960	47	764	.442	6.02	-	-

1320. Big Fork River at Big Falls, Minn.

Location.--Lat 48°12', long 93°48', in sec.35, T.155 N., R.25 W., on left bank at village of Big Falls, 700 ft downstream from falls, 0.3 mile downstream from bridge on U.S. Highway 71, and 4½ miles upstream from Sturgeon River.

Drainage area.--1,460 sq mi, approximately.

Records available.--August to November 1909, April to November 1910, April 1911 to September 1912 (gage heights and discharge measurements only); June 1928 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,144.71 ft above mean sea level, datum of 1929. Prior to June 10, 1911, staff gage at railroad bridge about 0.4 mile upstream at different datum. June 10, 1911, to Dec. 17, 1937, staff gage or chain gage at site 200 ft upstream at same datum.

Average discharge.--32 years (1928-60), 634 cfs.

Extremes.--1909-12, 1928-60: Maximum discharge, 14,800 cfs May 8, 9, 1950; maximum gage height, 17.08 ft May 8, 1950; minimum discharge recorded, 7 cfs Aug. 7, 1939.

Remarks.--Some diurnal fluctuation at low flow caused by powerplant a quarter of a mile upstream.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	871	458	317	207	129	158	2,550	3,339	737	259	287	1,429	897
1952	1,604	926	650	321	265	227	1,966	949	346	416	514	309	710
1953	256	238	200	124	118	154	946	1,693	2,730	1,167	643	741	752
1954	603	520	320	216	220	245	3,283	3,246	1,174	304	185	220	879
1955	273	254	174	103	90.4	86.3	1,606	1,038	1,171	240	183	184	449
1956	283	239	163	115	106	97.3	2,014	2,249	697	197	110	110	531
1957	135	189	111	60.1	51.2	58.2	2,384	1,472	1,648	1,533	463	983	757
1958	900	914	366	151	132	209	375	281	524	675	135	111	399
1959	126	182	88.0	55.3	45.4	69.8	459	1,322	815	399	236	919	394
1960	662	416	265	184	132	117	1,140	1,140	839	261	142	269	464

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.69	0.35	0.25	0.16	0.09	0.12	1.95	2.64	0.56	0.20	0.23	1.09	8.33
1952	1.27	.71	.51	.25	.20	.18	1.52	.75	.26	.33	.41	.24	6.63
1953	.20	.18	.16	.10	.08	.12	.72	1.34	2.09	.92	.51	.57	6.99
1954	.48	.40	.25	.17	.16	.19	2.51	2.56	.90	.24	.15	.17	8.18
1955	.22	.19	.14	.08	.06	.07	1.23	.82	.90	.19	.14	.14	4.18
1956	.22	.18	.13	.09	.08	.08	1.54	1.78	.53	.16	.09	.08	4.96
1957	.11	.14	.09	.05	.04	.05	1.82	1.16	1.26	1.21	.37	.75	7.05
1958	.71	.70	.29	.12	.09	.16	.29	.22	.40	.53	.11	.08	3.70
1959	.10	.14	.07	.04	.03	.06	.35	1.04	.62	.32	.19	.70	3.66
1960	.52	.32	.21	.15	.10	.09	.87	.90	.64	.21	.11	.21	4.33

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches	
		Discharge	Date							
1950	-	-	-	-	-	-	-	1,344	12.50	
1951	1208	11,000	Apr. 29, 1951	110	897	0.614	8.33	1,026	9.53	
1952	1238	4,950	Apr. 18, 1952	219	710	.486	6.63	501	4.68	
1953	1278	7,500	June 17, 1953	90	752	.515	6.99	814	7.58	
1954	1338	9,730	Apr. 17, 1954	158	879	.602	8.18	816	7.60	
1955	1398	3,700	Apr. 12, 1955	82	449	.308	4.18	448	4.16	
1956	1438	6,240	Apr. 21, 1956	90	531	.364	4.96	510	4.77	
1957	1508	9,940	Apr. 23, 1957	48	757	.518	7.05	903	8.41	
1958	1558	1,300	July 15, 1958	95	399	.273	3.70	250	2.31	
1959	1628	1,860	May 23, 1959	41	394	.270	3.66	473	4.40	
1960	1708	4,270	Apr. 16, 1960	110	464	.318	4.33	-	-	

1335. Rainy River at Manitou Rapids, Minn.

(International gaging station)

Location.--Lat 48°38'04", long 93°54'47", in sec.36, T.160 N., R.26 W., on left bank of Manitou Rapids, $\frac{3}{2}$ miles east of Manitou Post Office and 4 miles west of Indus.

Drainage area.--19,400 sq mi, approximately.

Records available.--July 1928 to September 1960. Monthly discharge only for some periods, published in WSP 1308. October 1911 to October 1924 (gage heights only) at a site near Birchdale in files of Corps of Engineers. Published as "near Birchdale" 1932-34.

Gage.--Water-stage recorder. Datum of gage is 1,062.48 ft above mean sea level, datum of 1929. Prior to Nov. 10, 1934, chain gage at site near Birchdale 7 miles downstream at different datum.

Average discharge.--32 years (1928-60), 11,710 cfs.

Extremes.--1928-60: Maximum discharge, 71,600 cfs May 12, 1950 (gage height, 21.04 ft); minimum daily, 928 cfs Dec. 26, 1929.

Remarks.--Diurnal fluctuation caused by powerplant at International Falls. Some regulation at low and medium flows by Rainy and Namakin Lakes.

Cooperation.--This station is maintained by the United States under agreement with Canada.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	17,440	11,270	14,550	12,450	9,143	9,323	19,710	29,890	22,260	12,540	7,752	14,340	15,080
1952	15,720	14,510	16,870	15,090	13,550	11,740	15,630	8,760	7,180	21,250	13,580	12,100	13,820
1953	8,079	7,306	7,035	7,590	8,486	8,533	10,670	10,530	18,040	19,450	12,210	12,720	10,740
1954	11,150	9,615	9,677	9,419	9,614	10,070	20,010	32,960	37,450	17,840	8,955	8,344	15,440
1955	7,619	5,375	6,252	7,092	7,632	7,948	15,620	10,440	10,150	12,770	9,901	6,161	8,920
1956	6,427	6,966	8,919	10,350	10,840	11,020	22,320	25,280	21,160	13,710	10,510	9,256	13,053
1957	5,680	4,838	4,658	7,567	7,556	7,908	17,250	15,780	19,990	24,620	10,190	10,520	11,390
1958	11,150	11,150	9,668	10,080	9,575	9,516	7,675	4,459	5,263	8,609	4,566	4,166	7,986
1959	4,808	4,534	4,665	6,995	7,321	8,557	8,951	11,410	10,670	9,885	8,787	12,350	8,242
1960	11,390	10,950	10,030	10,400	8,970	7,940	10,510	8,540	17,370	10,660	7,580	7,560	10,140

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1.04	0.65	0.86	0.74	0.49	0.55	1.13	1.78	1.28	0.75	0.46	0.82	10.55
1952	.93	.82	1.00	.90	.74	.70	.90	.52	.41	1.26	.81	.70	9.69
1953	.48	.42	.42	.45	.35	.51	.61	.63	1.04	1.16	.73	.73	7.53
1954	.66	.55	.58	.56	.52	.60	1.15	1.96	2.15	1.06	.53	.48	10.80
1955	.45	.31	.37	.42	.41	.47	.90	.62	.58	.76	.58	.35	6.23
1956	.38	.40	.53	.61	.60	.65	1.28	1.50	1.22	.81	.62	.53	9.13
1957	.34	.28	.28	.45	.41	.47	.98	.94	1.15	1.46	.61	.61	7.98
1958	.66	.64	.57	.60	.51	.57	.44	.26	.30	.51	.27	.24	5.57
1959	.29	.26	.28	.42	.39	.51	.51	.68	.61	.59	.56	.71	5.77
1960	.68	.63	.60	.62	.49	.47	.60	.51	1.00	.63	.45	.43	7.11

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	24,330	17.05
1951	1208	49,000	May 5, 1951	4,960	15,080	0.777	10.55	15,590	10.75
1952	1238	30,400	July 23, 1952	4,960	13,820	.712	9.69	11,760	8.26
1953	1278	32,600	July 4, 1953	3,000	10,740	.554	7.53	11,420	8.00
1954	1358	41,300	Apr. 18, 1954	6,220	15,440	.796	10.80	14,500	10.14
1955	1388	24,500	July 5, 1955	2,980	8,920	.460	6.23	9,176	6.14
1956	1438	35,700	Apr. 22, 1956	4,970	13,050	.673	9.13	12,480	8.72
1957	1508	45,100	June 25, 1957	2,800	11,390	.587	7.98	12,800	8.95
1958	1558	14,200	Nov. 17, 1957	2,120	7,996	.412	5.57	6,479	4.53
1959	1628	17,900	Sept. 10, 1959	3,600	8,242	.425	5.77	9,780	6.85
1960	1708	22,800	June 13, 1960	4,040	10,140	.523	7.11	-	-

1342. Rapid River near Baudette, Minn.

Location--Lat 48°32'10", long 94°33'45", in NE $\frac{1}{4}$ sec.1, T.158 N., R.31 W., on left bank 75 ft upstream from bridge on State Highway 72, 1.2 miles downstream from North Branch Rapid River, and 12 miles south of Baudette.

Drainage area--543 sq mi.

Records available--October 1956 to September 1960.

Gage--Water-stage recorder. Datum of gage is 1,093.92 ft above mean sea level, datum of 1929 (Minnesota Highway Department bench mark).

Extremes--1956-60: Maximum discharge, 4,080 cfs Apr. 21, 1957 (gage height, 14.58 ft); minimum daily, 3.1 cfs Feb. 20-25, 1959; minimum gage height, 1.67 ft Sept. 22, 1958.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957	49.3	232	33.5	12.6	9.75	8.42	1,270	598	654	718	79.4	278	328
1958	477	441	35.7	7.00	6.32	15.1	82.4	56.3	67.5	746	91.9	20.6	172
1959	30.2	52.1	21.4	6.83	3.42	6.08	275	407	233	172	40.3	59.0	109
1960	97.3	53.1	15.0	6.80	5.67	3.84	388	193	360	201	169	169	138

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957	0.10	0.48	0.07	0.03	0.02	0.02	2.61	1.27	1.34	1.52	0.17	0.57	8.20
1958	1.01	.91	.08	.01	.01	.03	.17	.12	.14	1.58	.20	.04	4.30
1959	.06	.11	.05	.01	.007	.01	.57	.96	.48	.36	.09	.12	2.70
1960	.12	.11	.03	.02	.01	.008	.80	.41	.74	.43	.36	.35	3.48

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1957	1508	4,080	Apr. 21, 1957	7.7	328	0.604	8.20	382	9.55
1958	1558	1,500	July 8, 1958	4.5	172	.317	4.30	101	2.51
1959	1628	803	May 7, 1959	3.1	109	.201	2.70	114	2.86
1960	1708	831	June 28, 1960	3.3	138	.254	3.48	-	-

1395. Warroad River near Warroad, Minn.

Location.--Lat 48°52'00", long 95°21'20", in SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.12, T.162 N., R.17 W., on upstream handrail of bridge near center of span, half a mile upstream from Bulldog Run and 2 $\frac{1}{2}$ miles south of Warroad.

Drainage area.--110 sq mi, approximately.

Records available.--March 1946 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Chain gage. Datum of gage is 1,070.74 ft above mean sea level, datum of 1929 (levels by Stanley Johnson, consulting engineer and instructor at University of North Dakota).

Average discharge.--14 years (1946-60), 33.9 cfs.

Extremes.--1946-60: Maximum discharge, 1,410 cfs June 11, 1947 (gage height, 9.50 ft); no flow Mar. 28, 1947, Aug. 20-29, 1953, Sept. 11-16, 19-22, 1960.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	54.7	20.8	11.9	6.51	4.48	5.16	385	123	10.5	2.03	2.08	6.04	52.4
1952	6.80	4.38	3.31	2.25	1.96	2.18	153	26.0	17.0	152	21.1	4.17	32.9
1953	2.50	3.07	1.50	1.06	1.18	23.6	62.3	29.5	76.7	28.3	2.13	8.99	20.0
1954	15.1	10.2	4.40	2.63	4.18	3.68	198	128	55.6	2.33	1.99	1.03	35.6
1955	1.40	2.10	1.35	.84	.85	.91	99.0	41.5	48.1	4.50	1.19	2.57	16.9
1956	6.65	5.42	4.88	3.62	3.01	3.10	289	163	22.3	26.8	4.99	26.5	46.4
1957	5.12	43.3	4.86	3.47	2.90	30.1	117	43.8	54.4	120	9.10	30.1	38.7
1958	37.2	32.6	6.26	1.05	3.36	8.28	20.8	10.3	9.34	56.3	4.85	1.15	16.1
1959	5.92	19.1	15.1	3.88	2.79	13.4	129	50.0	16.0	15.9	3.26	1.35	22.9
1960	5.03	4.51	2.36	1.15	.98	.89	91.2	28.2	20.6	3.78	.95	.18	13.2

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.57	0.21	0.12	0.07	0.04	0.05	3.90	1.29	0.11	0.02	0.02	0.06	6.46
1952	.07	.04	.03	.02	.02	.02	1.56	.27	.17	1.59	.22	.04	4.05
1953	.03	.03	.02	.01	.01	.25	.63	.31	.78	.30	.02	.09	2.48
1954	.16	.10	.05	.03	.04	.04	2.01	1.34	.56	.02	.02	.01	4.38
1955	.01	.02	.01	.009	.008	.01	1.00	.43	.49	.05	.01	.03	2.08
1956	.07	.06	.05	.04	.03	.03	2.94	1.71	.23	.28	.05	.27	5.76
1957	.05	.44	.05	.04	.03	.32	1.19	.46	.55	1.26	.10	.31	4.80
1958	.39	.33	.07	.01	.03	.09	.21	.11	.09	.59	.05	.01	1.98
1959	.06	.19	.16	.04	.03	.14	1.31	.52	.16	.17	.03	.01	2.82
1960	.05	.05	.02	.01	.01	.01	.93	.30	.21	.04	.01	.002	1.64

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	96.5	11.91
1951	1208	776	Apr. 22, 1951	0.5	52.4	0.476	6.46	46.3	5.70
1952	1238	473	July 5, 1952	1.9	32.9	.299	4.05	32.3	3.99
1953	1278	138	Apr. 12, 1953	0	20.0	.182	2.48	21.9	2.71
1954	1358	427	Apr. 15, 1954	.7	35.6	.324	4.38	33.5	4.11
1955	1388	185	Apr. 22, 1955	.4	16.9	.154	2.08	17.9	2.22
1956	1438	1,060	Apr. 22, 1956	1.2	46.4	.422	5.76	49.4	6.12
1957	1508	333	Apr. 23, 1957	2.0	38.7	.352	4.80	40.7	5.05
1958	1558	123	July 8, 1958	.1	16.1	.146	1.98	13.0	1.60
1959	1628	331	Apr. 7, 1959	.5	22.9	.208	2.82	20.6	2.54
1960	1708	230	Apr. 14, 1960	0	13.2	†.120	1.64	-	-

† Corrected.

1400. Bulldog Run near Warroad, Minn.

Location.--Lat 48°51'30", long 95°20'20", in SE $\frac{1}{4}$ sec.7, T.162 N., R.36 W., on right bank at downstream side of highway bridge, three-quarters of a mile upstream from mouth and 3 miles south of Warroad.

Drainage area.--14.2 sq mi.

Records available.--March 1946 to November 1951.

Gage.--Staff gage. Altitude of gage is 1,090 ft (from topographic map).

Average discharge.--5 years (1946-51), 4.02 cfs.

Extremes.--1946-51: Maximum discharge, 420 cfs June 10, 1947 (gage height, 6.91 ft); no flow for many days.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	3.92	0.41	0.08	0	0	0	71.8	3.33	0.07	0	0.01	0.12	6.58
1952	.01	0	-	-	-	-	-	-	-	-	-	-	-

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.32	0.03	0.007	0	0	0	5.64	0.27	0.006	0	0.001	0.009	6.28
1952	.001	0	-	-	-	-	-	-	-	-	-	-	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	7.08	6.77
1951	1208	228	Apr. 10, 1951	0	6.58	0.463	6.28	-	-

1405. East Branch Warroad River near Warroad, Minn.

Location.--Lat 48°51'30", long 95°18'40", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.8, T.162 N., R.36 W., on right downstream abutment of highway bridge, 2 miles upstream from mouth and 3 miles south of Warroad.

Drainage area.--102 sq mi.

Records available.--March 1946 to September 1954. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Staff gage. Altitude of gage is 1,080 ft (from topographic map).

Average discharge.--7 years (1947-54), 21.1 cfs.

Extremes.--1946-54: Maximum discharge, 1,340 cfs June 11, 1947 (gage height, 9.36 ft, from floodmark); no flow for many days.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	51.1	13.0	6.11	3.51	2.54	3.48	179	78.2	7.08	2.25	3.32	8.84	29.9
1952	13.5	2.77	1.68	1.46	1.76	1.96	69.0	12.9	11.8	102	5.97	3.37	18.7
1953	1.90	2.33	1.00	.80	.82	10.0	27.2	26.4	32.7	11.5	2.26	10.2	10.6
1954	8.72	6.99	3.35	2.19	2.46	2.46	104	62.4	30.2	5.60	1.88	.62	19.2

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.58	0.14	0.07	0.04	0.03	0.04	1.96	0.88	0.08	0.03	0.04	0.10	3.99
1952	.15	.03	.02	.02	.02	.02	.75	.14	.13	1.16	.07	.04	2.25
1953	.02	.03	.01	.009	.008	.11	.30	.30	.36	.13	.03	.11	1.42
1954	.10	.08	.04	.02	.03	.03	1.13	.71	.33	.06	.02	.007	2.56

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	46.3	6.18
1951	1208	476	Apr. 28, 1951	1.4	29.9	0.293	3.99	25.5	3.40
1952	1238	614	July 4, 1952	1.4	18.7	.287	2.55	18.0	2.41
1953	1278	52	May 31, 1953	0	10.6	.104	1.42	11.8	1.58
1954	1338	238	Apr. 16, 1954	.2	19.2	.188	2.56	-	-

UPPER MISSISSIPPI RIVER BASIN

MISSISSIPPI RIVER MAIN STEM

2010. Winnibigoshish Lake near Deer River, Minn.

Location.--Lat 47°25'42", long 94°03'00", in sec.25, T.146 N., R.27 W., at dam on Mississippi River, 1 mile northwest of Little Winnibigoshish Lake and 14 miles northwest of town of Deer River.

Drainage area.--1,442 sq mi.

Records available.--April 1884 to September 1960. Prior to October 1941, month-end contents only, published in WSP 1308. Published as Winnibigoshish Reservoir near Deer River, October 1941 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 1,289.47 ft above mean sea level, adjustment of 1912. Prior to July 8, 1949, staff gage at same site and datum.

Extremes.--1884-1960: Maximum contents observed, 996,500 acre-ft July 30, 1905 (gage height, 14.45 ft); minimum observed, 33,680 acre-ft below zero of capacity table Oct. 20, 1931 (gage height, -0.69 ft).

Remarks.--Reservoir is formed by Winnibigoshish Lake and several other natural lakes controlled by a concrete and timber dam, completed in 1884; storage began in 1884. Capacity between gage height 0.00 ft and gage height 14.2 ft (maximum operating stage) is 967,930 acre-ft, of which 653,580 acre-ft is controlled storage above gage height 6.00 ft (minimum allowable stage). Contents shown herein are contents above gage height 0.00 ft. Water is used to benefit navigation on Mississippi River below Minneapolis.

Cooperation.--Records furnished by Corps of Engineers in terms of cfs-days and converted to acre-feet by Geological Survey.

Contents, in thousands of acre-feet, on last day of month

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	610.97	573.10	535.50	500.71	471.17	470.52	550.59	657.29	620.08	570.30	536.81	554.53
1952	578.01	558.47	555.18	529.60	486.92	474.45	535.50	581.52	566.79	573.81	587.83	549.93
1953	522.38	481.02	429.16	408.20	384.54	392.73	411.27	493.65	564.69	610.97	671.90	641.77
1954	587.13	528.29	488.89	449.51	422.89	458.71	544.02	614.99	610.27	572.41	536.81	514.50
1955	516.47	482.53	461.98	448.86	446.90	452.13	488.89	539.43	591.33	594.14	553.87	515.81
1956	492.18	460.66	442.30	467.88	485.61	503.34	542.71	573.11	555.18	540.08	545.34	504.65
1957	481.02	473.14	474.45	463.29	449.52	479.05	541.40	595.54	701.12	657.29	583.62	557.81
1958	517.12	493.49	466.57	444.93	435.08	433.11	442.96	424.20	436.39	454.77	439.67	419.88
1959	396.50	395.26	411.27	427.89	441.64	450.18	465.26	490.86	517.78	540.74	545.99	540.74
1960	532.88	519.75	517.78	513.84	495.46	467.23	502.68	523.69	540.74	551.90	513.19	487.58

2015. Mississippi River at Winnibigoshish Dam, near Deer River, Minn.

Location.--Lat 47°25'42", long 94°03'00", in SW¹/₄ sec.25, T.146 N., R.27 W., at dam 1 mile northwest of Little Winnibigoshish Lake, 14 miles northwest of town of Deer River, and at mile 1,248 upstream from Ohio River.

Drainage area.--1,442 sq mi.

Records available.--May 1884 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder on headwater and staff gage on tailwater. Datum of gage is 1,289.47 ft above mean sea level, adjustment of 1912. Prior to July 8, 1949, staff headwater gage at same site and datum.

Average discharge.--76 years (1884-1960), 502 cfs, unadjusted.

Extremes.--1884-1960: Maximum daily discharge, 4,370 cfs Aug. 6, 1905; no flow at times in several years.

Remarks.--Daily discharge is computed on basis of modified weir formula and corrected to conform with discharge measurements, the head being determined from readings of headwater and tailwater gages. Flow completely regulated by Winnibigoshish Lake (see preceding record). Runoff adjusted for change in contents in Winnibigoshish Lake.

Cooperation.--Records computed by Corps of Engineers and reviewed by Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second (observed)

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,203	1,343	1,237	1,176	1,229	903	47	199	1,609	1,083	806	732	962
1952	852	925	987	1,221	1,304	865	49	89	668	745	443	632	713
1953	483	944	1,115	735	744	248	55.0	50.8	210	598	462	811	537
1954	995	1,435	1,207	1,186	1,021	164	60.6	195	981	1,056	513	357	763
1955	422	722	640	549	492	323	53.3	56.3	85.2	266	223	391	551
1956	392	427	414	264	211	206	54.6	255	304	332	335	283	290
1957	402	402	398	506	600	14	58	95	199	1,779	1,452	995	577
1958	1,138	867	861	781	566	292	109	50.8	44.0	43.0	133	348	436
1959	500	213	208	192	194	196	64.4	50.3	48.7	76.3	89.1	446	173
1960	497	453	427	435	576	673	98.5	55.5	60.1	60.3	376	997	350

Monthly and yearly runoff, in inches (adjusted) $\frac{a}{a}$, of Mississippi River at Winnibigoshish Dam, near Deer River, Minn.

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.67	0.55	0.50	0.49	0.50	0.71	1.08	1.54	0.76	0.22	0.21	0.80	8.03
1952	.83	.46	.75	.64	.42	.53	.83	.67	.33	.69	.54	-.003	6.69
1953	.03	.19	.22	.31	.23	.30	.28	1.11	1.09	1.08	1.16	.24	6.24
1954	.09	.34	.45	.44	.46	.53	1.16	1.09	.69	.35	-.05	-.01	5.54
1955	.36	.11	.25	.27	.33	.33	.52	.70	.74	.25	-.35	-.19	3.32
1956	.01	-.08	.09	.54	.39	.39	.55	.60	.002	.07	.34	-.31	2.59
1957	.01	.21	.34	.26	.25	.48	.86	.78	1.53	.85	.20	.43	6.20
1958	.38	.36	.34	.34	.28	.21	.21	-.20	.19	.27	-.09	.01	2.30
1959	-.06	.15	.37	.37	.32	.27	.25	.37	.39	.36	.14	.28	3.21
1960	.30	.18	.32	.30	.19	.17	.54	.32	.27	.19	-.20	.05	2.63

a Adjusted for change in contents in Winnibigoshish Lake.

Note.--Negative figures indicate that evaporation and seepage from reservoir exceeded inflow.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year			
		Observed			Adjusted $\frac{a}{a}$			Observed		Adjusted $\frac{a}{a}$	
		Maximum day		Minimum day	Mean	Mean	Per square mile	Runoff in inches	Mean	Mean	Runoff in inches
		Discharge	Date								
1950	-	-	-	-	-	-	-	-	1,263	1,187	11.16
1951	1208	-	June 17, 1951	25	962	853	0.592	8.03	860	887	8.35
1952	1238	1,877	Mar. 1, 1952	0	713	707	.490	6.69	711	537	5.09
1953	1278	1,510	Dec. 13, 19, 1952	34	537	664	.460	6.24	628	710	6.68
1954	1358	1,739	Nov. 22, 1953	0	763	587	.407	5.54	607	570	5.58
1955	1388	811	Nov. 24, 1954	44	351	353	.245	3.32	305	278	2.62
1956	1438	704	Sept. 28, 1956	0	290	275	.191	2.59	288	332	3.13
1957	1508	2,021	July 20, 1957	0	577	504	.350	6.20	717	706	6.72
1958	1558	1,242	Oct. 24, 1957	33	436	246	.170	2.30	256	180	1.68
1959	1628	518	Sept. 23, 1959	39	173	340	.236	3.21	228	375	3.55
1960	1708	896	Aug. 21, 25, 1960	49	350	277	.192	2.63	-	-	-

a Adjusted for change in contents in Winnibigoshish Lake.

LEECH LAKE RIVER BASIN

2060. Leech Lake at Federal Dam, Minn.

Location--Lat 47°12'23", long 94°18'31", in lot 2, sec. 14, T. 143 N., R. 29 W., at head of Leech Lake River on Waboose Bay, 5 miles southwest of town of Federal Dam.

Drainage area--1.163 sq mi.

Records available--April 1884 to September 1960. Month-end contents only for some periods, published in WSP 1308. Published as Leech Lake Reservoir at Federal Dam October 1941 to September 1956.

Gage--Water-stage recorder. Datum of gage is 1,293.23 ft above mean sea level, adjustment of 1912. Prior to Dec. 31, 1884, staff gage half a mile north of outlet to Leech Lake River at datum 5.76 ft lower. Dec. 31, 1884, to May 24, 1931, staff gage half a mile north of outlet to Leech Lake River at present datum.

Extremes--1884-1960: Maximum contents observed, 734,300 acre-ft June 30, 1916 (gage height, 5.18 ft); minimum observed, 72,830 acre-ft below zero of capacity table Sept. 30, Nov. 19, 1934, Jan. 9, 1935 (gage height, -1.18 ft).

Remarks--Reservoir is formed by Leech Lake and several other natural lakes controlled by concrete and timber dam; storage began in 1884; original timber structure completed in 1884, replaced by present dam in 1902. Capacity between gage height -0.50 ft and gage height 5.24 ft (maximum operating stage) is 743,330 acre-ft, of which 683,780 acre-ft is controlled storage above gage height 0.00 ft (minimum allowable stage). Contents shown herein are contents above gage height -0.50 ft. Water is used to benefit navigation on Mississippi River below Minneapolis.

Cooperation--Records furnished by Corps of Engineers in terms of cfs-days and converted to acre-feet by Geological Survey.

Contents, in thousands of acre-feet, on last day of month

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	308.99	273.58	243.25	199.00	175.66	197.73	283.70	359.56	369.67	325.43	292.55	302.67
1952	324.17	320.37	321.84	290.02	255.90	253.83	346.91	298.88	298.76	328.22	350.70	302.67
1953	238.19	192.68	147.36	120.16	89.97	126.68	178.92	293.82	339.33	339.33	367.14	319.11
1954	297.61	183.27	161.51	133.22	112.54	139.76	252.10	317.94	314.05	308.99	257.16	217.97
1955	193.95	174.56	154.98	143.02	145.19	146.28	205.32	245.77	241.98	254.63	174.56	150.62
1956	139.76	140.84	149.54	158.25	169.12	187.62	250.83	287.49	257.16	234.40	240.72	201.53
1957	182.18	172.38	173.47	175.65	183.27	181.09	273.59	296.35	283.70	315.31	276.12	268.53
1958	241.98	219.24	195.21	160.43	133.22	122.33	123.42	116.89	144.10	129.96	110.37	109.28
1959	92.11	100.68	109.28	123.42	126.69	135.40	150.62	190.15	217.97	262.22	264.74	248.30
1960	239.45	230.61	244.51	251.67	211.64	195.21	272.32	335.54	348.17	319.11	278.64	236.93

2065. Leech Lake River at Federal Dam, Minn.

Location.--Lat 47°14'45", long 94°13'12", in sec.29, T.144 N., R.28 W., or right bank at dam on Leech Lake River at town of Federal Dam, 2 miles downstream from natural outlet of Leech Lake.

Drainage area.--1,163 sq mi.

Records available.--May 1884 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder, headwater gage, and staff tailwater gage. Datum of gages is 1,293.23 ft above mean sea level, adjustment of 1912. Prior to July 3, 1948, staff headwater gage at same datum. May 27 to Nov. 30, 1929, staff gage at site 600 ft downstream at different datum.

Average discharge.--76 years (1884-1960), 337 cfs, unadjusted.

Extremes.--1884-1960: Maximum daily discharge, 2,520 cfs June 7, 1957 (result of dam failure); no flow at times.

Remarks.--Discharge computed on basis of modified weir formula, the head being obtained from readings on tailwater gage and mean gage height from recording headwater gage. Flow completely regulated by Leech Lake. Runoff adjusted for change in contents in Leech Lake.

Cooperation.--Records computed by Corps of Engineers and reviewed by Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second (observed)

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	808	738	824	934	784	287	42	210	524	496	447	459	545
1952	510	742	822	954	822	511	55	600	621	415	408	527	582
1953	706	957	984	826	484	194	36.0	85.8	578	698	452	820	559
1954	1,230	1,005	955	894	870	129	65	179	567	584	580	541	631
1955	442	518	480	514	469	334	55.5	209	401	423	591	63.5	375
1956	121	211	207	154	101	105	56.1	205	163	139	124	131	143
1957	201	265	324	195	112	425	54.0	50.4	1,565	2.0	119	309	301
1958	456	475	581	733	690	495	108	47.9	47.4	41.7	50	47.6	313
1959	84.6	75.0	47.0	51.5	50.3	41.8	38.9	41.0	43.8	53.6	98	422	87.0
1960	391	349	342	369	397	395	74.7	54.7	105	94.3	341	401	276

Monthly and yearly runoff, in inches (adjusted) a/

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.41	0.14	0.33	0.21	0.33	0.64	1.43	1.43	0.67	-0.22	-0.09	0.60	5.88
1952	.85	.65	.84	.44	.21	.43	1.61	-.18	.43	1.06	.75	-.27	6.82
1953	-.34	.17	.15	.38	-.05	.78	.88	1.94	1.28	.69	.90	.01	6.79
1954	.87	-.88	.60	.43	.45	.57	1.87	1.23	.48	.50	-.28	-.11	5.75
1955	.05	.18	.16	.32	.45	.35	1.01	.86	.32	.62	-.70	-.32	3.30
1956	-.06	.22	.34	.29	.27	.40	1.07	.79	-.33	-.23	.22	-.51	2.47
1957	-.11	.10	.34	.23	.22	.39	1.54	.42	1.29	.51	-.51	.17	4.59
1958	.02	.09	.19	.17	.18	.32	.12	-.06	.46	-.19	-.27	.03	1.08
1959	-.19	.21	.19	.28	.10	.18	.28	.68	.49	.77	.14	.14	3.27
1960	.24	.19	.56	.16	.04	.13	1.32	1.07	.30	-.38	-.31	-.29	3.03

a Adjusted for change in contents in Leech Lake.

Note.--Negative figures indicate that evaporation and seepage from lake exceeded inflow.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year		
		observed				Adjusted a/			Observed		Adjusted a/
		Momentary maximum		Minimum day	Mean	Mean	Per square mile	Runoff in inches	Mean	Mean	Runoff in inches
		Discharge	Date								
1950	-	-	-	-	-	-	-	-	665	613	7.15
1951	1208	1,028	Dec. 28, 1950	10	545	503	0.433	5.88	519	628	7.34
1952	1238	1,048	Jan. 12, 1952	38	582	582	.500	6.82	620	380	4.46
1953	1278	1,317	June 21, 1953	9	559	582	.500	6.79	615	635	7.40
1954	1338	1,339	Oct. 7, 1953	41	631	491	.422	5.75	493	474	5.53
1955	1388	681	Aug. 12, 1955	42	375	282	.242	3.30	300	292	3.41
1956	1438	310	Nov. 2, 1955	46	143	213	.163	2.47	164	170	2.30
1957	1508	2,520	June 7, 1957	2	301	394	.339	4.59	361	391	4.56
1958	1558	808	Jan. 22, 1958	3	313	93	.080	1.08	203	84	.99
1959	1628	543	Sept. 23, 1959	17	87.0	279	.240	3.27	161	348	4.05
1960	1708	780	Aug. 26, 1960	45	276	260	.224	3.03	-	-	-

a Adjusted for change in contents in Leech Lake.

2105. Pokegama Lake near Grand Rapids, Minn.

Location.--Lat 47°10'00", long 93°33'20", NW $\frac{1}{4}$ sec.17, T.54 N., R.25 W., at narrows on Highway 169, 4 miles south of Grand Rapids.

Drainage area.--3,265 sq mi.

Records available.--April 1884 to September 1960. Month-end contents only for some periods, published in WSP 1308. Published as Pokegama Reservoir near Grand Rapids October 1941 to October 1956.

Gage.--Water-stage recorder. Datum of gage is 1,264.89 ft above mean sea level, adjustment of 1912. Prior to May 30, 1949, staff gage at Pooles Arm of Pokegama Lake, 5 miles northwest at same datum.

Extremes.--1884-1960: Maximum contents, 155,000 acre-ft May 8, 1897 (gage height, 13.50 ft); minimum observed, 4,520 acre-ft below zero of capacity table Sept. 30, 1934 (gage height, 4.12 ft).

Remarks.--Reservoir is formed by Pokegama Lake and several other natural lakes controlled by concrete dam; storage began in 1884; original timber dam completed in 1884, replaced by present structure in 1888-89. Capacity between gage height 4.50 ft and gage height 12.00 ft (maximum operating stage) is 120,750 acre-ft, of which 102,390 acre-ft is controlled storage above gage height 6.00 ft (minimum allowable stage). Contents shown herein are contents above gage height 4.50 ft. Water is used to benefit navigation on Mississippi River below Minneapolis. Records of chemical analyses for the period June to September 1959 are published in report of the Geological Survey.

Cooperation.--Records furnished by Corps of Engineers in terms of cfs-days and converted to acre-ft by Geological Survey.

Monthly contents, in thousands of acre-feet, on last day of month

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	60.10	53.97	56.35	49.05	45.06	31.42	79.02	73.24	66.54	69.56	66.20	67.87
1952	70.56	77.00	59.80	41.37	47.70	33.96	109.62	68.04	67.20	122.81	61.68	56.95
1953	44.49	27.42	43.78	30.75	24.22	23.02	56.80	89.85	64.86	62.00	61.88	72.24
1954	57.71	59.94	43.63	38.65	40.22	18.37	110.05	72.41	59.79	63.02	63.19	61.39
1955	54.88	51.14	46.81	32.39	28.35	24.900	52.48	60.39	56.35	61.68	57.86	56.20
1956	57.86	45.92	20.63	26.23	38.65	21.42	53.53	60.83	58.30	60.54	62.18	59.04
1957	61.51	45.06	27.96	25.43	27.16	25.03	70.56	60.68	65.53	64.52	65.53	67.04
1958	58.30	61.17	52.78	50.55	46.36	29.95	38.23	39.65	55.62	56.50	47.85	48.15
1959	45.63	49.19	49.30	47.85	47.40	50.10	58.53	65.70	65.37	65.70	65.70	60.39
1960	58.60	53.23	53.38	52.93	52.33	53.98	58.90	66.20	64.52	58.75	57.71	60.54

2110. Mississippi River at Grand Rapids, Minn.

Location.--Lat 47°13'56", long 93°31'48", in SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 21, T.55 N., R.25 W. (corrected) in machine room of Blandin Paper Mill in Grand Rapids, 400 ft upstream (revised) from bridge on State Highway 169, 2.5 miles upstream from Prairie River, and at mile 1,182 upstream from Ohio River.

Drainage area.--3,370 sq mi, approximately.

Records available.--October 1883 to September 1960. Monthly discharge only for some periods, published in WSP 1308. Published as "at Pokegama Dam near Grand Rapids" 1942-44.

Gage.--Water-stage recorder. Datum of gage is 1,242.00 ft above mean sea level, adjustment of 1912. Prior to Feb. 17, 1945, staff gages operated by Corps of Engineers at Pokegama Dam $3\frac{1}{2}$ miles upstream at datum 22.89 ft higher. Feb. 17, 1945, to Sept. 3, 1948, water-stage recorder at site 300 ft upstream, within 0.10 ft of present datum. Sept. 9, 1948, to Jan. 6, 1949, staff gage at site 400 ft downstream at present datum. Jan. 7, 1949, to Jan. 16, 1951, tape float and inside staff gages at present site and datum.

Average discharge.--77 years (1883-1960), 1,109 cfs.

Extremes.--1883-1960: Maximum discharge, 12,500 cfs Sept. 3, 1948 (gage height, 15.2 ft, from floodmark), caused by dam failure at gage, from rating curve extended above 4,500 cfs by logarithmic plotting; maximum daily, 5,250 cfs Sept. 5, 8, 1905; no flow at times in several years.

Remarks.--Flow completely regulated by Pokegama Lake. Backwater from Prairie River occurs at times in most years. Records of chemical analyses for the period June to September 1959 are published in report of the Geological Survey.

Cooperation.--Records furnished by Corps of Engineers, 1883-1944, 1959-60.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2,580	2,191	1,837	2,110	2,185	2,185	1,436	1,851	2,047	1,806	1,783	1,728	1,978
1952	1,826	1,923	2,144	2,410	2,478	2,503	1,146	1,488	1,268	1,342	2,121	1,649	1,859
1953	1,213	1,736	1,715	1,924	1,571	1,248	682	760	1,767	2,517	1,688	2,527	1,612
1954	2,325	2,496	2,375	2,316	2,101	1,809	1,098	1,900	1,880	1,839	1,498	1,452	1,923
1955	1,201	1,404	1,450	1,430	1,246	1,100	893	957	960	1,024	965	698	1,113
1956	622	889	1,094	515	279	675	794	856	665	525	525	505	664
1957	565	941	1,049	839	852	724	795	875	1,867	2,552	2,112	1,705	1,242
1958	2,051	1,794	1,695	1,825	1,705	1,846	468	182	353	249	243	420	1,067
1959	359	324	304	298	286	305	247	393	453	867	257	1,174	439
1960	1,160	964	870	871	933	1,100	1,220	886	758	442	484	926	883

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	2,424	9.77
1951	1208	3,870	May 14, 1951	304	1,978	0.587	7.98	1,918	7.73
1952	1238	3,320	Aug. 19, 1952	20	1,859	.552	7.51	1,755	7.09
1953	1278	3,390	Sept. 16, 1953	160	1,612	.478	6.51	1,825	7.38
1954	1338	3,170	Dec. 1, 1953	251	1,923	.571	7.74	1,659	6.68
1955	1388	2,280	Dec. 2, 1954	268	1,113	.330	4.48	991	3.99
1956	1438	1,840	June 1, 1956	160	664	.197	2.68	659	2.66
1957	1508	3,250	July 20, 1957	360	1,242	.369	5.00	1,493	6.01
1958	1558	2,490	Oct. 30, 1957	58	1,067	.317	4.30	685	2.76
1959	1628	1,840	July 11, 1958	144	439	.130	1.77	607	2.45
1960	1708	1,860	Apr. 28, 1960	216	883	.262	3.57	-	-

2170. Swan River near Warba, Minn.

Location.--Lat 47°06'40", long 93°15'50", in SE $\frac{1}{4}$ sec.33, T.54 N., R.23 W., on left bank 75 ft upstream from highway bridge, $1\frac{1}{4}$ miles south of Warba, $3\frac{1}{2}$ miles northwest of Swan River, and 22 miles upstream from mouth.

Drainage area.--254 sq mi.

Records available.--October 1953 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,259.80 ft above mean sea level (Minnesota State Highway Department bench mark).

Average discharge.--7 years (1953-60), 132 cfs.

Extremes.--1953-60: Maximum discharge, 1,000 cfs Apr. 13, 1954 (gage height, 9.07 ft); maximum gage height, 9.02 ft Apr. 13, 1954 (backwater from ice); minimum discharge, 34 cfs Aug. 29, 30, 1956; minimum gage height, 2.05 ft Aug. 30, 1956.

Flood in May 1950 reached a stage of about 11.5 ft, from information by local residents.

Remarks.--Records of chemical analyses for the periods September 1955 to September 1958 and June to September 1959 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	131	119	116	99	105	129	613	528	223	80.6	59.5	61.0	189
1955	71.2	67.1	65.9	51.0	50.8	61.9	373	273	234	144	185	79.6	138
1956	115	83.7	86.8	70.5	75.9	76.6	526	266	81.1	45.8	49.6	40.2	126
1957	43.4	69.3	43.0	39.2	39.7	51.5	431	280	194	296	118	68.2	140
1958	74.4	85.9	58.3	39.2	48.3	69.8	80.2	60.9	166	165	79.5	82.9	84.3
1959	71.1	87.7	51.3	37.8	36.5	49.3	113	341	213	152	52.3	128	111
1960	105	86.1	80.5	72.5	55.6	50.5	272	343	293	133	67.2	60.8	135

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	0.59	0.52	0.53	0.45	0.43	0.59	2.69	2.39	0.98	0.37	0.27	0.27	10.08
1955	.32	.29	.30	.23	.21	.28	1.64	1.24	1.03	.65	.84	.35	7.38
1956	.52	.37	.39	.32	.32	.35	2.31	1.21	.36	.21	.23	.18	6.77
1957	.20	.30	.19	.18	.16	.23	1.89	1.27	.85	1.34	.54	.30	7.45
1958	.34	.38	.26	.18	.20	.32	.35	.28	.73	.75	.36	.36	4.51
1959	.32	.39	.23	.17	.15	.22	.50	1.55	.94	.69	.24	.56	5.96
1960	.48	.38	.37	.33	.24	.23	1.19	1.56	1.29	.61	.31	.27	7.26

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-
1954	1338	1,000	Apr. 13, 1954	48	189	0.744	10.08	175	9.35
1955	1388	627	Apr. 11, 1955	47	138	.543	7.38	145	7.75
1956	1438	853	Apr. 14, 1956	34	126	.496	6.77	115	6.18
1957	1508	905	Apr. 22, 1957	36	140	.551	7.45	145	7.74
1958	1558	390	July 2, 1958	38	84.3	.332	4.51	83.5	4.47
1959	1628	559	May 20, 1959	35	111	.437	5.96	117	6.25
1960	1708	721	June 1, 1960	45	135	.531	7.26	-	-

SANDY RIVER BASIN

2185. Sandy Lake at Libby, Minn.

Location.--Lat 46°46'40", long 93°19'20", in sec.36, T.50 N., R.24 W., at Libby, 1 mile upstream from dam on Sandy River, 2 miles upstream from mouth, and 14 miles north of McGregor.

Drainage area.--421 sq mi.

Records available.--July to December 1893, October to December 1894, July 1895 to September 1960. Prior to October 1941 month-end contents only, published in WSP 1308. Published as Sandy Lake Reservoir at Libby October 1941 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 1,207.71 ft above mean sea level, adjustment of 1912. Prior to Sept. 23, 1949, float gage at same site and datum.

Extremes.--1895-1960: Maximum contents, 167,200 acre-ft May 19, 1950 (gage height, 17.81 ft); minimum observed, 5,950 acre-ft below zero of capacity table Jan. 20, 1921 (gage height, 0.65 ft).

Remarks.--Reservoir is formed by Sandy, Flowage, Snake, and Aitkin Lakes controlled by concrete dam. Storage began in 1893; original timber crib dam completed in 1895, replaced by present structure in 1911. Capacity between gage height 1.72 ft and gage height 11.0 ft (maximum operating stage) is 72,500 acre-ft, of which 37,540 acre-ft is controlled storage above gage height 7.0 ft (minimum allowable stage). Contents shown herein are contents above gage height 1.72 ft. Water is used to benefit navigation on Mississippi River below Minneapolis.

Cooperation.--Records furnished by Corps of Engineers in terms of cfs-days and converted to acre-feet by Geological Survey.

Contents, in acre-feet, on last day of month

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	57,260	57,760	50,480	41,100	35,860	35,370	67,680	59,130	59,030	58,930	65,740	60,020
1952	62,610	49,540	40,840	35,280	36,280	35,030	78,600	59,620	61,010	100,280	53,930	51,390
1953	42,740	42,220	41,780	41,690	35,280	51,390	53,070	70,290	57,070	53,460	64,220	50,840
1954	50,750	42,220	36,450	34,790	35,200	33,760	81,720	60,810	52,790	54,220	53,930	54,030
1955	57,170	54,030	41,690	36,700	36,700	34,160	49,730	53,450	53,930	55,740	51,480	53,360
1956	49,730	46,900	35,950	39,460	42,990	35,700	59,720	54,220	52,980	52,500	52,410	51,760
1957	46,450	39,380	39,030	38,130	37,870	36,360	61,010	53,170	56,980	54,030	52,600	52,600
1958	44,940	46,630	39,380	39,110	37,110	36,200	42,570	43,600	51,940	52,790	52,040	42,650
1959	47,260	56,980	59,330	54,030	44,670	38,870	45,560	57,660	55,260	52,220	53,360	54,600
1960	51,300	42,910	38,630	35,530	35,620	36,950	62,990	55,450	52,220	52,790	52,130	51,110

2190. Sandy River at Sandy Lake Dam, at Libby, Minn.

Location.--Lat 46°47'18", long 93°19'06", in sec.25, T.50 N., R.24 W., at dam at outlet of Sandy Lake, a quarter of a mile north of Libby and 1.4 miles upstream from mouth.

Drainage area.--421 sq mi.

Records available.--July 1893 to March 1894, July 1894, November 1894 to March 1895, August 1895 to September 1960. Monthly discharge only for some periods, published in WSP 1308. Published as "below Sandy Lake Reservoir" 1893-1916.

Gage.--Water-stage recorders on headwater and tailwater. Datum of gages is 1,207.71 ft above mean sea level, adjustment of 1912. Prior to June 20, 1949, staff gages at same site and datum.

Average discharge.--65 years (1895-1960), 203 cfs, unadjusted.

Extremes.--1893-1960: Maximum daily discharge, 3,738 cfs July 12, 1897; no flow at times.

Remarks.--Discharge computed on basis of head over dam, using modified weir formula, head being obtained from headwater and tailwater recorder records. Flow completely regulated by Sandy Lake.

Cooperation.--Records computed by Corps of Engineers and reviewed by Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second (observed)

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	12	28	152	170	145	96	597	675	375	81	25	1,168	292
1952	601	714	318	178	48.6	81.5	794	552	58.5	820	1,355	356	492
1953	151	57.2	47.0	45.5	142	81.8	879	561	1,192	1,027	1,503	377	507
1954	35.7	212	216	115	71.8	129	362	1,284	603	212	33.1	47	278
1955	10.0	113	218	97.2	38.5	72.9	444	46.9	174	690	764	157	237
1956	221	181	224	30.4	10.0	130	1,059	528	122	47.4	121	100	223
1957	108	157	50.0	50.0	50.0	74.8	650	497	321	395	56.0	26.0	203
1958	166	61.3	186	38.0	59.4	95.1	11.2	10.5	60.9	334	74.2	412	126
1959	0	0	0	114	179	134	1.50	165	638	275	12.7	54.1	130
1960	153	204	133	93.9	29.8	26.9	276	1,085	380	34.3	25.8	2.00	205

Monthly and yearly runoff, in inches (adjusted) a/

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.13	0.10	0.09	0.05	0.13	0.24	3.02	1.46	0.99	0.22	0.37	2.84	9.64
1952	1.76	1.30	.48	.24	.17	.17	4.04	.67	.22	4.00	1.65	.83	15.53
1953	.03	.13	.11	.12	.07	.94	2.40	2.31	2.57	2.65	4.60	.40	16.33
1954	.09	.18	.33	.24	.16	.29	3.09	2.58	1.24	.64	.08	1.3	9.05
1955	.17	.16	.05	.04	.10	.09	1.87	.30	.48	1.97	1.90	.50	7.53
1956	.44	.35	.13	.24	.18	.03	3.88	1.20	.27	.11	.33	-.002	7.16
1957	.06	.10	.12	.10	.11	.14	2.82	1.01	1.02	.95	.09	.07	6.59
1958	.11	.24	.19	.09	.06	.22	.31	.08	.53	.95	.17	.67	3.62
1959	.21	.43	.10	.08	.03	.11	.30	.99	1.58	.62	.09	.20	4.74
1960	.27	.17	.17	.12	.08	.13	1.90	2.63	.86	.12	.04	-.04	6.45

a Adjusted for change in contents in Sandy Lake.

Note.--Negative figures indicate that evaporation and seepage exceeded inflow.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year		
		Observed			Adjusted a/			Observed	Adjusted a/	
		Maximum day		Minimum day	Mean	Mean	Per square mile	Runoff in inches	Mean	Mean
		Discharge	Date							
1950	-	-	-	-	-	-	-	397	405	13.04
1951	1208	1,660	Sept. 13, 1951	10	292	299	0.710	9.64	413	400
1952	1238	2,949	July 26, 1952	10	492	480	1.14	15.53	377	378
1953	1278	2,452	Aug. 19, 1953	10	507	506	1.20	16.33	524	517
1954	1338	1,867	May 16, 1954	0	278	282	.670	9.05	268	275
1955	1368	1,950	July 5, 1955	10	237	236	.561	7.53	261	253
1956	1438	1,773	Apr. 23, 1956	10	223	222	.527	7.16	197	201
1957	1508	1,325	Apr. 28, 1957	10	203	204	.485	6.59	212	212
1958	1558	1,325	Sept. 16, 1958	0	126	112	.266	3.62	91.3	119
1959	1628	1,965	June 8, 1959	0	130	146	.347	4.74	171	142
1960	1708	1,758	May 13, 1960	2	205	200	.475	6.45	-	-

a Adjusted for change in contents in Sandy Lake.

2205. Mississippi River below Sandy River, near Libby, Minn.

Location.--Lat 46°47', long 93°20', in sec.25, T.50 N., R.24 W., on right bank 600 ft downstream from Sandy River, three-quarters of a mile northwest of Libby, and at mile 1,106 upstream from Ohio River.

Drainage area.--5,060 sq mi, approximately.

Records available.--April 1930 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,204.55 ft above mean sea level, adjustment of 1912. Prior to July 28, 1931, staff gage at site 600 ft upstream at datum 3.16 ft higher.

Average discharge.--30 years (1930-60), 1,853 cfs.

Extremes.--1930-60: Maximum discharge, 16,000 cfs May 17, 1950 (gage height, 20.02 ft); minimum, 83 cfs Nov. 16, 1936 (gage height, 1.44 ft).

Remarks.--Flow regulated by powerplants and Winnibigoshish, Leech, Pokegama, and Sandy Lakes.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	3,229	2,634	2,580	2,618	2,524	2,592	4,051	4,815	3,236	2,250	2,075	3,643	3,021
1952	3,559	3,641	2,961	2,895	2,824	2,990	4,438	2,955	1,642	3,214	4,299	2,601	3,171
1953	1,715	2,151	1,941	2,133	2,061	2,138	3,081	2,845	4,510	5,296	5,202	4,195	3,110
1954	3,018	3,276	3,138	2,825	2,646	2,377	4,450	5,801	3,660	2,302	1,782	1,546	3,079
1955	1,395	1,678	1,708	1,574	1,378	1,442	2,814	1,941	2,071	2,170	2,446	1,151	1,816
1956	1,153	1,250	1,654	844	603	1,041	3,742	2,738	1,182	677	865	696	1,371
1957	794	1,377	1,197	978	925	934	3,295	2,911	2,739	4,529	2,757	1,913	2,035
1958	2,298	2,152	1,954	1,936	1,878	2,025	980	484	1,195	1,291	566	1,190	1,494
1959	676	728	480	567	659	690	822	2,043	2,416	2,002	565	1,952	1,134
1960	1,874	1,555	1,294	1,225	1,242	1,379	3,010	3,920	2,460	1,054	747	1,205	1,746

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.74	0.58	0.59	0.60	0.52	0.59	0.89	1.10	0.71	0.51	0.47	0.80	8.10
1952	.81	.80	.67	.66	.60	.68	.98	.67	.36	.73	.98	.57	8.51
1953	.39	.47	.44	.49	.42	.49	.68	.65	.99	1.21	1.19	.92	8.34
1954	.69	.72	.72	.64	.54	.54	.98	1.34	.81	.52	.41	.34	8.25
1955	.32	.37	.39	.36	.28	.33	.62	.44	.46	.49	.56	.25	4.87
1956	.26	.28	.38	.19	.13	.24	.83	.62	.26	.15	.20	.15	3.69
1957	.18	.30	.27	.22	.19	.21	.73	.66	.60	1.03	.63	.42	5.44
1958	.52	.47	.45	.44	.39	.46	.22	.11	.26	.29	.13	.26	4.00
1959	.15	.16	.11	.13	.14	.16	.18	.47	.53	.46	.13	.43	3.05
1960	.43	.34	.29	.28	.26	.31	.66	.89	.54	.24	.17	.27	4.68

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	3,931	10.55
1951	1208	5,840	May 6, 1951	1,480	3,021	0.597	8.10	3,164	8.47
1952	1238	5,880	Apr. 28, 1952	1,270	3,171	.627	8.51	2,807	7.53
1953	1278	6,730	Aug. 6, 1953	1,470	3,110	.615	9.34	3,415	9.17
1954	1336	6,960	May 6, 1954	1,360	3,079	.608	8.25	2,688	7.20
1955	1388	4,910	Apr. 11, 1955	730	1,816	.359	4.87	1,756	4.71
1956	1438	5,440	Apr. 21, 1956	349	1,371	.271	3.69	1,312	3.52
1957	1508	6,030	July 23, 1957	437	2,035	.402	5.44	2,290	6.13
1958	1558	2,650	Nov. 1, 1958	390	1,494	.295	4.00	1,114	2.98
1959	1628	4,660	June 2, 1959	398	1,134	.224	3.05	1,372	3.69
1960	1708	5,660	May 5, 1960	418	1,746	.345	4.68	-	-

2275. Mississippi River at Aitkin, Minn.

Location.--Lat 46°32'26", long 93°42'26", in W $\frac{1}{2}$ sec.24, T.47 N., R.27 W., on upstream side of highway bridge at north edge of Aitkin, 1 mile downstream from Mud River and at mile 1,055.9 upstream from Ohio River.

Drainage area.--6,140 sq mi, approximately.

Records available.--March 1945 to September 1960.

Gage.--Wire-weight gage. Datum of gage is 1,185.41 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Mar. 1, 1945, to July 12, 1954, staff gage and July 13, 1954, to June 23, 1955, chain gage, at same site and datum.

Average discharge.--15 years (1945-60), 2,893 cfs.

Extremes.--1945-60: Maximum discharge observed, 20,000 cfs Mar. 20, 1950 (gage height, 19.49 ft); minimum daily, 236 cfs Oct. 6, 1948.

Remarks.--Flow partly regulated by powerplants and Winnibigoshish, Leech, Pokegama, and Sandy Lakes. Water diverted at medium and high stages into Aitkin diversion channel, $\frac{6}{8}$ miles above station, bypasses station and returns to river $15\frac{1}{2}$ miles below station. Diversion began Apr. 2, 1955. Records include flow in diversion channel.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	3,404	2,710	2,664	2,693	2,667	2,717	6,240	6,893	4,216	2,830	2,295	4,869	3,682
1952	4,749	5,194	3,629	3,517	3,046	3,060	7,515	4,484	2,007	6,146	6,549	3,528	4,458
1953	2,014	2,345	2,233	2,207	2,159	2,559	4,769	4,998	7,168	6,849	8,270	5,145	4,237
1954	3,415	3,595	3,390	3,110	2,904	2,715	6,619	7,897	4,872	3,265	2,114	1,748	3,807
1955	1,641	1,880	1,921	1,715	1,502	1,564	4,473	2,478	2,790	3,682	4,116	1,582	2,451
1956	1,620	1,592	1,805	892	716	1,112	7,063	3,994	1,748	814	999	788	1,934
1957	787	1,420	1,317	1,049	973	1,057	4,616	4,168	3,569	5,392	3,411	2,111	2,497
1958	2,455	2,337	2,070	1,908	1,870	2,019	1,284	669	1,687	1,634	768	1,428	1,693
1959	869	994	677	662	689	780	1,081	2,708	3,692	2,368	731	1,941	1,433
1960	1,946	1,741	1,522	1,292	1,344	1,580	4,363	5,690	3,378	1,381	831	1,270	2,194

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.64	0.49	0.50	0.51	0.45	0.51	1.13	1.29	0.77	0.53	0.43	0.88	8.13
1952	.89	.94	.68	.66	.54	.57	1.37	.84	.36	1.15	1.23	.64	9.87
1953	.38	.43	.42	.41	.37	.48	.87	.94	1.30	1.29	1.55	.93	9.37
1954	.64	.65	.64	.58	.49	.51	1.20	1.48	.89	.61	.40	.32	8.41
1955	.31	.34	.36	.32	.25	.29	.81	.47	.51	.69	.77	.29	5.41
1956	.30	.29	.34	.19	.13	.21	1.28	.75	.32	.15	.19	.14	4.29
1957	.15	.26	.25	.20	.16	.20	.84	.78	.65	1.01	.64	.38	5.52
1958	.46	.42	.39	.36	.32	.38	.23	.13	.31	.34	.14	.26	3.74
1959	.16	.18	.13	.12	.12	.15	.20	.51	.67	.44	.14	.35	3.17
1960	.37	.32	.29	.24	.24	.30	.79	1.07	.61	.26	.16	.23	4.88

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches	
		Discharge	Date							
1950	-	-	-	-	-	-	-	-	-	10.29
1951	1208	8,600	May 8, 1951	1,760	3,682	0.600	8.13	4,856	9.01	
1952	1258	10,100	Apr. 15, 1952	1,630	4,458	.726	9.87	3,876	8.58	
1953	1278	10,800	Aug. 14, 1953	1,830	4,237	.690	9.37	4,556	10.07	
1954	1358	9,480	May 6, 7, 1954	1,550	3,807	.620	8.41	3,390	7.49	
1955	1388	7,890	Aug. 4, 1955	1,100	2,451	.399	5.41	2,415	5.33	
1956	1458	9,850	Apr. 17, 1956	482	1,934	.315	4.29	1,808	4.02	
1957	1508	9,340	Apr. 28, 1957	472	2,497	.407	5.52	2,778	6.13	
1958	1558	3,110	July 5, 1958	472	1,693	.276	3.74	1,329	2.94	
1959	1628	7,180	June 3, 1959	558	1,453	.233	3.17	1,658	3.68	
1960	1708	8,650	May 6, 1960	563	2,194	.357	4.88	-	-	

PINE RIVER BASIN

2305. Pine River Reservoir at Cross Lake, Minn.

Location (revised).--Lat 46°40'09", long 94°06'44", in SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 21, T. 137 N., R. 27 W., at dam on Pine River at outlet of Cross Lake at village of Cross Lake.

Drainage area.--562 sq mi.

Records available.--March 1886 to September 1960. Month-end contents only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 1,216.32 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to May 3, 1949, staff gage at same site and datum.

Extremes.--1886-1960: Maximum contents observed, 173,600 acre-ft July 10, 1916 (gage height, 18.24 ft); minimum observed, 1,310 acre-ft below zero of capacity table Aug. 20, 1918 (gage height, 1.35 ft).

Remarks.--Reservoir is formed by Trout, Whitefish, Rush, and Cross Lakes and several other natural lakes controlled by timber crib dams; storage began in 1886; dam completed in 1886. Capacity between gage height 2.35 ft and gage height 18.5 ft (maximum operating stage) is 177,520 acre-ft, of which 131,310 acre-ft is controlled storage above gage height 9.0 ft (minimum allowable stage). Contents shown herein are contents above gage height 2.35 ft. Water is used to benefit navigation on Mississippi River below Minneapolis.

Cooperation.--Records furnished by Corps of Engineers in terms of cfs-days and converted to acre-feet by Geological Survey.

Contents, in thousands of acre-feet, on last day of month

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	89.6	87.3	83.3	78.5	75.4	75.6	83.4	104.1	98.8	96.8	102.0	87.2
1952	92.8	92.1	86.2	73.4	73.5	76.9	84.6	92.2	100.1	97.4	95.4	86.2
1953	90.2	88.4	88.6	81.6	68.5	79.0	96.2	104.3	92.1	97.4	99.4	100.8
1954	73.7	78.0	72.9	68.7	75.2	74.8	102.2	99.4	98.6	99.2	98.9	100.1
1955	102.4	100.4	89.2	90.2	75.2	73.4	90.6	95.6	91.3	97.0	95.1	94.8
1956	92.2	90.6	88.0	83.3	75.4	72.1	93.3	99.6	94.7	96.6	94.4	90.5
1957	82.8	77.7	81.6	78.0	76.4	81.3	92.1	98.6	98.0	98.3	94.0	98.9
1958	92.5	92.6	84.1	75.0	73.5	76.8	80.9	81.6	86.7	87.6	86.7	85.4
1959	81.4	83.3	77.1	74.2	75.4	78.2	82.5	101.7	100.9	98.1	97.4	92.6
1960	93.5	90.1	86.7	82.2	79.0	74.4	94.8	96.7	96.7	91.6	91.6	89.7

2310. Pine River at Cross Lake Dam, at Cross Lake, Minn.

Location (revised).--Lat 46°40'05", long 94°06'44", in SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.21, T.137 N., R.27 W., at dam at outlet of Cross Lake at village of Cross Lake.

Drainage area.--562 sq mi.

Records available.--April 1886 to September 1960. Monthly discharge only for some periods, published in WSP 1308. Published as "below Pine River Reservoir" 1895-1916, 1929, and as "at Pine River Dam, at Cross Lake" 1941-56.

Gage.--Water-stage recorder, headwater gage, and tape float tailwater gage. Datum of gage is 1,216.32 ft above mean sea level, datum of 1929. Mar. 26, 1886, to May 31, 1929, staff gages on headwater and tailwater at same sites and datum. June 1 to Nov. 30, 1929, staff gage in tailwater at datum 1.60 ft lower. Dec. 1, 1929, to May 2, 1949 (staff gage on headwater and Dec. 1, 1929, to August 1949, staff gage) on tailwater at present sites and datum.

Average discharge.--74 years (1886-1960), 208 cfs, unadjusted.

Extremes.--1886-1960: Maximum daily discharge, 2,246 cfs in June 1896 (does not include flow bypassing dam through crevasse); no flow at times.

Remarks.--Discharge computed principally on basis of modified weir formula, the head being obtained from readings on tailwater gage and from headwater recorder. Flow completely regulated by Pine River Reservoir.

Cooperation.--Records furnished by Corps of Engineers and reviewed by Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second (observed)

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	60	135	232	229	227	226	416	248	515	129	52	581	253
1952	297	447	497	451	219	186	696	109	10.7	706	560	200	366
1953	184	177	117	232	353	133	209	398	914	167	372	149	282
1954	571	118	154	308	131	248	278	688	335	155	80.8	76.8	264
1955	86.9	128	297	330	196	192	124	75.3	249	119	490	64.9	197
1956	126	106	184	215	282	231	253	344	286	74.8	181	65.7	195
1957	162	254	64.8	112	131	104	269	173	463	131	91.1	191	191
1958	221	135	256	270	133	89.3	84.1	70.0	67.0	55.7	65.8	100	129
1959	95.6	96.0	186	135	60.0	60.0	43.8	51.8	260	222	92.0	142	121
1960	77.3	118	180	183	183	185	88.6	454	256	145	54.3	47.7	165

Monthly and yearly runoff, in inches (adjusted) $\frac{a}{b}$

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.27	0.19	0.34	0.31	0.32	0.47	1.09	1.20	0.85	0.20	0.28	0.66	6.18
1952	.80	.87	.82	.50	.42	.49	1.63	.48	.28	1.36	1.08	1.44	9.16
1953	.18	.29	.26	.24	.22	.63	.99	1.09	1.41	.52	.83	.34	6.99
1954	.27	.38	.15	.50	.46	.50	1.46	1.33	.64	.30	.16	.11	6.26
1955	.25	.19	.23	.71	-.14	.33	.82	.32	.35	.43	.94	.12	4.55
1956	.17	.16	.29	.28	.28	.37	1.20	.92	.40	.22	.30	-.0002	4.59
1957	.07	.34	.26	.11	.19	.38	.89	.57	.90	.70	.15	.32	4.88
1958	.24	.27	.24	.25	.20	.29	.30	.17	.31	.14	.11	.15	2.67
1959	.06	.26	.17	.18	.15	.22	.25	.75	.49	.36	.17	.12	3.16
1960	.19	.35	.26	.22	.28	.28	.86	.99	.51	.13	.11	.03	4.13

† Corrected.

a Adjusted for change in contents in Pine River Reservoir.

Note.--Negative figures indicate that evaporation and seepage exceeded inflow.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year		
		Observed			Adjusted a/			Observed		
		Maximum day	Minimum day	Mean	Mean	Per square mile	Runoff in inches	Mean	Mean	Runoff in inches
		Discharge	Date							
1950	-	-	-	-	-	-	-	366	359	8.67
1951	1208	1,150	June 8-11, 1951	10	253	256	0.456	6.18	321	7.88
1952	1238	1,530	July 22, 1952	10	366	378	.673	9.16	302	7.40
1953	1278	1,200	June 21, 1953	10	282	288	.512	6.99	313	7.07
1954	1338	1,590	May 4, 1954	48	264	263	.469	6.26	256	6.13
1955	1388	950	Aug. 7-14, 1955	30	197	190	.358	4.55	189	4.50
1956	1438	495	June 5-10, 1956	55	195	189	.336	4.59	200	4.64
1957	1508	890	June 27-30, 1957	45	191	203	.361	4.88	202	4.96
1958	1558	340	Oct. 23-25, 1957	55	129	110	.196	2.67	110	2.42
1959	1628	405	June 5-14, 1959	40	121	131	.233	3.16	120	3.47
1960	1708	555	May 7, 1960	45	165	161	.286	4.13	-	-

a Adjusted for change in contents in Pine River Reservoir.

2415. Rabbit River near Crosby, Minn.

Location.--Lat 46°30'55", long 93°57'35", in NE $\frac{1}{4}$ sec.35, T.47 N., R.29 W., on right bank a third of a mile downstream from Clinker Lake control dam and 2 miles north of Crosby.

Drainage area.--8.38 sq mi.

Records available.--August 1945 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,190.00 ft above mean sea level, adjustment of 1912.

Average discharge.--15 years (1945-60), 6.16 cfs.

Extremes.--1945-60: Maximum discharge, 94 cfs June 27, 1946 (gage height, 7.54 ft), from rating curve extended above 30 cfs (caused by release from logjam); no flow at times.

Remarks.--Some regulation by Clinker Lake. Flow affected by pumping from Rabbit Lake and underground mine.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	8.77	5.61	5.00	4.53	4.29	4.35	7.39	18.6	16.2	5.76	4.86	19.3	8.72
1952	14.6	10.6	8.73	4.49	3.70	3.90	19.1	9.71	2.92	16.5	25.0	8.40	10.7
1953	2.37	2.43	3.16	3.71	3.73	4.35	10.3	13.4	17.0	10.5	24.6	8.62	8.72
1954	3.17	3.27	3.95	3.68	3.80	4.17	9.26	13.7	8.49	3.10	2.98	3.09	5.23
1955	3.01	2.71	1.94	2.35	2.80	3.65	8.01	3.05	2.20	7.79	6.10	3.40	3.92
1956	2.87	3.03	4.02	3.48	3.30	2.94	14.8	9.57	5.12	1.97	2.43	1.55	4.58
1957	.51	1.98	1.69	2.25	2.75	4.82	10.8	9.99	8.20	5.97	2.13	2.50	4.47
1958	2.37	2.26	1.93	1.78	1.59	2.20	2.72	.66	1.17	3.49	1.56	2.29	2.00
1959	1.36	1.73	1.52	1.82	2.45	2.16	2.56	8.70	11.3	5.65	1.55	1.11	3.49
1960	1.37	2.22	2.63	3.34	2.14	2.10	3.29	9.84	3.61	1.32	.50	.09	2.71

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1.21	0.75	0.69	0.62	0.53	0.60	0.98	2.56	2.15	0.79	0.67	2.57	14.12
1952	2.01	1.41	1.20	.62	.48	.54	2.54	1.34	.39	2.27	3.44	1.12	17.36
1953	.33	.32	.44	.51	.46	.60	1.37	1.84	2.27	1.45	3.39	1.15	14.13
1954	.44	.43	.54	.51	.47	.57	1.23	1.89	1.13	.43	.41	.41	8.46
1955	.41	.36	.27	.32	.35	.50	1.07	.42	.29	1.07	.84	.45	6.35
1956	.39	.40	.55	.48	.42	.40	1.97	1.32	.68	.27	.33	.21	7.42
1957	.07	.26	.23	.31	.34	.66	1.44	1.37	1.09	.82	.29	.33	7.21
1958	.33	.30	.26	.24	.20	.30	.36	.09	.16	.48	.21	.29	3.22
1959	.19	.23	.21	.25	.30	.30	.34	1.20	1.50	.78	.21	.15	5.66
1960	.19	.30	.36	.46	.28	.29	.44	1.35	.48	.18	.07	.01	4.41

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	13.4	21.78
1951	1208	29	May 26, 1951	3.0	8.72	1.04	14.12	9.94	16.09
1952	1238	59	July 20, 1952	1.9	10.7	1.28	17.36	8.51	13.83
1953	1278	36	Aug. 11, 1953	1.9	8.72	1.04	14.13	8.92	14.45
1954	1338	25	May 3, 1954	2.5	5.23	.624	8.46	5.00	8.09
1955	1398	15	July 13, 1955	1.5	3.92	.468	6.35	4.11	6.65
1956	1438	22	Apr. 19, 1956	.8	4.58	.547	7.42	4.09	6.64
1957	1508	21	Apr. 28, 29, 1957	.3	4.47	.533	7.21	4.67	7.54
1958	1558	4.6	Apr. 7, 1958	.2	2.00	†.239	3.22	1.83	2.96
1959	1628	23	May 31, 1959	.5	3.49	.416	5.66	3.63	5.88
1960	1708	16	May 5, 1960	0	2.71	.323	4.41	-	-

† Corrected.

2440. Crow Wing River at Nimrod, Minn.

Location.--Lat 46°39', long 94°53', in sec.32, T.137 N., R.33 W., on right bank 300 ft (revised) upstream from highway bridge, 0.2 mile north of Nimrod, and 0.7 mile upstream from Cat River.

Drainage area.--1,010 sq mi, approximately.

Records available.--April 1910 to September 1914, July 1930 to September 1960 (winter records incomplete prior to 1940).

Gage.--Water-stage recorder. Datum of gage is 1,313.27 ft above mean sea level, datum of 1929 (levels by Wadena County Highway Department from Minnesota Highway Department bench mark). Apr. 15, 1910, to Sept. 30, 1914, chain gage at bridge 10 ft downstream at datum 2.2 ft lower. July 28, 1930, to Aug. 19, 1948, chain gage and Aug. 20, 1948, to Nov. 4, 1949, wire-weight gage, at former bridge 10 ft downstream at same datum.

Average discharge.--21 years (1939-60), 457 cfs.

Extremes.--1910-14, 1930-60: Maximum discharge, 2,330 cfs Apr. 7, 1943, Aug. 9, 1944; maximum gage height, 7.64 ft Apr. 20, 1950 (backwater from ice); minimum discharge observed, 45 cfs Aug. 7, 1936.

Remarks.--Flow affected by natural storage in many lakes.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	423	333	315	309	291	368	769	723	672	354	300	427	441
1952	503	514	596	404	439	481	1,187	641	382	879	655	513	600
1953	375	390	339	295	303	387	705	779	1,302	795	836	641	596
1954	547	501	419	430	435	538	1,129	1,004	629	350	317	353	554
1955	426	386	343	281	256	354	654	550	495	485	709	380	445
1956	337	321	298	282	295	335	794	581	366	197	297	244	362
1957	228	348	281	221	200	313	667	594	659	583	351	437	407
1958	461	424	345	246	231	258	333	312	385	279	189	317	315
1959	283	306	239	199	198	249	329	515	497	515	444	578	363
1960	440	368	304	346	295	305	779	798	587	336	357	457	447

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.48	0.37	0.36	0.35	0.30	0.42	0.85	0.83	0.74	0.40	0.34	0.47	5.91
1952	.57	.57	.68	.46	.47	.55	1.31	.73	.42	1.00	.75	.57	8.08
1953	.43	.43	.39	.34	.31	.44	.78	.89	1.44	.91	.95	.71	8.02
1954	.62	.55	.48	.49	.45	.61	1.25	1.15	.69	.40	.36	.39	7.44
1955	.49	.43	.39	.32	.26	.40	.72	.63	.55	.55	.81	.42	5.97
1956	.38	.35	.34	.32	.32	.38	.88	.66	.40	.22	.34	.27	4.86
1957	.26	.38	.32	.25	.21	.36	.74	.68	.73	.67	.40	.43	5.48
1958	.53	.47	.39	.28	.24	.29	.37	.36	.42	.32	.22	.35	4.24
1959	.32	.34	.27	.23	.20	.28	.36	.59	.55	.59	.51	.64	4.88
1960	.50	.41	.35	.39	.32	.35	.86	.91	.65	.38	.41	.50	6.03

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Near	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	546	7.33
1951	1208	982	Apr. 15, 1951	245	441	0.437	5.91	486	6.52
1952	1238	al,800	July 20, 1952	320	600	.594	8.08	557	7.51
1953	1278	1,730	June 21, 1953	280	596	.590	8.02	627	8.42
1954	1358	1,510	Apr. 15, 1954	259	554	.549	7.44	528	7.10
1955	1388	1,040	Apr. 7, 1955	245	445	.441	5.97	428	5.73
1956	1438	1,040	Apr. 13, 1956	164	362	.358	4.86	353	4.75
1957	1508	1,120	June 23, 1957	190	407	.403	5.48	438	5.91
1958	1558	498	Oct.25,26, 1957	140	315	.312	4.24	281	3.78
1959	1628	833	July 8, 1959	190	363	.359	4.88	387	5.21
1960	1708	1,260	May 4-5, 1960	203	447	.443	6.03	-	-

a Maximum daily discharge.

2450. Long Prairie River near Osakis, Minn.

Location.--Lat 45°58', long 95°05', in sec.22, T.129 N., R.35 W., on left upstream abutment of concrete diversion dam, 200 ft below diversion to Lake Osakis, 4 miles southwest of Clotho, and 7½ miles northeast of Osakis.

Records available.--March 1939 to June 1947 (fragmentary records of headwater elevation), November 1949 to March 1954.

Gage.--Staff gage. Datum of gage is 1,319.32 ft above mean sea level, adjustment of 1912 (levels by Minnesota Department of Conservation). Prior to Oct. 1, 1941, staff gage at same site and datum. Oct. 1, 1941, to June 30, 1947, staff gage at same site at datum 0.42 ft higher. Nov. 7, 1949, to Sept. 30, 1951, staff gage on downstream abutment at same datum.

Extremes.--1949-54: Maximum discharge, 951 cfs Apr. 9, 1952 (gage height, 6.05 ft, from graph based on gage readings); minimum daily, 7.5 cfs Feb. 24 to Mar. 4, 1950; minimum gage height, 1.44 ft Nov. 11-17, 1953.

Remarks.--Flow is diverted at times, just above station, to Osakis Lake and thence to Sauk River basin. Above a stage of about 3.6 ft, a small portion of the flow bypasses the gage through a natural diversion channel located half a mile upstream.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	59.1	32.7	24.5	24.0	25.5	56.4	357	211	185	124	76.7	69.2	104
1952	75.5	106	102	91.7	83.5	102	465	204	86.4	99.4	76.5	69.9	130
1953	48.7	39.2	21.3	18.5	21.1	90.1	184	120	105	56.6	32.4	34.6	64.3
1954	21.0	15.2	27.8	23.6	36.4	64.8	-	-	-	-	-	-	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	83.7	-
1951	1208	616	Apr. 14, 1951	21	104	-	-	118	-
1952	1258	951	Apr. 9, 1952	57	130	-	-	115	-
1953	1278	326	Apr. 10, 1953	17	64.3	-	-	60.5	-
1954	1338	-	-	a12	-	-	-	-	-

a Minimum during period October to March.

2465. Gull Lake near Brainerd, Minn.

Location.--Lat 46°24'40", long 94°21'26", in N½ sec.20, T.134 N., R.29 W., in pool of dam on Gull River, 800 ft south of outlet of Gull Lake, a quarter of a mile upstream from Gull Lake Dam, and 8 miles northwest of Brainerd.

Drainage area.--287 sq mi.

Records available.--August 1911 to September 1960. Prior to October 1941, month-end contents only, published in WSP 1308. Published as Gull Lake Reservoir near Brainerd October 1941 to September 1956.

Gage.--Water-stage recorder. Datum of gage is 1,188.14 ft above mean sea level, adjustment of 1912. Prior to Aug. 10, 1949, staff gage 800 ft north of present site at same datum.

Extremes.--1911-60: Maximum contents, 74,800 acre-ft June 30, 1914, corrected (gage height, 7.30 ft); minimum observed, 22,250 acre-ft Mar. 20, 1924 (gage height, 3.00 ft).

Remarks.--Reservoir is formed by Gull Lake and several other natural lakes controlled by concrete dam completed in 1913; storage began in 1912. Capacity between gage height 1.00 ft and gage height 7.00 ft (maximum operating stage) is 70,830 acre-ft, of which 26,020 acre-ft is controlled storage above gage height 5.00 ft (minimum allowable stage). Contents shown herein are contents above gage height 1.00 ft. Water is used to benefit navigation on Mississippi River below Minneapolis.

Cooperation.--Records furnished by Corps of Engineers in terms of cfs-days and converted to acre-feet by Geological Survey.

Contents, in acre-feet, on last day of month

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	60,870	58,270	55,750	48,690	47,660	47,800	50,120	59,710	61,930	61,930	64,550	59,970
1952	61,730	55,420	47,920	47,530	46,890	47,400	55,680	56,840	60,750	68,080	58,810	57,100
1953	55,800	52,580	51,160	51,680	45,070	51,810	59,070	62,190	56,710	58,680	61,010	53,480
1954	51,810	55,420	47,790	44,810	46,502	46,240	58,540	64,020	59,200	58,680	60,490	58,020
1955	56,970	55,550	45,980	46,120	46,890	45,850	58,280	58,020	57,370	57,500	57,760	56,970
1956	56,970	56,320	56,450	53,740	47,530	45,980	55,550	61,540	57,370	59,710	58,150	55,800
1957	51,290	48,050	51,550	49,600	48,690	52,840	55,030	59,450	60,620	57,370	55,680	58,410
1958	54,640	55,800	47,660	45,720	46,240	48,440	54,520	56,450	60,360	57,630	58,540	56,450
1959	54,390	53,230	45,850	48,120	47,150	48,180	52,070	63,630	60,100	59,070	58,410	56,190
1960	55,950	53,740	52,200	50,380	48,690	48,950	48,050	59,200	58,020	55,420	58,280	56,320

2470. Gull River at Gull Lake Dam, near Brainerd, Minn.

Location.--Lat 46°24'40", long 94°21'12", in sec.20, T.134 N., R.29 W., in headwater and tailwater of dam at outlet of Gull Lake, 8 miles northwest of Brainerd.

Drainage area.--287 sq mi.

Records available.--August 1911 to September 1960. Monthly discharge only for some periods, published in WSP 1308. Published as "at Gull Lake Reservoir" 1929.

Gage.--Water-stage recorder on headwater, and staff gage on tailwater. Datum of gage is 1,188.14 ft above mean sea level, adjustment of 1912. August 1911 to May 23, 1929, and Dec. 1, 1929, to Aug. 1, 1949, both gages were staff gages at same site and datum. May 24 to Nov. 30, 1929, staff gage 500 ft downstream at different datum.

Average discharge.--49 years (1911-60), 102 cfs, unadjusted.

Extremes.--1911-60: Maximum daily discharge, 1,123 cfs May 15, 1938; no flow at times.

Remarks.--Discharge computed at dam on basis of modified weir formulas, the head being obtained from readings on tail-water gage and from headwater recorder. Flow completely regulated by Gull Lake.

Cooperation.--Records furnished by Corps of Engineers and reviewed by Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second (observed)

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	19.0	66.0	128	128	94.4	114	323	125	175	86.8	37.6	246	128
1952	137	304	329	145	124	126	450	56.5	14	463	390	45.3	216
1953	13.7	104	93.5	82.0	202	81.6	198	231	387	44.2	200	180	150
1954	49.7	10.0	210	145	89.0	145	195	193	239	38.7	12.1	82.8	116
1955	62.7	57.3	181	56.5	65.3	85.1	81.1	60.3	78.1	128	65.8	9.0	77.8
1956	9.00	33.3	68.4	91.0	144	93.9	160	190	168	13.9	91.9	10.0	89.1
1957	70.5	131	10.0	66.7	64.0	58.7	250	70.0	311	176	29.0	18.0	104
1958	95.2	40.0	169	89.7	43.3	31.8	21.5	18.0	57.5	79.0	16.1	48.3	59.4
1959	52.2	107	133	36.2	20.9	22.7	21.3	116	180	63.1	22.4	46.8	68.7
1960	38.3	63.9	105	99.7	82.9	65.5	124	271	94.0	29.4	15.0	15.0	83.8

Monthly and yearly runoff, in inches (adjusted) a/

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.21	0.09	0.22	0.18	0.27	0.47	1.41	1.14	0.82	0.35	0.32	0.66	6.14
1952	.65	.78	.83	.56	.42	.54	2.29	.30	.31	2.34	.96	.06	10.04
1953	.03	.20	.28	.36	.30	.77	1.24	1.13	1.15	.31	.96	.21	6.94
1954	.09	.27	.35	.38	.36	.57	1.56	1.13	.61	.12	.17	.16	5.77
1955	.18	.13	.10	.24	.29	.27	1.13	.24	.24	.52	.28	-.02	3.60
1956	-.04	.09	.28	.19	.13	.28	1.25	1.15	.38	.21	.27	-.11	4.16
1957	-.01	.30	.27	.14	.17	.51	1.12	.57	1.28	.49	.006	.25	5.22
1958	.14	.23	.15	.23	.19	.27	.48	.20	.48	.14	.12	.05	2.68
1959	.08	.34	.05	.16	.14	.16	.34	1.22	.47	.19	.05	.04	3.24
1960	.14	.10	.32	.28	.20	.28	.42	1.81	.29	-.05	.25	-.07	3.97

a Adjusted for change in contents in Gull Lake.

Note.--Negative figures indicate that evaporation and seepage exceeded inflow.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year		
		Observed			Adjusted a/			Observed	Adjusted a/	
		Maximum day	Minimum day	Mean	Mean	Per square mile	Runoff in inches	Mean	Mean	Runoff in inches
		Discharge	Date							
1950	-	-	-	-	-	-	-	166	170	8.13
1951	1208	468	Apr. 18, 1951	10	128	130	0.453	6.14	175	7.88
1952	1238	1,105	July 23, 1952	10	216	212	.739	10.04	169	8.29
1953	1278	681	May 31, 1953	10	150	145	.505	6.94	156	7.14
1954	1338	640	June 2, 1954	10	116	122	.425	5.77	118	5.47
1955	1368	†476	July 9, 1955	9	77.8	76.4	.266	3.60	61.7	3.60
1956	1438	463	June 1, 1956	9	89.1	87.5	.305	4.16	97.4	4.31
1957	1508	610	June 26, 1957	10	104	108	.376	5.22	112	5.06
1958	1558	204	Dec. 7, 1957	11	59.4	56.7	.198	2.68	58.2	2.63
1959	1628	494	June 2, 1959	18	68.7	68.3	.238	3.24	61.6	3.3
1960	1708	512	Apr. 27, 1960	15	83.8	84.0	.293	3.97	-	-

† Corrected.

a Adjusted for change in contents in Gull Lake.

MISSISSIPPI RIVER MAIN STEM

2670. Mississippi River near Royalton, Minn.

Location.--Lat 45°51'40", long 94°21'30", in lot 2, sec.20, T.39 N., R.32 W., at plant of Minnesota Power & Light Co., 4 miles northwest of Royalton, 4.5 miles downstream from Swan River, and at mile 956 upstream from Ohio River.

Drainage area.--11,600 sq mi, approximately.

Records available.--March 1924 to September 1960.

Average discharge.--36 years (1924-60), 3,892 cfs.

Extremes.--1924-60: Maximum daily discharge, 29,400 cfs Apr. 13, 1952; minimum daily, 254 cfs Nov. 25, 1936.

Remarks.--Discharge computed on basis of powerplant records. Flow partly regulated by powerplants and Winnibigoshish, Leech, Pokegama, Sandy, and Gull Lakes and by Pine River Reservoir.

Cooperation.--Records collected by Minnesota Power & Light Co. under general supervision of Geological Survey, in connection with a Federal Power Commission project.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	4,221	3,250	3,621	3,668	3,670	3,830	10,400	9,625	6,694	4,490	3,345	7,934	5,391
1952	7,364	7,983	6,456	4,610	3,818	4,226	18,020	7,725	3,400	11,390	11,360	5,688	7,680
1953	3,152	3,378	3,194	3,253	3,512	4,814	10,200	9,374	15,150	10,070	15,230	7,496	7,415
1954	5,145	4,957	4,367	4,288	3,856	5,048	12,040	14,540	8,932	5,360	3,175	3,010	6,235
1955	2,912	3,019	2,925	2,769	2,897	2,568	9,270	4,101	4,542	5,761	7,023	2,818	4,100
1956	2,751	2,439	2,762	2,084	1,844	2,156	12,920	7,843	4,709	1,734	2,510	1,598	3,772
1957	1,623	2,824	2,018	1,755	1,659	2,902	8,920	7,425	8,857	9,308	5,123	4,704	4,768
1958	4,360	3,971	3,317	3,000	2,783	3,359	3,254	1,945	2,942	3,267	1,565	2,542	3,026
1959	1,789	2,166	1,571	1,231	1,150	1,486	2,331	5,565	7,686	4,682	1,718	3,162	2,885
1960	2,892	2,448	2,328	2,335	2,168	2,209	7,587	10,010	5,769	2,553	1,506	2,074	3,656

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.42	0.31	0.36	0.36	0.33	0.38	1.00	0.96	0.64	0.45	0.33	0.76	6.30
1952	.73	.77	.64	.46	.35	.42	1.73	.77	.33	1.13	1.13	.55	9.01
1953	.31	.32	.32	.32	.32	.46	.98	.93	1.46	1.00	1.51	.72	8.67
1954	.51	.48	.45	.43	.35	.50	1.16	1.45	.86	.53	.32	.29	7.31
1955	.29	.29	.29	.28	.22	.26	.80	.41	.44	.57	.70	.27	4.82
1956	.27	.23	.27	.21	.17	.21	1.24	.78	.45	.17	.25	.15	4.40
1957	.16	.27	.20	.17	.15	.29	.86	.74	.85	.93	.51	.45	5.58
1958	.43	.38	.33	.30	.25	.33	.31	.19	.28	.32	.16	.24	3.52
1959	.18	.21	.16	.12	.10	.15	.22	.55	.74	.47	.17	.30	3.37
1960	.29	.24	.23	.23	.20	.22	.73	.99	.55	.25	.15	.20	4.28

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Maximum day		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	6,690	8.17
1951	1208	14,900	Apr. 17, 1951	1,370	5,391	0.465	6.30	6,288	7.35
1952	1258	29,400	Apr. 13, 1952	2,520	7,680	.662	9.01	6,669	7.82
1953	1279	20,700	Aug. 13, 1953	1,570	7,435	.639	8.67	7,814	9.14
1954	1338	19,300	May 8, 1954	2,430	6,235	.558	7.31	5,764	6.76
1955	1388	12,100	Apr. 5, 1955	1,960	4,100	.353	4.82	4,025	4.72
1956	1438	18,400	Apr. 14, 1956	787	3,772	.325	4.40	3,645	4.26
1957	1508	17,700	June 28, 1957	1,140	4,768	.411	5.58	5,205	6.09
1958	1558	5,510	July 5, 1958	887	3,026	.261	3.52	2,511	2.93
1959	1628	16,000	June 2, 1959	1,060	2,883	.249	3.37	3,064	3.58
1960	1708	14,900	May 7, 1960	1,200	3,656	.315	4.28	-	-

2705. Sauk River near St. Cloud, Minn.

Location.--Lat 45°33'35", long 94°14'00", in SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 8, T.124 N., R.28 W., on right bank half a mile northwest of Waite Park, 3 miles west of St. Cloud, and 5 miles upstream from mouth.

Drainage area.--925 sq mi.

Records available.--July 1909 to December 1912, April to December 1913, May to November 1929, March 1930 to September 1931, April to November 1932, March to November 1933, March 1934 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,034.95 ft above mean sea level, adjustment of 1912. Prior to Nov. 22, 1934, chain gage on highway bridge 1 mile downstream at datum 6.77 ft lower.

Average discharge.--30 years (1909-12, 1930-31, 1934-60), 248 cfs.

Extremes.--1909-13, 1929-60: Maximum discharge, 5,580 cfs Apr. 13, 1951 (gage height, 7.89 ft); minimum, 0.3 cfs Nov. 25, 1936.

Remarks.--Flow regulated by powerplants and reservoirs above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	74.7	52.0	51.4	58.1	82.0	167	1,774	671	511	396	109	267	350
1952	204	427	449	156	195	249	2,763	766	585	899	611	419	642
1953	101	135	122	98.1	111	393	794	495	1,301	796	715	194	439
1954	105	143	111	133	137	319	454	732	554	421	177	224	300
1955	227	174	126	117	115	183	493	145	82.3	159	78.6	53.6	163
1956	62.7	53.8	39.2	39.5	23.1	55.5	666	225	117	114	898	192	208
1957	104	190	110	74.9	60.5	361	553	484	1,333	1,088	762	1,136	522
1958	555	477	327	163	111	362	676	350	200	122	130	258	312
1959	135	150	98.7	65.3	55.7	73.7	77.9	273	397	79.1	58.8	46.1	125
1960	53.3	64.7	57.5	60.0	56.9	95.9	727	227	97.6	56.1	46.3	54.7	132

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.09	0.06	0.06	0.07	0.09	0.21	2.14	0.84	0.62	0.49	0.14	0.32	5.12
1952	.25	.52	.56	.19	.23	.31	3.33	.96	.71	1.12	.76	.51	9.45
1953	.13	.16	.15	.12	.12	.49	.96	.62	1.57	.99	.89	.23	6.43
1954	.13	.17	.14	.17	.26	.40	.55	.91	.67	.53	.22	.27	4.42
1955	.28	.21	.16	.15	.13	.23	.59	.18	.10	.20	.10	.06	2.59
1956	.08	.06	.05	.05	.03	.07	.80	.28	.14	.14	1.12	.23	3.05
1957	.13	.23	.14	.09	.07	.45	.67	.60	1.61	1.36	.95	1.37	7.67
1958	.69	.57	.41	.20	.13	.45	.82	.44	.24	.15	.16	.31	4.57
1959	.17	.18	.11	.08	.06	.09	.09	.34	.48	.10	.07	.06	1.83
1960	.07	.08	.07	.07	.07	.12	.88	.28	.12	.07	.06	.07	1.96

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	281	4.12
1951	1208	5,580	Apr. 13, 1951	35	350	0.378	5.13	426	6.25
1952	1258	5,410	Apr. 15, 1952	78	642	.694	9.45	581	8.56
1953	1278	2,740	June 20, 1953	65	439	.475	6.43	439	6.45
1954	1338	1,480	May 4, 1954	77	300	.324	4.42	314	4.63
1955	1388	790	Apr. 6, 1955	42	163	.176	2.39	132	1.93
1956	1438	2,010	Aug. 8, 1956	22	208	.225	3.05	228	3.36
1957	1508	2,920	June 22, 1957	58	522	.564	7.67	602	8.84
1958	1558	1,060	Apr. 11, 1958	97	312	.337	4.57	229	3.36
1959	1628	973	June 6, 1959	45	125	.135	1.85	109	1.59
1960	1708	1,480	Apr. 5, 1960	41	132	.143	1.96	-	-

2750. Elk River near Big Lake, Minn.

Location.--Lat 45°20', long 93°40', in sec.23, T.33 N., R.27 W., on right bank at upstream side of highway bridge, 4 miles east of Big Lake and 4 miles downstream from St. Francis River.

Drainage area.--615 sq mi.

Records available.--April 1911 to September 1917, April to September 1931, April to November 1932, March to November 1933, March 1934 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 899.60 ft above mean sea level, datum of 1929. April 1911 to Sept. 30, 1917, staff gage and Apr. 1, 1931, to July 26, 1934, chain gage, at same site and datum.

Average discharge.--32 years (1911-17, 1934-60), 246 cfs.

Extremes.--1911-17, 1931-60: Maximum discharge, 5,330 cfs Apr. 10, 1952 (gage height, 10.36 ft), from rating curve extended above 3,800 cfs; minimum, 3.6 cfs July 31, 1934.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	133	113	95.0	88.3	84.4	123	1,359	346	263	604	245	482	327
1952	312	436	312	158	150	165	1,680	328	410	888	328	403	463
1953	162	159	142	126	109	402	536	504	599	361	346	125	298
1954	108	144	140	96.9	140	201	333	946	740	784	176	227	338
1955	294	218	156	116	108	172	638	143	137	166	227	413	232
1956	175	168	113	96.1	92.9	114	953	248	148	161	551	171	249
1957	128	197	102	73.7	72.1	326	347	316	1,019	432	252	500	314
1958	279	258	197	96.5	79.8	126	352	180	156	102	124	250	184
1959	149	180	85.2	56.4	50.5	129	119	214	163	97.6	83.3	141	123
1960	111	97.5	96.7	103	72.0	90.9	491	277	184	114	86.4	160	157

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.25	0.20	0.18	0.17	0.14	0.23	2.46	0.65	0.48	1.13	0.46	0.87	7.22
1952	.58	.79	.59	.30	.26	.31	3.05	.61	.74	1.66	.61	.73	10.23
1953	.30	.29	.27	.24	.18	.75	.97	.94	1.09	.68	.65	.23	6.59
1954	.20	.26	.26	.18	.24	.38	.60	1.77	1.34	1.47	.33	.41	7.44
1955	.55	.39	.29	.22	.18	.32	1.16	.27	.25	.31	.43	.75	5.12
1956	.33	.31	.21	.18	.16	.21	1.73	.47	.27	.30	1.03	.31	5.51
1957	.24	.36	.19	.14	.12	.61	.63	.59	1.85	.81	.47	.91	6.92
1958	.52	.47	.37	.18	.14	.24	.64	.34	.28	.19	.23	.45	4.05
1959	.28	.33	.16	.11	.09	.24	.22	.40	.30	.18	.16	.26	2.73
1960	.21	.18	.18	.19	.13	.17	.89	.52	.33	.21	.16	.29	3.46

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	262	5.77
1951	1208	3,280	Apr. 11, 1951	76	327	0.532	-	388	8.55
1952	1238	5,330	Apr. 10, 1952	124	463	.753	10.23	413	9.13
1953	1278	1,320	Mar. 27, 1953	95	298	.485	6.59	292	6.45
1954	1338	3,120	May 1, 1954	92	338	.550	7.44	361	7.95
1955	1388	1,470	Apr. 6, 1955	81	232	.377	5.12	214	4.74
1956	1438	3,100	Apr. 8, 1956	86	249	.405	5.51	246	5.45
1957	1508	2,500	June 27, 1957	68	314	.511	6.92	339	7.49
1958	1558	538	Apr. 12, 1958	59	184	.299	4.05	157	3.46
1959	1628	330	May 10, 1959	48	123	.200	2.73	114	2.53
1960	1708	1,580	Apr. 3, 1960	40	157	.255	3.46	-	-

Location.--Lat 45°18', long 93°34', in SE¹ sec.34, T.33 N., R.26 W., fourth principal meridian, on left bank in town of Elk River, and at mile 884.6 above Ohio River.

Records available.--July 1915 to October 1956.

Gage.--Water-stage recorder. Datum of gage is 847.92 ft above mean sea level, adjustment of 1912. Prior to July 18, 1932, chain gage at highway bridge 50 ft upstream at same datum.

Extremes.--1915-56: Maximum discharge, 49,200 cfs Apr. 12, 1952 (gage height, 14.49 ft); minimum, 278 cfs Nov. 15, 1933.

Remarks.--Flow slightly regulated, except during extreme floods, by six reservoirs on headwaters; total usable capacity, 1,640,610 acre-ft; total normal operating capacity, 948,900 acre-ft. Diurnal regulation caused by powerplants above station.

[illegible][illegible][illegible]

2760. North Fork Crow River near Regal, Minn.

Location.--Lat 45°22'55", long 94°47'40", in S $\frac{1}{2}$ sec.11, T.122 N., R.33 W., on right bank 12 ft upstream from highway bridge and 3 miles southeast of Regal.

Drainage area.--215 sq mi.

Records available.--July 1943 to October 1954.

Gage.--Water-stage recorder. Datum of gage is 1,195.92 ft above mean sea level, datum of 1929. July 1943 to May 9, 1944, staff gage and May 10, 1944, to July 13, 1948, chain gage, at same site and datum.

Average discharge.--11 years (1943-54), 61.8 cfs.

Extremes.--1943-54: Maximum discharge, 2,120 cfs Apr. 11, 1952 (gage height, 6.11 ft), from rating curve extended above 900 cfs; maximum gage height recorded, 6.73 ft Apr. 6, 1951 (backwater from ice); no flow at times in most years.

Remarks.--At high stages a portion of flow bypasses gage from a point about 1 mile upstream, and returns to the main channel at a point about two-thirds of a mile below gage. This flow is included in the station record.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	18.1	9.03	3.4	2.6	1.67	11.2	634	191	134	97.0	21.0	76.5	99.5
1952	54.2	56.0	82.5	17.7	20.9	14.3	911	102	256	247	91.6	40.1	157
1953	14.9	12.2	1.62	.26	0	86.8	160	121	203	55.2	202	20.9	73.5
1954	10.6	14.0	9.10	1.51	28.5	81.1	93.8	126	78.1	18.3	8.54	14.7	40.4
1955	15.9	-	-	-	-	-	-	-	-	-	-	-	-

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.10	0.05	0.02	0.01	0.01	0.06	3.29	1.03	0.70	0.52	0.11	0.40	6.30
1952	.29	.29	.44	.10	.10	.08	4.73	.55	1.33	1.33	.49	.21	9.94
1953	.08	.06	.009	.001	0	.47	.83	.65	1.05	.30	1.08	.11	4.64
1954	.06	.07	.05	.008	.14	.43	.49	.68	.41	.10	.05	.08	2.57
1955	.09	-	-	-	-	-	-	-	-	-	-	-	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	48.1	3.04
1951	1238	1,400	Apr. 6, 1951	1	99.5	0.463	6.30	113	7.15
1952	1238	2,120	Apr. 11, 1952	2	157	.730	9.94	143	9.07
1953	1278	896	June 16, 1953	0	73.5	.342	4.64	73.9	4.67
1954	1338	329	May 2, 1954	.8	40.4	.188	2.57	-	-
1955	1338	-	-	-	-	-	-	-	-

2780. Middle Fork Crow River near Spicer, Minn.

Location.--Lat 45°15'45", long 94°48'10", in NE $\frac{1}{4}$ sec.27, T.121 N., R.33 W., on right bank 75 ft upstream from highway bridge, 1 $\frac{1}{2}$ miles downstream from Lake Calhoun, 3 miles downstream from Green Lake, and 6.8 miles northeast of Spicer.

Drainage area.--179 sq mi.

Records available.--March 1949 to September 1960.

Gage.--Water-stage recorder and concrete and steel V-notch sharp-crested weir. Datum of gage is 1,147.93 ft above mean sea level, datum of 1929 (Kandiyohi County Highway Department bench mark). Prior to July 20, 1950, chain gage at bridge 75 ft downstream at same datum.

Average discharge.--11 years (1949-60), 54.7 cfs.

Extremes.--1949-60: Maximum discharge, 408 cfs June 29, 1953; maximum gage height, 6.67 ft June 25, 1957; no flow Mar. 15-24, 1949, Feb. 26 to Mar. 26, 1960.

Remarks.--Flow affected by natural storage and some regulation from lakes above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	7.15	2.39	14.2	14.5	26.3	60.5	121	246	214	135	68.7	95.0	83.9
1952	84.1	85.8	96.7	76.5	75.6	71.3	215	258	136	237	138	71.8	129
1953	21.5	6.58	15.9	8.60	24.9	53.0	142	182	230	270	138	53.2	97.4
1954	16.4	3.88	10.2	25.4	49.2	73.0	76.8	93.5	61.3	37.9	10.6	8.63	38.8
1955	8.11	17.6	22.9	24.2	28.1	30.3	54.0	39.5	9.99	32.7	13.0	2.87	23.6
1956	2.20	1.73	1.78	4.48	1.88	12.7	19.6	23.6	38.4	16.8	97.0	52.1	22.7
1957	12.6	14.1	13.7	9.87	11.6	17.4	83.4	84.5	220	229	187	215	91.8
1958	183	125	86.4	62.5	40.5	64.9	106	78.5	43.8	22.1	4.49	2.03	68.4
1959	2.01	1.88	1.40	.95	.50	1.45	3.26	11.8	14.9	3.08	1.35	1.33	3.66
1960	1.45	1.37	1.51	1.10	.24	.40	16.9	33.6	40.3	21.1	4.83	6.26	10.8

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.05	0.01	0.09	0.09	0.15	0.39	0.75	1.58	1.34	0.87	0.44	0.59	6.35
1952	.54	.53	.62	.49	.46	.46	1.34	1.66	.85	1.52	.89	.45	9.81
1953	.14	.04	.10	.04	.14	.41	.88	1.17	1.43	1.74	.89	.39	7.37
1954	.11	.02	.07	.16	.29	.47	.48	.60	.38	.24	.07	.05	2.94
1955	.05	.11	.15	.16	.16	.19	.34	.25	.06	.21	.08	.02	1.78
1956	.01	.01	.01	.03	.01	.08	.12	.15	.24	.11	.62	.32	1.71
1957	.08	.09	.09	.06	.07	.11	.52	.54	1.37	1.48	1.20	1.34	6.95
1958	1.18	.78	.56	.40	.24	.42	.66	.51	.27	.14	.03	.01	5.20
1959	.01	.01	.009	.006	.003	.009	.02	.08	.09	.02	.009	.008	.27
1960	.009	.009	.01	.007	.001	.003	.11	.22	.25	.14	.03	.04	.83

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	33.8	2.57
1951	1208	269	May 7, 1951	1.8	83.9	0.469	6.35	104	7.89
1952	1238	318	Apr. 26, 1952	45	129	.721	9.81	110	8.40
1953	1278	408	June 29, 1953	-	37.4	.544	7.37	96.2	7.29
1954	1338	154	Mar. 13, 1954	2.6	38.8	.217	2.94	40.3	3.05
1955	1388	79	Apr. 21, 1955	2.2	23.6	.132	1.78	20.0	1.50
1956	1438	120	Aug. 19, 1956	1.4	22.7	.127	1.71	25.6	1.94
1957	1508	387	June 25, 1957	1.9	91.8	.513	6.95	121	9.21
1958	1558	222	Oct. 1, 1957	1.8	68.4	.582	5.20	35.8	2.71
1959	1628	30	May 12, 1959	.5	3.66	.020	.27	3.59	.27
1960	1708	75	May 27, 1960	0	10.8	.060	.83	-	-

2785. South Fork Crow River at Cosmos, Minn.

Location.--Lat 44°56'05", long 94°40'30", in SW $\frac{1}{4}$ sec. 14, T.117 N., R.32 W., on downstream side of bridge on State Highway 7, 1 mile east of Cosmos, $\frac{3}{4}$ miles upstream from small tributary, and $\frac{3}{4}$ miles west of Corvuso.

Drainage area.--221 sq mi.

Records available.--March 1945 to September 1960.

Gage.--Wire-weight gage. Datum of gage is 1,079.09 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Mar. 1 to Sept. 3, 1945, chain gage and Sept. 4, 1945, to June 12, 1959, wire-weight gage, at same site at datum 3.00 ft higher.

Average discharge.--15 years (1945-60), 47.3 cfs.

Extremes.--1945-60: Maximum discharge, 1,290 cfs June 17, 1957 (gage height, 9.62 ft, from graph based on gage readings); no flow at times each year except 1956-58.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	4.69	1.49	0.06	0	0	0	303	207	112	94.1	68.8	47.3	69.9
1952	35.5	33.8	41.0	16.1	3.75	5.35	477	264	183	234	155	85.0	126
1953	44.2	30.5	11.1	9.11	1.73	110	147	199	145	163	184	54.1	92.3
1954	14.5	22.4	19.5	4.39	10.9	23.6	58.2	71.4	48.2	13.4	1.88	1.99	25.1
1955	5.87	7.49	4.22	2.15	.48	15.8	38.5	5.35	.86	59.5	24.2	8.01	14.5
1956	7.57	3.6 ^a	.42	.43	.69	22.9	97.3	28.4	32.5	10.9	56.3	31.6	24.3
1957	21.4	22.2	9.18	4.72	1.06	4.22	67.5	47.0	326	372	383	361	135
1958	168	119	59.1	32.9	6.74	44.4	146	51.2	63.0	16.8	.51	.63	59.1
1959	.11	.29	0	0	0	.19	.52	4.31	.91	.15	1.06	1.57	.76
1960	1.07	1.17	6.97	.62	.05	81.6	82.4	26.3	10.6	6.63	44.2	14.6	23.1

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.02	0.008	0.0003	0	0	0	1.53	1.08	0.57	0.49	0.36	0.24	4.30
1952	.19	.17	.21	.08	.02	.03	2.41	1.38	.82	1.22	.81	.43	7.77
1953	.23	.15	.06	.05	.01	.57	.74	1.04	.73	.85	.96	.27	5.66
1954	.13	.11	.10	.02	.05	.12	.29	.37	.24	.07	.01	.01	1.52
1955	.03	.04	.02	.01	.002	.08	.19	.03	.004	.31	.13	.04	.89
1956	.04	.02	.002	.002	.003	.12	.49	.15	.16	.06	.29	.16	1.50
1957	.11	.11	.05	.02	.005	.02	.34	.28	1.65	1.94	2.00	1.82	8.32
1958	.87	.80	.31	.17	.03	.23	.74	.27	.32	.09	.003	.003	3.64
1959	.0006	.001	0	0	0	.001	.003	.02	.005	.0008	.006	.008	.05
1960	.006	.006	.04	.003	.0002	.43	.42	.14	.05	.03	.23	.07	1.43

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	19.8	1.21
1951	-	-	-	-	-	-	-	78.7	4.84
1952	1208	a590	Apr. 14, 1951	0	69.9	0.316	4.30	124	7.64
1953	1238	958	Apr. 8, 1952	0	126	.570	7.77	90.7	5.56
1954	1278	461	Mar. 22, 1953	0	92.3	.418	5.66	21.0	1.27
1955	1338	140	May 1, 1954	.1	25.1	.114	1.52	14.0	.86
1956	1389	240	July 11, 1955	0	14.5	.066	.89	27.8	1.71
1957	1438	259	Apr. 3, 1956	.3	24.3	.110	1.50	160	9.82
1958	1508	1,890	June 17, 1957	1.0	135	.611	8.32	30.1	1.86
1959	1558	356	Apr. 6, 1958	.1	59.1	.267	3.64	1.51	.10
1960	1628	27	May 5, 1959	0	.76	.0034	.05	-	-
1960	1708	760	Mar. 30, 1960	0	23.1	.105	1.43	-	-

a Maximum daily discharge.

2790. South Fork Crow River near Mayer, Minn.

Location.--Lat 44°54'20", long 93°53'05", in SW¹/₄SW¹/₄ sec.30, T.117 N., R.25 W., rear center of span on downstream side of bridge on State Highway 7, 1.3 miles north of Mayer, 4.3 miles southwest of Watertown, and 16 miles upstream from confluence with North Fork.

Drainage area.--1,170 sq mi, approximately.

Records available.--April 1934 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Wire-weight gage. Datum of gage is 926.00 ft above mean sea level (levels by Hennepin County Park Board Survey). Prior to June 14, 1940, chain gage at same site and datum.

Average discharge.--26 years (1934-60), 220 cfs.

Extremes.--1934-60: Maximum discharge, 11,000 cfs Apr. 10, 1952 (gage height, 15.70 ft); no flow at times.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	20.2	3.92	0.82	1.96	2.24	14.4	2,306	1,136	447	751	197	328	434
1952	165	116	170	58.5	48.3	61.7	4,145	792	389	985	457	231	632
1953	66.7	42.2	28.2	19.8	17.1	560	760	1,114	940	1,176	1,204	105	507
1954	34.9	49.8	24.9	9.5	16.2	352	239	525	258	217	35.8	75.8	151
1955	45.7	41.5	21.6	8.86	4.41	225	265	26.8	16.5	570	91.6	23.3	113
1956	13.6	9.71	2.26	2.01	2.40	21.7	390	94.7	836	255	518	75.1	185
1957	30.2	49.1	20.2	5.74	6.30	281	268	206	2,442	1,865	1,080	1,090	613
1958	541	318	154	44.4	22.6	117	641	145	354	67.3	9.06	5.89	185
1959	4.81	6.24	.58	.01	0	8.13	13.7	71.6	26.2	12.4	6.05	6.08	13.1
1960	8.05	6.15	8.62	16.4	2.54	146	1,040	372	95.5	78.5	28.5	121	159

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.02	0.004	0.0008	0.002	0.002	0.01	2.20	1.12	10.43	0.74	0.19	0.31	5.03
1952	.16	.11	.17	.06	.04	.06	3.95	.78	.37	.97	.45	.22	7.34
1953	.07	.04	.03	.02	.02	.55	.73	1.10	.90	1.16	1.19	.10	5.91
1954	.03	.05	.02	.01	.01	.33	.23	.52	.25	.21	.04	.07	1.77
1955	.05	.04	.02	.01	.004	.22	.25	.03	.02	.56	.09	.02	1.51
1956	.01	.009	.002	.002	.002	.02	.37	.09	.80	.25	.51	.07	2.14
1957	.03	.05	.02	.006	.006	.28	.26	.20	2.33	1.84	1.06	1.04	7.12
1958	.34	.30	.15	.04	.02	.12	.61	.14	.34	.07	.009	.006	2.14
1959	.005	.006	.0006	.00001	0	.008	.01	.07	.02	.01	.006	.006	.14
1960	.008	.006	.008	.02	.002	.14	.99	.37	.09	.08	.03	.12	1.86

† Corrected.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	198	2.29
1951	1208	5,070	Apr. 12, 1951	0.7	434	0.371	5.03	470	5.44
1952	1238	11,000	Apr. 10, 1952	45	632	.540	7.34	605	7.04
1953	1278	3,900	June 30, 1953	14	507	.433	5.91	500	5.87
1954	1358	1,440	July 3, 1954	1.4	151	1.29	1.77	151	1.78
1955	1388	1,500	July 17, 1955	1.2	113	.097	1.51	106	1.22
1956	1438	2,850	June 22, 1956	1.9	185	.158	2.14	191	2.21
1957	1508	9,660	June 23, 1957	3.9	613	.524	7.12	673	7.81
1958	1558	1,490	Apr. 10, 1958	3.7	185	.158	2.14	118	1.37
1959	1628	344	May 7, 1959	0	13.1	.011	.14	14.0	.15
1960	1708	3,550	Apr. 3, 1960	2.0	159	.136	1.86	-	-

2800. Crow River at Rockford, Minn.

Location.--Lat 45°05'15", long 93°44'00", in sec.29, T.119 N., R.24 W., on right bank at Rockford, 150 ft downstream from bridge on State Highway 55 and 1 mile downstream from confluence of North and South Forks.

Drainage area.--2,520 sq mi, approximately.

Records available.--April to July 1906 (published as "near Dayton"), June 1909 to September 1917, April to November 1929, March 1930 to September 1931, April to November 1932, March to November 1933, March 1934 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 893.65 ft above mean sea level, adjustment of 1912. Apr. 13 to July 21, 1906, staff gage at Berning Mill at site 14 miles downstream at different datum. June 4, 1909, to Sept. 30, 1917, staff gage at site 600 ft downstream at different datum. Apr. 23, 1929, to Aug. 21, 1934, chain gage at site 600 ft downstream at present datum.

Average discharge.--35 years (1909-17, 1930-31, 1934-60), 565 cfs.

Extremes.--1909-17, 1929-60: Maximum discharge, 13,900 cfs Apr. 13, 1952 (gage height, 16.24 ft); minimum, 1.8 cfs Nov. 15, 1936 (gage height, 1.05 ft), caused by ice jam upstream.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	76.9	50.7	35.5	40.7	47.0	122	4,383	2,696	1,109	1,747	908	1,207	1,036
1952	709	591	792	368	295	344	7,705	2,496	1,070	2,240	1,466	665	1,558
1953	219	134	97.5	103	102	871	1,891	2,232	1,932	2,725	1,989	440	1,068
1954	153	150	135	89.5	146	687	752	1,426	656	504	156	280	426
1955	249	205	108	75.9	72.2	446	1,014	251	130	1,232	369	130	359
1956	73.3	59.0	42.2	48.5	51.3	75.7	1,170	428	1,125	590	2,120	631	535
1957	177	225	105	63.4	52.2	513	981	776	3,998	4,359	2,511	2,880	1,391
1958	1,341	1,035	655	288	196	501	1,592	618	646	203	88.6	82.7	605
1959	63.0	71.5	27.9	20.5	12.5	91.3	144	283	161	89.2	46.6	64.6	90.0
1960	62.3	57.2	58.7	94.5	41.1	228	2,204	924	432	185	109	267	387

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.04	0.02	0.02	0.02	0.02	0.06	1.94	1.23	0.49	0.80	0.42	0.53	5.59
1952	.32	.26	.36	.17	.13	.18	3.41	1.14	.47	1.02	.67	.29	8.40
1953	.10	.06	.04	.05	.04	.40	.84	1.02	.86	1.25	.91	.19	5.76
1954	.07	.07	.06	.04	.06	.31	.33	.65	.29	.23	.07	.12	2.30
1955	.11	.09	.05	.03	.03	.20	.45	.11	.06	.56	.17	.06	1.92
1956	.03	.03	.02	.02	.02	.03	.52	.20	.50	.27	.97	.28	2.89
1957	.08	.10	.05	.03	.02	.23	.43	.36	1.77	1.99	1.15	1.27	7.48
1958	.61	.46	.30	.13	.08	.23	.70	.28	.29	.09	.04	.04	3.25
1959	.03	.03	.01	.009	.005	.04	.06	.13	.07	.04	.02	.03	.47
1960	.03	.03	.03	.04	.02	.10	.98	.42	.19	.08	.05	.12	2.09

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	515	2.79
1951	1208	7,720	Apr. 16, 1951	32	1,036	0.411	5.59	1,199	6.45
1952	1238	13,900	Apr. 13, 1952	275	1,558	.618	8.40	1,421	7.86
1953	1278	5,180	July 3, 1953	65	1,068	.424	5.76	1,068	5.76
1954	1338	2,620	May 5, 1954	76	428	.170	2.30	438	2.35
1955	1388	2,360	July 18, 1955	65	359	.142	1.92	327	1.75
1956	1438	3,280	Aug. 10, 1956	39	535	.212	2.89	563	3.04
1957	1508	13,500	June 26, 1957	47	1,391	.552	7.48	1,603	8.62
1958	1558	2,510	Apr. 12, 1958	56	605	.240	3.25	364	1.95
1959	1628	524	May 8, 1959	12	90.0	.036	.47	91.4	.49
1960	1708	4,800	Apr. 5, 1960	29	387	.154	2.09	-	-

2860. Rum River near St. Francis, Minn.

Location.--Lat 45°19'40", long 93°22'20", in SE $\frac{1}{4}$ sec.19, T.33 N., R.24 W., on left bank at upstream side of highway bridge, 4 miles south of St. Francis and 15 $\frac{1}{2}$ miles upstream from mouth.

Drainage area.--1,360 sq mi, approximately.

Records available.--May to November 1929, March 1930 to September 1931, April to November 1932, March 1933 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 861.12 ft above mean sea level, adjustment of 1912. Prior to Nov. 9, 1933, chain gage at site 50 ft downstream at same datum.

Average discharge.--28 years (1930-31, 1933-60), 549 cfs.

Extremes.--1929-60: Maximum discharge, 9,260 cfs Apr. 13, 1952 (gage height, 11.03 ft); minimum, 29 cfs Aug. 18, 1934 (gage height, 1.91 ft).

Remarks.--Occasional regulation by Ogechie (also controls Mille Lacs Lake) and Onamia Lakes.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	198	172	176	173	177	274	2,586	955	646	1,474	526	1,267	718
1952	972	1,101	694	456	388	335	4,093	986	976	2,298	926	936	1,178
1953	514	452	424	353	340	983	1,704	1,879	1,815	1,037	1,601	564	976
1954	512	525	492	357	466	626	1,122	3,043	1,920	2,532	503	645	1,067
1955	760	520	352	330	289	479	1,694	439	356	322	592	857	579
1956	448	394	284	278	282	315	2,730	713	513	397	778	268	616
1957	235	330	179	140	135	620	965	751	2,277	1,378	472	1,054	711
1958	415	459	268	217	143	215	837	429	407	286	147	255	343
1959	213	255	113	83.5	82.1	157	202	461	418	173	131	200	208
1960	205	191	157	157	109	165	970	651	451	267	143	221	507

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.17	0.14	0.15	0.15	0.14	0.23	2.12	0.81	0.53	1.25	0.45	1.01	7.18
1952	.82	.90	.59	.39	.31	.28	3.36	.84	.80	1.95	.79	.77	11.80
1953	.44	.37	.36	.30	.26	.83	1.40	1.59	1.49	.88	1.36	.45	9.74
1954	.43	.43	.42	.30	.36	.53	.92	2.58	1.58	2.15	.43	.53	10.66
1955	.64	.43	.30	.28	.22	.41	1.39	.37	.28	.27	.50	.67	5.78
1956	.38	.32	.24	.24	.22	.27	2.24	.60	.42	.34	.66	.24	6.17
1957	.20	.27	.15	.12	.10	.53	.79	.64	1.87	1.17	.40	.83	7.10
1958	.35	.38	.23	.18	.11	.18	.69	.36	.53	.24	.12	.24	3.41
1959	.18	.21	.10	.07	.06	.13	.17	.39	.34	.15	.11	.16	2.07
1960	.17	.16	.13	.13	.09	.14	.80	.55	.37	.23	.12	.18	3.07

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	644	6.42
1951	1208	5,650	Apr. 16, 1951	130	718	0.528	7.18	994	9.03
1952	1238	9,260	Apr. 13, 1952	191	1,178	.866	11.80	1,073	10.66
1953	1278	3,760	June 26, 1953	260	976	.717	9.74	997	9.85
1954	1358	8,200	May 2, 1954	340	1,067	.785	10.66	1,076	10.75
1955	1388	3,500	Apr. 7, 1955	250	579	.426	5.78	536	5.35
1956	1438	7,560	Apr. 11, 1956	237	616	.453	6.17	584	5.85
1957	1508	6,580	June 28, 1957	133	711	.523	7.10	745	7.44
1958	1558	1,570	Apr. 14, 1958	108	343	.252	3.41	236	2.94
1959	1628	1,000	June 6, 1959	76	208	.153	2.07	226	2.04
1960	1708	2,600	Apr. 5, 1960	85	307	.226	3.07	-	-

MISSISSIPPI RIVER MAIN STEM

2885. Mississippi River near Anoka, Minn.

Location.--Lat 45°07'36", long 93°17'48", in SW $\frac{1}{4}$ sec.12, T.119 N., R.21 W., on right bank half a mile downstream from Coon Creek, $1\frac{1}{2}$ miles downstream from hydroelectric plant of Northern States Power Co., at Coon Rapids, $6\frac{1}{2}$ miles downstream from Anoka, and at mile 864.8 upstream from Ohio River.

Drainage area.--19,100 sq mi, approximately.

Records available.--June 1931 to September 1960. Prior to October 1931 published as "at Coon Rapids, near Anoka."

Gage.--Water-stage recorder. Datum of gage is 805.02 ft above mean sea level, adjustment of 1912. Prior to June 14, 1932, at site $1\frac{1}{4}$ miles upstream at different datum.

Average discharge.--29 years (1931-60), 6,857 cfs.

Extremes.--1931-60: Maximum discharge, 75,900 cfs Apr. 14, 1952 (gage height, 17.51 ft); minimum, 586 cfs Sept. 13, 1934 (gage height, 0.37 ft).

Remarks.--Flow slightly regulated by six reservoirs on headwaters; total usable capacity, 1,640,600 acre-ft. Diurnal fluctuation caused by powerplant above station. Records of chemical analyses and water temperatures for the period August to September 1960 are published in report of the Geological Survey. Records of chemical analyses by the city of St. Paul for the period 1940-49 are published in Geological Survey Circular 274.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	5,673	3,964	4,429	4,561	4,614	5,190	26,130	17,630	11,060	6,588	12,780		9,472
1952	10,870	12,270	10,160	7,856	6,661	6,595	41,410	15,480	9,015	21,120	16,750	9,615	13,980
1953	5,054	4,965	4,561	4,608	4,993	8,868	16,580	16,340	23,290	17,020	21,880	9,905	11,540
1954	6,789	6,802	5,678	5,769	5,750	7,701	15,560	22,850	15,120	11,880	5,297	5,598	9,585
1955	5,545	4,978	4,141	3,711	3,558	4,421	14,320	5,863	5,851	8,196	8,951	5,352	6,230
1956	4,281	3,536	3,862	3,219	2,838	3,265	20,450	10,500	7,553	3,894	8,941	3,784	6,334
1957	2,822	4,641	3,286	2,650	2,464	5,929	12,920	11,240	19,430	19,060	10,780	12,200	8,969
1958	8,060	7,426	5,155	4,521	4,052	5,624	8,272	4,427	5,050	4,591	2,615	4,319	5,343
1959	2,904	3,427	2,407	1,873	1,651	2,293	3,575	7,823	10,050	5,752	2,550	4,313	4,057
1960	4,036	3,478	3,259	3,115	2,767	3,168	14,690	14,530	8,142	3,965	2,265	3,428	5,565

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.34	0.23	0.27	0.28	0.25	0.31	1.53	1.06	0.65	0.67	0.40	0.75	6.74
1952	.66	.72	.61	.47	.38	.40	2.42	.93	.53	1.27	1.01	.56	9.96
1953	.31	.29	.28	.28	.27	.54	.97	.99	1.36	1.03	1.32	.58	8.22
1954	.41	.40	.34	.35	.31	.46	.91	1.38	.88	.72	.32	.33	6.81
1955	.33	.29	.25	.22	.18	.27	.84	.35	.34	.49	.54	.31	4.41
1956	.26	.21	.23	.19	.16	.20	1.19	.63	.44	.24	.54	.22	4.51
1957	.17	.27	.20	.16	.13	.36	.75	.68	1.14	1.15	.65	.71	6.37
1958	.49	.43	.31	.27	.22	.34	.48	.27	.29	.28	.16	.25	3.79
1959	.18	.20	.15	.11	.09	.14	.21	.47	.59	.35	.15	.25	2.89
1960	.24	.20	.20	.19	.16	.19	.86	.88	.48	.24	.14	.20	3.98

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	10,490	7.44
1951	1208	41,800	Apr. 15, 1951	1,900	9,472	0.496	6.74	11,080	7.89
1952	1238	75,900	Apr. 14, 1952	5,770	13,980	.732	9.96	12,410	8.85
1953	1278	34,500	June 27, 1953	2,520	11,540	.604	8.22	11,930	8.49
1954	1358	36,000	May 5, 1954	4,050	9,585	.502	6.81	9,199	6.53
1955	1388	27,700	Apr. 2, 1955	3,050	6,230	.326	4.41	5,981	4.24
1956	1438	30,000	Apr. 11, 1956	1,870	6,334	.332	4.51	6,252	4.45
1957	1508	44,500	June 27, 1957	2,240	8,969	.470	6.37	9,801	6.96
1958	1558	12,200	June 12, 1958	1,780	5,343	.280	3.79	4,343	3.09
1959	1628	20,400	June 5, 1959	1,480	4,057	.212	2.89	4,230	3.00
1960	1708	38,400	Apr. 3, 1960	1,670	5,565	.291	3.98	-	-

a Maximum daily discharge.

2895. Minnehaha Creek at Minnetonka Mills, Minn.

Location.--Lat 44°56'30", long 93°26'45", near center of E½ sec.15, T.117 N., R.22 W., on left bank 40 ft upstream from bridge on county highway at Minnetonka Mills, 2.2 miles downstream from outlet of Minnetonka Lake, and 2.9 miles northwest of Hopkins.

Drainage area.--130 sq mi.

Records available.--August 1953 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 916.11 ft above mean sea level, datum of 1929.

Average discharge.--7 years (1953-60), 11.4 cfs.

Extremes.--1953-60: Maximum discharge, 198 cfs July 4, 1957; maximum gage height, 6.78 ft Dec. 12, 1957 (backwater from ice); no flow for many days in most years.

Remarks.--Discharge affected by storage in Minnetonka Lake controlled by fixed-crest dam.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	51.5	-
1954	1.00	1.04	0.75	0.13	0.44	2.07	6.60	93.5	83.5	83.2	7.64	2.87	23.7
1955	1.24	.64	.59	.14	.16	2.88	19.7	4.93	.14	1.99	.04	0	2.68
1956	0	0	0	0	0	.04	.75	.38	1.12	1.10	25.1	1.72	2.55
1957	.39	.82	.15	0	0	1.23	2.11	2.27	51.5	153	112	114	36.7
1958	31.7	25.0	11.9	6.09	3.60	7.17	†52.0	16.9	3.86	.11	.19	0	13.2
1959	0	.02	.01	0	0	0	0	.23	.16	.49	0	0	.08
1960	.003	0	.12	0	0	.11	3.26	7.08	2.20	.75	.16	.73	1.20

† Corrected.

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	0.44	-
1954	0.009	0.009	0.007	0.001	0.004	0.02	0.06	0.83	0.72	0.74	0.07	.02	†2.49
1955	.01	.006	.003	.001	.001	.03	.17	.04	.001	.02	.0004	0	.28
1956	0	0	0	0	0	.0003	.006	.003	.01	.01	.22	.01	.26
1957	.003	.007	.001	0	0	.01	.02	.44	1.56	.99	.98	0	3.83
1958	.28	.21	.11	.05	.03	.06	.45	.15	.03	.001	.002	0	1.37
1959	0	.0002	.00006	0	0	0	0	.002	.001	.04	0	0	.04
1960	.00003	0	.001	0	0	.001	.03	.06	.02	.007	.001	.003	.13

† Not previously published.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-
1953	1338	-	-	-	-	-	-	-	-
1954	1338	172	May 4, 1954	0.1	23.7	†0.182	†2.49	23.7	2.48
1955	1388	39	Apr. 21, 1955	0	2.68	.021	.28	2.49	.26
1956	1438	46	Aug. 11, 1956	0	2.55	.020	.26	2.66	.27
1957	1508	198	July 4, 1957	0	36.7	.282	3.83	42.4	4.42
1958	1558	76	Oct. 1, 1957	0	13.2	.102	1.37	7.46	.77
1959	1628	4.7	June 25, 1959	0	.08	.00062	.04	.08	.04
1960	1708	31	May 22, 1960	0	1.20	.092	.13	-	-

† Not previously published.

2900. Little Minnesota River near Peever, S. Dak.

Location.--Lat 45°36'05", long 96°52'18", in SW $\frac{1}{4}$ sec.13, T.12S N., R.50 W., on right bank 2 miles northwest of town of Browns Valley, Minn., $\frac{3}{4}$ miles upstream from proposed Lake Traverse diversion, 5.3 miles northeast of Peever, $7\frac{1}{4}$ miles downstream from Jorgenson River, and 8 miles upstream from Big Stone Lake.

Drainage area.--447 sq mi.

Records available.--October 1939 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,000 ft (from topographic map).

Oct. 1, 1939, to Mar. 20, 1940, staff gage at site $4\frac{1}{2}$ miles downstream at different datum. Mar. 21 to Apr. 12, 1940, staff gage at site 100 ft downstream at present datum. Apr. 13 to Aug. 27, 1940, staff gage at present site and datum.

Average discharge.--21 years (1939-60), 47.4 cfs (34,320 acre-ft per year).

Extremes.--1939-60: Maximum discharge, 4,730 cfs Apr. 8, 1952 (gage height, 12.16 ft); maximum gage height, 13.35 ft Mar. 25, 1943, from floodmark (backwater from ice); no flow at times in 1940, 1942, 1950, 1954, 1957, 1959.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.84	1.00	0.90	0.85	10.2	16.4	318	45.5	51.4	25.9	4.92	2.03	39.5
1952	4.65	7.75	5.31	2.66	2.70	3.76	1,321	75.5	16.8	9.44	.87	.63	119
1953	.57	.81	.82	.64	.59	30.5	51.8	87.3	163	29.7	29.3	2.30	33.1
1954	.93	2.07	1.42	.18	7.08	25.1	66.1	126	107	10.6	1.73	2.36	29.3
1955	3.23	3.58	2.30	.74	.27	32.4	50.9	6.74	6.69	4.09	.74	.33	9.34
1956	.67	.61	.34	.46	.31	.51	63.7	32.6	12.2	1.67	5.86	.62	9.91
1957	.58	1.25	.78	.17	.83	55.9	74.3	148	109	20.5	13.4	33.7	38.3
1958	24.5	34.7	10.8	2.78	12.0	91.1	221	40.6	11.0	4.62	.33	.32	37.7
1959	.51	1.65	.28	.01	.02	23.5	12.2	3.99	18.7	9.42	.23	.08	5.91
1960	.32	.45	.63	.62	.43	101	259	27.4	19.5	10.9	.69	.67	35.0

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	51	60	55	52	589	1,010	18,930	2,800	3,060	1,590	302	121	28,600
1952	286	461	326	164	156	231	78,600	4,640	1,000	590	54	37	86,540
1953	35	48	50	39	33	1,870	3,080	5,370	9,710	1,830	1,800	137	24,000
1954	57	123	87	11	393	1,540	3,930	7,770	6,360	653	106	140	21,170
1955	198	213	141	45	15	1,990	3,030	415	398	251	46	20	6,760
1956	41	36	21	28	18	.31	3,790	2,010	724	103	361	37	7,200
1957	56	75	48	17	46	3,430	4,420	9,120	6,460	1,260	824	2010	27,750
1958	1,510	2,060	664	171	664	5,600	13,170	2,500	651	294	20	19	27,510
1959	51.3	98.0	17.3	.6	1.0	1,450	726	245	1,110	579	14.1	4.8	4,280
1960	19	27	39	38	25	6,240	15,410	1,680	1,160	670	43	40	25,390

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1950	-	-	-	-	-	-	-	58.2	1.77	42,110	
1951	1208	1,320	Apr. 4, 1951	0.4	39.5	0.088	1.19	28,600	40.7	1.23	29,510
1952	1238	4,730	Apr. 8, 1952	.4	119	.266	3.62	86,540	118	3.58	85,600
1953	1278	818	June 16, 1953	.4	33.1	.074	1.02	24,000	33.3	1.03	24,140
1954	1338	2,300	May 27, 1954	0	29.3	.066	.89	21,170	29.6	.90	21,460
1955	1398	156	Apr. 2, 1955	.2	9.34	†.021	.29	6,760	8.71	.27	6,310
1956	1438	226	Apr. 15, 1956	.3	9.91	†.022	.30	7,200	10.0	.30	7,260
1957	1508	697	May 22, 1957	0	38.3	.086	1.15	27,750	44.0	1.32	31,820
1958	1558	625	Apr. 9, 1958	.2	37.7	.084	1.14	27,310	32.1	.96	23,230
1959	1628	340	June 27, 1959	0	5.91	.013	.18	4,280	5.8?	.17	4,220
1960	1708	1,050	Apr. 7, 1960	.1	35.0	.078	1.07	25,390	-	-	-

† Corrected.

5-2905. Whetstone River near Corona, S. Dak.

Location.--Lat 45°22', long 96°46', in NW $\frac{1}{4}$ sec. 34, T.122 N., R.49 W., at downstream side of highway bridge, a quarter of a mile downstream from nearest tributary, 2 miles north of Corona, and 5 $\frac{3}{4}$ miles southeast of Wilmot.

Drainage area.--170 sq mi, approximately.

Records available.--August 1953 to September 1957.

Gage.--Wire-weight gage and since July 22, 1956, crest-stage gage. Datum of gage is 1,103.41 ft above mean sea level, datum of 1929.

Extremes.--1953-57: Maximum discharge, 1,140 cfs May 21, 1957 (gage height, 10.23 ft), from rating curve extended above 190 cfs on basis of velocity-area study and logarithmic plotting; no flow Oct. 1, 6-9, 1956.

Remarks.--Some small diversions above station for irrigation.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1953	-	-	-	-	-	-	-	-	-	-	32.7	2.35	-
1954	0.82	1.24	1.40	0.96	14.4	59.4	87.1	44.1	74.2	4.20	2.15	1.70	24.2
1955	4.11	4.63	1.70	.66	.66	67.5	24.2	4.04	6.23	1.07	1.55	.71	9.84
1956	.67	.58	.27	.23	.27	6.04	65.7	10.0	4.44	1.56	4.52	.36	7.82
1957	.75	1.76	1.17	.42	.82	55.1	39.8	139	71.9	10.0	23.0	23.2	30.8

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1953	-	-	-	-	-	-	-	-	-	-	2,010	140	-
1954	50	74	86	59	800	3,650	5,180	2,710	4,420	258	132	101	17,520
1955	253	275	105	41	37	4,150	1,440	248	371	66	96	42	7,120
1956	41	34	16	14	15	371	3,910	615	264	96	278	21	5,680
1957	46	105	72	26	46	3,390	2,370	8,520	4,280	615	1,410	1,380	22,260

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1953	1338	-	-	-	-	-	-	-
1954	1338	534	June 6, 1954	0.3	24.2	17,520	24.8	17,940
1955	1388	520	Mar. 12, 1955	.1	9.84	7,120	9.10	6,580
1956	1438	411	Apr. 5, 1956	.2	7.82	5,680	8.00	5,810
1957	1508	1,140	May 21, 1957	0	30.8	22,260	-	-

2910. Whetstone River near Big Stone City, S. Dak.

Location.--Lat 45°17'32", long 96°29'14", SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 18, T. 121 N., R. 46 W., on right bank 20 ft downstream from highway bridge, $1\frac{1}{2}$ miles west of Big Stone City, and $4\frac{1}{2}$ miles upstream from Big Stone Lake.

Drainage area.--389 sq mi.

Records available.--March 1910 to November 1912 (no winter records) and March 1931 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 996.96 ft above mean sea level, adjustment of 1912. Mar. 8, 1910, to Nov. 30, 1912, staff gage 2 miles downstream at different datum. Mar. 18, 1931, to Aug. 27, 1938, chain gage and Aug. 28, 1938, to May 3, 1939, wire-weight gage, at site 20 ft upstream at present datum. May 4, 1939, to Nov. 8, 1952, water-stage recorder at site 80 ft downstream at present datum.

Average discharge.--29 years (1931-60), 44.1 cfs (31,930 acre-ft per year).

Extremes.--1910-12, 1931-60: Maximum discharge, 5,710 cfs Apr. 8, 1952 (gage height, 13.64 ft, from floodmark); maximum gage height, 13.95 ft Apr. 11, 1947; no flow at times in most years.

Maximum stage known, about 26 ft in June 1919, present site and datum, from information by local resident.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2.96	3.58	2.55	0.51	4.06	25.7	286	30.2	36.3	26.9	7.63	6.23	35.8
1952	9.36	14.5	14.0	3.97	5.03	6.68	1,386	83.5	78.0	36.3	6.53	3.10	135
1953	3.26	6.19	3.58	2.37	2.79	117	103	119	204	80.5	48.4	8.88	58.4
1954	6.26	9.57	7.55	3.21	16.3	96.1	116	94.6	241	21.8	10.4	7.64	52.4
1955	11.1	10.4	7.66	5.03	5.15	108	43.8	12.7	9.49	5.92	5.02	3.06	19.1
1956	4.05	3.53	1.74	1.77	2.96	8.89	102	19.6	32.6	12.6	24.7	4.29	18.1
1957	3.57	6.02	3.32	1.13	1.41	73.6	124	412	163	24.3	30.4	57.2	75.5
1958	70.5	77.9	32.4	13.7	29.1	119	224	41.4	21.1	13.4	4.83	3.74	54.2
1959	4.12	7.43	2.38	1.38	1.50	23.7	14.7	9.12	10.1	1.68	.87	1.88	6.50
1960	1.91	3.69	6.70	3.92	3.17	88.7	245	17.4	20.0	5.62	4.34	3.18	33.5

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	182	213	157	31	225	1,580	17,020	1,860	2,160	1,650	471	371	25,920
1952	576	865	859	244	290	411	82,490	5,120	4,640	2,230	393	184	98,300
1953	201	369	220	146	155	7,180	6,120	7,330	12,120	4,950	2,980	528	42,300
1954	385	570	464	197	907	5,910	6,910	5,820	14,330	1,340	641	454	37,930
1955	681	622	471	309	286	6,630	2,610	782	565	354	309	182	13,810
1956	249	210	107	109	170	547	6,050	1,210	1,940	773	1,520	255	13,140
1957	220	358	204	69	78	4,520	7,370	25,330	9,720	1,490	1,870	3,410	54,640
1958	4,340	4,640	1,990	843	1,610	7,330	13,310	2,540	1,260	824	297	222	39,210
1959	253	442	146	84.9	72.4	1,460	877	561	600	104	53.8	52.2	4,710
1960	117	218	412	241	182	5,460	14,600	1,070	1,190	346	267	189	24,290

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30										Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff		Mean	Runoff	
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet		Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1951	1208	1,100	Apr. 5, 1951	0	35.8	0.092	1.25	25,920	36.5	1.27	26,400			
1952	1238	5,710	Apr. 8, 1952	1.0	135	.347	4.74	98,300	38.2	1.33	27,670			
1953	1278	1,110	June 24, 1953	2.0	58.4	.150	2.04	42,300	59.3	2.07	42,930			
1954	1338	3,350	June 7, 1954	2.5	52.4	.135	1.81	37,930	52.9	1.82	38,280			
1955	1388	570	Mar. 12, 1955	1.2	19.1	.049	.66	13,810	17.4	.60	12,600			
1956	1438	429	Apr. 6, 1956	1.6	18.1	.047	.63	13,140	18.4	.64	13,360			
1957	1508	3,680	May 21, 1957	.8	75.5	.194	2.64	54,640	89.5	3.13	64,830			
1958	1558	998	Apr. 7, 1958	3.1	54.2	.139	1.87	39,210	40.2	1.38	29,080			
1959	1628	70	Mar. 23, 1959	0	6.50	.017	.23	4,710	6.37	.22	4,610			
1960	1708	1,560	Apr. 6, 1960	.4	33.5	.086	1.16	24,290	-	-	-			

† Corrected.

2920. Minnesota River at Ortonville, Minn.

Location.--Lat 45°17'44", long 96°26'38", in NE¼NW¼ sec.16, T.121 N., R.46 W., on left bank 400 ft downstream from bridge on U.S. Highway 12, 1,300 ft downstream from dam at outlet of Big Stone Lake, at Ortonville.

Drainage area.--1,160 sq mi, approximately.

Records available.--February 1938 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 956.38 ft above mean sea level, datum of 1929. Prior to Mar. 31, 1939, staff gage on downstream side of dam 1,300 ft upstream at datum 1.31 ft higher.

Average discharge.--22 years (1938-60), 113 cfs (81,810 acre-ft per year).

Extremes.--1938-60: Maximum discharge, 3,060 cfs Apr. 13, 1952 (gage height, 12.92 ft); no flow Dec. 13, 1940.

Remarks.--Some regulation by Big Stone Lake.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1.50	9.97	0.76	0.69	2.80	22.7	652	269	131	82.0	31.4	34.8	103
1952	10.4	8.92	29.6	34.6	46.2	148	2,195	861	212	77.3	11.7	5.67	301
1953	5.68	2.62	1.66	2.35	2.52	96.6	240	258	102	175	143	25.4	88.4
1954	3.66	2.82	1.01	.48	29.8	122	145	183	454	125	31.1	24.5	93.5
1955	23.0	22.1	4.96	4.65	4.19	88.2	152	38.6	15.3	5.25	2.79	.93	30.1
1956	2.09	1.56	.44	.46	.45	19.5	99.3	91.1	51.0	33.7	37.5	24.8	30.1
1957	14.2	6.54	5.12	4.50	4.61	20.8	108	312	549	178	132	179	126
1958	149	160	100	56.5	35.0	180	470	208	59.0	24.4	6.43	4.01	121
1959	5.05	10.6	2.84	1.43	1.51	35.3	22.8	14.0	5.83	2.08	.25	.67	8.57
1960	2.14	3.86	5.17	4.77	3.26	39.5	284	173	91.4	62.4	26.4	33.2	60.6

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	92	593	47	42	156	1,390	38,810	16,560	7,770	5,040	1,930	2,070	74,500
1952	641	531	1,820	2,130	2,660	9,130	330,600	52,920	12,620	4,750	720	338	218,900
1953	348	156	102	145	140	5,940	14,250	15,840	6,100	10,750	8,760	1,510	64,040
1954	225	168	62	29	1,650	7,530	8,640	11,270	27,030	7,680	1,910	1,460	67,650
1955	1,410	1,310	305	286	232	5,420	9,020	2,370	909	323	171	55	21,810
1956	128	93	27	29	26	1,200	5,850	5,600	3,040	2,070	2,310	1,480	21,850
1957	876	589	315	276	256	1,280	6,400	19,200	32,680	10,970	8,100	10,630	91,370
1958	9,150	9,500	6,180	3,460	1,940	11,090	27,990	12,780	3,510	1,500	396	239	87,760
1959	311	630	175	88	84	2,170	1,357	858	347	128	16	40	6,200
1960	132	230	318	293	187	2,430	16,920	10,640	5,440	3,840	1,620	1,970	44,020

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30				Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean
		Discharge	Date				
1950	-	-	-	-	-	-	95.4
1951	1208	956	Apr. 9, 1951	0.4	103	74,500	106
1952	1238	3,060	Apr. 13, 1952	2.9	301	218,900	298
1953	1278	632	Apr. 15, 1953	1.3	88.4	64,040	88.2
1954	1338	905	June 8, 1954	.2	93.5	67,650	97.0
1955	1368	357	Apr. 20, 1955	.2	30.1	21,810	26.3
1956	1438	299	Apr. 7, 1956	.2	30.1	21,850	31.9
1957	1508	939	May 22, 1957	3.8	126	91,370	158
1958	1558	932	Apr. 28, 1958	3.1	121	87,760	88.5
1959	1628	206	Apr. 28, 1959	.1	8.57	6,200	7.97
1960	1708	618	Mar. 30, 1960	1.2	60.6	44,020	-

2925. Minnesota River near Odessa, Minn.

Location.--Lat 45°15'22", long 96°20'20", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.29, T.121 N., R.45 W., near center of span on upstream side of highway bridge, 0.6 mile southwest of Odessa and 5.0 miles upstream from Yellow Bank River.

Drainage area.--1,340 sq mi, approximately.

Records available.--July 1909 to December 1912 (no winter records), May 1944 to September 1960.

Gage.--Wire-weight gage. Datum of gage is 940.76 ft above mean sea level, datum of 1929. July 4, 1909, to Dec. 31, 1912, chain gage at site 250 ft upstream at datum 0.45 ft lower. May 5, 1944, to July 18, 1948, chain gage at site 250 ft upstream at present datum.

Average discharge.--16 years (1944-60), 120 cfs (86,880 acre-ft per year).

Extremes.--1909-12, 1944-60: Maximum discharge, 3,070 cfs Apr. 13, 1952 (gage height, 14.06 ft, from graph based on gage readings); no flow at times during 1950, 1951, 1954, 1959, 1960.

Remarks.--Some regulation by Big Stone Lake.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2.17	16.6	0	0	0.62	22.4	690	310	149	90.8	28.7	30.8	111
1952	14.1	12.3	40.5	40.1	66.0	158	2,187	1,055	276	128	13.6	9.74	332
1953	9.05	4.17	3.74	3.28	2.73	121	260	272	213	270	144	32.9	112
1954	3.15	9.60	3.91	.79	46.7	127	152	205	504	162	31.2	19.5	105
1955	23.5	24.1	6.58	4.82	4.72	102	183	52.6	14.9	6.61	2.95	1.44	35.7
1956	2.03	2.39	1.99	2.14	1.37	21.1	103	85.3	60.9	37.0	33.8	27.5	31.5
1957	15.5	7.48	5.05	4.40	3.99	21.3	112	306	607	244	170	245	145
1958	215	242	127	65.2	42.6	239	522	266	69.1	†32.0	5.81	3.45	153
1959	4.61	11.8	3.03	.95	.11	35.4	29.2	18.4	8.85	1.40	.05	0	9.53
1960	1.01	4.05	5.10	5.58	3.50	27.2	297	202	97.4	70.0	26.6	32.8	64.2

† Corrected.

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	133	991	0	0	35	1,370	41,030	19,090	8,870	5,590	1,760	1,840	80,710
1952	864	730	2,490	2,470	3,800	9,700	130,100	64,850	16,450	7,900	835	580	240,800
1953	557	248	230	202	152	7,440	15,450	16,710	12,660	16,800	8,850	1,950	81,050
1954	193	571	240	48	2,590	7,800	9,010	12,600	29,890	9,940	1,920	1,160	76,060
1955	1,440	1,430	405	296	262	6,290	10,900	3,240	889	407	181	86	25,830
1956	125	142	122	132	79	1,300	6,140	5,240	3,620	2,280	2,080	1,630	22,890
1957	950	445	311	271	221	1,310	6,640	18,840	36,120	15,000	10,480	14,560	†105,100
1958	13,200	14,400	7,820	4,010	2,360	14,680	31,050	16,350	4,110	1,970	357	205	110,500
1959	283	702	186	59	6.1	2,180	1,740	1,130	527	86	3.0	0	6,900
1960	62	241	313	343	201	1,670	17,680	12,440	5,790	4,300	1,630	1,950	46,620

† Corrected.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30				Calendar year		
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	102	73,960
1951	1208	945	Apr. 11, 1951	-	111	80,710	115	85,670
1952	1258	3,070	Apr. 13, 1952	4.1	332	240,800	328	237,700
1953	1278	544	June 28, 1953	1.5	112	81,050	112	81,020
1954	1338	1,000	June 8, 1954	0	105	76,060	108	78,330
1955	1388	274	Apr. 7, 1955	.3	35.7	25,830	31.7	22,940
1956	1438	151	May 15, 1956	.4	31.5	22,890	33.3	24,210
1957	1508	703	June 14, 1957	3.3	145	†105,100	192	138,900
1958	1558	636	Apr. 13, 1958	2.7	153	110,500	105	76,260
1959	1628	83	Apr. 8, 1959	0	5.53	6,900	8.76	6,350
1960	1708	567	Mar. 31, 1960	0	64.2	46,620	-	-

* Revised.

† Corrected.

2930. Yellow Bank River near Odessa, Minn.

Location.--Lat 45°13'35", long 96°21'12", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.1, T.120 N., R.46 W., on left bank 150 ft downstream from highway bridge, $\frac{3}{4}$ miles southwest of Odessa, and $\frac{1}{2}$ miles upstream from mouth.

Drainage area.--398 sq mi.

Records available.--October 1939 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 953.34 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark). Prior to Aug. 28, 1940, wire-weight gage at site 150 ft upstream at same datum.

Average discharge.--21 years (1939-60), 57.7 cfs (41,770 acre-ft per year).

Extremes.--1939-60: Maximum discharge, 6,260 cfs Apr. 4, 1952 (gage height, 17.06 ft); maximum gage height, 17.98 ft Mar. 25, 1943, from floodmark (backwater from ice); no flow Jan. 26 to Feb. 8, 1940, Jan. 8, 9, 1942, Jan. 25 to Feb. 25, 1959.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2.87	4.27	2.21	1.59	16.2	23.7	574	57.4	45.8	26.8	13.3	8.91	64.1
1952	13.6	17.7	19.5	5.74	4.14	7.12	1,341	67.1	90.8	85.0	12.7	5.44	137
1953	4.34	6.0	6.44	4.2	3.95	177.12	113	139	475	168	250	15.6	114
1954	8.18	14.5	14.6	8.80	25.2	116	184	151	301	23.0	8.90	11.5	72.0
1955	13.4	16.3	10.8	6.54	3.33	84.5	67.9	20.6	20.3	22.1	6.53	3.43	24.5
1956	2.49	1.56	.70	1.47	.98	5.26	127	29.8	75.0	54.3	90.0	11.6	33.3
1957	5.33	10.2	7.73	3.59	1.52	38.8	90.7	330	117	18.8	21.8	41.3	57.6
1958	33.5	50.7	22.1	8.20	7.44	84.9	155	38.4	18.6	10.6	3.32	1.64	36.2
1959	2.65	3.81	1.91	4.1	0.2	27.2	19.0	11.8	8.41	1.00	.57	.25	6.44
1960	.97	1.64	4.76	4.13	1.66	163	317	27.5	22.1	9.42	3.08	1.70	46.2

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	177	254	136	98	898	1,460	34,150	3,530	2,720	1,650	817	530	46,420
1952	838	1,050	1,200	292	238	438	79,770	4,120	5,400	5,220	781	324	99,670
1953	267	357	396	262	219	10,980	6,710	8,530	28,240	10,340	15,400	928	82,530
1954	503	861	899	541	1,400	7,130	10,950	9,270	17,930	1,410	547	687	52,130
1955	826	970	664	402	185	6,200	4,040	1,260	1,210	1,360	402	204	17,720
1956	153	93	43	90	57	324	7,540	1,830	4,460	3,340	5,530	690	24,150
1957	328	608	475	221	84	2,380	5,400	20,280	6,940	1,160	1,340	2,460	41,680
1958	2,060	3,010	1,360	504	413	5,220	9,230	2,360	1,110	652	204	98	26,220
1959	163	227	117	25	1.0	1,670	1,130	726	500	61	23	15	4,660
1960	60	97	293	254	95	10,020	18,870	1,690	1,310	579	189	101	33,560

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year			
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff	Mean		Runoff	
		Discharge	Date					Inches	Acre-feet	Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	-	-	-
1951	1208	4,080	Apr. 5, 1951	1.1	64.1	0.161	2.19	46,420	53.1	1.80	38,420
1952	1238	6,260	Apr. 4, 1952	3.4	137	.345	2.19	99,670	134	2.32	48,940
1953	1278	2,230	June 26, 1953	3.4	114	.286	3.89	82,530	116	3.94	83,770
1954	1338	2,190	June 8, 1954	5.0	72.0	.181	2.47	52,130	72.3	2.49	52,320
1955	1388	475	Mar. 12, 1955	1.4	24.5	.062	.84	17,720	21.5	.74	15,550
1956	1438	513	Apr. 7, 1956	.6	33.3	.084	1.14	24,150	34.8	1.20	25,270
1957	1508	1,870	May 22, 1957	1.3	57.6	.145	1.96	41,680	64.5	2.19	45,700
1958	1558	392	Apr. 9, 1958	1.2	36.2	.091	1.22	26,220	28.0	.95	20,500
1959	1628	89	May 31, 1959	0	6.44	.016	.21	4,660	6.36	.20	4,600
1960	1708	1,600	Apr. 7, 1960	.2	46.2	.116	1.58	33,560	-	-	-

2940. Pomme de Terre River at Appleton, Minn.

Location.--Lat 45°12'10", long 96°01'20"; in SW¼NW¼ sec.14, T.120 N., R.43 W., on left bank at Appleton, 60 ft upstream from bridge on U.S. Highway 59 and State Highway 119 and 8 miles upstream from mouth.

Drainage area.--905 sq mi. At site used prior to Dec. 22, 1952, 885 sq mi.

Records available.--March 1931 to September 1935 (no winter records), October 1935 to September 1960. Prior to October 1953, published as "near Appleton."

Gage.--Water-stage recorder and concrete control. Datum of gage is 978.00 ft above mean sea level, datum of 1929. Prior to Dec. 22, 1952, staff gage at site 4 miles upstream at datum 25.17 ft higher.

Average discharge.--25 years (1935-60), 89.0 cfs (64,430 acre-ft per year).

Extremes.--1931-60: Maximum discharge, 5,050 cfs Apr. 8, 1952 (gage height, 10.13 ft, site and datum then in use); no flow for several periods.

Remarks.--Flow affected by lakes above station. Occasional regulation by old milldam 500 ft upstream.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	48.0	53.7	33.3	23.4	25.6	37.4	770	276	205	162	91.1	63.0	149
1952	75.0	96.2	136	66.6	57.4	52.5	1,562	294	165	184	85.2	60.2	235
1953	38.0	31.1	33.2	22.0	19.6	130	218	229	280	190	95.5	43.7	111
1954	29.6	32.0	32.8	21.8	32.4	86.0	195	252	142	94.3	41.5	46.7	84.1
1955	51.9	49.0	37.6	24.7	18.4	60.2	121	63.3	51.6	128	45.7	20.5	56.2
1956	17.7	17.9	9.20	7.94	8.03	15.0	232	124	144	64	71.7	34.6	61.9
1957	22.8	37.1	25.8	12.6	7.56	77.7	135	161	290	152	143	209	106
1958	200	210	94.0	64.0	54.1	161	299	106	71.0	70.6	38.6	26.1	116
1959	18.6	30.1	16.4	7.35	3.67	35.9	73.0	47.3	84.4	69.3	41.1	25.1	37.8
1960	27.0	31.0	30.9	24.8	16.2	64.6	388	134	105.4	78.1	43.6	59.6	85.2

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2,950	3,200	2,040	1,440	1,420	2,300	45,790	16,950	12,200	9,960	5,600	3,750	107,600
1952	4,610	5,730	8,350	4,100	3,300	3,230	92,960	18,090	9,810	11,310	5,240	3,580	170,300
1953	2,340	1,850	2,040	1,350	1,090	8,010	12,970	14,100	16,640	11,660	5,870	2,600	80,520
1954	1,820	1,900	2,020	1,340	1,800	5,290	11,590	15,510	8,460	5,800	2,550	2,780	60,860
1955	3,190	2,920	2,310	1,520	1,020	3,700	7,200	3,890	3,070	7,850	2,810	1,220	40,700
1956	1,090	1,060	566	488	462	921	13,780	7,600	8,580	3,940	4,410	2,060	44,960
1957	1,400	2,210	1,590	776	420	4,780	8,070	9,870	17,280	9,320	8,770	12,460	76,950
1958	12,310	12,520	5,780	3,940	3,000	9,930	17,800	6,500	4,220	4,340	2,370	1,550	84,260
1959	1,140	1,790	1,010	452	204	2,210	4,340	2,910	5,020	4,260	2,530	1,490	27,360
1960	1,660	1,840	1,900	1,520	932	3,970	23,100	8,220	6,240	4,800	2,680	3,550	60,410

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30								Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff		
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet	
1950	-	-	-	-	-	-	-	-	126	1.93	91,120	
1951	1208	4,150	Apr. 8, 1951	20	149	0.168	2.28	107,600	163	2.51	118,100	
1952	1238	5,050	Apr. 8, 1952	44	235	.266	3.62	170,300	217	3.35	157,800	
1953	1278	755	June 27, 1953	13	111	.123	1.66	80,520	111	1.65	80,050	
1954	1338	840	Apr. 29, 1954	13	84.1	.093	1.28	60,860	87.8	1.32	63,540	
1955	1388	565	July 13, 1955	17	56.2	.062	.85	40,700	48.3	.72	35,000	
1956	1438	479	Apr. 11, 1956	5.1	61.9	.068	.93	44,960	65.3	.99	47,440	
1957	1508	516	June 25, 1957	4.4	106	.117	1.60	76,950	141	2.12	102,400	
1958	1558	538	Apr. 8, 1958	18	116	.128	1.74	84,260	79.6	1.19	57,590	
1959	1628	595	June 2, 1959	3.0	37.8	.042	.55	27,360	39.8	.59	28,820	
1960	1708	1,270	Apr. 7, 1960	9.0	83.2	.092	1.25	60,410	-	-	-	

* Not previously published.

3000. Lac qui Parle River near Lac qui Parle, Minn.

Location.--Lat 45°00', long 95°55', in SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.27, T.118 N., R.42 W., on right bank 40 ft downstream from highway bridge and half a mile southwest of village of Lac qui Parle.

Drainage area.--983 sq mi.

Records available.--April 1910 to November 1914, March 1931 to September 1960 (winter records incomplete prior to 1934). Published as "at Lac qui Parle" 1910-14.

Gage.--Water-stage recorder. Datum of gage is 951.98 ft above mean sea level (Minnesota Highway Department bench mark). Apr. 27, 1910, to Nov. 15, 1914, staff gage at site 2 miles downstream at different datum. Mar. 17, 1931, to Mar. 9, 1937, staff gage at site 40 ft upstream at present datum.

Average discharge.--29 years (1912-13, 1931-32, 1933-60), 115 cfs (83,260 acre-ft per year).

Extremes.--1910-14, 1931-60: Maximum discharge, 11,100 cfs Apr. 6, 1952 (gage height, 18.18 ft); maximum gage height, 18.52 ft Mar. 24, 1948 (backwater from ice); no flow at times in several years.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	3.73	5.33	2.41	1.23	11.2	23.8	1,501	208	114	87.1	122	158	185
1952	60.5	63.4	74.6	14.0	11.6	16.5	3,264	314	292	492	30.4	4.41	383
1953	3.51	7.55	4.03	4.25	3.76	375	257	470	671	400	765	31.4	251
1954	14.1	23.0	14.5	9.41	73.4	536	474	398	196	50.4	16.0	20.7	152
1955	19.0	33.4	19.4	9.80	5.14	153	105	52.9	127	146	35.6	12.8	60.3
1956	3.35	5.53	3.04	1.71	2.53	63.5	313	61.1	268	245	493	57.9	127
1957	17.3	51.2	24.8	9.26	5.69	224	171	465	348	78.8	34.9	134	131
1958	83.6	127	61.9	26.6	25.5	205	411	73.8	49.2	37.5	4.19	2.29	92.2
1959	.72	3.46	2.24	.04	.01	37.7	32.4	35.2	42.2	1.09	5.8	2.81	13.7
1960	1.37	2.72	4.63	4.70	1.81	180	1,104	114	71.4	36.9	8.95	13.0	127

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	229	317	148	75	624	1,470	89,290	12,760	6,780	5,360	7,500	9,380	133,900
1952	3,720	3,770	4,590	862	667	1,020	194,200	19,320	17,360	30,280	1,870	263	277,900
1953	216	449	248	261	209	23,070	15,320	26,890	39,330	24,600	47,020	1,870	182,100
1954	870	1,370	894	579	4,070	32,980	28,220	24,470	11,640	3,100	981	1,230	110,400
1955	1,170	1,990	1,190	590	285	9,400	6,270	3,250	7,560	9,010	2,190	764	43,670
1956	208	329	187	105	146	3,910	18,610	3,760	15,940	15,090	30,320	3,440	92,040
1957	1,060	3,050	1,530	569	316	13,780	10,170	26,600	20,720	4,840	2,150	7,950	94,700
1958	5,140	7,550	3,810	1,640	1,410	12,590	24,440	4,540	2,930	2,310	258	136	66,750
1959	44	206	137	2.4	.6	2,320	1,930	2,170	2,510	67	357	167	19,910
1960	84	162	284	289	104	11,070	65,690	7,000	4,250	2,270	550	772	92,520

† Corrected.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year				
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet		
1950	-	-	-	-	-	-	-	-	107	1.49	77,750	-	-
1951	1208	6,500	Apr. 8, 1951	0.3	185	0.188	2.54	133,900	201	2.76	145,300	201	2.76
1952	1238	11,100	Apr. 6, 1952	2.3	383	.390	5.30	277,900	367	5.09	266,800	255	3.53
1953	1278	2,660	Mar. 23, 1953	1.4	251	.255	3.48	182,100	255	3.53	184,300	154	2.13
1954	1338	1,890	Mar. 24, 1954	5.8	152	.155	2.12	110,400	154	2.13	111,600	154	2.13
1955	1368	1,180	July 11, 1955	4.8	60.3	.061	.82	43,670	155.3	.75	40,040	134	1.86
1956	1438	1,120	Aug. 12, 1956	.3	127	.129	1.75	92,040	134	1.86	96,960	146	2.01
1957	1508	1,400	Mar. 26, 1957	4.8	131	.133	1.81	94,700	146	2.01	105,600	146	2.01
1958	1558	953	Mar. 27, 1958	.3	92.2	.094	1.28	66,750	69.9	.98	50,640	13.9	.15
1959	1628	215	June 2, 1959	0	15.7	.014	.19	19,910	13.9	.15	10,050	-	-
1960	1708	3,110	Mar. 31, 1960	0	127	.129	1.75	92,520	-	-	-	-	-

† Corrected.

3005. Tenmile Creek near Boyd, Minn.

Location.--Lat 44°56'10", long 95°53'20", in SE $\frac{1}{4}$ sec.14, T.117 N., R.42 W., on left downstream abutment of highway bridge on U.S. Highway 212, 7 miles north of Boyd and $7\frac{1}{2}$ miles west of Montevideo.

Drainage area.--82.8 sq mi.

Records available.--May 1949 to December 1951.

Gage.--Staff gage. Datum of gage is 1,018.83 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Extremes.--1949-51: Maximum discharge, 373 cfs Apr. 12, 13, 1951 (gage height, 5.40 ft); no flow at times.
Flood in April 1952 reached a discharge of 609 cfs (gage height, 5.70 ft), from contracted-opening measurement.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0	0	0	0	0.50	0.15	156	42.7	6.20	1.32	6.32	11.1	18.6
1952	7.18	3.09	6.30	-	-	-	-	-	-	-	-	-	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0	0	0	0	28	9.1	9,300	2,630	369	81	388	660	13,470
1952	442	184	388	-	-	-	-	-	-	-	-	-	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year			
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff	Inches	Acre-feet	Mean	Runoff	
		Discharge	Date								Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	-	6.88	1.12	4,980
1951	1208	373	Apr.12,13,1951	0	18.6	0.225	3.05	-	13,470	20.0	3.28	14,480
1952	1208	-	-	-	-	-	-	-	-	-	-	-

3010. Minnesota River near Lac qui Parle, Minn.

Location.--Lat 45°01'17", long 95°52'05", in NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.24, T.118 N., R.42 W., on left bank 200 ft downstream from dam at Lac qui Parle Outlet, 2.4 miles northeast of village of Lac qui Parle, and 3.5 miles west of Watson.

Drainage area.--4,050 sq mi, approximately.

Records available.--October 1942 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 900.00 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Nov. 10, 1944, at datum 0.20 ft lower.

Average discharge.--18 years (1942-60), 668 cfs (483,600 acre-ft per year).

Extremes.--1942-60: Maximum discharge, 19,700 cfs Apr. 10, 1952 (gage height, 37.98 ft, from floodmark); no flow Nov. 17, 1942, Sept. 29, 1947, Oct. 19 to Nov. 18, 1951, Nov. 24, 1952.

Remarks.--Part of flow from 2,050 sq mi of Chippewa River basin at times diverted into Minnesota River above station. Some regulation by Lac qui Parle, Marsh, and Big Stone Lakes.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	25.5	28.1	44.7	30.3	155	243	5,098	2,039	628	456	267	531	792
1952	120	68.7	270	245	170	363	10,590	3,722	1,078	2,984	556	40.6	1,670
1953	58.1	32.4	33.0	48.3	250	551	1,331	1,325	1,799	5,309	2,046	639	956
1954	40.1	39.9	50.4	83.2	299	921	1,315	1,369	1,071	497	85.7	117	490
1955	52.4	49.2	79.0	89.7	109	571	463	267	121	565	29.0	73.9	207
1956	39.1	33.5	33.0	35.4	55.4	46.5	969	325	606	526	756	128	296
1957	33.8	146	76.6	61.2	50.9	278	704	736	2,093	2,435	1,076	1,044	731
1958	1,123	1,012	538	257	234	695	1,915	992	281	126	58.6	24.5	606
1959	25.2	25.6	56.8	60.5	57.1	123	164	122	217	19.6	18.4	21.5	75.7
1960	22.7	52.6	49.5	53.1	54.0	158	3,312	609	367	234	53.4	114	419

Monthly and yearly discharge, in acre-feet, of Minnesota River near Lac qui Parle, Minn.

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,570	1,670	2,750	1,860	8,590	14,950	303,400	125,400	37,400	28,040	18,410	31,620	573,700
1952	7,390	4,090	16,600	15,090	9,750	22,230	630,400	223,900	64,020	177,300	34,210	2,420	1,212,000
1953	3,570	1,930	2,030	2,850	13,860	32,640	79,200	81,500	107,100	203,500	125,800	38,000	692,000
1954	2,470	2,380	3,100	5,120	16,580	56,660	78,250	84,200	63,720	29,950	5,270	6,960	354,700
1955	3,220	2,930	4,860	5,520	6,060	35,130	27,540	16,440	7,210	34,750	1,780	4,400	149,800
1956	2,400	1,990	2,030	2,180	3,190	2,860	57,650	19,980	36,050	32,360	46,500	7,590	214,800
1957	2,080	8,670	4,710	3,760	2,530	17,090	41,800	45,280	124,500	149,700	66,190	62,140	†528,800
1958	69,060	60,250	33,070	15,830	12,990	42,720	114,000	61,000	16,730	7,770	5,800	1,460	438,500
1959	1,550	1,520	3,490	3,720	3,170	7,550	9,740	7,530	12,920	1,210	1,130	1,280	54,810
1960	1,390	3,130	3,040	3,270	3,110	9,740	197,100	37,470	21,820	14,390	3,280	6,780	304,500

† Corrected.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet	
		Discharge	Date						
1950	-	-	-	-	-	-	587	425,100	
1951	1208	9,760	Apr. 10, 1951	10	792	573,700	823	595,800	
1952	1238	19,700	Apr. 10, 1952	0	1,670	1,212,000	1,642	1,192,000	
1953	1278	7,800	June 30, 1953	0	956	692,000	956	692,400	
1954	1338	1,960	Mar. 29, 1954	36	490	354,700	494	357,700	
1955	1368	1,290	July 15, 1955	25	207	149,800	201	145,250	
1956	1438	1,440	Apr. 18, 1956	31	296	214,800	308	†223,800	
1957	1508	3,800	June 29, 1957	32	731	†528,800	934	675,800	
1958	1558	2,750	Apr. 17, 1958	24	606	438,500	390	282,700	
1959	1628	600	June 2, 1959	16	75.7	54,810	77.1	55,810	
1960	1708	5,230	Apr. 9, 1960	20	419	304,500	-	-	

† Corrected.

3035. Chippewa River at Benson, Minn.

Location.--Lat 45°18'40", long 95°37'30", in NE¼NE¼ sec.12, T.121 N., R.40 W., on down-stream side of bridge on U.S. Highway 12, three-quarters of a mile west of Benson.

Drainage area.--1,270 sq mi, approximately.

Records available.--May 1949 to November 1951.

Gage.--Staff gage. Datum of gage is 1,018.10 ft above mean sea level, datum of 1929.

Extremes.--1949-51: Maximum discharge, 2,230 cfs Apr. 7, 1951 (gage height, 9.72 ft); minimum daily, 3.2 cfs Feb. 3, 4, 7, 8, 1950; minimum gage height, 2.62 ft Sept. 2, 3, 1949.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	43.0	27.0	13.7	12.2	12.9	15.4	1,087	629	370	376	154	173	243
1952	132	118	-	-	-	-	-	-	-	-	-	-	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2,640	1,610	843	748	714	946	64,680	38,660	22,030	23,130	9,490	10,280	175,800
1952	8,100	7,010	-	-	-	-	-	-	-	-	-	-	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean
		Discharge	Date				Inches	Acre-feet	
1950	-	-	-	-	-	-	-	-	175
1951	1208	2,230	Apr. 7, 1951	-	243	0.191	2.58	175,800	1.87
1952	1208	-	-	-	-	-	-	-	-

3040. Shakopee Creek near Benson, Minn.

Location.--Lat 45°12'50", long 95°38'10", in SE $\frac{1}{4}$ sec.11, T.120 N., R.40 W., on downstream piling of county highway bridge, 1 $\frac{1}{2}$ miles upstream from mouth and 7 miles southwest of Benson.

Drainage area.--352 sq mi.

Records available.--May 1949 to December 1954.

Gage.--Staff gage. Datum of gage is 1,002.33 ft above mean sea level, datum of 1929 (Corps of Engineer's bench mark).

Average discharge.--5 years (1949-54), 96.6 cfs (69,940 acre-ft per year).

Extremes.--1949-54: Maximum discharge, 2,680 cfs Apr. 10, 1952 (gage height, 14.04 ft, from floodmark); from rating curve extended above 1,400 cfs on basis of logarithmic plotting; no flow for many days in most years.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	4.58	1.66	0	0	0.15	0.77	477	203	101	83.4	55.0	78.2	84.4
1952	59.8	52.4	43.9	9.83	9.61	9.14	932	212	175	509	130	45.4	132
1953	28.2	12.6	3.23	.058	0	77.3	144	121	574	486	348	83.2	157
1954	22.3	12.2	14.8	4.41	3.59	48.4	77.6	67.4	61.7	16.9	4.81	3.01	28.2
1955	5.48	4.94	1.09	-	-	-	-	-	-	-	-	-	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	281	99	0	0	8.3	48	28,400	12,460	6,000	5,740	3,380	4,710	61,130
1952	3,680	3,120	2,700	605	553	562	55,430	13,020	10,410	31,270	8,000	2,700	132,000
1953	1,730	752	198	3.6	0	4,750	8,580	7,460	34,150	29,900	21,450	4,950	113,900
1954	1,370	725	910	271	199	2,980	4,620	4,140	3,670	1,040	296	179	20,400
1955	337	294	67	-	-	-	-	-	-	-	-	-	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year			
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	31.8	1.22	23,000
1951	1208	1,030	Apr. 9, 1951	0	84.4	0.240	3.25	61,130	97.0	3.74	70,250
1952	1238	2,680	Apr. 10, 1952	-	182	.517	7.03	132,000	173	6.66	125,200
1953	1278	1,720	June 27, 1953	0	157	.446	6.06	113,900	158	6.08	114,200
1954	1338	120	Mar. 25, 1954	0	28.2	.080	1.10	20,400	25	1.98	18,090

† Corrected.

3045. Chippewa River near Milan, Minn.

Location.--Lat 45°06'39", long 95°47'57", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.16, T.119 N., R.41 W., on right bank 800 ft upstream from bridge on State Highway 40, 2.0 miles upstream from small tributary, and $5\frac{1}{2}$ miles east of Milan.

Drainage area.--1,870 sq mi, approximately.

Records available.--March 1937 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 959.69 ft above mean sea level, datum of 1929. Prior to Mar. 23, 1940, chain gage and Mar. 23, 1940, to June 14, 1942, wire-weight gage, on bridge 800 ft downstream at same datum.

Average discharge.--23 years (1937-60), 239 cfs (173,000 acre-ft per year).

Extremes.--1937-60: Maximum discharge, 6,930 cfs Apr. 9, 1952 (gage height, 12.12 ft); maximum gage height, 12.29 ft Apr. 7, 1952 (backwater from ice); no flow at times during 1940.

Remarks.--Flow regulated by several small lakes above station.

Monthly and yearly mean discharge, in cubic feet per second --

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	61.8	44.4	23.9	16.0	18.5	32.6	2,022	968	517	550	247	272	397
1952	210	201	354	123	56.4	42.2	3,661	1,352	974	1,822	542	277	800
1953	123	80.5	45.6	31.5	40.0	338	876	760	1,718	1,390	744	200	531
1954	78.7	77.4	68.9	48.8	69.7	311	417	506	279	118	56.7	65.1	175
1955	68.6	66.7	35.1	19.3	14.6	78.6	243	145	49.1	253	56.7	23.8	88.3
1956	32.6	24.0	7.91	7.25	9.39	50.5	551	185	127	87.3	196	71.9	112
1957	32.5	96.0	34.4	8.46	4.16	356	403	419	700	1,239	757	994	504
1958	732	564	288	140	109	443	790	398	222	96.4	40.1	30.9	322
1959	27.5	57.2	18.9	4.05	2.86	24.2	90.9	125	219	30.1	43.3	22.4	55.4
1960	31.0	34.5	25.5	14.8	9.15	109	853	226	122	71.2	51.4	61.5	133

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	3,800	2,640	1,470	986	1,030	2,010	120,300	59,520	30,770	33,790	15,220	16,180	287,700
1952	12,920	11,970	21,740	7,550	3,240	2,590	217,800	83,150	57,940	112,100	33,310	16,490	580,800
1953	7,570	4,790	2,800	1,940	2,220	20,780	52,150	46,750	102,200	85,490	45,730	11,880	384,300
1954	4,840	4,610	4,240	3,000	3,870	19,130	24,840	31,100	16,600	7,230	3,480	3,870	126,800
1955	4,220	3,970	2,160	1,190	809	4,830	14,460	8,890	2,920	15,560	3,490	1,420	63,920
1956	2,000	1,430	486	446	540	3,110	32,810	11,380	7,530	5,370	12,040	4,280	81,420
1957	2,000	5,710	2,120	520	231	21,900	23,970	25,740	101,200	76,180	46,550	59,130	365,200
1958	44,990	33,560	17,680	8,630	6,060	27,220	47,040	24,470	13,200	5,920	2,470	1,840	233,100
1959	1,690	3,400	1,160	249	159	1,490	5,410	7,670	13,020	1,850	2,660	1,330	741,730
1960	1,910	2,050	1,570	908	526	6,730	50,740	13,880	7,250	4,380	3,160	3,660	96,760

† Corrected.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year			
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff		
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet	
1950	-	-	-	-	-	-	-	-	237	1.70	171,600	-
1951	1208	5,020	Apr. 9, 1951	11	397	0.212	2.89	287,700	451	3.26	326,400	-
1952	1238	6,930	Apr. 9, 1952	38	800	.428	5.82	580,800	757	5.51	549,300	-
1953	1278	5,950	June 25, 1953	24	531	.284	3.86	384,300	529	3.84	382,800	-
1954	1338	846	May 3, 1954	32	175	.094	1.27	126,800	171	1.23	123,500	-
1955	1388	592	July 14, 1955	13	88.3	.047	.64	63,920	79.4	.56	57,480	-
1956	1438	899	Apr. 13, 1956	6.8	112	.060	.80	81,420	120	.87	87,340	-
1957	1508	3,770	June 27, 1957	3.5	504	.270	3.66	365,200	624	4.53	451,600	-
1958	1558	1,170	Oct. 1, 1957	19	322	.172	2.34	233,100	200	1.43	143,100	-
1959	1628	476	June 1, 1959	2.5	55.4	.030	.39	741,730	54.4	.38	39,370	-
1960	1708	2,820	Apr. 4, 1960	7.1	133	.071	.97	96,760	-	-	-	-

† Corrected.

3110. Minnesota River at Montevideo, Minn.

Location.--Lat 44°56'00", long 95°44'00", in NW¼NW¼ sec.19, T.117 N., R.47 W., on right bank 100 ft upstream from bridge on U.S. Highway 212, at Montevideo, and 400 ft downstream from Chippewa River.

Drainage area.--6,180 sq mi, approximately.

Records available.--July 1909 to September 1917, October 1917 to September 1929 (no winter records), October 1929 to September 1960. Prior to October 1939, published as "near Montevideo." Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 910.87 ft above mean sea level, adjustment of 1912. July 22, 1909, to Feb. 4, 1932, chain gage at bridge 600 ft downstream at present datum. Feb. 5, 1932, to Nov. 26, 1934, chain gage at bridge 100 ft downstream at present datum.

Average discharge.--39 years (1909-17, 1929-60), 615 cfs (445,200 acre-ft per year).

Extremes.--1909-60: Maximum discharge, 24,500 cfs Apr. 10, 1952 (gage height, 20.02 ft, from floodmark); no flow for several days in 1933-34, 1936.

Remarks.--Flow regulated by Big Stone Lake since Apr. 17, 1937, Lac qui Parle Lake since January 1938, and Marsh Lake since Nov. 1, 1939.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	45.6	68.0	69.5	46.5	168	318	5,842	2,846	1,182	1,008	586	873	1,085
1952	337	260	548	338	273	444	12,550	4,674	1,787	3,771	1,100	309	2,193
1953	178	121	95.1	85.3	325	877	2,178	2,206	2,539	4,382	2,888	877	1,404
1954	140	143	145	137	372	1,251	1,774	1,863	1,359	605	157	189	678
1955	135	115	116	119	133	744	717	445	185	1,004	148	109	333
1956	79.6	68.8	48.8	46.0	70.0	108	1,577	533	736	633	1,044	226	430
1957	76.6	26.8	14.1	78.3	64.2	575	1,210	1,230	3,070	3,060	1,890	1,940	1,137
1958	1,781	1,661	964	411	352	1,194	2,461	1,592	556	238	106	62	934
1959	44.9	33.5	62.3	68.4	61.6	149	273	237	457	46.7	60.6	49.7	128
1960	54.9	84.1	81.7	73.0	63.5	212	4,009	830	497	354	105	185	541

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2,800	4,050	4,270	2,860	9,300	19,560	347,600	175,000	70,340	61,950	36,030	51,940	785,700
1952	20,700	15,480	33,710	20,800	15,730	27,280	746,900	287,400	308,400	231,900	67,610	18,410	1,592,000
1953	10,950	7,206	5,845	5,242	19,040	53,930	123,600	135,600	151,100	239,400	177,600	52,190	1,017,000
1954	8,580	8,525	8,924	8,430	20,650	76,890	105,500	114,600	80,890	37,220	9,683	11,260	491,200
1955	8,280	6,830	7,150	7,310	7,370	45,750	42,640	27,370	11,010	61,750	9,080	6,470	241,000
1956	4,890	4,090	3,000	2,830	4,020	6,630	93,820	32,760	43,810	38,950	64,220	13,440	312,500
1957	4,710	15,640	8,700	4,810	3,570	35,350	71,970	75,620	182,700	188,400	116,400	115,200	†823,100
1958	103,500	98,940	59,240	25,300	19,560	73,440	146,500	85,580	33,090	14,650	6,540	3,720	676,000
1959	2,770	1,990	3,830	4,200	3,420	9,130	16,220	14,600	27,220	2,670	3,740	2,960	92,950
1960	3,380	5,000	5,030	4,490	3,650	13,060	238,600	51,060	29,570	21,740	6,460	10,980	393,000

† Corrected.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30				Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean
		Discharge	Date				
1950	-	-	-	-	-	-	633
1951	1208	12,200	Apr. 11, 1951	30	1,085	785,700	1,166
1952	1238	24,500	Apr. 10, 1952	125	2,193	1,592,000	2,130
1953	1278	9,770	June 30, 1953	80	1,404	1,017,000	1,407
1954	1338	2,400	Mar. 29, 1954	82	678	491,200	673
1955	1368	2,180	July 15, 1955	75	333	241,000	319
1956	1438	2,040	Apr. 19, 1956	45	430	312,500	454
1957	1508	5,500	June 17, 1957	58	1,137	†823,100	1,466
1958	1558	3,050	Apr. 19, 1958	54	934	676,000	576
1959	1628	1,030	June 3, 1959	28	128	92,950	135
1960	1708	6,010	Apr. 11, 1960	46	541	393,000	-

† Corrected.

3135. Yellow Medicine River near Granite Falls, Minn.

Location.--Lat 44°43', long 95°31', in sec.35, T.115 N., R.39 W., on right bank 50 ft downstream from highway bridge, 6 miles upstream from mouth, and 8 miles south of town of Granite Falls.

Drainage area.--653 sq mi.

Records available.--March 1931 to September 1935 (no winter records), October 1935 to September 1938, October 1939 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 971.59 ft above mean sea level, datum of 1929. Mar. 16, 1931, to June 10, 1936, chain gage and June 11, 1936, to June 13, 1938, wire-weight gage, on bridge 50 ft upstream at same datum. Oct. 12, 1939, to Nov. 30, 1952, staff gage 500 ft downstream at same datum.

Average discharge.--24 years (1935-38, 1939-60), 99.7 cfs (72,180 acre-ft per year).

Extremes.--1931-38, 1939-60: Maximum discharge, 11,800 cfs June 18, 1957 (gage height, 12.41 ft); no flow at times in 1931, 1933, 1948, 1959.

Flood in June 1919 reached a stage of 17.5 ft, from information by local residents.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	4.76	5.27	3.95	2.75	10.2	13.3	1610	175	124	110	141	153	195
1952	55.5	42.7	49.5	15.3	13.4	14.7	5,196	201	601	379	41.0	14.5	381
1953	8.01	10.5	6.22	8.10	8.00	248	206	434	200	152	510	27.8	153
1954	11.5	16.5	13.2	9.05	38.9	442	203	110	57.0	19.3	7.87	8.52	78.5
1955	9.11	12.3	7.54	5.56	4.18	77.0	42.9	27.4	9.14	92.6	11.2	5.98	25.7
1956	2.71	2.67	3.13	3.10	2.87	11.1	117	23.9	145	62.7	54.9	5.20	36.1
1957	3.48	12.4	7.90	3.24	2.84	135	109	169	1,868	388	127	63.9	240
1958	36.0	65.2	38.7	20.7	26.6	125	320	45.0	19.3	76.6	4.49	4.54	65.1
1959	3.35	5.48	4.30	1.96	.12	16.7	15.6	14.2	11.4	2.66	16.3	7.20	8.32
1960	8.04	7.75	7.95	7.19	3.84	159	1,155	88.9	63.8	48.7	10.6	8.85	130

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	293	313	243	218	564	820	95,830	7,370	6,750	8,680	9,130	141,000	141,000
1952	3,410	2,540	3,040	940	770	906	190,200	12,380	35,780	23,300	2,520	865	276,700
1953	492	623	383	498	444	15,260	12,230	26,660	11,880	9,320	31,380	1,650	110,800
1954	706	984	810	557	2,180	27,180	12,080	6,770	3,390	1,180	484	507	56,810
1955	560	733	464	342	232	4,730	2,550	1,680	544	5,690	689	356	18,570
1956	167	159	192	191	185	685	6,990	1,470	8,620	3,860	3,380	310	26,190
1957	214	739	486	199	157	8,290	6,460	10,380	111,200	23,870	7,800	3,800	173,600
1958	2,210	3,880	2,380	1,270	1,480	7,680	19,050	2,770	1,150	4,710	276	270	47,130
1959	206	326	265	120	6.9	1,030	928	876	679	164	1,000	428	6,029
1960	494	461	489	442	221	9,810	68,730	5,470	3,800	3,000	650	526	94,090

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year			
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff		
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet	
1950	-	-	-	-	-	-	-	-	59.5	1.24	43,080	
1951	1208	7,470	Apr. 7, 1951	-	195	0.299	4.04	141,000	206	4.28	149,100	
1952	1238	9,810	Apr. 9, 1952	5.0	381	.583	7.35	276,700	371	7.72	269,200	
1953	1278	1,560	Aug. 4, 1953	4.4	153	.234	3.18	110,800	154	3.21	111,800	
1954	1338	2,140	Mar. 24, 1954	4.4	78.5	.120	1.62	56,810	77.5	1.60	56,060	
1955	1388	742	July 7, 1955	3.4	25.7	.039	.54	18,570	24.0	.51	17,330	
1956	1438	778	June 20, 1956	1.9	36.1	.055	.76	26,190	137.3	.78	27,110	
1957	1508	11,800	June 18, 1957	2.0	240	.368	4.99	173,600	249	5.15	180,600	
1958	1558	790	Apr. 8-9, 1958	2.6	65.1	.100	1.36	47,130	54.5	1.14	39,450	
1959	1628	520	Aug. 28, 1959	0	8.32	.013	.18	6,030	9.22	.15	6,680	
1960	1708	3,500	Apr. 1, 1960	3.2	130	.200	2.70	94,090	-	-	-	

† Corrected.

3140. Chetomba Creek near Maynard, Minn.

Location.--Lat 44°52'30", long 95°26'30", in NW¼NW¼ sec.9, T.116 N., R.38 W., on right upstream abutment of bridge on county highway, 2½ miles southeast of Maynard.

Drainage area.--200 sq mi, approximately.

Records available.--May 1949 to September 1951.

Gage.--Staff gage. Datum of gage is 1,018.4 ft above mean sea level, datum of 1929.

Extremes.--1949-51: Maximum discharge, 1,150 cfs Apr. 6, 1951 (gage height, 7.38 ft, from graph based on gage readings); no flow at times.

Flood in April 1952 reached a stage of 8.2 ft (discharge, 1,970 cfs, by contracted-opening and flow-over-road measurement).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0	0	0	0	0	0	360	76.2	48.2	43.8	4.42	7.89	44.8

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0	0	0	0	0	0	21,440	4,680	2,870	2,690	277	469	32,420

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year					
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff	Mean	Runoff		Mean	Runoff	
		Discharge	Date						Inches	Acre-feet		Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	-	-	17.6	1.21	12,760
1951	1208	1,150	Apr. 6, 1951	0	44.8	0.224	3.04	-	32,420	-	-	-	-

3145. Hawk Creek near Maynard, Minn.

Location.--Lat 44°52'10", long 95°28'50", at west edge of sec.7, T.116 N., R.38 W., on downstream handrail of bridge on county highway, 2½ miles southwest of Maynard.

Drainage area.--474 sq mi.

Records available.--May 1949 to September 1954.

Gage.--Wire-weight gage. Datum of gage is 995.50 ft above mean sea level, datum of 1929. Prior to Nov. 25, 1953, chain gage at same site and datum.

Extremes.--1949-54: Maximum discharge, 3,130 cfs Apr. 10, 1952 (gage height, 13.56 ft, from floodmark); no flow at times.
Maximum stage known, 16.1 ft on June 19, 1957, from floodmark (discharge, 6,970 cfs).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.49	0.30	0.06	0.06	0.28	0.35	1,099	306	189	201	53.8	55.0	158
1952	30.0	32.1	80.1	10.3	5.20	6.97	1,518	209	320	571	105	14.1	240
1953	4.58	1.64	.997	.774	.925	206	228	267	543	485	682	35.7	206
1954	7.96	4.53	3.81	3.13	22.1	109	76.8	80.8	43.2	1.32	.28	.163	29.5

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	30	18	4.0	3.6	15	21	65,420	18,810	11,230	12,370	3,310	3,270	114,500
1952	1,850	1,910	4,920	634	299	429	90,300	12,850	19,030	35,100	6,430	837	174,600
1953	28	98	61	48	51	12,690	15,580	16,430	32,320	29,840	41,940	2,130	149,200
1954	469	270	234	193	1,230	6,720	4,570	4,970	2,570	81	16	9.7	21,350

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year					
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff	Mean	Runoff		Mean	Runoff	
		Discharge	Date						Inches	Acre-feet		Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	-	-	63.6	1.82	46,040
1951	1208	2,380	Apr. 7, 1951	0	158	0.333	4.52	-	114,500	170	4.86	123,100	-
1952	1238	3,130	Apr. 10, 1952	3.2	240	.506	6.90	-	174,600	229	6.57	166,100	-
1953	1278	2,260	June 26, 27, 28	0	206	.435	5.90	-	149,200	207	5.93	150,000	-
1954	1338	404	Mar. 21, 1954	0	29.5	.062	.85	-	21,350	-	-	-	-

3150. Redwood River at Marshall, Minn.

Location.--Lat 44°27', long 95°47', in NE $\frac{1}{4}$ sec.4, T.111 N., R.41 W., on upstream side of highway bridge on Fourth Street in Marshall, 10 miles upstream from Threemile Creek.

Drainage area.--307 sq mi.

Records available.--March 1940 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Chain gage. Datum of gage is 1,144.88 ft above mean sea level, datum of 1929.

Average discharge.--20 years (1940-60), 47.7 cfs (34,530 acre-ft per year).

Extremes.--1940-60: Maximum discharge, 5,370 cfs June 17, 1957 (gage height, 10.14 ft); maximum gage height, 11.05 ft Apr. 6, 1951 (from floodmark); no flow at times.

Remarks.--Unknown amount of natural diversion into Cottonwood River basin at extremely high stages.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	8.91	7.89	3.43	2.87	4.02	10.4	639	109	42.5	32.5	13.6	18.8	73.8
1952	21.3	13.6	15.0	7.95	7.52	16.7	917	106	120	57.5	5.89	4.00	107
1953	4.89	3.46	3.45	3.69	2.97	110	89.0	137	49.4	28.1	77.4	7.88	43.5
1954	5.95	8.40	7.74	4.45	19.3	192	97.8	33.4	34.1	5.44	14.8	11.4	36.3
1955	8.86	8.52	6.78	5.41	3.73	48.8	34.7	15.4	4.71	2.31	1.38	1.14	11.9
1956	3.26	2.34	.95	1.18	1.35	8.14	21.3	10.3	14.6	7.64	8.02	2.28	6.78
1957	2.35	4.17	2.19	1.10	.80	61.7	32.3	26.5	752	126	61.0	89.1	96.0
1958	20.7	22.2	22.0	9.54	11.7	49.0	156	29.9	11.4	5.04	4.54	4.66	28.8
1959	4.79	7.55	3.36	1.67	.68	16.5	10.5	8.02	4.98	1.04	2.16	1.24	5.24
1960	3.14	3.66	2.52	3.87	3.32	107	406	44.0	21.1	23.7	7.06	11.1	52.7

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	548	470	211	177	223	641	38,000	6,690	2,530	2,000	836	1,120	53,450
1952	1,310	812	921	478	433	1,030	54,580	6,500	7,110	3,530	362	238	77,320
1953	301	206	212	227	165	6,730	5,300	8,450	2,940	1,730	4,760	469	31,490
1954	366	500	476	274	1,070	11,780	5,820	2,050	2,030	334	908	681	26,290
1955	545	507	417	332	207	3,000	2,060	945	280	142	98	68	8,590
1956	200	139	59	73	78	500	1,270	632	871	470	493	136	4,920
1957	145	249	134	168	144	3,790	1,920	1,630	44,740	7,760	3,750	5,300	69,530
1958	1,270	1,320	1,350	587	651	3,010	9,300	1,840	676	310	279	277	20,870
1959	295	449	207	103	38	1,020	626	493	297	64	133	74	3,800
1960	193	218	155	238	191	6,600	24,130	2,700	1,260	1,460	434	661	38,240

† Corrected.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30										Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff		Mean	Inches	Acre-feet
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet			
1950	-	-	-	-	-	-	-	-	-	27.4	1.20	-	-	19,840
1951	1208	2,740	Apr. 6, 1951	2.4	73.8	0.240	3.25	53,450	76.3	3.37	55,260	-	-	-
1952	1238	1,800	Apr. 8, 1952	1.1	107	.349	4.72	77,320	103	4.57	74,980	-	-	-
1953	1278	628	Mar. 21, 1953	.8	43.5	.142	1.92	31,490	44.4	1.96	32,110	-	-	-
1954	1338	890	Mar. 22, 1954	2.5	36.3	.118	1.82	26,290	36.5	1.63	26,420	-	-	-
1955	1388	162	Mar. 14, 1955	0	11.9	.039	.53	8,590	10.4	1.46	7,520	-	-	-
1956	1438	47	June 26, 1956	.2	6.78	.022	1.30	4,920	6.96	.31	5,050	-	-	-
1957	1508	5,370	June 17, 1957	.4	96.0	.312	4.24	69,530	101	4.45	72,940	-	-	-
1958	1558	388	Apr. 9, 1958	1.9	28.8	.094	1.27	20,870	24.7	1.09	17,880	-	-	-
1959	1628	24	Mar. 23, 1959	0	5.24	.017	.24	3,800	4.71	.20	3,410	-	-	-
1960	1708	1,410	Apr. 1, 1960	.2	52.7	.172	2.33	38,240	-	-	-	-	-	-

† Corrected.

3165. Redwood River near Redwood Falls, Minn.

Location.--Lat 44°31'25", long 95°10'20", in SE¹/₄NE¹/₄ sec.9, T.112 N., R.36 W., on right bank 20 ft upstream from highway bridge, 3 miles west of town of Redwood Falls, and 8.5 miles upstream from mouth.

Drainage area.--697 sq mi.

Records available.--July 1909 to September 1914 (no winter records except 1911-12) and August 1930 to September 1960 (no winter records 1930-35).

Gage.--Water-stage recorder. Datum of gage is 972.33 ft above mean sea level, datum of 1929. July 1909 to September 1914, chain gage at bridge 20 ft downstream at datum 0.22 ft lower. August 1930 to Mar. 25, 1940, chain gage and Mar. 26, 1940, to Oct. 25, 1949, wire-weight gage, at bridge 20 ft downstream at present datum.

Average discharge.--26 years (1911-12, 1935-60), 95.6 cfs (69,200 acre-ft per year).

Extremes.--1909-14, 1930-60: Maximum discharge, 19,700 cfs June 18, 1957 (gage height, 15.92 ft, from floodmark); no flow for several days in January 1940 and for part of each day Aug. 19, 20, 1959.

Remarks.--Natural discharge affected by unknown amount of interbasin flow between Yellow Medicine, Redwood, and Cottonwood River basins during extreme floods.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	9.18	8.77	4.11	3.65	11.7	23.0	1458	323	156	124	76.0	76.1	188
1952	46.0	32.1	40.5	10.7	11.9	30.9	1950	247	339	343	37.4	17.2	257
1953	9.49	10.4	7.17	5.99	6.48	365	193	353	162	117	400	30.6	140
1954	16.5	24.5	17.8	8.83	56.1	348	204	90.4	57.8	17.5	16.9	28.9	74.0
1955	21.6	23.6	11.9	8.44	6.90	94.1	74.9	34.1	11.2	17.6	5.55	2.77	26.2
1956	3.84	4.51	1.91	1.54	1.80	16.8	73.6	25.3	67.8	29.0	25.0	6.04	21.4
1957	4.25	14.3	8.14	2.38	2.21	103	80.7	67.6	1,900	405	169	152	241
1958	68.1	77.6	59.2	22.0	21.6	97.0	348	64.2	32.5	23.3	6.47	5.86	68.7
1959	5.11	10.7	3.51	.57	.83	42.7	19.7	21.4	18.2	2.32	2.08	1.78	10.8
1960	3.72	7.65	15.4	9.62	2.86	499	910	92.6	67.7	183	55.7	52.4	158

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	565	522	253	225	650	1,410	86,750	19,840	9,280	7,600	4,680	4,530	136,300
1952	2,830	1,810	2,490	658	685	1,900	116,000	15,200	20,190	21,080	2,300	1,020	186,500
1953	583	618	441	368	360	22,420	11,500	21,720	9,650	7,180	24,570	1,820	101,200
1954	1,010	1,460	1,100	543	3,110	21,380	12,120	5,560	3,440	1,080	1,040	1,720	53,560
1955	1,330	1,400	730	519	383	5,780	4,460	2,100	666	1,080	341	165	18,950
1956	236	268	118	95	104	1,030	4,380	1,550	4,030	1,790	1,548	359	15,500
1957	261	853	500	146	123	6,350	4,800	4,160	112,900	24,870	10,400	9,070	174,400
1958	4,190	4,620	3,640	1,350	1,200	5,960	20,720	3,950	1,930	1,440	398	348	49,750
1959	314	635	203	35	46	2,630	1,170	1,320	1,080	142	128	106	7,810
1960	228	455	825	592	165	30,710	54,140	5,690	4,030	11,230	3,430	3,120	114,600

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year			
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff	Mean	Runoff		
		Discharge	Date						Inches	Acre-feet	
1950	-	-	-	-	-	-	-	49.5	0.97	35,840	-
1951	1208	4,860	Apr. 7, 1951	2.5	188	0.270	3.66	136,300	196	3.83	142,200
1952	1238	6,790	Apr. 5, 1952	5.5	257	.369	5.02	186,300	249	4.87	180,700
1953	1278	1,340	Mar. 20, 1953	-	140	.200	2.72	101,200	142	2.77	103,200
1954	1338	1,470	Mar. 25, 1954	5.3	74.0	.106	1.44	55,560	75.8	1.44	53,450
1955	1398	329	Mar. 14, 1955	1.4	26.2	.038	.52	18,950	22.3	.44	16,120
1956	1438	485	June 17, 1956	1.4	21.4	.031	.42	15,500	22.7	.44	16,500
1957	1508	19,700	June 18, 1957	1.9	241	.346	4.68	174,400	†256	4.98	185,300
1958	1558	719	Apr. 12, 1958	2.9	68.7	.099	1.34	49,750	53.1	1.04	38,450
1959	1628	302	June 25, 1959	.1	10.8	.015	.21	7,810	11.3	.22	8,160
1960	1708	7,660	Mar. 31, 1960	.6	158	.227	5.08	114,600	-	-	-

† Corrected.

3170. Cottonwood River near New Ulm, Minn.

Location.--Lat 44°17'40", long 94°26'40", in N $\frac{1}{2}$ sec.33, T.110 N., R.30 W., on left bank 600 ft upstream from highway bridge, 1.8 miles south of New Ulm, and 2 miles upstream from mouth.

Drainage area.--1,280 sq mi, approximately.

Records available.--July 1909 to December 1913 and March 1931 to March 1938 (no winter records most years), August 1938 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 799.09 ft above mean sea level, adjustment of 1912. July 1, 1909, to Dec. 13, 1913, chain gage at site 2.7 miles upstream at different datum. Mar. 15, 1931, to Mar. 31, 1938, chain or wire-weight gage 2 $\frac{1}{2}$ miles upstream at datum 11.41 ft higher. Aug. 23, 1938, to June 25, 1948, staff gage at present site and datum.

Average discharge.--26 years (1911-13, 1935-37, 1938-60), 240 cfs (173,800 acre-ft per year).

Extremes.--1909-13, 1931-60: Maximum discharge, 13,800 cfs July 9, 1947 (gage height, 16.94 ft, from floodmark), from rating curve extended above 9,000 cfs, result of dam failure; minimum observed, 0.5 cfs Nov. 27, 1952 (gage height, 0.77 ft).

Remarks.--Some regulation by dam at Cottonwood Lake and several other small lakes above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	30.4	34.8	12.8	12.8	74.1	150	3,549	1,105	691	455	322	186	550
1952	142	96.6	129	65.2	277	494	3,797	339	284	205	35.4	23.9	485
1953	29.4	23.9	19.5	21.2	23.2	606	332	1,090	911	215	712	63.1	332
1954	42.0	43.6	39.5	20.4	229	816	279	291	223	55.7	35.2	50.3	177
1955	55.8	41.5	27.4	20.3	19.3	240	177	61.8	17.2	20.4	14.0	6.57	58.7
1956	21.4	11.9	5.97	5.88	6.73	30.7	168	38.9	350	104	110	28.4	73.1
1957	23.7	36.3	21.7	8.08	8.44	326	213	149	1,232	420	179	99.8	226
1958	99.1	122	83.5	41.0	24.0	32.8	548	201	173	83.6	34.9	20.5	127
1959	18.8	19.7	9.04	4.56	6.59	82.7	40.0	90.0	185	29.4	67.3	49.4	50.3
1960	33.6	48.6	65.2	103	29.3	594	1,600	449	242	212	98.0	141	301

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,870	2,070	784	785	4,120	9,250	211,200	767,970	41,120	27,970	19,770	11,050	398,000
1952	8,740	5,750	7,930	3,890	15,950	30,350	225,900	30,850	16,900	12,580	2,170	1,420	352,400
1953	1,810	1,420	1,200	1,300	1,290	37,270	19,760	67,040	48,240	13,240	43,800	3,760	240,100
1954	2,580	2,430	2,430	1,250	12,700	50,160	16,630	17,970	13,270	3,420	2,160	2,990	128,000
1955	3,430	2,470	1,690	1,250	1,070	14,760	10,510	3,890	1,020	1,260	859	391	42,510
1956	1,320	709	367	361	387	1,890	9,990	2,390	20,810	6,370	6,770	1,690	53,050
1957	1,460	2,160	1,330	497	469	20,020	12,700	9,140	73,310	25,830	11,020	5,940	163,900
1958	6,090	7,260	5,140	2,520	1,330	5,710	32,600	12,340	10,320	5,140	2,150	1,220	91,820
1959	1,160	1,170	556	280	366	5,090	2,380	5,530	11,020	1,910	4,140	2,940	36,440
1960	2,070	2,890	4,010	6,390	1,690	56,520	95,220	27,620	14,380	13,060	6,020	8,420	218,200

† Corrected.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year			
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	118	1.24	85,390
1951	1208	11,500	Apr. 7, 1951	8.5	550	0.430	5.83	398,000	574	6.09	415,700
1952	1238	10,500	Apr. 5, 1952	9.5	485	.379	5.16	352,400	461	4.90	334,400
1953	1278	3,750	May 27, 1953	3.7	332	.259	3.53	240,100	336	3.59	243,300
1954	1358	2,950	Mar. 21, 1954	14	177	.138	1.87	128,000	177	1.86	128,000
1955	1388	1,330	Mar. 12, 1955	3.9	58.7	.046	.63	42,510	51.5	.56	37,320
1956	1438	2,210	June 24, 1956	2.2	73.1	.057	.79	53,050	76.6	.82	55,610
1957	1508	5,360	June 25, 1957	3.5	226	.177	2.39	163,900	245	2.60	177,400
1958	1558	2,760	May 30, 1958	16	127	.099	1.36	91,820	105	1.13	76,220
1959	1628	1,480	June 1, 1959	4.1	50.3	.039	.53	36,440	58.7	.61	42,530
1960	1708	5,920	Mar. 30, 1960	2.2	301	†.235	3.18	218,200	-	-	-

† Corrected.

3180. East Branch Blue Earth River near Brice lyn, Minn.

Location.--Lat 43°37'50", long 93°47'25", in NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 23, T.102 N., R.25 W., in center of span on downstream side of highway bridge, 2 miles upstream from Brust Creek, 3 miles downstream from south Walnut Lake, and 5 miles northeast of Brice lyn.

Drainage area.--132 sq mi.

Records available.--March 1951 to September 1960. Prior to October 1957, published as East Fork Blue Earth River near Brice lyn.

Gage.--Wire-weight gage. Datum of gage is 1,129.14 ft above mean sea level, datum of 1929 (Minnesota State Highway Department bench mark).

Average discharge.--9 years (1951-60), 26.6 cfs (19,260 acre-ft per year).

Extremes.--1951-60: Maximum discharge, 1,320 cfs Apr. 7, 1951 (gage height, 10.68 ft, from graph based on gage readings); no flow for many days.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	22.8	618	151	61.6	110	19.5	66.6	-
1952	40.9	26.4	27.5	6.71	13.7	115	262	49.2	38.3	65.1	6.54	8.91	54.9
1953	.06	0	0	0	0	90.2	72.7	91.0	64.5	7.97	41.2	0	30.8
1954	0	0	0	0	0	2.29	8.99	44.2	115	38.9	11.2	19.4	19.8
1955	53.4	31.8	13.5	7.02	6.20	61.8	63.6	19.7	44.2	86.3	1.19	0	32.6
1956	0	0	0	0	0	16.5	56.4	27.9	14.9	15.4	43.8	1.52	14.7
1957	0	0	0	0	0	.82	4.88	6.25	15.8	25.0	4.53	1.46	4.93
1958	.22	4.00	4.31	2.25	1.13	5.91	32.1	16.3	2.69	1.74	.06	0	5.89
1959	0	0	0	0	0	.31	16.1	18.6	31.5	32.6	5.55	15.2	10.0
1960	41.5	33.7	25.9	24.5	3.07	33.2	59.8	257	175	88.2	2.81	.06	65.6

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	0.20	5.23	1.32	0.52	0.96	0.17	0.56	-
1952	0.36	0.22	0.24	0.06	0.11	1.00	2.21	.43	.32	.57	.06	.08	5.66
1953	.0006	0	0	0	0	.79	.61	.79	.54	.07	.56	0	3.16
1954	0	0	0	0	0	.02	.06	.59	.97	.34	.10	.16	2.04
1955	.47	.27	.12	.06	.05	.54	.54	.17	.37	.75	.01	0	3.35
1956	0	0	0	0	0	.14	.48	.24	.13	.13	.38	.01	1.51
1957	0	0	0	0	0	.007	.04	.05	.13	.22	.04	.01	.50
1958	.002	.03	.04	.02	.009	.05	.27	.14	.02	.02	.0006	0	.60
1959	0	0	0	0	0	.003	.14	.16	.27	.29	.05	.13	1.04
1960	.36	.29	.23	.21	.02	.29	.84	2.24	1.48	.77	.02	.0005	6.75

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches	
		Discharge	Date							
1950	-	-	-	-	-	-	-	-	-	-
1951	1208	al, 320	Apr. 7, 1951	-	-	-	-	-	-	-
1952	1238	75	Apr. 1, 1952	0.3	54.9	.233	5.66	47.0	5.66	
1953	1278	231	Mar. 21, 1953	0	30.8	0.416	3.16	30.8	3.16	
1954	1338	274	June 24, 1954	0	19.8	.150	2.04	28.1	2.90	
1955	1388	196	July 8, 1955	0	32.6	.247	3.35	24.3	2.49	
1956	1438	207	Apr. 1, 1956	0	14.7	.111	1.51	14.7	1.51	
1957	1508	62	June 30, 1957	0	4.93	.037	.50	5.64	.57	
1958	1558	56	Apr. 27, 1958	0	5.89	.045	.60	5.18	.53	
1959	1628	81	June 3, 1959	0	10.0	.076	1.04	18.5	1.92	
1960	1708	935	May 23, 1960	0	65.6	.497	6.75	-	-	

a Maximum for period March to September 1951.

3200. Blue Earth River near Rapidan, Minn.

Location.--Lat 44°05'44", long 94°06'33", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 6, T.107 N., R.27 W., on left bank 0.2 mile downstream from powerplant of Northern States Power Co., 2 miles west of Rapidan, 3 $\frac{1}{2}$ miles downstream from Watonwan River, and 7 $\frac{1}{2}$ miles upstream from LeSueur River.

Drainage area.--2,430 sq mi, approximately.

Records available.--July 1909 to November 1910 (no winter records), October 1939 to September 1945, July 1949 to September 1960. Published as "at Rapidan Mills" 1909-10.

Gage.--Water-stage recorder. Datum of gage is 808.80 ft above mean sea level, adjustment of 1912. July 20, 1909, to Apr. 28, 1910, chain gage at site a quarter of a mile upstream at different datum. Apr. 29 to Nov. 12, 1910, staff gage at site 807 ft upstream at different datum. Oct. 4 to Nov. 14, 1939, staff gage at present site and datum.

Average discharge.--17 years (1939-45, 1949-60), 714 cfs (516,900 acre-ft per year).

Extremes.--1909-10, 1939-45, 1949-60: Maximum discharge, 26,100 cfs Apr. 8, 1951 (gage height, 14.97 ft), from rating curve extended above 16,000 cfs by logarithmic plotting; minimum, 6.9 cfs Oct. 12, 1955 (gage height, 1.04 ft).

Remarks.--Flow regulated by Rapidan Reservoir (capacity, 2,980 acre-ft).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	37.6	44.4	32.2	30.6	130	664	9,022	2,422	2,021	2,651	735	1,301	1,586
1952	685	392	353	171	755	1,952	4,895	822	859	1,041	393	325	1,048
1953	69.7	58.1	47.9	52.8	62.2	1,415	1,057	2,611	4,440	621	988	85.7	961
1954	53.6	72.6	75.9	32.7	118	528	293	727	2,122	941	305	293	463
1955	423	298	175	126	47.4	796	778	376	506	473	80.7	72.4	348
1956	23.3	30.4	16.0	17.3	19.2	348	641	374	1,450	418	566	82.6	332
1957	42.2	70.3	52.5	25.6	22.0	270	292	300	689	467	179	96.5	208
1958	85.7	149	128	61.5	54.0	160	639	319	253	247	46.8	26.9	181
1959	22.6	36.5	21.6	19.0	14.2	110	155	280	825	194	164	215	171
1960	325	338	347	462	132	440	2,435	4,573	2,201	891	247	573	1,082

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2,310	2,640	1,980	1,880	7,210	40,830	536,900	148,900	120,200	163,000	45,190	77,390	1,148,000
1952	42,110	23,300	21,690	10,520	45,440	120,000	291,300	50,950	49,950	64,010	24,170	19,350	760,800
1953	4,280	3,460	2,940	3,230	3,460	87,020	62,880	160,500	284,200	38,190	60,770	5,100	696,000
1954	5,290	4,320	4,670	2,010	6,000	32,450	17,440	44,690	126,300	57,850	18,780	17,450	335,200
1955	26,020	17,750	10,770	7,730	2,630	48,970	46,320	23,130	30,090	29,100	4,960	4,310	251,800
1956	1,430	1,810	986	1,060	1,100	21,420	38,120	23,020	86,450	25,680	34,810	4,510	240,800
1957	2,590	4,190	3,230	1,570	1,220	16,620	17,400	18,430	39,840	28,740	11,020	5,740	150,600
1958	5,270	8,860	7,840	3,780	3,000	9,840	38,010	19,610	15,040	15,200	2,880	1,600	130,900
1959	1,390	2,170	1,330	1,110	791	6,760	9,220	17,250	49,080	11,950	10,080	12,780	123,900
1960	20,010	20,120	21,360	28,410	7,620	27,050	144,900	281,200	130,900	54,800	15,180	34,690	785,600

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year			
		Momentary maximum			Minimum day	Mean	Per square mile	Runoff	Mean	Runoff		
		Discharge	maximum	Date						Inches	Acres	Acres
1950	-	-	-	-	-	-	-	-	212	1.18	153,600	-
1951	1208	26,100	Apr. 8, 1951	15	1,586	0.653	8.88	1,148,000	1,697	9.49	1,229,000	-
1952	1238	14,700	Apr. 1, 1952	17	1,048	.431	5.88	760,800	943	5.29	684,300	-
1953	1278	19,700	June 9, 1953	15	961	.395	5.38	696,000	964	5.40	697,600	-
1954	1338	6,230	June 25, 1954	18	463	.191	2.58	335,200	521	2.90	377,500	-
1955	1388	3,660	Mar. 12, 1955	10	348	.143	1.94	251,800	278	1.55	201,500	-
1956	1438	5,670	June 18, 1956	7.4	332	.137	1.86	240,800	340	1.91	246,600	-
1957	1508	3,440	May 28, 1957	16	208	.086	1.14	150,600	225	1.24	162,600	-
1958	1558	1,270	Apr. 8, 1958	18	181	.074	1.01	130,900	157	.88	113,800	-
1959	1628	3,670	June 6, 1959	12	171	.070	.96	123,900	249	1.38	180,500	-
1960	1708	16,600	May 24, 1960	20	1,082	.445	6.06	785,600	-	-	-	-

3205. Le Sueur River near Rapidan, Minn.

Location.--Lat 44°06'40", long 94°02'28", in SW $\frac{1}{4}$ sec.35, T.108 N., R.27 W., on right bank 600 ft downstream from highway bridge, 1.8 miles northeast of Rapidan, and 2.3 miles upstream from mouth.

Drainage area.--1,100 sq mi, approximately.

Records available.--October 1939 to September 1945, July 1949 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 775.76 ft above mean sea level, datum of 1929. Prior to Nov. 15, 1939, staff gage at same site and datum.

Average discharge.--17 years (1939-45, 1949-60), 331 cfs (239,600 acre-ft per year).

Extremes.--1939-45, 1949-60: Maximum discharge, 21,200 cfs May 22, 1960 (gage height, 22.72 ft, from floodmark); minimum daily, 1.6 cfs Feb. 9-25, 1959; minimum gage height, 1.85 ft Aug. 22, 23, 1955.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	15.7	17.5	14.4	11.1	16.1	127	4,996	1,130	1,316	843	236	1,019	807
1952	343	248	378	78.4	108	857	2,530	391	443	510	107	91.2	506
1953	21.1	*22.0	17.6	19.3	18.8	702	579	1,752	999	334	1,231	37.7	482
1954	22.9	26.8	28.5	15.7	33.4	195	118	483	617	117	38.4	45.7	145
1955	79.9	67.5	32.3	22.8	19.8	491	338	111	196	102	10.6	7.87	124
1956	11.3	11.1	5.81	8.85	9.41	39.8	257	133	1,138	283	134	15.3	169
1957	10.5	16.3	8.25	2.96	6.35	78.7	48.3	88.7	134	387	185	40.2	84.8
1958	21.7	62.6	39.5	26.4	17.1	33.8	239	125	78.8	36.5	10.1	15.3	58.7
1959	8.66	12.6	5.04	3.00	1.68	48.7	85.3	91.2	273	281	40.6	179	85.9
1960	291	323	301	241	59.6	234	1,290	3,710	1,270	887	100	45.4	732

† Corrected.

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	966	1,040	865	684	895	7,800	*297,300	69,490	78,330	51,850	14,520	60,630	584,400
1952	21,080	14,750	23,250	4,820	6,230	52,720	150,800	24,040	26,380	31,380	6,570	5,420	367,400
1953	1,300	1,300	1,080	1,190	1,040	43,150	34,430	107,700	59,460	20,530	75,700	2,240	349,100
1954	1,410	1,590	1,750	970	1,850	12,000	7,010	29,700	36,730	7,180	2,360	2,720	105,300
1955	4,910	4,010	1,980	1,400	1,100	30,200	20,110	6,820	11,680	6,250	653	468	189,580
1956	696	660	357	544	541	2,450	15,300	8,160	67,710	17,430	8,240	910	123,000
1957	649	968	507	182	352	4,840	2,880	5,460	7,960	23,810	11,380	2,390	161,380
1958	1,330	3,730	2,430	1,620	947	2,080	14,240	7,680	4,690	2,250	624	908	42,530
1959	532	747	310	185	93	3,000	5,070	5,610	16,230	17,300	2,490	17,650	62,220
1960	17,910	19,210	18,490	14,820	3,430	14,400	76,610	227,800	75,310	54,560	6,170	2,700	531,400

† Corrected.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year			
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff	Mean	Runoff		
		Discharge	Date						Inches	Acres-feet	
1950	-	-	-	-	-	-	-	133	1.64	96,470	-
1951	1208	13,200	Apr. 7, 1951	23	807	0.734	9.97	584,400	10.92	640,600	-
1952	1238	9,640	Apr. 2, 1952	23	506	.480	6.26	367,400	5.31	312,000	-
1953	1278	5,120	May 25, 1953	16	482	.438	5.96	349,100	4.96	350,200	-
1954	1358	1,610	June 23, 1954	13	145	.132	1.80	105,300	1.54	111,400	-
1955	1388	1,760	Mar. 13, 1955	4.9	124	.113	1.52	189,580	1.11	80,390	-
1956	1438	3,980	June 18, 1956	5.2	169	.154	2.09	123,000	1.70	123,400	-
1957	1508	1,790	May 28, 1957	1.7	84.8	.077	1.05	161,380	92.2	66,740	-
1958	1558	525	Apr. 27, 1958	6.0	58.7	.053	.73	42,530	50.6	36,650	-
1959	1628	1,510	May 31, 1959	1.6	85.9	.078	1.06	62,220	161	116,200	-
1960	1708	21,200	May 22, 1960	22	732	.665	9.08	531,400	-	-	-

† Corrected.

3250. Minnesota River at Mankato, Minn.

Location.--Lat 44°10'10", long 94°00'15", in sec.7, T.108 N., R.26 W., on left bank at downstream side of Main Street Bridge in Mankato, 1.8 miles downstream from Blue Earth River and at mile 106.4.

Drainage area.--14,900 sq mi, approximately.

Records available.--May 1903 to September 1960 (no winter records 1904, 1906-10, 1918-29). Published as "near Mankato" 1903-21.

Gage.--Water-stage recorder. Datum of gage is 747.92 ft above mean sea level, datum of 1929. Prior to Aug. 6, 1910, staff gage and Aug. 6, 1910, to Oct. 19, 1921, chain gage, at site 1.8 miles upstream at datum 6.4 ft higher. Mar. 15, 1922, to Nov. 30, 1924, chain gage at present site and datum.

Average discharge.--39 years (1905, 1910-17, 1929-60), 2,350 cfs (1,701,000 acre-ft per year).

Extremes.--1903-60: Maximum discharge, 66,600 cfs Apr. 9, 1951 (gage height, 26.20 ft, from floodmark); minimum observed, 26 cfs Aug. 4, 1934.
Maximum stage known, 29.9 ft Apr. 26, 1881, from floodmark, present site and datum (discharge, 90,000 cfs).

Remarks. Some diurnal fluctuation at low and medium stages caused by powerplants on Blue Earth River.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	239	225	191	184	278	1,459	31,800	11,890	5,951	7,772	2,951	4,527	5,611
1952	2,175	1,332	1,925	837	1,573	3,692	35,140	9,884	4,770	8,260	2,514	1,005	6,068
1953	405	302	212	257	465	4,541	5,996	10,080	10,430	8,497	9,614	1,735	4,408
1954	461	482	508	314	803	3,922	3,954	4,274	5,006	2,241	815	693	1,959
1955	910	708	481	369	270	2,772	2,560	1,376	1,050	3,365	698	389	1,254
1956	238	208	137	140	147	678	3,463	1,544	4,664	2,163	2,276	583	1,351
1957	246	500	356	197	158	1,398	2,703	2,298	12,650	9,583	4,047	3,489	3,141
1958	2,517	2,185	1,785	817	1,946	5,544	2,705	1,621	1,656	332	238	1,839	2,384
1959	173	194	130	118	114	549	718	850	1,899	654	400	662	538
1960	737	805	634	1,164	390	1,298	15,230	11,100	5,021	3,439	778	1,389	3,492

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	14,700	13,390	11,770	11,540	15,320	89,730	1,892,000	731,100	354,100	477,900	181,400	269,400	4,062,000
1952	133,700	79,280	118,400	51,490	90,510	227,000	2,091,000	807,700	285,800	507,900	154,600	59,780	4,405,000
1953	24,930	18,000	13,030	15,810	25,830	279,200	356,800	820,100	620,800	522,500	391,100	103,200	3,191,000
1954	28,350	28,670	31,260	19,280	44,610	241,100	235,300	262,800	297,900	137,800	50,100	41,220	1,418,000
1955	55,940	42,120	29,590	22,670	15,030	170,400	152,400	64,600	62,480	206,900	42,900	23,170	908,200
1956	14,610	12,360	8,450	8,600	8,460	41,710	206,100	94,950	277,500	133,000	140,000	34,710	980,400
1957	15,150	29,750	21,910	12,120	8,780	85,940	160,800	141,300	752,800	589,200	248,800	207,600	2,274,000
1958	154,800	167,200	106,700	53,020	34,280	119,400	329,900	166,300	96,840	64,910	24,120	14,180	1,332,000
1959	10,610	11,530	8,010	7,230	6,340	33,730	42,750	52,250	113,000	40,240	24,620	39,390	389,700
1960	45,340	47,910	38,990	71,580	22,430	79,830	906,000	682,300	298,800	211,400	47,850	82,660	2,535,000

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	1,572	1.43	1,138,000
1951	1208	66,600	Apr. 9, 1951	119	5,611	0.377	5.11	4,062,000	6,014	5.48	4,354,000
1952	1238	53,500	Apr. 14, 1952	494	6,068	.407	5.54	4,405,000	5,689	5.19	4,130,000
1953	1278	25,100	June 10, 1953	124	4,408	.296	4.00	3,191,000	4,453	4.05	3,224,000
1954	1338	10,000	June 23, 1954	270	1,959	.131	1.78	1,418,000	2,014	1.82	1,458,000
1955	1388	8,200	Mar. 12, 1955	226	1,254	.084	1.14	908,200	1,127	1.03	816,000
1956	1438	11,600	June 26, 1956	116	1,351	.091	1.24	980,400	1,394	1.28	1,012,000
1957	1508	41,700	June 24, 1957	120	3,141	.211	2.87	2,274,000	3,642	3.31	2,636,000
1958	1558	7,570	Apr. 13, 1958	180	1,839	.123	1.67	1,332,000	1,289	1.17	933,100
1959	1628	4,850	June 3, 1959	106	538	.036	.48	389,700	679	.62	491,800
1960	1708	34,300	May 23, 1960	231	3,492	.234	3.20	2,535,000	-	-	-

† Corrected.

3300. Minnesota River near Carver, Minn.

Location.--Lat 44°43'28", long 93°37'58", in NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.31, T.115 N., R.23 W., on left bank $2\frac{1}{2}$ miles south of Carver and at mile 36 upstream from Mississippi River.

Drainage area.--16,200 sq mi, approximately.

Records available.--September 1934 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 690.00 ft above mean sea level, datum of 1929. Prior to Dec. 5, 1934, staff gage at same site and datum. Auxiliary chain gage $2\frac{3}{4}$ miles upstream at same datum.

Average discharge.--26 years (1934-60), 2,973 cfs (2,152,000 acre-ft per year).

Extremes.--1934-60: Maximum discharge, 64,100 cfs Apr. 11, 1951 (gage height, 27.71 ft); maximum gage height, 28.31 ft Apr. 16, 1952; minimum discharge, 79 cfs Nov. 17, 1955; minimum gage height, 2.66 ft Nov. 22, 1935.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	337	271	221	227	206	1,571	30,390	13,780	5,688	9,172	3,558	4,609	5,834
1952	2,545	1,790	2,886	1,392	1,759	3,934	36,860	11,480	4,882	8,146	3,493	1,369	6,774
1953	684	558	337	309	500	4,448	6,710	10,590	13,080	10,490	10,980	2,579	5,156
1954	763	750	753	437	889	4,156	4,483	4,973	5,479	2,871	1,062	958	2,303
1955	1,068	924	604	487	367	3,067	3,055	1,654	1,131	3,598	1,010	589	†1,472
1956	373	326	246	245	241	698	3,852	1,656	5,141	3,037	2,754	880	1,618
1957	405	576	520	298	262	1,430	2,968	2,359	10,790	12,270	4,994	3,776	3,400
1958	2,795	3,053	2,151	1,125	735	2,400	5,700	3,035	2,214	1,265	580	364	2,120
1959	288	289	215	206	197	582	923	2,064	1,058	676	942	942	697
1960	1,032	1,136	1,068	1,399	588	1,037	16,950	13,010	6,622	3,815	920	1,474	4,078

† Corrected.

Monthly and annual runoff, in thousands of acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	20.72	16.14	13.60	13.98	11.45	96.58	1,808	847.4	338.5	563.9	218.8	274.2	4,223
1952	156.5	106.5	177.5	85.57	101.2	241.9	2,193	706.0	290.5	562.4	214.8	81.44	4,917
1953	42.06	33.17	20.71	19.01	27.78	273.5	399.3	651.0	778.1	644.7	675.2	153.4	3,718
1954	46.92	44.62	46.32	26.85	49.38	255.5	266.7	305.8	326.0	176.5	65.30	57.00	1,667
1955	65.70	54.96	37.15	29.91	20.38	188.6	181.8	101.7	67.29	221.2	62.10	35.06	1,066
1956	22.94	19.38	15.10	15.09	13.85	42.93	229.2	101.8	305.9	186.7	169.3	52.35	1,175
1957	24.91	54.29	31.95	18.30	14.57	87.32	176.6	145.0	641.8	754.7	307.1	224.7	2,461
1958	171.9	181.7	132.2	69.19	40.71	147.6	339.2	186.6	151.7	77.81	34.41	21.68	1,535
1959	17.68	17.20	13.24	12.68	10.95	35.76	55.12	56.74	122.8	65.08	41.56	56.06	504.9
1960	63.45	67.59	65.69	86.01	33.83	63.75	1,007	799.8	394.0	234.6	56.57	87.71	2,960

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year			
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	1,854	1.54	1,342,000
1951	1208	64,100	Apr. 11, 1951	150	5,834	0.360	4.88	4,223,000	6,373	5.33	4,613,000
1952	1238	60,600	Apr. 16, 1952	786	6,774	.418	5.70	4,917,000	6,299	5.30	4,573,000
1953	1278	25,000	June 14, 1953	245	5,156	.317	4.30	3,718,000	5,193	4.54	3,760,000
1954	1338	10,500	June 26-27, 1954	380	2,303	.142	1.93	1,667,000	2,330	1.96	1,697,000
1955	1388	7,650	Mar. 17, 1955	320	†1,472	.091	1.23	1,066,000	1,334	1.12	965,500
1956	1438	12,800	June 20, 1956	123	1,618	.100	1.38	1,175,000	1,665	1.42	1,208,000
1957	1508	40,800	June 26, 1957	228	3,400	.210	2.85	2,461,000	3,945	3.30	2,856,000
1958	1558	7,640	Apr. 15, 1958	293	2,120	.131	1.78	1,535,000	1,515	1.28	1,097,000
1959	1628	3,880	June 5, 1959	175	697	.043	.58	504,900	903	.75	653,500
1960	1708	36,400	May 25, 1960	450	4,078	.252	3.44	2,960,000	-	-	-

† Corrected.

3310. Mississippi River at St. Paul, Minn.

Location.--Lat 44°56'40", long 93°05'20", in SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.6, T.28 N., R.22 W., on left bank in St. Paul, 300 ft upstream from Robert Street Bridge, 6 miles downstream from Minnesota River, and at mile 839.3 upstream from Ohio River.

Drainage area.--36,800 sq mi, approximately.

Records available.--March 1892 to September 1960 (prior to 1901, fragmentary during some winters). Records prior to March 1892, published in the 19th Annual Report, Part 4, have been found to be unreliable and should not be used. Monthly discharge only for some periods, published in WSP 1308. Gage-height records (winter records incomplete) collected at same site since 1866 are contained in reports of U.S. Weather Bureau, War Department, and Mississippi River Commission.

Gage.--Water-stage recorder. Datum of gage is 684.16 ft above mean sea level, adjustment of 1912. Prior to Mar. 18, 1925, staff or chain gage at several sites within 300 ft of present site at same datum. Mar. 18, 1925, to Mar. 10, 1933, water-stage recorder and Mar. 11, 1933, to Sept. 14, 1939, staff gage, at present site and datum. Since September 1938, auxiliary water-stage recorder 5.4 miles downstream.

Average discharge.--62 years (1894-95, 1896-97, 1900-60), 9,833 cfs (adjusted for diversion).

Extremes.--1892-1960: Maximum discharge, 125,000 cfs Apr. 16, 1952 (gage height, 22.02 ft); minimum daily, 632 cfs Aug. 26, 1934.

Maximum stage known since at least 1870, that of Apr. 16, 1952. Flood of Apr. 29, 1881, reached a stage of 19.7 ft (discharge, 107,000 cfs), determined by Corps of Engineers.

Remarks.--Slight regulation except during extreme floods by reservoirs on headwaters and by powerplants. Beginning July 20, 1938, sewage from Minneapolis and St. Paul, which formerly entered above station, was diverted to a sewage-disposal plant, thence to river below station. Figures herein include this diversion. Records of water temperatures for the period October 1956 to September 1960 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	6,272	4,306	4,790	5,069	5,139	7,040	54,710	36,540	17,300	21,960	10,330	18,370	15,990
1952	14,290	14,510	13,170	8,810	8,110	10,600	78,710	31,780	14,050	31,090	20,820	10,740	21,370
1953	5,789	5,698	4,897	4,799	5,361	14,250	24,740	26,830	36,930	29,030	33,660	12,760	17,130
1954	7,430	7,674	6,641	6,437	6,908	12,190	20,190	29,420	21,300	15,940	6,839	6,767	12,340
1955	7,995	6,327	4,890	4,567	4,227	7,897	17,780	8,084	7,481	12,260	9,862	6,362	8,136
1956	4,948	3,862	4,167	3,483	3,174	4,142	24,860	13,240	13,460	7,791	12,600	4,753	8,364
1957	5,275	5,532	5,827	2,918	2,765	7,263	15,970	13,930	27,890	36,890	17,700	17,140	12,950
1958	11,520	16,690	7,556	5,701	4,857	7,995	13,850	7,413	7,265	6,031	3,543	4,904	7,998
1959	3,316	3,770	2,867	2,251	1,982	3,116	4,609	9,078	12,180	7,017	3,304	5,269	4,904
1960	5,189	4,759	4,642	4,981	3,677	4,405	30,190	27,120	17,000	8,003	3,394	5,274	9,871

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.20	0.13	0.15	0.16	0.15	0.22	1.66	1.14	0.52	0.69	0.32	0.56	5.90
1952	.45	.44	.41	.28	.24	.33	2.39	1.00	.43	.97	.65	.33	7.92
1953	.18	.17	.15	.15	.15	.45	.75	.84	1.12	.91	1.05	.39	6.31
1954	.23	.23	.21	.20	.20	.38	.61	.92	.65	.50	.21	.21	4.55
1955	.24	.19	.15	.14	.12	.25	.54	.25	.23	.38	.31	.19	2.99
1956	.15	.12	.13	.11	.09	.13	.75	.42	.41	.24	.39	.14	3.08
1957	.10	.16	.12	.09	.08	.22	.48	.42	.84	1.15	.55	.52	4.73
1958	.36	.32	.24	.19	.14	.25	.42	.23	.22	.19	.10	.15	2.80
1959	.10	.11	.09	.07	.06	.10	.14	.28	.37	.22	.16	.16	1.60
1960	.16	.14	.15	.16	.11	.14	.91	.85	.52	.25	.11	.16	3.66

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches		Mean	Runoff in inches	
		Discharge	Date								
1950	-	-	-	-	-	-	-	-	-	12,590	4.65
1951	1208	92,800	Apr. 16, 1951	1,930	15,990	0.435	5.90	19,220	6.72		
1952	1238	125,000	Apr. 16, 1952	4,610	21,370	.581	7.92	19,220	7.12		
1953	1278	47,000	June 27, 1953	2,800	17,130	.465	6.31	17,570	6.48		
1954	1338	43,460	May 6, 1954	4,250	12,340	.335	4.55	12,100	4.46		
1955	1388	25,700	Apr. 7, 1955	3,280	8,136	.221	2.99	7,639	2.81		
1956	1438	34,900	Apr. 11, 1956	2,120	9,364	.227	3.08	8,314	3.06		
1957	1508	78,400	June 29, 1957	2,110	12,950	.352	4.73	14,400	5.27		
1958	1558	18,200	Apr. 14, 1958	1,950	7,598	.206	2.80	5,936	2.18		
1959	1628	22,200	June 5, 1959	1,420	4,904	.133	1.80	5,294	1.95		
1960	1708	43,300	May 28, 1960	1,950	9,871	.268	3.66	-	-		

3325. Namekagon River near Trego, Wis.

Location.--Lat 45°56'50", long 91°53'15", in SW $\frac{1}{4}$ sec.17, T.40 N., R.12 W., at powerplant of the Northern States Power Co., 4 miles downstream from Potato Creek and 5 miles northwest of Trego.

Drainage area.--503 sq mi.

Records available.--October 1927 to September 1960.

Gage.--Headwater and tailwater gages read hourly.

Average discharge.--33 years (1927-60), 470 cfs.

Extremes.--1927-60: Maximum daily discharge, 5,200 cfs Sept. 2, 1941; minimum daily, 113 cfs Aug. 17, Sept. 7, 1930.

Remarks.--Discharge computed from powerplant records on basis of ratings developed by the Geological Survey.

Correction.--In WSP 1308, the monthly runoff for June 1949 is listed in error; it should be 0.70 inch.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	374	336	333	306	304	366	921	718	824	799	523	750	546
1952	592	596	470	420	406	423	1,075	576	535	735	800	502	577
1953	593	374	372	348	342	556	730	743	722	650	897	426	529
1954	383	412	424	367	385	396	827	1,146	912	744	567	624	600
1955	710	546	461	396	383	438	765	462	503	553	660	479	530
1956	506	528	445	420	383	414	846	644	728	608	839	448	551
1957	417	448	415	364	359	460	663	481	598	576	398	576	480
1958	444	474	416	389	373	441	588	7429	422	1,026	505	547	506
1959	445	479	371	355	340	397	447	627	487	422	429	611	451
1960	563	433	418	407	386	390	736	834	681	486	524	769	550

† Corrected.

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.86	0.75	0.76	0.70	0.63	0.84	2.04	1.65	1.83	1.83	1.20	1.66	14.75
1952	1.36	1.32	1.08	.96	.87	.97	2.39	1.33	1.18	1.68	1.37	1.11	15.62
1953	.89	.83	.85	.80	.71	1.28	1.62	1.70	1.60	1.49	1.58	.95	14.30
1954	.88	.91	.97	.84	.80	.91	1.83	2.63	2.02	1.70	1.30	1.38	16.17
1955	1.63	1.21	1.06	.91	.79	1.00	1.70	1.06	1.12	1.27	1.51	1.06	14.32
1956	1.16	1.17	1.02	.96	.82	.95	1.88	1.48	1.61	1.39	1.46	.99	14.89
1957	.96	.99	.95	.83	.74	1.05	1.47	1.10	1.33	1.32	.91	1.28	12.93
1958	1.02	1.05	.95	.89	.77	1.01	1.30	.98	.94	2.35	1.16	1.21	13.63
1959	1.02	1.06	.85	.81	.70	.91	.99	1.44	1.08	.97	.98	1.35	12.16
1960	1.29	.96	.96	.93	.83	.89	1.63	1.91	1.47	1.11	1.20	1.71	14.89

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	469	12.87
1951	1208	1,500	Apr. 15, 1951	233	546	1.09	14.75	598	16.14
1952	1238	1,480	July 22, 1952	350	577	1.15	15.62	533	14.45
1953	1279	1,330	May 23, 1953	304	529	1.05	14.30	536	14.49
1954	1338	2,140	May 4, 1954	316	600	1.19	16.17	642	17.31
1955	1398	1,120	July 6, 1955	341	530	1.05	14.32	510	13.77
1956	1438	1,630	June 16, 1956	288	551	1.10	14.89	534	14.44
1957	1508	1,120	June 24, 1957	287	480	0.954	12.93	484	13.05
1958	1558	2,380	July 3, 1958	259	506	1.01	15.63	502	13.54
1959	1628	886	May 7, 1959	234	451	0.97	12.16	461	12.44
1960	1708	1,420	May 23, 1960	259	550	1.09	14.89	-	-

3335. St. Croix River near Danbury, Wis.

Location.--Lat 46°04'30", long 92°14'50", in sec.33, T.42 N., R.15 W., on left bank on State Trunk Highway 35, 3.5 miles downstream from Namekagon River, 10 miles northeast of Danbury, and at mile 129.2.

Drainage area.--1,588 sq mi.

Records available.--March 1914 to September 1960. Prior to October 1933 published as "at Swiss."

Gage.--Water-stage recorder. Datum of gage is 882.21 ft above mean sea level, datum of 1929. Prior to Apr. 23, 1937, staff or chain gage at old highway bridge 40 ft downstream at same datum. Apr. 23, 1937, to Jan. 5, 1939, chain gage at present site and datum.

Average discharge.--46 years (1914-60), 1,293 cfs.

Extremes.--1914-60: Maximum discharge, 10,200 cfs May 6, 1950 (gage height, 8.22 ft); minimum observed, 393 cfs Aug. 6, 13, 1934 (gage height, -0.20 ft, site then in use).

Correction.--In WSP 1308, the number of the water-supply paper in which revisions for water year 1918 were published is listed in error. Those revisions were published in WSP 1628.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,257	1,010	910	850	872	1,061	3,694	2,118	2,934	2,329	1,472	2,595	1,757
1952	1,878	2,151	1,475	1,224	1,181	1,202	3,821	1,635	1,854	3,028	1,798	1,463	1,891
1953	1,136	1,087	1,091	1,019	1,010	1,821	2,406	2,541	2,343	1,868	1,986	1,142	1,625
1954	1,023	1,222	1,303	1,070	1,052	1,151	2,830	3,802	2,961	2,138	1,555	1,859	1,833
1955	1,968	1,552	1,174	1,027	979	1,080	2,732	1,284	1,457	1,467	2,223	1,357	1,527
1956	1,266	1,435	1,214	1,091	1,036	1,149	3,127	1,843	1,840	1,576	1,521	1,052	1,511
1957	1,058	1,285	1,039	921	923	1,287	2,154	1,537	1,630	1,801	962	1,547	1,329
1958	1,103	1,384	1,061	962	901	1,133	1,715	1,026	984	5,230	1,105	1,488	1,344
1959	1,057	1,222	1,001	888	827	1,035	1,161	1,915	1,445	1,034	961	1,535	1,174
1960	1,443	1,116	1,040	1,014	905	956	3,099	2,280	1,611	1,034	1,152	1,739	1,447

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.91	0.71	0.66	0.62	0.57	0.77	2.60	1.53	2.06	1.70	1.07	1.82	15.02
1952	1.36	1.51	1.07	.89	.80	.87	2.68	1.19	1.30	2.20	1.31	1.03	16.21
1953	.82	.76	.79	.74	.66	1.32	1.69	1.84	1.65	1.36	1.44	.80	13.87
1954	.74	.86	.95	.78	.69	.84	1.99	2.76	2.08	1.55	1.13	1.11	15.68
1955	1.43	1.09	.85	.75	.64	.78	1.92	.93	1.02	1.06	1.61	.85	13.03
1956	.92	1.01	.88	.79	.70	.83	2.20	1.34	1.29	1.14	1.10	.74	12.94
1957	.77	.90	.75	.67	.61	.93	1.51	.97	1.15	1.31	.70	1.09	11.36
1958	.80	.97	.77	.70	.59	.82	1.21	.74	.69	2.35	.80	1.05	11.49
1959	.77	.86	.73	.64	.54	.75	.82	1.39	1.01	.75	.70	1.08	10.04
1960	1.05	.78	.75	.74	.61	.69	2.18	1.66	1.13	.75	.84	1.22	12.40

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	1208	5,840	Apr. 14, 1951	800	1,757	1.11	15.02	1,477	12.63
1952	1238	6,980	July 21, 1952	1,110	1,891	1.19	16.21	1,952	16.68
1953	1278	6,540	May 22, 1953	920	1,625	1.02	13.87	1,709	14.64
1954	1358	8,300	May 2, 1954	974	1,833	1.15	15.68	1,644	14.05
1955	1368	4,200	Apr. 6, 1955	897	1,527	.962	13.03	1,929	16.50
1956	1438	4,950	Apr. 13, 1956	953	1,511	.952	12.94	1,461	12.47
1957	1508	3,600	June 24, 1957	828	1,329	.837	11.36	1,471	12.55
1958	1558	8,500	July 2, 1958	798	1,344	.846	11.49	1,342	11.48
1959	1628	3,520	May 12, 1959	688	1,174	.739	10.04	1,322	11.31
1960	1708	3,910	Apr. 25, 1960	800	1,447	.911	12.40	1,202	10.26

3360. St. Croix River near Grantsburg, Wis.

Location.--Lat 45°55'25", long 92°38'20", near center of sec.30, T.40 N., R.18 W., on left bank at Norway Point, 0.5 mile downstream from Sand Creek, 10 miles north of Grantsburg, and at mile 102.4.

Drainage area.--2,820 sq mi, approximately.

Records available.--April 1923 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 848.98 ft above mean sea level, adjustment of 1912 (levels by Northern States Power Co.). Prior to Aug. 15, 1934, chain gage and Aug. 15, 1934, to Oct. 21, 1938, staff gage in stilling well, at same site and datum.

Average discharge.--37 years (1923-60), 2,323 cfs.

Extremes.--1923-60: Maximum discharge, 26,300 cfs May 7, 1950 (gage height, 15.06 ft); minimum, 510 cfs Aug. 14, 17, 1934.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,985	1,666	1,549	1,420	1,460	1,823	7,574	3,297	4,701	4,240	2,299	5,610	3,130
1952	3,531	4,174	2,575	1,940	1,860	1,908	8,645	2,748	3,064	6,630	2,937	2,331	3,526
1953	1,825	1,774	1,608	1,538	1,591	3,458	4,904	5,540	4,965	3,173	3,968	1,897	3,028
1954	1,752	2,080	2,338	1,773	1,723	1,917	5,283	8,187	5,753	4,435	2,499	3,122	3,412
1955	3,429	2,656	1,958	1,712	1,625	1,897	5,816	2,246	2,433	2,590	4,064	2,413	2,739
1956	2,257	2,695	1,972	1,761	1,608	1,756	6,988	5,137	3,225	2,487	2,492	1,788	2,675
1957	1,810	2,293	1,757	1,483	1,466	2,402	4,520	2,713	3,780	3,988	1,615	3,091	2,577
1958	1,995	2,622	1,872	1,582	1,550	2,008	3,552	1,803	2,050	5,843	1,702	2,596	2,435
1959	1,716	2,203	1,367	1,145	1,134	1,444	1,980	3,459	2,681	1,736	1,366	2,369	1,885
1960	2,436	1,959	1,813	1,666	1,338	1,360	5,960	4,533	2,877	1,529	1,553	2,791	2,481

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.81	0.66	0.63	0.58	0.54	0.74	3.00	1.35	1.86	1.73	0.94	2.22	15.06
1952	1.44	1.65	1.05	.79	.71	.78	3.42	1.12	1.21	2.71	1.20	.92	17.00
1953	.75	.70	.66	.63	.59	1.41	1.94	2.27	1.96	1.30	1.62	.75	14.58
1954	.72	.82	.96	.72	.64	.78	2.09	3.35	2.28	1.81	1.02	1.24	16.43
1955	1.40	1.05	.80	.70	.60	.78	2.30	.92	.96	1.06	1.66	.95	13.18
1956	.92	1.07	.81	.72	.62	.72	2.76	1.28	1.28	1.02	1.02	.71	12.93
1957	.74	.91	.72	.61	.54	.98	1.79	1.11	1.50	1.63	.66	1.22	12.41
1958	.82	1.04	.77	.65	.57	.82	1.41	.74	.81	2.39	.70	1.03	11.75
1959	.70	.87	.56	.47	.42	.59	.78	1.41	1.06	.71	.56	.94	9.07
1960	1.00	.78	.74	.68	.51	.56	2.36	1.85	1.14	.63	.63	1.10	11.98

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	3,130	15.06
1951	1208	14,500	Apr. 15, 1951	1,280	3,130	1.11	15.06	3,554	17.10
1952	1238	19,000	July 22, 1952	1,800	3,526	1.25	17.00	3,103	14.87
1953	1278	16,300	May 23, 1953	1,500	3,028	1.07	14.58	3,109	14.97
1954	1338	21,100	May 3, 1954	1,700	3,412	1.21	16.43	3,569	17.18
1955	1388	9,660	Apr. 3, 1955	1,490	2,739	.971	13.18	2,644	12.73
1956	1438	12,600	Apr. 6, 1956	1,500	2,675	.949	12.93	2,587	12.50
1957	1508	10,000	June 25, 1957	1,350	2,577	.914	12.41	2,629	12.67
1958	1558	18,500	July 3, 1958	1,190	2,435	.863	11.75	2,334	11.25
1959	1628	7,550	June 2, 1959	992	1,885	.688	9.07	1,964	9.46
1960	1708	7,770	Apr. 16, 1960	1,110	2,481	.880	11.98	-	-

3385. Snake River near Pine City, Minn.

Location.--Lat 45°50'30", long 92°56'00", in SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.26, T.39 N., R.21 W., on left bank at site of former powerplant and dam, half a mile downstream from Cross Lake and $\frac{1}{2}$ miles northeast of Pine City.

Drainage area.--958 sq mi.

Records available.--June 1913 to September 1917, July 1951 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 919.00 ft above mean sea level, datum of 1929. June 25, 1913, to Sept. 30, 1917, staff gage at site 500 ft downstream at different datum. July 1 to Oct. 28, 1951, staff gage at present site and datum.

Average discharge.--13 years (1913-17, 1951-60), 567 cfs.

Extremes.--1913-17, 1951-60: Maximum discharge, 7,710 cfs May 4, 1954; maximum gage height, 8.30 ft Apr. 12, 13, 1952; minimum discharge, 22 cfs Mar. 23, 1960; minimum gage height, 2.65 ft Jan. 15, 1955.
A discharge measurement of 12,500 cfs was made May 9, 1950.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	1,782	288	1,201	-
1952	828	1,403	500	197	191	171	4,367	509	618	3,400	730	531	1,119
1953	172	141	134	117	124	974	2,456	2,144	2,201	753	1,998	168	954
1954	108	180	177	122	166	255	1,191	2,703	2,283	2,093	213	417	827
1955	455	284	187	124	96.7	201	2,233	312	234	275	1,022	498	493
1956	371	334	201	164	159	177	3,515	611	242	118	386	130	530
1957	119	213	105	66.4	58.0	465	997	494	2,075	898	190	542	517
1958	239	307	153	86.1	69.0	178	785	331	393	459	83.5	279	280
1959	150	198	84.3	50.1	43.9	70.2	172	422	586	123	73.1	168	177
1960	171	153	107	140	91.4	136	1,049	812	424	156	56.2	165	288

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	2.14	0.35	1.40	-
1952	1.00	1.63	0.60	0.24	0.21	0.21	5.09	0.61	0.72	4.09	.88	.62	15.90
1953	.21	.16	.16	.14	.13	1.17	2.86	2.58	2.56	.91	2.40	.62	13.50
1954	.13	.19	.21	.15	.18	.31	1.39	3.25	2.66	2.52	.26	.49	11.74
1955	.55	.33	.23	.15	.11	.24	2.60	.38	.27	.33	1.23	.68	7.00
1956	.45	.39	.24	.20	.18	.21	4.09	.74	.28	.14	.46	.15	7.53
1957	.14	.25	.13	.08	.06	.56	1.16	.59	2.42	1.08	.23	.63	7.33
1958	.29	.36	.18	.10	.07	.21	.91	.40	.46	.55	.10	.33	3.96
1959	.18	.23	.10	.06	.05	.08	.20	.51	.68	.15	.09	.18	2.51
1960	.21	.18	.13	.17	.10	.16	1.22	.98	.49	.19	.07	.18	4.08

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	1238	a3,130	July 9, 1951	-	-	-	-	-	-
1952	1238	7,550	Apr. 12-13, 1952	143	1,119	1.17	15.90	929	13.20
1953	1278	5,380	June 25, 1953	100	954	.986	13.50	953	13.50
1954	1358	7,710	May 4, 1954	93	827	.863	11.74	868	12.32
1955	1388	4,480	Apr. 7, 1955	93	493	.515	7.00	491	6.97
1956	1438	7,670	Apr. 9, 1956	84	530	.553	7.53	491	6.97
1957	1508	6,730	June 26, 1957	53	517	.540	7.33	540	7.64
1958	1558	1,500	Apr. 12, 1958	47	280	.292	3.96	258	3.64
1959	1628	1,600	June 5, 1959	41	177	.185	2.51	177	2.52
1960	1708	2,000	Apr. 5, 1960	33	288	.301	4.08	-	-

a Maximum discharge for period July to September.

3395. St. Croix River near Rush City, Minn.

Location.--Lat 45°42'15", long 92°52'20", in SW $\frac{1}{4}$ sec. 8, T.37 N., R.20 W., on right bank 200 ft upstream from old site of Northern Pacific Railway bridge, 5 miles east of Rush City, 10 miles downstream from Snake River, and at mile 80.6.

Drainage area.--5,120 sq mi, approximately.

Records available.--April 1923 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 772.47 ft above mean sea level, datum of 1929. Prior to Aug. 18, 1934, chain gage on railroad bridge 200 ft downstream at same datum. Aug. 18, 1934, to Feb. 22, 1950, staff gage in stilling well at present site and datum.

Average discharge.--37 years (1923-60), 3,624 cfs.

Extremes.--1923-60: Maximum discharge, 60,600 cfs May 8, 1950 (gage height, 19.04 ft, from floodmarks); minimum observed, 630 cfs Aug. 14, 1933.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2,632	2,216	1,920	1,760	1,798	2,262	15,830	5,582	7,130	7,782	3,315	9,539	5,136
1952	6,115	7,390	3,929	2,645	2,498	2,523	18,510	4,071	4,436	15,500	5,073	3,602	6,355
1953	2,217	2,180	1,981	1,807	1,905	5,548	9,954	11,190	11,610	5,678	8,511	2,631	5,450
1954	2,298	2,753	2,955	2,209	2,245	2,518	9,176	14,510	11,550	8,702	3,437	4,385	5,574
1955	4,879	3,541	2,681	2,315	2,139	2,532	10,730	3,208	3,460	3,737	7,507	3,788	4,213
1956	3,508	3,843	2,732	2,460	2,276	2,424	14,930	5,192	4,291	3,164	3,588	2,271	4,211
1957	2,310	2,977	2,234	1,783	1,710	3,237	7,973	4,297	7,515	5,928	2,270	4,167	3,863
1958	2,649	3,469	2,497	1,999	1,971	2,612	5,232	2,745	3,415	8,174	2,211	3,547	3,382
1959	2,244	2,899	1,750	1,476	1,454	1,865	2,652	4,802	4,623	2,539	1,813	2,975	2,601
1960	3,167	2,518	2,281	2,162	1,762	1,943	8,530	7,172	4,185	2,194	1,975	3,206	3,421

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.59	0.48	0.43	0.40	0.37	0.51	3.45	1.26	1.55	1.75	0.75	2.08	13.62
1952	1.38	1.61	.88	.60	.53	.57	4.03	.92	.97	3.49	1.14	.78	16.30
1953	.50	.48	.45	.41	.39	1.25	2.17	2.52	2.53	1.28	1.92	.57	14.47
1954	.52	.60	.67	.50	.46	.57	2.00	3.27	2.52	1.96	.77	.96	14.80
1955	1.10	.77	.60	.52	.44	.57	2.34	.72	.75	.84	1.69	.82	11.16
1956	.79	.84	.62	.55	.48	.55	3.25	1.17	.94	.71	.81	.49	11.20
1957	.52	.65	.50	.40	.35	.73	1.74	.97	1.64	1.33	.51	.91	10.25
1958	.60	.76	.56	.45	.40	.59	1.14	.62	.74	1.84	.50	.77	8.97
1959	.51	.63	.39	.33	.30	.42	.58	1.10	1.01	.57	.41	.65	6.30
1960	.71	.55	.51	.49	.37	.44	1.86	1.61	.91	.49	.44	.70	9.08

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	4,954	13.13
1951	1208	35,100	Apr. 14, 1951	1,570	5,156	1.00	13.62	6,028	15.99
1952	1238	43,100	July 22, 1952	2,330	6,355	1.24	16.90	5,433	14.46
1953	1278	26,700	June 22-23, 1953	1,600	5,450	1.06	14.47	5,587	14.83
1954	1338	43,700	May 3, 1954	2,110	5,574	1.09	14.80	5,834	15.48
1955	1388	18,500	Apr. 3, 1955	1,920	4,213	.823	11.16	4,126	10.94
1956	1438	28,100	Apr. 7, 1956	2,020	4,211	.822	11.20	4,007	10.62
1957	1508	23,000	Apr. 1, 1957	1,600	3,863	.754	10.25	3,956	10.50
1958	1558	27,200	July 4, 1958	1,780	3,382	.661	8.97	3,238	8.58
1959	1628	13,200	June 2, 1959	1,400	2,601	.508	6.90	2,693	7.14
1960	1708	11,100	Apr. 16, 1960	1,530	3,421	.668	9.08	-	-

3400. Sunrise River near Stacy, Minn.

Location.--Lat 45°24'30", long 92°55'50", in NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.26, T.34 N., R.21 W., on right bank on upstream side of highway bridge, 2 $\frac{1}{2}$ miles northeast of Stacy and 2 $\frac{1}{2}$ miles downstream from small tributary.

Drainage area.--167 sq mi (revised).

Records available.--January 1949 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 855 ft (from topographic map). Prior to Nov. 10, 1949, chain gage at same site and datum.

Average discharge.--11 years (1949-60), 65.5 cfs.

Extremes.--1949-60: Maximum discharge, 806 cfs Apr. 12, 1952 (gage height, 7.88 ft); minimum observed, 3.6 cfs July 17, 1949 (gage height, 1.98 ft).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	12.4	11.5	15.3	13.8	16.2	25.5	206	129	71.7	103	55.5	172	69.3
1952	104	108	101	73.2	60.2	48.3	413	137	144	166	115	70.1	128
1953	33.5	31.3	31.6	36.4	33.0	117	187	162	148	112	61.8	37.2	82.7
1954	24.2	31.0	40.3	24.8	21.1	45.0	95.9	270	125	80.4	31.1	50.4	70.3
1955	68.8	54.3	30.3	23.7	23.4	63.8	133	35.1	32.3	22.3	23.2	23.2	44.5
1956	20.5	25.5	21.9	18.2	19.7	23.5	165	83.5	44.7	48.7	112	22.5	50.5
1957	19.3	35.6	24.6	14.2	11.9	42.7	90.0	104	170	140	89.9	229	80.9
1958	86.8	83.1	58.4	41.0	26.9	37.6	85.8	55.6	44.3	31.0	19.3	27.4	49.8
1959	24.6	30.4	11.4	8.67	7.86	13.7	18.5	64.1	35.4	23.5	26.1	37.6	25.2
1960	62.4	52.5	34.1	30.5	22.4	29.6	102	162	92.3	51.5	43.2	120	66.9

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.09	0.08	0.11	0.10	0.10	0.18	1.38	0.89	0.48	0.71	0.38	1.15	5.65
1952	.72	.72	.70	.51	.39	.33	2.76	.95	.96	1.14	.80	.47	10.45
1953	.23	.21	.22	.25	.21	.61	1.25	1.12	.99	.77	.43	.25	6.74
1954	.17	.21	.28	.17	.13	.31	.64	1.87	.83	.56	.21	.34	5.72
1955	.48	.36	.21	.16	.15	.44	.89	.24	.22	.15	.16	.15	3.61
1956	.14	.17	.15	.13	.13	.16	1.10	.58	.30	.34	.77	.15	4.12
1957	.13	.24	.17	.10	.07	.29	.60	.71	1.13	.97	.62	1.53	6.56
1958	.60	.56	.40	.28	.17	.26	.57	.38	.30	.21	.13	.18	4.04
1959	.17	.20	.08	.06	.05	.09	.12	.44	.24	.16	.18	.25	2.04
1960	.43	.35	.24	.21	.14	.20	.68	1.12	.82	.36	.30	.80	5.45

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	52.3	4.26
1951	1208	325	Apr. 15, 1951	8.8	69.3	0.415	5.65	92.3	7.51
1952	1238	806	Apr. 12, 1952	34	128	.766	10.45	110	8.97
1953	1278	322	Mar. 25, 1953	27	82.7	.495	6.74	82.7	6.74
1954	1338	481	May 3, 1954	16	70.3	.421	5.72	75.1	6.11
1955	1388	202	Apr. 3, 1955	8.4	44.5	.266	3.61	37.3	3.02
1956	1438	296	Apr. 7, 1956	15	50.5	.302	4.12	51.5	4.20
1957	1508	378	June 26, 1957	10	80.9	.495	6.56	93.5	7.58
1958	1558	135	Oct. 1, 1957	13	49.8	.298	4.04	33.2	2.93
1959	1628	120	May 11, 1959	7.2	25.2	.151	2.04	32.2	2.61
1960	1708	324	May 25, 1960	10	66.9	.401	5.45	-	-

3405. St. Croix River at St. Croix Falls, Wis.

Location.--Lat 45°24'30", long 92°38'45", in NW¼ sec.30, T.34 N., R.18 W., on left bank 1,800 ft downstream from powerplant of Northern States Power Co., in St. Croix Falls, and at mile 52.2.

Drainage area.--5,930 sq mi, approximately.

Records available.--January 1902 to September 1960. Prior to January 1910 monthly discharge only, published in WSP 1308. Prior to October 1939, published as "near St. Croix Falls."

Gage.--Water-stage recorder. Datum of gage is 690.47 ft above mean sea level, adjustment of 1912. Prior to July 1905, gage heights and discharge measurements were used to determine flow. July 1905 to February 1940 records were computed from power generation at the St. Croix Falls powerplant 1,800 ft upstream.

Average discharge.--58 years (1902-60), 4,051 cfs.

Extremes.--1902-60: Maximum discharge, 54,900 cfs May 8, 1950 (gage height, 25.19 ft); minimum daily, 75 cfs July 17, 1910.

Remarks.--Flow regulated by powerplant upstream.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2,895	2,289	2,175	2,041	2,006	2,592	18,000	6,235	7,876	8,924	3,594	11,250	5,810
1952	6,924	8,495	4,553	3,048	2,812	2,866	22,320	4,869	5,132	17,260	5,557	4,026	7,317
1953	2,547	2,418	2,479	2,298	2,324	6,848	11,820	13,300	6,472	9,775	2,775	6,367	6,367
1954	2,466	3,008	3,133	2,505	2,616	3,084	10,650	16,940	13,450	10,250	3,741	5,098	6,425
1955	5,784	3,936	2,836	2,454	2,416	3,059	13,840	3,601	3,672	4,218	9,777	4,153	5,001
1956	3,736	3,925	3,057	2,722	2,571	2,729	17,400	6,003	4,688	3,540	4,171	2,487	4,739
1957	2,500	3,329	2,529	2,071	2,013	3,982	9,003	4,882	9,339	7,290	2,732	5,570	4,601
1958	3,106	4,058	2,647	2,152	2,168	2,964	6,159	3,130	3,908	8,946	2,347	3,943	3,798
1959	2,465	3,056	1,905	1,701	1,650	2,097	2,902	5,505	5,035	2,709	2,068	3,588	2,876
1960	3,571	2,611	2,153	2,292	1,874	2,155	9,652	8,291	4,886	2,356	2,215	3,795	3,616

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.56	0.43	0.42	0.40	0.35	0.50	3.39	1.21	1.48	1.73	0.70	2.12	13.29
1952	1.35	1.60	.89	.59	.51	.56	4.20	.95	.97	3.56	1.08	.76	16.82
1953	.50	.45	.48	.45	.41	1.33	2.22	2.59	2.46	1.28	1.90	.52	14.57
1954	.48	.57	.61	.49	.46	.60	2.00	3.29	2.53	1.99	.73	.96	14.71
1955	1.12	.74	.55	.48	.42	.59	2.60	.70	.73	.82	1.90	.78	11.43
1956	.73	.74	.59	.53	.47	.53	3.27	1.17	.88	.69	.81	.47	10.88
1957	.49	.63	.49	.40	.35	.77	1.69	.95	1.76	1.42	.53	1.05	10.53
1958	.60	.76	.51	.42	.38	.58	1.16	.61	.74	1.74	.46	.74	8.70
1959	.48	.57	.37	.33	.29	.41	.55	1.07	.95	.53	.40	.64	6.59
1960	.69	.49	.42	.45	.34	.42	1.82	1.61	.92	.46	.43	.71	8.76

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	5,424	12.40
1951	1208	33,700	Apr. 15, 1951	1,420	5,810	0.980	13.29	6,864	15.72
1952	1238	45,000	July 23, 1952	2,540	7,317	1.23	16.82	6,273	14.41
1953	1278	32,600	May 24, 1953	1,380	6,367	1.07	14.57	6,464	14.80
1954	1338	44,400	May 4, 1954	1,780	6,425	1.08	14.71	6,758	15.46
1955	1388	22,000	Apr. 4, 1955	1,870	5,001	.843	11.43	4,845	11.08
1956	1438	31,600	Apr. 7, 1956	1,720	4,739	.799	10.88	4,540	10.43
1957	1508	25,800	June 24, 1957	1,440	4,601	.776	10.53	4,720	10.79
1958	1558	26,200	July 4, 1958	1,610	3,798	.640	8.70	3,600	8.25
1959	1628	14,500	June 3, 1959	1,360	2,876	.485	6.59	2,954	6.77
1960	1708	16,700	Apr. 3, 1960	1,430	3,816	.643	8.76	-	-

3415. Apple River near Somerset, Wis.

Location.--Lat 45°09'30", long 92°43'00", in sec.21, T.31 N., R.19 W., at powerplant of Northern States Power Co., 3.5 miles downstream from Somerset.

Drainage area.--555 sq mi.

Records available.--January 1901 to September 1914 (monthly discharge only), October 1914 to September 1960.

Gage.--Headwater and tailwater gages read hourly.

Average discharge.--59 years (1901-60), 303 cfs.

Extremes.--1901-60: Maximum daily discharge, 2,460 cfs June 17, 1943; minimum daily, 7 cfs Aug. 21, 1927, Sept. 30, 1929, July 19, 1932, Aug. 2, 3, 1933.

Remarks.--Discharge computed from records of gate openings, head, and plant efficiency. Flow regulated by many powerplants upstream, but service ponds are small and monthly flows are only slightly affected.

Cooperation.--Records of daily discharge furnished by Northern States Power Co.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	246	203	199	184	199	282	1,014	430	491	509	316	652	393
1952	447	454	354	302	305	323	1,300	438	459	356	356	305	449
1953	235	224	266	253	232	494	501	446	444	311	223	169	317
1954	187	216	231	224	265	303	457	957	563	422	270	333	370
1955	376	324	255	241	230	360	551	263	251	212	183	204	287
1956	234	250	225	209	217	243	643	312	267	213	272	191	273
1957	176	216	210	182	180	355	316	269	301	296	219	343	255
1958	225	263	220	200	201	270	322	227	196	235	182	172	226
1959	178	165	140	139	137	183	202	278	193	241	223	284	197
1960	260	244	240	256	193	217	488	516	395	199	173	367	295

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.51	0.41	0.41	0.38	0.37	0.59	2.04	0.89	0.99	1.06	0.66	1.31	9.62
1952	.95	.91	.74	.63	.59	.67	2.61	.91	.92	.74	.74	.61	11.00
1953	.49	.45	.55	.53	.43	1.03	1.01	.93	.89	.65	.46	.34	7.76
1954	.39	.43	.48	.47	.50	.63	.92	1.99	1.13	.88	.56	.67	9.05
1955	.78	.65	.53	.50	.43	.75	1.11	.50	.44	.38	.41		7.03
1956	.49	.50	.47	.43	.42	.51	1.29	.65	.54	.44	.57	.33	6.69
1957	.37	.43	.44	.38	.34	.74	.63	.56	.61	.61	.45	.67	6.25
1958	.47	.53	.46	.42	.38	.56	.65	.47	.39	.49	.38	.33	5.55
1959	.37	.33	.29	.29	.26	.38	.41	.58	.39	.50	.46	.57	4.83
1960	.54	.49	.50	.53	.38	.45	.98	1.07	.79	.41	.36	.74	7.24

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	378	7.56
1951	1208	1,930	Apr. 14-16, 1951	135	393	0.708	9.62	444	10.87
1952	1238	2,380	Apr. 10, 1952	150	449	.809	11.00	475	9.91
1953	1278	1,300	Mar. 23, 1953	60	317	.571	7.76	379	7.57
1954	1338	2,200	May 5, 1954	75	370	.667	9.05	376	9.71
1955	1388	760	Apr. 7, 1955	95	287	.517	7.03	237	6.53
1956	1438	1,540	Apr. 8, 1956	100	273	.492	6.69	234	6.47
1957	1508	890	Mar. 25, 1957	90	255	.459	6.25	234	6.47
1958	1558	703	Apr. 10, 1958	110	226	.407	5.55	217	5.08
1959	1628	495	Sept. 3, 1959	40	197	.355	4.83	219	5.37
1960	1708	1,060	May 27, 1960	10	295	.532	7.24	-	-

3445. Mississippi River at Prescott, Wis.

Location.--Lat 44°44'45", long 92°48'00", in sec. 9, T.26 N., R.20 W., on left bank at Prescott, 200 ft downstream from St. Croix River, 300 ft south of Chicago, Burlington & Quincy Railroad bridge, 800 ft south of bridge on U.S. Highway 10, and at mile 811.4 upstream from Ohio River.

Drainage area.--44,800 sq mi, approximately.

Records available.--June 1928 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 600.00 ft above mean sea level, adjustment of 1912 (levels by Corps of Engineers). Prior to Aug. 2, 1932, staff gage at railroad bridge 300 ft upstream at following datums: June 3, 1928, to Sept. 30, 1929, 69.27 ft higher; Oct. 1, 1929, to Sept. 30, 1930, 67.68 ft higher; Oct. 1, 1930, to Aug. 1, 1932, 69.28 ft higher. Aug. 2, 1932, to Oct. 30, 1938, water-stage recorder at present site at datum 69.28 ft higher. Auxiliary water-stage recorder 10.7 miles downstream from base gage.

Average discharge.--32 years (1928-60), 14,810 cfs.

Extremes.--1928-60: Maximum discharge, 155,000 cfs Apr. 16-18, 1952 (gage height, 89.03 ft); minimum daily, 1,380 cfs July 13, 1940; minimum gage height, 65.08 ft Aug. 29, 1934, present datum.

Remarks.--Some regulation by reservoirs, navigation dams, and powerplants at low and medium stages. Flood flow not materially affected by artificial storage.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	9,362	6,798	7,926	7,893	7,941	10,690	70,650	43,590	25,720	34,330	16,050	32,010	22,750
1952	22,490	24,780	18,310	13,691	12,820	15,540	200,100	39,270	20,190	48,970	30,020	17,680	30,310
1953	9,585	9,346	8,520	8,265	8,950	20,900	58,150	39,990	49,640	39,210	43,840	17,280	24,550
1954	11,420	12,200	10,830	10,010	10,860	16,630	29,900	47,790	34,960	28,190	10,830	12,200	19,690
1955	13,750	11,130	8,671	7,726	7,464	12,560	31,380	12,890	12,180	17,310	18,900	11,510	13,810
1956	9,625	9,017	8,548	7,231	6,768	7,925	42,940	19,750	18,870	11,710	17,560	7,897	13,960
1957	6,720	10,200	7,421	5,977	5,534	11,900	26,250	19,640	34,570	48,220	21,980	23,100	18,500
1958	15,910	16,300	10,970	8,600	7,909	12,540	21,280	12,490	12,560	15,540	6,735	9,989	12,590
1959	6,514	7,797	6,121	4,482	4,295	6,196	7,962	15,460	18,140	10,310	6,323	9,677	8,533
1960	10,140	8,184	7,600	8,128	6,193	6,973	40,030	35,650	24,640	11,370	6,667	10,570	14,660

† Corrected.

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.24	0.17	0.20	0.20	0.18	0.28	1.76	1.12	0.64	0.88	0.41	0.80	6.88
1952	.58	.62	.47	.35	.31	.40	2.49	1.01	.50	1.26	.77	.44	9.20
1953	.25	.23	.22	.21	.21	.54	.95	1.03	1.24	1.01	1.13	.43	7.45
1954	.29	.30	.28	.26	.25	.43	.74	1.23	.67	.73	.28	.30	5.96
1955	.35	.28	.22	.20	.17	.32	.78	.33	.30	.45	.49	.29	4.18
1956	.25	.22	.22	.19	.16	.20	1.07	.51	.47	.30	.45	.20	4.24
1957	.17	.25	.19	.15	.13	.31	.65	.51	.86	1.24	.56	.58	5.60
1958	.41	.41	.28	.22	.18	.32	.53	.32	.31	.40	.17	.25	3.80
1959	.17	.19	.13	.12	.10	.16	.20	.40	.45	.27	.16	.24	2.59
1960	.26	.20	.20	.21	.15	.19	1.00	.92	.61	.29	.17	.26	4.45

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	19,060	5.78
1951	1208	128,000	Apr. 17, 1951	4,820	22,750	0.508	6.88	26,220	7.94
1952	1238	155,000	Apr. 16-18, 1952	10,900	30,310	.677	9.20	27,120	8.23
1953	1278	67,700	June 25, 1953	5,450	24,550	.548	7.45	25,140	7.62
1954	1338	82,800	May 5, 1954	7,650	19,690	.440	5.96	19,620	5.94
1955	1398	45,200	Apr. 7, 1955	6,480	13,810	.308	4.18	13,280	4.02
1956	1438	62,700	Apr. 10, 1956	5,520	13,960	.312	4.24	13,720	4.16
1957	1508	94,000	June 30, 1957	4,810	18,500	.413	5.60	20,080	6.09
1958	1558	28,400	July 6, 1958	3,320	12,580	.281	3.80	10,590	3.19
1959	1628	35,300	June 5, 1959	3,400	8,533	.190	2.59	9,083	2.76
1960	1708	54,000	May 30, 1960	3,500	14,660	.327	4.45	-	-

3552. Cannon River at Welch, Minn.

Location.--Lat 44°33'50", long 92°43'55", in NW¼SW¼ sec.27, T.113 N., R.16 W., on right bank 0.3 mile downstream from highway bridge at Welch and 1.8 miles upstream from Belle Creek.

Drainage area.--1,320 sq mi, approximately.

Records available.--June 1909 to January 1914 (no winter records 1909-11), November 1930 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 699.16 ft above mean sea level, datum of 1929. Prior to Nov. 11, 1930, chain gage on highway bridge at site 0.3 mile upstream at datum 3.00 ft lower. Nov. 11, 1930, to Oct. 11, 1938, water-stage recorder at site 0.3 mile upstream at present datum.

Average discharge.--31 years (1911-13, 1931-60), 464 cfs.

Extremes.--1909-14, 1930-60: Maximum discharge, 15,800 cfs Apr. 2, 1952 (gage height, 12.00 ft), from rating curve extended above 9,100 cfs by logarithmic plotting; maximum gage height, 12.04 ft Mar. 23, 1936 (site then use); minimum discharge, 2.5 cfs Jan. 3, 1950 (gage height, 0.06 ft, backwater from ice).
Maximum stage known, 17.1 ft, present datum, in April 1888, from floodmark at mill about 2,400 ft upstream.

Remarks.--Diurnal fluctuation caused by powerplants above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	98.0	104	110	149	229	249	2,745	994	1,020	1,824	1,537	1,521	882
1952	744	541	711	363	356	809	4,312	738	688	651	336	247	871
1953	161	181	196	197	212	979	708	1,090	863	1772	1,211	222	569
1954	173	175	229	151	165	454	291	685	1,480	428	228	300	397
1955	603	324	271	267	222	1,083	791	272	230	574	198	137	416
1956	138	174	218	163	188	409	973	229	1,286	630	420	193	418
1957	143	164	146	193	216	395	176	191	512	1,081	1,190	414	404
1958	231	307	318	177	299	287	462	281	472	196	168	161	279
1959	132	153	151	121	121	354	227	127	442	273	263	498	239
1960	384	354	416	372	173	439	1,265	2,207	1,829	648	196	240	711

† Corrected.

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.09	0.09	0.10	0.13	0.18	0.22	2.32	0.87	0.86	1.59	1.34	1.29	9.08
1952	.65	.46	.62	.32	.29	.71	3.64	.64	.58	.57	.29	.21	8.98
1953	.14	.15	.17	.17	.17	.85	.60	.95	.73	.67	1.06	.19	5.85
1954	.15	.15	.20	.13	.13	.40	.25	.60	1.25	.37	.20	.25	4.08
1955	.53	.27	.24	.23	.18	.95	.67	.24	.19	.50	.17	.12	4.29
1956	.12	.15	.19	.14	.15	.36	.82	.20	1.09	.55	.38	.16	4.31
1957	.12	.14	.13	.17	.17	.34	.15	.17	.43	.94	1.04	.35	4.15
1958	.20	.26	.28	.15	.24	.25	.39	.25	.40	.17	.15	.14	2.88
1959	.12	.13	.13	.11	.10	.31	.19	.11	.37	.24	.23	.42	2.46
1960	.34	.30	.36	.33	.14	.38	1.07	1.93	1.55	.57	.17	.20	7.34

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	323	3.33
1951	1208	14,600	July 21, 1951	58	882	0.668	9.08	1,024	10.53
1952	1238	15,800	Apr. 2, 1952	98	871	.660	8.98	749	7.71
1953	1278	4,220	July 25, 1953	100	569	.431	5.85	573	5.89
1954	1338	13,200	June 20, 1954	98	397	.301	4.08	449	4.62
1955	1388	8,150	July 8, 1955	73	416	.315	4.29	360	3.71
1956	1438	4,800	Apr. 3, 1956	70	418	.317	4.31	411	4.24
1957	1508	5,840	Aug. 14, 1957	67	404	.306	4.15	439	4.50
1958	1558	4,780	June 4, 1958	74	279	.211	2.88	244	2.52
1959	1628	4,220	June 26, 1959	72	239	.181	2.46	299	3.08
1960	1708	9,420	May 23, 1960	80	711	.538	7.34	-	-

3554. Moose Lake near Winter, Wis.

Location.--Lat 46°02'00", long 91°04'30", in NE $\frac{1}{4}$ sec.14, T.41 N., R.6 W., on West Fork Chippewa River, 15 miles north of Winter.

Drainage area.--225 sq mi.

Records available.--October 1926 to September 1960.

Gage.--Staff gage. Datum of gage is at mean sea level (Northern States Power Co. bench mark).

Extremes.--1927-60: Maximum contents on last day of month, 520 million cubic feet Aug. 31, 1941 (gage height, 1,375.6 ft); no usable contents at times.

Remarks.--Dam was completed and storage began in 1893. Usable capacity in winter, 400 million cubic feet between elevations 1,367.0 and 1,374.0 ft; in summer, no usable capacity (limits established by Northern States Power Co.).

Cooperation.--Gage heights and capacity table furnished by Northern States Power Co.

Contents, in millions of cubic feet, on last day of month												
Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	20	70	35	20	35	0	265	428	386	400	400	393
1952	98	65	8	0	10	20	344	400	400	393	400	400
1953	132	20	15	12	12	170	400	400	400	393	400	400
1954	178	65	20	15	30	40	435	393	386	400	400	400
1955	134	25	10	10	5	20	297	400	400	414	400	400
1956	130	30	10	0	15	10	351	379	400	400	400	400
1957	155	20	10	0	0	55	257	400	393	400	400	400
1958	150	28	10	0	10	40	393	400	400	400	400	400
1959	100	15	0	10	10	65	400	393	400	400	381	400
1960	105	20	30	20	45	60	379	386	393	400	400	393

3556. Lake Chippewa near Winter, Wis.

Location.--Lat 45°53'20", long 91°04'40", in SE $\frac{1}{4}$ sec.2, T.39 N., R.6 W., on Chippewa River just downstream from mouth of East Fork Chippewa River and 5.5 miles northwest of Winter.

Drainage area.--775 sq mi.

Records available.--March 1923 to September 1960. Published as Chippewa Reservoir 1939-53.

Gage.--Chain gage. Datum of gage is at mean sea level (Northern States Power Co. bench mark).

Extremes.--1923-60: Maximum contents observed, 11,000 million cubic feet Sept. 18, 19, 1926 (gage height, 1,314.4 ft); minimum observed, 48 million cubic feet Dec. 22, 1925, to Mar. 22, 1926 (gage height, 1,288.7 ft).

Remarks.--Dam was completed and storage began in 1923. Usable capacity, 10,000 million cubic feet between elevations 1,287.0 and 1,313.0 ft (limits stipulated by Public Service Commission of Wisconsin).

Contents, in millions of cubic feet, on last day of month												
Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	5,608	5,300	3,866	2,080	925	2,480	8,435	10,036	10,108	9,640	9,424	10,036
1952	10,038	10,076	8,940	5,772	2,280	1,776	9,712	8,204	9,008	10,304	8,567	7,445
1953	6,295	5,188	3,272	1,266	850	3,426	8,270	10,180	10,108	8,872	9,316	7,874
1954	6,740	6,542	5,745	3,690	2,200	2,100	8,906	9,424	10,324	10,324	9,928	10,180
1955	10,108	9,640	7,775	5,272	2,620	2,680	8,634	8,303	8,974	8,974	8,940	7,973
1956	7,478	6,950	5,440	3,783	2,424	2,393	7,379	8,974	9,604	9,388	9,496	7,874
1957	6,740	6,020	4,994	3,748	2,773	3,489	6,740	7,775	9,496	9,928	8,468	8,171
1958	7,250	6,950	5,580	3,624	1,776	2,560	5,745	6,350	7,160	9,496	9,496	9,328
1959	9,784	9,568	6,920	4,116	1,498	1,960	3,162	6,850	7,808	8,501	10,288	10,324
1960	9,748	8,105	6,350	4,812	2,783	2,240	7,775	10,072	10,036	9,856	10,218	10,036

3560. Chippewa River at Bishops Bridge, near Winter, Wis.

Location.--Lat 45°50'55", long 91°04'45", in sec.23, T.39 N., R.6 W., on right bank 15 ft upstream from highway bridge, 3.2 miles downstream from Lake Chippewa Dam, and 3.7 miles northwest of Winter.

Drainage area.--787 sq mi.

Records available.--February 1912 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Altitude of gage is 1,270 ft (from Lake Chippewa datum). Prior to Jan. 27, 1914, staff gage at same site at datum 3.44 ft higher. Jan. 27, 1914, to May 27, 1916, staff gage and May 28, 1916, to July 22, 1930, chain gage, at same site and datum.

Average discharge.--48 years (1912-60), 715 cfs.

Extremes.--1912-60: Maximum discharge, 7,520 cfs Sept. 4, 5, 1941 (gage height, 11.05 ft); minimum, 14 cfs Apr. 17-20, 1925 (gage height, 3.25 ft).

Remarks.--Flow completely regulated by Moose Lake and Lake Chippewa.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	379	506	903	767	583	253	251	1,239	1,927	1,713	739	1,298	881
1952	1,029	1,126	1,106	1,607	1,319	539	436	1,486	536	1,216	1,605	867	1,075
1953	800	745	872	738	583	287	195	1,057	1,200	1,640	653	753	782
1954	698	616	908	861	749	491	290	2,823	1,046	749	474	837	881
1955	1,217	892	1,178	1,256	1,080	441	264	600	461	575	1,582	1,024	881
1956	899	1,012	954	864	707	336	281	355	431	582	667	808	658
1957	746	740	679	631	552	293	188	195	213	348	745	736	506
1958	714	701	846	768	610	227	186	169	169	1,059	600	593	555
1959	476	586	1,204	1,108	783	219	275	204	176	182	282	1,389	572
1960	1,340	1,190	1,105	1,028	911	494	250	517	769	308	407	1,706	834

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	793	-
1951	1208	3,620	July 9, 10, 1951	174	881	-	-	1,004	-
1952	1238	3,340	July 22-25, 1952	174	1,075	-	-	1,008	-
1953	1278	4,070	July 5-7, 1953	174	782	-	-	763	-
1954	1338	6,800	May 4, 1954	211	881	-	-	971	-
1955	1388	2,490	Oct. 15, 1954	181	881	-	-	845	-
1956	1438	1,100	Oct. 4, 1955	210	658	-	-	599	-
1957	1508	818	Oct. 1, 1956	170	506	-	-	514	-
1958	1558	3,480	July 9, 1958	164	555	-	-	555	-
1959	1628	2,890	Sept. 1, 1959	173	572	-	-	686	-
1960	1708	4,630	Sept. 3, 1960	170	834	-	-	-	-

Note.--Monthly and yearly figures of discharge per square mile and runoff in inches, previously published in water-supply papers, may not represent natural flow because of uncertainty in the adjustments for effect of regulation, diversion, and evaporation. Those figures are not published herein.

3565. Chippewa River near Bruce, Wis.

Location.--Lat 45°27'05", long 91°15'40", in SE $\frac{1}{4}$ sec.5, T.34 N., R.7 W., on right bank 1 mile east of Bruce and 1 mile downstream from Thornapple River.

Drainage area.--1,630 sq mi, approximately.

Records available.--December 1913 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,059.62 ft above mean sea level, datum of 1929. Prior to May 28, 1935, chain gage at railroad bridge 0.8 mile upstream at datum 2.30 ft higher.

Average discharge.--46 years (1914-60), 1,428 cfs.

Extremes.--1913-60: Maximum discharge, 25,800 cfs Sept. 1, 1941 (gage height, 20.46 ft, from floodmarks), from rating curve extended above 20,000 cfs; minimum, 155 cfs June 10, 1932 (gage height, 0.9 ft, site and datum then in use).

Remarks.--Flow from 48 percent of the drainage area regulated by Moose Lake and Lake Chippewa.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	593	685	1,183	993	890	628	5,174	3,081	3,926	3,293	1,236	3,393	2,086
1952	2,181	2,378	1,719	1,984	1,711	962	4,088	2,235	1,206	2,029	2,322	1,201	2,002
1953	1,080	1,015	1,071	930	584	1,647	2,100	3,116	2,033	2,049	1,451	1,003	1,514
1954	878	892	1,281	1,059	882	811	3,523	5,971	3,392	1,944	914	1,813	1,950
1955	2,382	1,425	1,546	1,565	1,351	887	2,500	1,147	1,298	1,027	2,023	1,266	1,535
1956	1,279	1,458	1,275	1,181	978	630	2,667	1,056	1,866	1,133	1,489	1,107	1,340
1957	1,015	1,064	969	824	755	871	1,456	1,117	1,344	959	1,082	1,376	1,068
1958	1,033	1,149	1,117	979	761	578	1,574	707	716	2,992	970	1,108	1,144
1959	862	1,012	1,380	1,278	979	483	652	1,563	823	1,108	1,269	3,149	1,229
1960	2,409	1,675	1,409	1,367	1,087	767	2,958	2,099	1,589	803	1,512	2,529	1,681

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	1,465	-
1951	1208	12,500	Apr. 12, 1951	460	2,086	-	-	2,406	-
1952	1238	9,630	Apr. 9, 1952	630	2,002	-	-	1,742	-
1953	1278	14,500	May 22, 1953	440	1,514	-	-	1,504	-
1954	1338	19,400	May 2, 1954	644	1,950	-	-	2,144	-
1955	1388	6,660	Oct. 16, 1954	640	1,535	-	-	1,421	-
1956	1438	11,900	Apr. 6, 1956	580	1,340	-	-	1,260	-
1957	1508	4,620	June 23, 1957	450	1,068	-	-	1,089	-
1958	1558	9,500	July 2, 1958	468	1,144	-	-	1,140	-
1959	1628	6,780	July 9, 1959	380	1,299	-	-	1,418	-
1960	1708	11,500	Aug. 29, 1960	430	1,681	-	-	-	-

Note.--Monthly and yearly figures of discharge per square mile and runoff in inches, previously published in water-supply papers, may not represent natural flow because of uncertainty in the adjustments for effect of regulation, diversion, and evaporation. Those figures are not published herein.

3573. Rest Lake near Manitowish, Wis.

Location.--Lat 46°08'15", long 89°53'05", in NW $\frac{1}{4}$ sec.9, T.42 N., R.5 E., on Manitowish River, 3.7 miles upstream from Circle Lily Creek and 6.2 miles east of Manitowish.

Drainage area.--243 sq mi.

Records available.--October 1926 to September 1960.

Gage.--Staff gage. Altitude of gage is 1,490 ft (by U.S. Geological Survey bench mark near Lake).

Extremes.--1926-60: Maximum contents on last day of month, 1,054 million cubic feet Aug. 31, 1941 (gage height, 108.7 ft); no usable contents Mar. 31, Apr. 30, 1930, Dec. 31, 1932, and Jan. 31, 1933 (gage height, 102.5 ft).

Remarks.--Reservoir operation began in 1887. Reservoir consists of nine lakes. Usable capacity July 1 to Aug. 31, 260 million cubic feet between gage heights 107.25 and 108.50 ft, and Sept. 1 to June 30, 660 million cubic feet between gage heights 105.00 and 108.50 ft (limits stipulated by Public Service Commission of Wisconsin).

Contents, in millions of cubic feet, on last day of month

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	421	350	350	350	350	350	477	1,020	1,010	1,010	1,029	918
1952	632	350	350	350	350	350	625	1,010	1,010	1,010	1,010	733
1953	350	350	350	350	350	350	449	891	891	1,010	1,010	733
1954	378	350	350	350	350	350	883	1,010	1,010	973	1,010	817
1955	817	350	350	350	350	350	883	991	973	991	973	800
1956	421	350	350	350	350	350	535	991	991	973	973	767
1957	357	364	350	350	350	350	364	520	867	973	973	800
1958	364	350	350	350	350	350	595	850	973	991	982	733
1959	421	350	350	350	350	350	506	833	936	955	1,010	946
1960	407	350	350	350	350	350	850	1,010	1,010	1,000	1,020	900

3574. Flambeau Flowage near Mercer, Wis.

Location.--Lat 46°04'15", long 90°13'30", in SE $\frac{1}{4}$ sec.34, T.42 N., R.2 E., on North Fork Flambeau River, 10.2 miles southwest of Mercer.

Drainage area.--666 sq mi.

Records available.--September 1926 to September 1960. Published as Flambeau Reservoir, 1939-55.

Gage.--Staff gage. Datum of gage is at mean sea level (Northern States Power Co. bench mark).

Extremes.--1926-60: Maximum contents observed, 6,620,000,000 cu ft Oct. 16, 1927 (gage height, 1,572.95 ft); minimum observed, 8,000,000 cu ft Feb. 20, 1931 (gage height, 1,552.55 ft).

Remarks.--Dam was completed in 1926. Usable capacity, 5,895,000,000 cu ft between elevations 1,552 and 1,572 ft (limits stipulated by Public Service Commission of Wisconsin).

Contents, in millions of cubic feet, on last day in month

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	3,224	2,964	2,398	1,265	580	289	4,512	6,166	6,318	6,166	5,520	6,128
1952	6,432	6,166	5,340	3,710	1,893	342	5,052	5,748	5,976	6,052	5,748	4,836
1953	4,224	3,710	3,306	2,444	1,504	1,310	3,800	5,824	5,976	5,824	5,520	4,378
1954	3,830	3,740	3,620	2,834	1,374	517	4,944	6,052	5,976	5,124	4,316	4,584
1955	5,976	5,800	5,052	3,418	1,678	294	3,650	3,530	3,710	3,560	4,584	4,070
1956	4,161	4,223	3,800	2,705	1,310	200	3,094	3,746	3,502	3,740	4,070	3,418
1957	3,474	3,580	3,278	2,260	1,265	602	2,826	2,682	2,514	2,172	1,830	2,216
1958	2,421	2,886	2,964	2,150	1,121	330	2,194	2,172	2,106	4,161	4,161	4,512
1959	4,440	4,409	3,502	2,352	1,175	566	1,998	2,886	2,682	2,514	2,421	4,316
1960	5,976	6,014	4,656	3,650	2,172	690	4,944	6,014	5,900	4,944	4,476	5,160

3575. Flambeau River at Flambeau Flowage, Wis.

Location.--Lat 46°04'05", long 90°13'45", near north line of sec.3, T.41 N., R.2 E., on right bank 0.5 mile downstream from Flambeau Flowage, 10.6 miles southwest of Mercer, and at mile 114.5.

Drainage area.--666 sq mi.

Records available.--September 1927 to September 1960. Prior to October 1955, published as "at Flambeau Reservoir."

Gage.--Water-stage recorder. Datum of gage is 1,540.0 ft above mean sea level (Northern States Power Co. bench mark). Prior to June 14, 1937, chain gage and June 14, 1937, to Oct. 25, 1947, staff or float-tape gage, at same site and datum.

Average discharge.--33 years (1927-60), 633 cfs.

Extremes.--1927-60: Maximum discharge, 3,440 cfs May 28, 1939 (gage height, 8.59 ft, from floodmarks) and July 22-27, 1952 (gage height, 8.40 ft); minimum observed, 3.1 cfs Apr. 12, 1934 (gage height, 2.39 ft).

Remarks.--Flow regulated by Rest Lake and Flambeau Flowage.

Revisions.--Revised records for the water year 1945, superseding those published in WSP 1308, are given herewith. Revised daily discharges for the period affected are available and will be published in a subsequent water-supply paper.

Month	Mean	Per square mile	Runoff in inches	Maximum observed		Minimum day
				Discharge	Date	
June 1945.....	1,301	-	-	-	-	-
Water year 1944-45...	656	-	-	2,000	June 8, 1945	74
Calendar year 1945...	685	-	-	-	-	-

Note.--See footnote to summary table below.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	354	447	525	610	459	457	241	699	*1,350	*1,310	944	904	*693
1952	1,164	1,288	1,013	938	918	888	219	670	813	*1,576	*1,551	936	*966
1953	646	524	515	657	678	723	307	412	1,308	1,284	1,062	862	749
1954	608	430	566	638	921	666	180	1,529	1,120	871	722	600	738
1955	743	1,008	881	987	960	783	348	666	646	602	558	559	727
1956	545	569	638	749	825	690	245	330	587	491	549	602	568
1957	362	373	491	649	629	629	372	536	482	490	364	327	475
1958	339	304	360	567	639	561	184	292	300	298	524	546	408
1959	565	621	664	644	637	537	245	231	406	380	389	317	469
1960	661	846	805	868	925	878	260	1,206	942	857	718	722	808

* Revised.

Yearly discharge, in cubic feet per second, of Flambeau River at Flambeau Flowage, Wis.									
Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	546	-
1951	1208	*2,460	June 28, 1951	119	*693	-	-	*872	-
1952	1238	*3,440	July 22-27, 1952	51	*966	-	-	*818	-
1953	1278	2,200	July 2, 1953	86	749	-	-	742	-
1954	1338	3,420	May 3-4, 1954	75	738	-	-	824	-
1955	1388	1,910	Oct. 21, 1954	104	727	-	-	654	-
1956	1438	1,180	Feb. 13-14, 1956	151	568	-	-	524	-
1957	1508	761	Mar. 20, 1957	85	475	-	-	456	-
1958	1558	755	Feb. 13, 1958	102	408	-	-	479	-
1959	1628	724	Mar. 4, 1959	119	469	-	-	508	-
1960	1708	2,190	Oct. 31, 1959	119	808	-	-	-	-

* Revised.

Note.--Monthly and yearly figures of discharge per square mile and runoff in inches, previously published in water-supply papers, may not represent natural flow because of uncertainty in the adjustments for effect of regulation, diversion, and evaporation. Those figures are not published herein.

3585. Flambeau River at Babbs Island, near Winter, Wis.

Location--Lat 45°46'10", long 90°45'45", in SE $\frac{1}{4}$ sec.17, T.38 N., R.3 W., on right bank 3.6 miles upstream from Connors Creek, 11.5 miles upstream from South Fork Flambeau River, 13 miles east of Winter, and at mile 61.9.

Drainage area--1,000 sq mi.

Records available--August 1929 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage--Water-stage recorder. Altitude of gage is 1,330 ft (from river-profile map). Prior to Oct. 1, 1934, at bridge 300 ft upstream at datum 9.0 ft lower. Oct. 1, 1934, to Sept. 8, 1938, at bridge 300 ft upstream at present datum.

Average discharge--31 years (1929-60), 982 cfs.

Extremes--1929-60: Maximum discharge, 9,440 cfs June 25, 1946 (gage height, 9.45 ft); minimum, 86 cfs Oct. 21, 22, 1948 (gage height, 0.20 ft); minimum daily, 118 cfs Oct. 10, 1948.

Remarks--Flow regulated by Rest Lake and Flambeau Flowage.

Monthly and yearly mean discharge, in cubic feet per second													
Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	477	623	684	734	673	911	2,264	1,385	2,272	2,148	1,221	1,612	1,250
1952	1,559	1,841	1,417	1,326	1,309	1,214	1,988	1,215	1,264	2,386	1,918	1,126	1,548
1953	758	615	695	804	796	1,725	1,247	1,498	1,940	1,908	1,593	1,013	1,220
1954	690	611	827	778	980	921	1,846	2,736	1,666	1,135	973	985	1,180
1955	1,277	1,214	1,023	987	956	984	1,668	925	993	874	1,257	766	1,077
1956	803	906	837	810	831	755	1,276	660	807	691	953	727	837
1957	440	498	579	723	724	864	1,128	871	724	639	519	623	694
1958	467	562	466	617	677	706	763	520	463	1,192	709	896	670
1959	762	840	788	744	706	720	607	728	717	673	883	1,434	800
1960	1,149	1,019	933	1,105	1,089	1,051	1,754	1,876	1,296	1,055	1,284	1,414	1,252

Yearly discharge, in cubic feet per second									
Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	947	-
1951	1208	5,080	Apr. 11, 1951	347	1,250	-	-	1,505	-
1952	1238	5,950	July 23, 1952	678	1,548	-	-	1,319	-
1953	1278	6,890	May 22, 1953	293	1,220	-	-	1,225	-
1954	1338	6,170	May 1, 1954	355	1,180	-	-	1,296	-
1955	1388	3,600	Apr. 3, 1955	481	1,077	-	-	1,009	-
1956	1438	3,700	Apr. 8, 1956	452	837	-	-	751	-
1957	1508	1,960	Apr. 21, 1957	375	694	-	-	691	-
1958	1558	5,310	July 2, 1958	380	670	-	-	745	-
1959	1628	3,740	Sept. 7, 1959	456	800	-	-	860	-
1960	1708	4,330	Apr. 24, 1960	763	1,252	-	-	-	-

Note.--Monthly and yearly figures of discharge per square mile and runoff in inches, previously published in water-supply papers, may not represent natural flow because of uncertainty in the adjustments for effect of regulation, diversion, and evaporation. Those figures are not published herein.

3595. South Fork Flambeau River near Phillips, Wis.

Location.--Lat 45°42'15", long 90°36'55", in NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.10, T.37 N., R.2 W., on downstream side of bridge on left span, 0.4 mile downstream from Big Elk River and 12 miles west of Phillips.

Drainage area.--615 sq mi.

Records available.--August 1929 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Wire-weight gage. Altitude of gage is 1,360 ft (by barometer). Prior to Oct. 5, 1939, chain on staff gage and Oct. 5, 1939, to Jan. 11, 1954, wire-weight gage, at site 600 ft downstream at same datum.

Average discharge.--31 years (1929-60), 597 cfs.

Extremes.--1929-60: Maximum discharge, 10,200 cfs June 18, 1943 (gage height, 14.32 ft); minimum, 39 cfs Aug. 31, Sept. 3-5, 1933.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	164	233	206	169	158	471	2,779	1,439	1,469	1,278	493	1,376	852
1952	1,318	955	574	290	265	312	2,575	1,021	726	773	746	295	820
1953	164	154	164	161	141	645	1,325	1,114	1,002	935	803	298	578
1954	166	214	329	218	213	238	2,075	2,252	1,369	501	271	602	704
1955	1,293	573	359	226	179	241	1,962	548	758	241	573	215	598
1956	177	268	252	211	176	171	1,592	531	713	571	510	207	431
1957	159	231	221	145	120	362	1,195	499	518	342	195	597	364
1958	195	373	261	188	158	196	922	455	266	1,261	315	672	440
1959	412	566	214	145	140	175	601	914	401	533	714	2,273	590
1960	1,364	486	266	368	275	235	2,119	1,533	575	335	663	1,045	772

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.31	0.42	0.39	0.32	0.27	0.88	5.04	2.70	2.67	2.40	0.92	2.50	18.92
1952	2.47	1.75	1.08	.54	.47	.59	4.67	1.91	1.32	1.46	1.40	.52	18.16
1953	.31	.29	.51	.30	.24	1.21	2.40	2.09	1.82	1.75	1.50	.54	12.75
1954	.31	.39	.62	.41	.36	.45	3.76	4.22	2.48	.94	.51	1.09	15.54
1955	2.42	1.04	.67	.42	.30	.45	3.56	1.03	1.38	.45	1.07	.39	13.18
1956	.35	.49	.47	.39	.31	.32	2.53	1.00	1.29	1.07	.96	.38	9.54
1957	.26	.42	.42	.27	.20	.72	2.16	.93	.94	.64	.35	.72	8.03
1958	.37	.69	.49	.35	.27	.37	1.67	.85	.48	2.36	.59	1.22	9.70
1959	.77	1.03	.40	.27	.24	.33	1.09	1.71	.73	1.00	1.34	4.12	13.03
1960	2.56	.89	.50	.69	.48	.44	3.84	2.87	1.04	.63	1.24	1.90	17.07

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	536	11.85
1951	1208	5,750	Apr. 12, 1951	128	852	1.39	18.82	1,041	22.98
1952	1238	5,050	Apr. 20, 1952	191	820	1.33	18.16	622	13.78
1953	1278	3,020	May 22, 1953	140	578	.940	12.75	597	13.17
1954	1338	6,230	May 3, 1954	120	704	1.14	15.54	832	18.35
1955	1388	4,240	Oct. 16, 1954	53	598	.972	13.18	469	10.34
1956	1438	3,250	Apr. 8, 1956	143	431	.701	9.54	422	9.35
1957	1508	1,900	Apr. 21, 1957	84	364	.592	8.03	384	8.47
1958	1558	5,070	July 3, 1958	130	440	.715	9.70	470	10.36
1959	1628	5,420	Sept. 23, 1959	112	590	.959	13.03	669	14.77
1960	1708	4,020	Aug. 30, 1960	177	772	1.26	17.07	-	-

3600. Flambeau River near Ladysmith, Wis.

Location.--Lat 45°33'20", long 90°57'30", in S $\frac{1}{2}$ sec.35, T.36 N., R.5 W., at Big Falls powerplant of Lake Superior District Power Co., 2.3 miles upstream from Josie Creek, 4 miles upstream from highway bridge, and 8.5 miles northeast of Ladysmith.

Drainage area.--1,823 sq mi. At site used 1943-50, 1,838 sq mi.

Records available.--January 1903 to September 1906, October to December 1906 (gage heights only), January 1914 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Headwater and tailwater gages read hourly. Feb. 15, 1903, to Dec. 2, 1906, chain gage in Ladysmith at different datum. Jan. 1, 1914, to Sept. 30, 1923, chain gage at site 8 miles downstream at different datum. Oct. 1, 1923, to Sept. 24, 1943, headwater and tailwater gages at present site. Sept. 25, 1943, to Sept. 30, 1950, water-stage recorder at site 4 miles downstream at different datum.

Average discharge.--49 years (1903-6, 1914-60), 1,762 cfs.

Extremes.--1903-6, 1914-60: Maximum discharge, 20,200 cfs Apr. 11, 1922; minimum, 18 cfs Nov. 1, 1948 (gage height, 2.00 ft) at site and datum then in use; minimum daily, 74 cfs Oct. 31, 1948.

Remarks.--Discharge computed from powerplant records on basis of load-discharge rating of hydro-electric units as developed by Geological Survey and taintor-gate ratings based on theoretical formulas. Flow regulated by Big Falls powerplant and by Rest Lake and Flambeau Flowage.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	711	850	899	975	888	1,212	5,709	3,026	3,966	3,602	1,707	3,233	2,229
1952	3,025	2,826	1,860	1,490	1,479	1,332	5,477	2,272	2,064	3,185	2,704	1,379	2,424
1953	935	847	819	936	941	2,205	3,052	3,046	3,331	2,866	2,468	1,323	1,889
1954	895	866	1,176	1,008	1,261	1,177	4,542	5,356	3,445	1,709	1,182	1,688	2,041
1955	2,968	1,956	1,405	1,371	1,355	1,369	3,928	1,501	1,880	1,066	1,715	958	1,790
1956	1,070	1,194	1,078	1,080	1,089	985	3,083	1,308	1,779	1,420	1,697	971	1,394
1957	587	780	835	868	953	1,308	2,555	1,548	1,378	1,039	970	1,104	1,136
1958	716	966	774	827	874	967	1,966	1,098	817	2,910	1,075	1,724	1,227
1959	1,291	1,495	989	920	879	911	1,414	2,023	1,215	1,382	2,072	4,460	1,587
1960	2,850	1,732	1,356	1,478	1,262	1,279	4,420	3,930	2,064	1,418	1,780	2,837	2,201

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	1,672	-
1951	1208	14,200	Apr. 12, 1951	587	2,229	-	-	2,670	-
1952	1238	10,600	Apr. 23, 1952	766	2,424	-	-	1,996	-
1953	1278	10,600	May 22, 1953	492	1,889	-	-	1,920	-
1954	1338	13,700	May 2, 1954	561	2,041	-	-	2,325	-
1955	1388	7,100	Oct. 16, 1954	657	1,790	-	-	1,539	-
1956	1438	6,370	Apr. 8, 1956	739	1,394	-	-	1,305	-
1957	1508	4,110	Apr. 21, 1957	452	1,136	-	-	1,150	-
1958	1558	10,700	July 2, 1958	576	1,227	-	-	1,358	-
1959	1828	9,520	Sept. 23, 1959	609	1,587	-	-	1,770	-
1960	1708	8,050	Apr. 25, Aug. 29	784	2,201	-	-	-	-

Note.--Monthly and yearly figures of discharge per square mile and runoff in inches, previously published in water-supply papers, may not represent natural flow because of uncertainty in the adjustments for effect of regulation, diversion, and evaporation. Those figures are not published herein.

3605. Flambeau River near Bruce, Wis.

Location.--Lat 45°22'20", long 91°12'13", in lot 7 of NW $\frac{1}{4}$ sec.2, T.33 N., R.7 W., on right bank 2.5 miles downstream from Thornapple powerplant, 6 miles upstream from mouth, and 7 miles southeast of Bruce.

Drainage area.--1,897 sq mi.

Records available.--August 1951 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,060 ft (by river survey, WSP 417).

Average discharge.--9 years (1951-60), 1,854 cfs.

Extremes.--1951-60: Maximum discharge, 17,400 cfs May 1, 1954 (gage height, 10.90 ft); minimum, about 100 cfs Aug. 7, 9, 1957 (gage height, 2.06 ft).

Remarks.--Flow regulated by several powerplants above station and by Rest Lake and Flambeau Flowage.

Monthly and yearly mean discharge, in cubic feet per second, of Flambeau River near Bruce, Wis.

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	3,594	-
1952	3,143	3,134	1,973	1,509	1,501	1,415	5,559	2,521	2,381	3,632	2,900	1,529	2,600
1953	1,017	944	853	974	982	2,636	3,090	3,309	3,195	2,873	2,524	1,371	1,987
1954	925	932	1,225	1,021	1,286	1,189	5,077	6,082	3,928	1,849	1,246	1,943	2,225
1955	3,107	2,044	1,508	1,474	1,429	1,463	4,066	1,503	1,992	1,112	1,796	978	1,872
1956	1,146	1,316	1,083	1,063	1,076	1,053	3,184	1,395	1,913	1,491	1,845	988	1,460
1957	661	819	834	889	895	1,335	2,550	1,606	1,444	1,197	701	1,121	1,170
1958	773	1,061	859	875	949	1,061	2,140	1,189	909	3,203	1,141	1,909	1,341
1959	1,429	1,624	1,066	950	892	971	1,295	2,159	1,351	1,640	2,116	4,612	1,676
1960	3,108	1,844	1,403	1,546	1,343	1,449	4,597	4,117	2,133	1,587	2,198	2,955	2,356

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Runoff in inches
		Discharge	Date					
1950	-	-	-	-	-	-	-	-
1951	1238	-	-	-	-	-	-	-
1952	1238	11,000	Apr. 23, 1952	1,160	2,600	-	-	2,145
1953	1278	12,000	May 22, 1953	510	1,987	-	-	2,010
1954	1338	17,400	May 1, 1954	670	2,225	-	-	2,525
1955	1388	8,100	Oct. 16, 1954	676	1,872	-	-	1,609
1956	1438	7,150	Apr. 10, 1956	774	1,460	-	-	1,358
1957	1508	4,710	Apr. 3, 1957	287	1,170	-	-	1,201
1958	1558	14,000	July 2, 1958	643	1,341	-	-	1,460
1959	1628	10,600	Sept. 22, 1959	676	1,676	-	-	1,865
1960	1708	13,600	Aug. 28, 1960	742	2,356	-	-	-

Note.--Monthly and yearly figures of discharge per square mile and runoff in inches, previously published in water-supply papers, may not represent natural flow because of uncertainty in the adjustments for effect of regulation, diversion, and evaporation. Those figures are not published herein.

3615. South Fork Jump River near Ogema, Wis.

Location.--Lat 45°23'20", long 90°30'30", in NW¼ sec. 33, T.34 N., R.1 W., on right bank 2.1 miles downstream from Mondeaux River and 11 miles southwest of Ogema.

Drainage area.--328 sq mi.

Records available.--April 1944 to September 1954.

Gage.--Chain gage. Altitude of gage is 1,300 ft (from planimetric map).

Average discharge.--10 years (1944-54), 287 cfs.

Extremes.--1944-54: Maximum discharge, 9,020 cfs June 25, 1946 (gage height, 14.56 ft, from floodmark); minimum daily, 10 cfs Aug. 15, 16, 1947 (gage height, 1.85 ft).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	68.1	94.5	56.4	44.0	47.3	221	2,337	793	314	147	100	705	409
1952	742	378	220	59.9	53.7	54.3	1,811	279	561	252	160	47.8	383
1953	29.5	47.3	42.0	31.2	29.9	586	721	424	579	138	245	19.9	242
1954	23.9	50.3	92.7	39.4	67.0	115	944	949	461	127	53.8	406	277

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.24	0.32	0.20	0.15	0.15	0.78	7.94	2.79	1.07	0.52	0.35	2.40	16.91
1952	2.61	1.29	.77	.21	.18	.19	6.16	.98	1.91	.88	.56	.16	15.90
1953	.10	.16	.15	.11	.10	2.06	2.45	1.49	1.97	.48	.86	.07	10.00
1954	.08	.17	.33	.14	.21	.40	3.21	3.34	1.57	.45	.19	1.38	11.47

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Runoff in inches
		Discharge	Date					
1950	-	-	-	-	-	-	-	314
1951	1208	*6,320	Apr. 12, 1951	33	409	1.25	16.91	503
1952	1238	*4,110	Apr. 9, 1952	23	383	1.17	15.90	281
1953	1278	*4,560	June 21, 1953	17	242	.738	10.00	246
1954	1338	5,050	May 3, 1954	20	277	.845	11.47	-

* Revised.

3620. Jump River at Sheldon, Wis.

Location.--Lat 45°18'30", long 90°57'20", in sec.26, T.33 N., R.5 W., near right bank on downstream side of highway bridge in Sheldon, 1,500 ft upstream from Shoulder Creek (corrected) and 11 miles upstream from mouth.

Drainage area.--574 sq mi.

Records available.--July 1915 to September 1960.

Gage.--Wire-weight gage. Datum of gage is 1,092.75 ft above mean sea level, datum of 1929. Prior to Feb. 9, 1939, and Sept. 1, 1941, to Apr. 1, 1953, chain gage and Feb. 9, 1939, to Aug. 31, 1941, water-stage recorder, at same site and datum. Apr. 2, 1953, to Feb. 18, 1954, tape gage in creamery wellhouse 400 ft upstream at same datum.

Average discharge.--45 years (1915-60), 513 cfs.

Extremes.--1915-60: Maximum discharge, 46,000 cfs Aug. 31, 1941 (gage height, 18.8 ft, from floodmarks), from rating curve extended above 13,000 cfs on basis of contracted-opening measurement of peak flow; minimum observed, 11 cfs Dec. 18, 1943 (gage height, 3.99 ft).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	94.6	117	75.5	62.3	57.2	286	4,075	1,276	512	304	155	1,093	672
1952	1,385	623	387	99.4	86.0	82.4	3,190	439	888	355	331	95.4	660
1953	52.9	88.7	73.2	57.0	45.8	1,332	1,318	709	898	244	424	40.9	442
1954	42.4	96.9	131	56.4	72.6	134	1,613	1,759	932	247	94.8	618	483
1955	995	270	141	93.2	69.6	223	2,166	296	820	76.8	145	44.5	444
1956	79.3	170	84.0	79.0	71.1	69.3	1,994	559	906	382	346	47.5	397
1957	45.5	73.1	66.7	40.9	38.1	460	878	340	412	145	57.1	118	223
1958	96.9	245	132	70.2	62.4	172	1,249	353	434	997	103	505	366
1959	195	444	69.2	38.0	30.1	85.6	1,140	693	147	699	807	2,056	533
1960	1,144	335	208	194	87.3	134	2,146	2,088	270	105	215	413	613

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.19	0.23	0.15	0.13	0.10	0.57	7.92	2.56	1.00	0.61	0.31	2.12	15.89
1952	2.78	1.21	.78	.20	.16	.17	6.20	.87	1.73	.71	.63	.19	15.66
1953	.11	.17	.15	.11	.08	2.68	2.56	1.42	1.74	.49	.83	.08	10.44
1954	.09	.19	.26	.11	.13	.27	3.14	3.53	1.81	.50	.19	1.20	11.42
1955	2.00	.53	.28	.19	.13	.45	4.21	.59	1.59	.15	.23	.09	10.50
1956	.16	.33	.17	.16	.13	.14	3.88	1.12	1.76	.77	.70	.09	9.41
1957	.09	.14	.13	.08	.07	.92	1.71	.68	.80	.29	.11	.23	5.25
1958	.19	.48	.27	.14	.11	.35	2.43	.67	.84	2.00	.21	.98	8.67
1959	.39	.86	.14	.08	.05	.17	2.22	1.39	.29	1.40	1.62	4.00	12.61
1960	2.30	.65	.42	.39	.16	.27	4.17	4.19	.53	.21	.43	.80	14.52

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	491	15.60
1951	1208	11,900	Apr. 12, 1951	47	1.17	672	15.89	850	20.09
1952	1238	8,350	Apr. 9, 1952	55	660	1.15	15.66	477	11.32
1953	1278	7,600	Mar. 23, 1953	35	442	.770	10.44	447	10.55
1954	1338	11,100	May 1, 1954	12	483	.841	11.42	579	13.69
1955	1388	6,260	Apr. 3, 1955	22	444	.774	10.50	353	8.35
1956	1438	8,090	Apr. 6, 1956	25	397	.692	9.41	384	9.11
1957	1508	2,000	Mar. 26, 1957	29	223	.389	5.25	247	5.83
1958	1558	5,830	July 2, 1958	38	366	.638	8.67	386	9.12
1959	1628	6,700	Sept. 28, 1959	29	533	.929	12.61	617	14.59
1960	1708	7,300	May 6, 1960	51	613	1.07	14.52	-	-

3640. Yellow River at Cadott, Wis.

Location.--Lat 44°57'10", long 91°09'00", in center of E $\frac{1}{2}$ sec.31, T.29 N., R.6 W., on up-stream side near left end of bridge, 200 ft downstream from Svetlik Dam at Cadott and 6.0 miles upstream from Drywood Creek.

Drainage area.--351 sq mi.

Records available.--October 1942 to September 1960.

Gage.--Chain and crest-stage gages. Datum of gage is 946.54 ft above mean sea level, datum of 1929.

Average discharge.--18 years (1942-60), 275 cfs.

Extremes.--1942-60: Maximum discharge, 15,900 cfs June 28, 1943 (gage height, 18.15 ft, from graph based on gage readings); minimum observed, 1.5 cfs Aug. 25-26, 1958 (gage height, 0.64 ft) caused by closure of dam to fill recreation pond above.

Remarks.--Flow occasionally regulated by recreation dam 200 ft above gage.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	23.4	24.2	20.8	20.6	20.9	145	2,258	435	371	491	36.3	361	349
1952	440	261	227	24.9	30.6	34.4	1,735	201	182	160	139	25.9	287
1953	17.4	23.1	23.0	17.2	14.1	743	609	270	174	134	481	15.7	212
1954	13.2	36.4	62.3	21.1	66.6	191	653	1,183	921	261	43.1	273	311
1955	425	140	69.6	34.1	25.8	321	1,478	351	748	107	52.2	17.1	313
1956	39.2	87.5	40.4	33.5	28.6	32.5	1,274	340	424	185	120	18.3	217
1957	19.0	30.6	24.1	13.5	11.8	218	320	226	160	102	24.1	48.2	100
1958	42.4	117	59.8	28.0	50.3	175	771	178	824	341	34.4	106	226
1959	66.7	204	24.8	10.4	7.42	86.4	661	440	75.9	666	436	1,002	307
1960	712	170	166	118	22.5	110	952	1,217	206	61.5	180	310	353

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.08	0.08	0.07	0.07	0.06	0.48	7.17	1.43	1.18	1.61	0.12	1.15	13.50
1952	1.44	.83	.75	.08	.09	.11	5.52	.66	.58	.53	.46	.08	11.13
1953	.06	.07	.08	.06	.04	2.44	1.94	.89	.55	.44	1.58	.05	8.20
1954	.04	.12	.20	.07	.20	.63	2.08	3.89	2.93	.86	.14	.87	12.03
1955	1.39	.44	.23	.11	.08	1.06	4.70	1.15	2.38	.35	.17	.05	12.11
1956	.13	.28	.13	.11	.09	.11	4.05	1.12	1.35	.61	.40	.06	8.44
1957	.06	.10	.08	.04	.03	.72	1.02	.74	.51	.33	.08	.15	3.86
1958	.14	.37	.20	.09	.15	.58	2.45	.58	2.62	1.12	.11	.34	8.75
1959	.22	.65	.08	.03	.02	.28	2.10	1.44	.24	2.19	1.43	3.19	†11.87
1960	2.34	.54	.55	.39	.07	.36	3.03	4.00	.66	.20	.59	.98	13.71

† Corrected.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	243	9.37
1951	1208	*6,170	Apr. 8, 1951*	14	349	0.994	13.50	421	16.29
1952	1238	*3,600	Apr. 9, 1952	15	287	.818	11.13	214	8.32
1953	1278	*4,200	Mar. 23, 1953	10	212	.604	8.20	216	8.35
1954	1338	*9,050	June 18, 1954	9.0	311	.886	12.03	355	13.73
1955	1388	6,170	Apr. 15, 1955	10	313	.892	12.11	274	10.59
1956	1438	4,350	Apr. 6, 1956	14	217	.618	8.44	209	8.14
1957	1508	651	Mar. 26, 1957	9.5	100	.285	3.86	112	4.33
1958	1558	10,000	June 5, 1958	1.7	226	.644	8.75	232	†8.99
1959	1628	4,240	July 9, 1959	7.0	307	.875	†11.87	371	14.35
1960	1708	3,300	May 7, 1960	17	353	1.01	13.71	-	-

* Revised.

† Corrected.

CHIPPEWA RIVER BASIN

3642. Lake Wissota near Chippewa Falls, Wis.

Location.--Lat 44°56'20", long 91°20'25", in NW $\frac{1}{4}$ sec.3, T.28 N., R.8 W., on Chippewa River, 2.0 miles east of city limits of Chippewa Falls.

Drainage area.--5,548 sq mi.

Records available.--October 1934 to September 1960.

Gage.--Float gage. Datum of gage is at mean sea level (Northern States Power Co. bench mark).

Extremes.--1934-60: Maximum contents observed, 4,854,000,000 cu ft Aug. 31, 1941 (elevation, 901.12 ft); minimum observed, 218,000,000 cu ft Mar. 31, 1952 (elevation, 882.96 ft).

Remarks.--Dam was completed in 1917. This powerplant service pond has a capacity of 3,547,000,000 cu ft at normal operating elevation of 898.0 ft. Maximum elevation allowable is 902.0 ft. Usable contents below elevation 898.0 ft allowed by express permission of the Public Service Commission of Wisconsin in anticipation of increased runoff.

Contents, in millions of cubic feet, on last day of month												
Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	3,958	3,873	3,774	3,745	2,574	313	4,089	4,043	3,965	3,876	3,508	3,957
1952	3,852	3,965	3,879	3,830	3,410	218	3,564	3,865	3,991	3,822	3,865	3,935
1953	3,847	3,753	3,814	3,782	3,312	4,080	3,817	3,951	3,836	3,881	3,847	3,847
1954	3,809	3,844	3,788	3,927	3,141	2,305	4,086	3,844	3,946	3,871	3,898	3,793
1955	3,967	3,884	3,865	3,981	3,112	482	3,796	3,761	3,876	3,959	3,774	3,809
1956	3,898	3,881	3,771	3,822	3,391	505	3,895	3,777	4,029	3,852	3,713	3,777
1957	3,919	3,715	3,861	3,895	3,478	1,972	3,193	3,873	3,796	3,871	3,780	4,005
1958	3,865	3,898	3,755	3,774	3,970	2,952	3,924	3,938	3,849	3,839	3,833	3,924
1959	3,914	3,836	3,822	3,742	3,707	2,773	3,938	3,833	3,828	3,617	4,113	3,978
1960	3,983	3,948	3,952	3,846	3,418	1,223	4,005	3,976	3,828	3,822	3,978	3,790

3645. Duncan Creek at Bloomer, Wis.

Location.--Lat 45°06'00", long 91°29'20", in sec.8, T.30 N., R.9 W., on left bank 0.3 mile below Bloomer Dam at Bloomer.

Drainage area.--49.2 sq mi.

Records available.--October 1943 to December 1951. Monthly discharge only prior to April 1944, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 979.46 ft above mean sea level, datum of 1929. Prior to June 24, 1945, chain gage at same site and datum.

Average discharge.--8 years (1943-51), 30.7 cfs.

Extremes.--1944-51: Maximum discharge, 1,220 cfs Sept. 12, 1951 (gage height, 8.01 ft); minimum observed, 0.8 cfs Apr. 2, Nov. 10, 1944, Aug. 9, 10, 1945.

Remarks.--Diurnal fluctuation caused by feed mill just above station.

Monthly and yearly mean discharge, in cubic feet per second												
Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	15.6	18.5	16.6	15.2	16.1	17.2	144	32.9	49.8	47.5	19.5	69.3
1952	47.1	38.3	430.0	-	-	-	-	-	-	-	-	-

* Not previously published; estimated on basis of records for station at Chippewa Falls.

Monthly and yearly runoff, in inches												
Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	0.37	0.42	0.39	0.36	0.34	0.40	3.27	0.77	1.13	1.11	0.46	1.57
1952	1.10	.89	*.70	-	-	-	-	-	-	-	-	-

* Not previously published; see footnote to preceding table.

Yearly discharge, in cubic feet per second									
Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	35.7	9.84
1951	1208	1,220	Sept. 12, 1951	9.6	38.3	0.778	10.59	*43.8	*12.10
1952	1208	-	-	-	-	-	-	-	-

* Not previously published.

3650. Duncan Creek at Chippewa Falls, Wis.

Location.--Lat 44°56'50", long 91°24'00", in SW¼ sec.31, T.29 N., R.8 W., on downstream side near center of bridge in Irvin Park at Chippewa Falls, 1.7 miles upstream from mouth.

Drainage area.--114 sq mi.

Records available.--October 1942 to September 1955.

Gage.--Chain and crest-stage gages. Datum of gage is 851.61 ft above mean sea level, datum of 1929.

Average discharge.--13 years (1942-55), 86.8 cfs.

Extremes.--1942-55: Maximum discharge, 3,640 cfs Apr. 2, 1952 (gage height, 8.70 ft); no flow Aug. 7, Oct. 27, Dec. 11, 1949.
Flood of Apr. 3, 1934, reached a stage of about 15.4 ft, from floodmarks.

Remarks.--Diurnal fluctuation caused by three powerplants upstream.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	43.6	44.5	46.9	47.5	60.0	58.5	289	93.2	94.9	137	77.5	145	94.6
1952	1123	91.0	74.8	55.7	59.9	74.3	322	71.6	83.7	99.6	90.0	72.6	101
1953	63.8	59.3	58.0	50.2	47.5	182	80.4	80.7	84.7	65.7	64.4	46.8	73.9
1954	47.0	49.2	45.1	42.2	52.9	89.6	162	199	230	101	81.2	108	101
1955	99.8	68.2	61.1	57.2	60.2	98.7	109	66.0	81.4	66.2	60.5	50.9	73.3

† Corrected.

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.44	0.44	0.47	0.48	0.55	0.59	2.83	0.94	0.93	1.38	0.78	1.42	11.25
1952	1.25	.89	.76	.56	.57	.75	3.15	.72	.82	1.01	.91	.71	12.10
1953	.65	.58	.59	.51	.43	1.84	.79	.82	.83	.66	.65	.46	8.81
1954	.48	.48	.46	.43	.48	.91	1.58	2.01	2.27	1.02	.82	1.06	12.00
1955	1.01	.67	.62	.58	.55	1.00	1.06	.67	.80	.67	.61	.50	8.74

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	86.5	10.30
1951	1208	1,560	Apr. 8, 1951	24	94.6	0.830	11.25	108	12.80
1952	1238	3,640	Apr. 2, 1952	43	101	.886	12.10	92.2	11.02
1953	1278	1,430	Mar. 22, 1953	32	73.9	.648	8.81	70.5	8.41
1954	1338	3,220	June 18, 1954	30	101	.886	12.00	108	12.88
1955	1388	459	Oct. 15, 1954	31	73.3	.643	8.74	-	-

3655. Chippewa River at Chippewa Falls, Wis.

Location.--Lat 44°55'35", long 91°24'40", in lot 1, sec.12, T.28 N., R.9 W., on right bank at Chippewa Falls, 1 mile downstream from Duncan Creek.

Drainage area.--5,600 sq mi, approximately.

Records available.--June 1888 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 799.3 ft above mean sea level (Northern States Power Co. bench mark). Prior to January 1914, staff gage and January 1914 to site 1 mile upstream at different datum.

Average discharge.--72 years (1888-1960), 5,098 cfs.

Extremes.--1888-1960: Maximum discharge, 102,000 cfs Sept. 1, 1941 (gage height, 24.8 ft); minimum, 22 cfs Apr. 2, 1934 (gage height, 0.63 ft); minimum daily, 40 cfs Feb. 4, 1917. Maximum stage known, 26.94 ft Sept. 10, 1884, site and datum in use to June 1932.

Remarks.--Flow completely regulated by many powerplants above station, especially Chippewa Falls hydroelectric plant, which is just upstream and by Moose Lake, Lake Chippewa, Rest Lake, Flambeau Flowage, and Lake Wissota.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,660	1,783	2,165	2,216	2,703	4,209	21,880	9,240	10,230	9,701	3,742	9,546	6,574
1952	9,194	7,245	5,006	4,231	4,156	4,490	19,150	6,318	5,615	7,035	6,707	3,347	6,867
1953	2,495	2,434	2,470	2,212	2,375	8,580	9,007	8,744	7,304	6,161	5,773	2,721	5,041
1954	2,141	2,332	3,006	2,404	3,312	3,824	13,560	19,760	11,990	5,617	2,802	6,114	6,408
1955	6,610	4,618	3,604	3,348	3,591	5,549	11,560	4,172	6,221	2,637	4,422	2,511	5,070
1956	2,761	3,395	2,833	2,738	2,800	3,745	10,720	4,204	6,182	3,898	4,694	2,317	4,183
1957	2,003	2,323	2,037	1,986	1,972	5,195	5,530	3,659	4,171	2,825	2,004	2,980	3,058
1958	2,245	2,808	2,326	2,097	2,132	3,164	6,855	2,909	4,221	6,827	2,406	4,664	3,724
1959	2,777	3,614	2,764	2,458	2,230	2,785	4,205	6,131	2,572	5,882	4,758	13,170	4,446
1960	9,033	4,705	4,048	3,711	3,284	4,108	11,950	12,350	4,992	2,753	5,106	7,733	6,151

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	4,789	-
1951	1208	56,200	Apr. 13, 1951	237	6,574	-	-	7,904	-
1952	1238	37,800	Apr. 9, 1952	1,680	6,867	-	-	5,691	-
1953	1278	34,800	May 23, 1953	538	5,041	-	-	5,048	-
1954	1338	69,400	May 2, 1954	486	6,408	-	-	7,196	-
1955	1388	32,400	Oct. 15, 1955	532	5,070	-	-	4,407	-
1956	1438	32,600	Apr. 7, 1956	490	4,183	-	-	3,963	-
1957	1508	12,300	June 24, 1957	354	3,058	-	-	3,143	-
1958	1558	31,400	July 2, 1958	158	3,724	-	-	3,873	-
1959	1628	33,600	July 9, 1959	217	4,446	-	-	5,178	-
1960	1708	33,500	Aug. 29, 1960	355	6,151	-	-	-	-

Note.--Monthly and yearly figures of discharge per square mile and runoff in inches, previously published in water-supply papers, may not represent natural flow because of uncertainty in the adjustments for effect of regulation, diversion, and evaporation. Those figures are not published herein.

3665. Eau Claire River near Fall Creek, Wis.

Location.--Lat 44°48'35", long 91°16'50", in NW $\frac{1}{4}$ sec.19, T.27 N., R.7 W., on left bank 0.7 mile downstream from Beaver Creek, 1.3 miles upstream from Big Falls, and 3.2 miles north of Fall Creek.

Drainage area.--758 sq mi (revised).

Records available.--October 1942 to September 1955.

Gage.--Water-stage recorder. Altitude of gage is 830 ft (from topographic map).

Average discharge.--13 years (1942-55), 542 cfs.

Extremes.--1942-55: Maximum discharge, 17,200 cfs May 30, 1955 (gage height, 16.11 ft); minimum recorded, 58 cfs Dec. 4, 1953 (gage height, 0.57 ft).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	99.3	113	120	97.2	115	472	3,539	598	708	763	174	534	608
1952	407	400	366	187	170	325	3,395	362	678	412	415	162	603
1953	126	191	183	130	130	1,670	942	548	275	459	597	202	458
1954	157	79.7	108	76.6	167	457	772	2,099	1,595	751	188	493	580
1955	970	372	270	176	136	854	1,658	1,319	1,346	356	229	148	655

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.15	0.17	0.18	0.15	0.16	0.72	5.21	0.91	1.04	1.16	0.26	0.79	10.90
1952	.62	.59	.56	.28	.24	.50	5.00	.55	1.00	.63	.63	.24	10.84
1953	.19	.28	.28	.20	.18	2.54	1.39	.83	.41	.70	.91	.30	8.21
1954	.24	.12	.16	.12	.23	.69	1.14	3.19	2.35	1.14	.29	.73	10.40
1955	1.48	.55	.41	.27	.19	1.30	2.44	2.01	1.98	.54	.35	.22	11.74

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	426	7.64
1951	1208	13,800	Apr. 9, 1951	70	608	0.802	10.90	675	12.17
1952	1238	15,700	Apr. 3, 1952	124	603	.796	10.84	546	9.82
1953	1278	9,140	Mar. 23, 1953	116	458	.604	8.21	445	7.98
1954	1338	14,000	May 2, 1954	61	580	.765	10.40	687	12.32
1955	1388	17,200	May 30, 1955	118	655	.864	11.74	-	-

3670. Chippewa River at Eau Claire, Wis.

Location.--Lat 44°48'40", long 91°32'10", in NE $\frac{1}{4}$ sec.25, T.27 N., R.10 W., on downstream side near right end of bridge on State Highways 37 and 85 at Eau Claire, 1.2 miles upstream from Lowes Creek and 2.8 miles downstream from Eau Claire River.

Drainage area.--6,630 sq mi, approximately.

Records available.--October 1902 to March 1909, April 1944 to September 1954. Monthly discharge only for some periods, published in WSP 1308. Published as "near Eau Claire," 1902-9.

Gage.--Chain gage. Altitude of gage is 750 ft (from topographic map). Nov. 13, 1902, to Mar. 31, 1909, on different bridge at same site at different datum.

Average discharge.--16 years (1902-8, 1944-54), 6,561 cfs.

Extremes.--1902-9, 1944-54: Maximum discharge, 80,000 cfs May 2, 1954 (gage height, 22.00 ft, from graph based on gage readings); minimum daily, 190 cfs Dec. 18, 1907. Flood of Sept. 1, 1941, reached an estimated discharge of about 100,000 cfs.

Remarks.--Flow regulated by many powerplants above station and by Moose Lake, Lake Chippewa, Rest Lake, Flambeau Flowage, and Lake Wisconsin.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,793	1,958	2,317	2,409	3,542	4,840	25,320	9,909	11,200	11,250	3,746	10,020	7,336
1952	9,483	7,742	5,221	4,490	4,442	5,127	22,480	6,220	6,165	7,129	6,601	3,451	7,368
1953	2,659	2,710	2,782	2,604	2,756	10,320	10,130	9,525	8,057	7,290	6,596	3,497	5,764
1954	2,467	2,481	3,789	2,665	3,929	5,081	13,941	22,047	13,893	7,120	3,862	7,426	7,398

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	5,245	-
1951	1208	63,800	Apr. 13, 1951	1,100	7,336	-	-	8,713	-
1952	1238	*39,000	Apr. 9, 1952	1,340	7,368	-	-	6,171	-
1953	1278	*34,800	Mar. 24, 1953	1,170	5,764	-	-	5,815	-
1954	1358	80,000	May 2, 1954	1,130	7,398	-	-	-	-

* Revised.

Note.--Monthly and yearly figures of discharge per square mile and runoff in inches, previously published in water-supply papers, may not represent natural flow because of uncertainty in the adjustments for effect of regulation, diversion, and evaporation. Those figures are not published herein.

3671. Birch Lake at Birchwood, Wis.

Location.--Lat 45°39'35", long 91°33'25", in W½ sec.25, T.37 N., R.10 W., on Red Cedar River at Birchwood.

Drainage area.--68 sq mi, approximately.

Records available.--March 1928 to September 1960.

Gage.--Staff gage. Altitude of gage is 1,090 ft (from nearby bench mark).

Extremes.--1928-60: Maximum contents on last day of month, 1,061,000,000 cu ft June 30, 1943 (gage height, 119.4 ft); minimum, 109,800,000 cu ft Mar. 31, 1931 (gage height, 112.95 ft).

Remarks.--Reservoir operation began in 1882. Reservoir includes Lake Chetac and Birch Lake. Usable capacity in summer, 669,700,000 cu ft between gage heights 114.0 and 118.5 ft, and winter, 908,300,000 cu ft between gage heights 112.0 and 118.5 ft (limits stipulated by Public Service Commission of Wisconsin).

Contents, in millions of cubic feet on last day of month

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	824	695	527	427	398	441	760	856	776	792		808
1952	711	780	653	557	498	469	679	727	743	760	743	727
1953	1,010	679	633	572	557	587	679	858	792	727	808	711
1954	695	679	587	542	512	512	824	808	908	792	760	776
1955	776	633	542	512	469	455	663	663	727	690	743	727
1956	727	711	633	542	498	498	679	727	849	759	743	679
1957	635	572	527	512	498	527	663	776	792	743	743	727
1958	679	607	572	557	542	557	727	711	727	743	743	760
1959	695	648	587	587	587	587	648	808	760	727	841	760
1960	711	695	695	648	587	572	760	760	743	743	959	792

3672. Red Cedar Lake at Mikana, Wis.

Location.--Lat 45°35'20", long 91°36'05", on line between secs. 21 and 22, T.36 N., R.10 W., on Red Cedar River at south edge of Mikana.

Drainage area.--161 sq mi.

Records available.--March 1928 to September 1960. Published as "Cedar Lake" 1939-55.

Gage.--Staff gage. Altitude of gage is 1,080 ft (Northern States Power Co.).

Extremes.--1928-60: Maximum contents on last day of month, 779,000,000 cu ft June 30, 1943, and Aug. 31, 1960 (gage height, 111.6 ft); no usable contents at times in 1929 and 1930 (gage height, 105 ft or below).

Remarks.--Reservoir operation began in 1882. Reservoir includes Balsam, Hemlock, and Red Cedar Lakes. Usable capacity is 577,400,000 cu ft between gage heights 105.0 and 110.0 ft (limits established by Northern States Power Co.).

Contents, in millions of cubic feet, on last day of month

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	553	466	394	185	140	185	528	640	740	640	690	565
1952	516	478	394	334	207	174	516	602	652	615	602	577
1953	503	430	382	265	218	242	418	652	615	590	640	615
1954	540	516	418	334	299	322	677	640	640	590	615	602
1955	565	442	382	334	288	265	540	577	565	601	589	565
1956	565	528	394	322	253	230	430	552	601	601	577	552
1957	540	442	394	370	311	334	454	601	753	602	615	577
1958	553	454	358	276	265	265	528	553	553	615	602	615
1959	540	442	370	382	382	394	454	627	627	627	640	640
1960	540	491	430	418	346	311	627	640	615	590	779	627

3673. Long Lake near Brill, Wis.

Location.--Lat 45°40'05", long 91°40'50", in SW $\frac{1}{4}$ sec.24, T.37 N., R.11 W., on Brill River, 1 mile east of Nobleton and 5.4 miles north of Brill.

Drainage area.--82 sq mi, approximately.

Records available.--March 1928 to September 1960.

Gage.--Staff gage. Altitude of gage is 1,210 ft (from nearby bench marks).

Extremes.--1928-60: Maximum contents on last day of month, 565,100,000 cu ft July 31, 1928, (gage height, 6.8 ft); minimum, 83,000,000 cu ft Feb. 28, 1929, and Mar. 31, 1930 (gage height, 4.0 ft).

Remarks.--Reservoir operation began in 1883. Usable capacity June 15 to Sept. 5, 385,700,000 cu ft between gage heights 5.0 and 7.2 ft and Sept. 6 to June 14, 636,800,000 cu ft between gage heights 3.5 and 7.2 ft (limits stipulated by Public Service Commission of Wisconsin).

Contents, in millions of cubic feet, on last day of month

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	424	336	217	149	116	166	302	459	459	459	441	441
1952	406	389	336	268	217	217	319	371	406	424	406	389
1953	336	268	234	217	217	251	268	389	476	441	459	389
1954	302	234	200	183	200	302	476	547	441	424	459	389
1955	424	336	234	166	166	149	251	285	354	424	424	406
1956	406	371	302	251	234	217	268	354	441	441	424	354
1957	336	319	285	251	251	268	302	371	441	441	441	459
1958	389	319	285	268	251	268	336	354	424	441	424	441
1959	406	354	285	285	285	285	302	406	476	441	476	441
1960	424	389	371	319	268	268	354	441	476	459	547	494

3674. Bear Lake at Haugen, Wis.

Location.--Lat 45°36'30", long 91°46'25", in NE $\frac{1}{4}$ sec.18, T.36 N., R.11 W., on Bear Creek at Haugen.

Drainage area.--60 sq mi, approximately.

Records available.--March 1928 to September 1960.

Gage.--Staff gage. Altitude of gage is 1,140 ft (from nearby bench marks).

Extremes.--1928-60: Maximum contents on last day of month, 359,800,000 cu ft Apr. 30, 1928 (gage height, 90.8 ft); minimum, 3,100,000 cu ft Mar. 31, 1931 (gage height, 86.05 ft).

Remarks.--Reservoir operation began in 1880. Reservoir includes Kekegoma and Bear Lakes. Usable capacity, 413,300,000 cu ft between gage heights 87.0 and 91.8 ft, corrected (limits stipulated by Public Service Commission of Wisconsin).

Contents, in millions of cubic feet, on last day of month

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	175	190	182	96	96	96	182	279	279	263	255	246
1952	182	205	152	130	123	123	238	246	255	255	246	230
1953	190	137	116	102	102	152	175	222	271	230	222	198
1954	180	130	123	109	109	116	246	297	324	279	246	263
1955	230	175	137	109	109	116	137	167	175	182	182	175
1956	182	167	152	152	152	152	205	222	230	222	222	198
1957	182	175	160	152	152	160	182	205	246	238	230	238
1958	222	190	145	130	130	130	190	190	198	222	198	205
1959	190	175	160	152	145	130	137	175	190	213	263	246
1960	205	190	160	152	137	160	205	230	205	182	288	213

3675. Red Cedar River near Colfax, Wis.

Location.--Lat 45°03'50" long 91°42'45", in SW $\frac{1}{4}$ sec.22, T.30 N., R.11 W., on right bank 3.2 miles downstream from Trout Creek and 4.7 miles north of Colfax.

Drainage area.--1,100 sq mi, approximately.

Records available.--January 1914 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Altitude of gage is 940 ft (from topographic map). Mar. 19, 1914, to September 1925, chain gage and September 1925 to Sept. 9, 1937, water-stage recorder, 1 mile downstream at different datum.

Average discharge.--46 years (1914-60), 753 cfs.

Extremes.--1914-60: Maximum discharge, 21,900 cfs Apr. 3, 1934 (gage height, 11.4 ft, site and datum then in use), from rating curve extended above 4,900 cfs; minimum recorded, 128 cfs Mar. 13, 1954, result of freezeup.

Remarks.--Flow regulated by Birch, Cedar, Long, and Bear Lakes.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	449	471	522	468	498	680	2,764	1,110	1,506	1,191	645	1,737	1,001
1952	1,059	1,102	877	714	662	781	3,396	736	765	728	854	663	1,025
1953	515	549	515	483	477	1,726	993	1,024	829	534	738	436	737
1954	473	599	590	456	612	830	1,630	2,233	2,152	1,472	767	840	1,055
1955	918	814	685	611	576	931	1,225	519	736	488	569	419	708
1956	483	540	510	501	439	550	1,778	569	622	544	728	415	639
1957	418	495	445	374	401	981	585	465	971	675	464	577	571
1958	438	614	525	468	487	744	892	432	598	748	395	468	567
1959	439	478	347	298	307	495	444	659	568	1,062	649	802	547
1960	737	541	709	573	465	770	1,316	1,177	720	481	1,005	1,143	804

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches		Mean	Runoff in inches
		Discharge	Date							
1950	-	-	-	-	-	-	-	-	877	-
1951	1208	6,970	Apr. 12, 1951	260	1,001	-	-	-	1,135	-
1952	1238	7,900	Apr. 2, 1952	448	1,025	-	-	-	903	-
1953	1278	8,580	Mar. 22, 1953	289	737	-	-	-	744	-
1954	1338	10,300	June 18, 1954	320	1,055	-	-	-	1,119	-
1955	1388	1,990	Apr. 1, 1955	236	708	-	-	-	633	-
1956	1438	7,740	Apr. 5, 1956	303	639	-	-	-	624	-
1957	1508	2,520	June 24, 1957	298	571	-	-	-	589	-
1958	1558	2,470	Apr. 7, 1958	304	567	-	-	-	541	-
1959	1628	5,220	July 10, 1959	200	547	-	-	-	608	-
1960	1708	8,030	Aug. 29, 1960	281	804	-	-	-	-	-

Note.--Monthly and yearly figures of discharge per square mile and runoff in inches, previously published in water-supply papers, may not represent natural flow because of uncertainty in the adjustments for effect of regulation, diversion, and evaporation. Those figures are not published herein.

3680. Hay River at Wheeler, Wis.

Location.--Lat 45°02'50", long 91°54'40", in SW $\frac{1}{4}$ sec.25, T.30 N., R.13 W., on right bank 25 ft downstream from highway bridge in Wheeler, 1.8 miles upstream from Otter Creek, and 2.4 miles downstream from South Fork Hay River.

Drainage area.--426 sq mi.

Records available.--October 1950 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 893.66 ft above mean sea level, datum of 1929. Prior to Mar. 25, 1951, wire-weight gage on bridge at same datum.

Average discharge.--10 years (1950-60), 264 cfs.

Extremes.--1950-60: Maximum discharge, 6,700 cfs Mar. 22, 1953 (gage height, 13.36 ft), from rating curve extended above 3,200 cfs; minimum, 55 cfs Mar. 13, 1954 (gage height, 2.32 ft), result of freezeup.

Maximum stage known since at least 1915, 16.6 ft in April 1934, from floodmarks.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	*180	*143	133	113	137	197	1,257	283	543	351	214	531	*339
1952	270	320	247	214	211	187	1,448	260	250	300	422	254	364
1953	190	177	183	191	185	741	339	322	455	263	283	183	294
1954	169	198	195	189	223	368	809	767	579	352	238	312	367
1955	277	225	196	184	184	405	421	202	209	170	168	146	232
1956	171	169	151	142	142	155	802	198	253	211	297	159	237
1957	154	156	146	125	124	440	204	192	260	190	146	154	191
1958	147	156	153	118	225	284	320	153	183	203	142	141	185
1959	139	138	122	97.2	85.2	159	166	194	153	220	171	173	152
1960	181	159	332	168	124	384	410	514	289	169	389	254	280

* Not previously published; estimated on basis of records for nearby stations and rainfall records.

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	*0.49	*0.37	0.36	0.31	0.33	0.53	3.29	0.77	1.42	0.95	0.58	1.39	*10.79
1952	.75	.84	.67	.58	.53	.51	3.79	.70	.65	.81	1.14	.66	11.61
1953	.51	.46	.49	.52	.45	2.00	.89	.87	1.19	.71	.77	.46	9.34
1954	.46	.52	.53	.51	.55	1.00	2.32	2.08	1.52	.95	.64	.82	11.70
1955	.75	.59	.53	.50	.45	1.10	1.10	.55	.55	.46	.45	.38	7.41
1956	.46	.44	.41	.39	.36	.42	2.10	.54	.66	.57	.80	.41	7.56
1957	.42	.41	.40	.34	.30	1.19	.53	.52	.68	.51	.40	.40	6.10
1958	.40	.41	.41	.32	.56	.77	.84	.41	.48	.55	.38	.37	5.90
1959	.38	.36	.33	.26	.21	.43	.44	.53	.40	.59	.46	.45	4.84
1960	.49	.42	.30	.45	.31	1.04	1.07	1.39	.70	.46	1.05	.66	8.94

* Not previously published; see footnote to preceding table.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year			
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches	
		Discharge	Date							
1950	-	-	-	-	-	-	-	-	-	-
1951	1208	5,120	June 26, 1951	*106	*339	*0.796	*10.79	371	11.81	
1952	1258	5,120	Apr. 9, 1952	128	364	.854	11.61	340	10.83	
1953	1278	6,700	Mar. 22, 1953	152	294	.690	9.34	294	9.39	
1954	1358	6,600	Apr. 15, 1954	106	367	.862	11.70	378	12.06	
1955	1398	1,250	Apr. 6, 1955	132	232	.545	7.41	215	6.85	
1956	1458	5,270	Apr. 5, 1956	130	237	.556	7.56	234	7.48	
1957	1508	1,390	Mar. 23, 1957	110	191	.448	6.10	191	6.09	
1958	1558	2,790	Feb. 27, 1958	100	185	.434	5.90	180	5.75	
1959	1628	854	July 10, 1959	80	152	.357	4.84	175	5.58	
1960	1708	4,700	Aug. 29, 1960	110	280	.657	8.94	-	-	

* Not previously published.

• 3690. Red Cedar River at Menomonie, Wis.

Location.--Lat 44°53'00", long 91°55'55", in NW $\frac{1}{4}$ sec.26, T.28 N., R.13 W., on right bank at Menomonie, 900 ft downstream from powerhouse of Northern States Power Co. and 1,000 ft downstream from Wilson Creek.

Drainage area.--1,760 sq mi, approximately.

Records available.--June 1907 to September 1908, May 1913 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 780 ft above mean sea level (Northern States Power Co. bench mark). Prior to Sept. 3, 1908, chain gage at site 1 mile downstream at different datum. May 9, 1913, to Sept. 30, 1923, water-stage recorder at present site at datum 0.42 ft lower than present datum.

Average discharge.--48 years (1907-8, 1913-60), 1,192 cfs.

Extremes.--1907-8, 1913-23, 1925-60: Maximum discharge, 40,000 cfs Apr. 4, 1934 (gage height, 16.0 ft, from floodmarks), from rating curve extended above 13,000 cfs on basis of computed flow over Cedar Falls Dam 6 miles upstream; minimum, 21 cfs Dec. 9, 1928 (gage height, 0.65 ft).

Remarks.--Flow regulated by powerplants at Menomonie and Cedar Falls and by Birch, Cedar, Long, and Bear Lakes.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	729	712	824	730	814	1,090	1,434	2,203	1,620	969	2,298		1,448
1952	1,457	1,465	1,151	993	968	1,155	4,700	1,233	1,296	1,223	1,456	1,095	1,512
1953	891	935	902	886	872	2,646	1,387	1,506	1,302	1,076	1,174	875	1,208
1954	821	970	931	726	989	1,352	2,353	2,879	2,731	1,874	1,285	1,384	1,525
1955	1,368	1,221	1,011	882	882	1,423	1,436	881	1,026	837	772	678	1,035
1956	793	914	868	807	748	921	2,640	1,018	1,231	959	1,206	717	1,067
1957	713	805	759	656	748	1,803	927	785	1,327	961	750	974	910
1958	783	864	709	645	721	988	1,429	830	1,042	1,072	567	679	860
1959	701	746	601	532	536	1,006	768	996	879	1,486	922	1,183	865
1960	1,144	1,011	1,230	1,002	739	1,263	1,983	2,005	1,239	748	1,396	1,585	1,280

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Runoff in inches
		Discharge	Date					
1950	-	-	-	-	-	-	1,310	-
1951	1208	11,700	Apr. 13, 1951	373	1,448	-	1,600	-
1952	1238	12,000	Apr. 3, 1952	490	1,512	-	1,400	-
1953	1278	12,600	Mar. 23, 1953	624	1,208	-	1,207	-
1954	1338	12,700	June 19, 1954	516	1,525	-	1,599	-
1955	1388	2,670	Oct. 1, 1954	567	1,035	-	949	-
1956	1458	12,900	Apr. 5, 1956	530	1,067	-	1,042	-
1957	1508	4,740	Mar. 25, 1957	460	910	-	916	-
1958	1558	11,800	June 4, 1958	276	860	-	835	-
1959	1628	13,500	July 8, 1959	407	865	-	978	-
1960	1708	13,000	Aug. 29, 1960	441	1,280	-	-	-

Note.--Monthly and yearly figures of discharge per square mile and runoff in inches, previously published in water-supply papers, may not represent natural flow because of uncertainty in the adjustments for effect of regulation, diversion, and evaporation. Those figures are not published herein.

3695. Chippewa River at Durand, Wis.

Location.--Lat 44°37'45", long 91°58'10", in SW $\frac{1}{4}$ sec.21, T.25 N., R.13 W., on left bank at Durand, 75 ft downstream from highway bridge and 9.5 miles downstream from Red Cedar River.

Drainage area.--9,010 sq mi, approximately.

Records available.--July 1928 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 694.59 ft above mean sea level, datum of 1929. Prior to Dec. 9, 1930, chain or staff gage at bridge 400 ft downstream at same datum.

Average discharge.--32 years (1928-60), 7,320 cfs.

Extremes.--1928-60: Maximum discharge, 101,000 cfs May 3, 1954 (gage height, 15.40 ft); minimum observed, 1,020 cfs Nov. 24, 1950 (gage height, 0.12 ft).
Maximum stage known, 18.4 ft Sept. 12, 1884.

Remarks.--Flow partly regulated by powerplants, Moose Lake, Lake Chippewa, Rest Lake, Flambeau Flowage, Lake Wissota, and Birch, Cedar, Bear, and Long Lakes on upper Red Cedar River.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2,759	2,796	3,098	2,889	3,630	5,684	30,860	11,710	13,110	12,970	5,112	12,590	8,915
1952	11,340	9,499	6,851	6,006	5,985	6,464	28,970	8,436	8,091	8,537	8,811	4,713	9,458
1953	3,851	3,679	3,729	3,619	3,568	13,460	12,110	11,390	9,869	8,356	8,264	4,218	7,200
1954	3,583	3,745	4,379	3,481	4,650	6,228	16,390	28,220	17,420	9,724	4,659	8,735	9,284
1955	12,100	6,998	5,804	5,438	5,417	9,375	16,130	6,610	10,140	4,518	6,042	3,934	7,710
1956	4,427	5,158	4,477	4,276	4,121	5,591	17,520	6,638	8,151	6,095	6,991	4,016	6,443
1957	3,433	3,894	3,615	3,096	3,221	7,835	7,736	5,325	6,753	4,755	3,591	4,494	4,816
1958	3,703	4,682	4,198	3,345	3,436	5,061	9,491	4,713	6,748	10,450	3,753	5,877	5,457
1959	4,079	5,324	4,084	3,784	3,293	4,185	6,570	8,808	4,416	8,749	5,901	15,396	6,219
1960	11,900	7,007	6,478	5,816	4,952	5,916	15,860	17,950	7,511	4,660	6,386	11,010	8,791

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	7,131	-
1951	1208	71,800	Apr. 14, 1951	1,100	8,915	-	-	10,510	-
1952	1238	50,500	Apr. 11, 1952	3,400	9,458	-	-	8,082	-
1953	1278	37,500	Mar. 25, 1953	2,000	7,200	-	-	7,238	-
1954	1338	101,000	May 3, 1954	2,290	9,284	-	-	10,400	-
1955	1388	31,500	Oct. 18, 1954	2,680	7,710	-	-	6,794	-
1956	1438	42,700	Apr. 8, 1956	2,600	6,443	-	-	6,182	-
1957	1508	17,600	June 25, 1957	2,170	4,816	-	-	4,953	-
1958	1558	27,600	July 4, 1958	1,990	5,457	-	-	5,533	-
1959	1628	35,000	July 11, 1959	2,240	6,219	-	-	7,224	-
1960	1708	38,000	Aug. 31, 1960	2,420	8,791	-	-	-	-

Note.--Monthly and yearly figures of discharge per square mile and runoff in inches, previously published in water-supply papers, may not represent natural flow because of uncertainty in the adjustments for effect of regulation, diversion, and evaporation. Those figures are not published herein.

3700. Eau Galle River at Spring Valley, Wis.

Location.--Lat 44°51'00", long 92°14'15", between secs. 5 and 6, T.27 N., R.15 W., on downstream side near center of bridge at Spring Valley, 0.1 mile upstream from Mines Creek, 0.5 mile downstream from Lousy Creek, and at mile 29.96.

Drainage area.--64.8 sq mi.

Records available.--March 1944 to September 1960.

Gage.--Wire-weight and crest-stage gages. Datum of gage is 910.45 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark). Prior to July 31, 1957, chain gage at same site at datum 2.0 ft higher.

Average discharge.--16 years (1944-60), 25.4 cfs.

Extremes.--1944-60: Maximum discharge, 7,000 cfs Apr. 15, 1954 (gage height, 11.50 ft, present datum); minimum observed, 5.8 cfs Sept. 25, 27, 28, 30, 1949.
Maximum stage known since at least 1894, 18.98 ft, present datum, Sept. 18, 1942, from floodmarks (discharge, 33,000 cfs, estimated by Corps of Engineers on basis of slope-area measurement by Geological Survey of peak discharge of 39,000 cfs at Elmwood, drainage area, 91.9 sq mi).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	8.51	8.16	7.97	7.65	8.32	9.74	198	17.5	95.0	29.4	11.1	25.5	35.3
1952	12.8	22.8	12.4	11.1	10.2	10.5	252	15.9	28.1	26.2	54.1	10.4	38.6
1953	12.8	13.6	12.5	11.4	11.6	99.8	18.3	24.9	35.8	41.3	40.5	12.5	28.1
1954	12.1	12.2	15.4	11.1	15.3	72.2	177	125	91.1	44.4	15.1	29.4	50.7
1955	21.0	13.6	11.7	11.2	13.0	54.7	56.1	12.3	12.4	14.8	13.2	10.1	20.4
1956	11.5	11.8	11.0	10.6	9.12	10.8	91.2	12.8	35.1	13.3	40.7	11.1	22.3
1957	11.5	11.2	11.1	9.69	10.6	66.5	10.7	11.7	26.0	8.70	12.3	11.3	16.8
1958	11.1	11.1	10.1	9.44	50.8	11.4	27.9	9.79	10.4	9.70	9.55	9.05	14.7
1959	8.88	8.55	7.62	6.95	7.71	15.4	10.4	11.4	9.53	52.3	8.01	9.30	11.4
1960	11.1	9.68	55.1	9.95	8.54	74.2	20.9	24.8	14.9	9.03	9.53	11.0	21.5

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.15	0.14	0.14	0.14	0.13	0.17	3.41	0.31	1.64	0.52	0.20	0.44	7.39
1952	.23	.39	.22	.20	.17	.19	4.33	.28	.48	.47	.96	.18	8.10
1953	.23	.23	.22	.20	.19	1.78	.32	.44	.62	.73	.72	.21	5.89
1954	.21	.21	.24	.20	.25	1.29	3.05	2.22	1.40	.79	.27	.51	10.64
1955	.27	.23	.21	.20	.21	.97	.97	0.22	.21	.26	.24	.17	4.26
1956	.20	.20	.20	.19	.15	.19	1.57	.23	.60	.24	.72	.19	4.68
1957	.20	.19	.20	.17	.17	1.18	.18	.21	.45	.15	.22	.20	3.52
1958	.20	.19	.18	.17	.82	.20	.48	.17	.18	.17	.17	.16	3.09
1959	.16	.15	.14	.12	.12	.27	.18	.20	.16	.57	.14	.16	2.37
1960	.20	.17	.94	.18	.14	1.32	.36	.44	.26	.16	.17	.19	4.53

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	31.5	6.62
1951	1208, 1358	2,730	June 24, 1951	7.5	35.3	0.545	7.39	37.3	7.80
1952	1238, 1358	3,120	Aug. 8, 1952	9.0	38.6	.596	8.10	37.8	7.94
1953	1358	3,480	July 26, 1953	8.4	28.1	.454	5.89	28.0	5.87
1954	1358	7,000	Apr. 15, 1954	8.4	50.7	.782	10.64	51.4	10.79
1955	1388	1,280	Apr. 4, 1955	7.6	20.4	.315	4.26	19.4	4.05
1956	1438	5,130	Apr. 3, 1956	9	22.3	.344	4.68	22.3	4.67
1957	1508	2,490	Mar. 14, 1957	7.6	16.8	.259	3.52	16.7	3.50
1958	1558	1,460	Feb. 25, 1958	7.0	14.7	.227	3.09	14.1	2.97
1959	1628	6,200	July 8, 1959	6.5	11.4	.176	2.37	15.5	3.23
1960	1708	5,210	Mar. 27, 1960	7.8	21.5	.332	4.53	-	-

3705. Eau Galle River at Elmwood, Wis.

Location.--Lat 44°46'40", long 92°09'55", in sec.35, T.27 N., R.15 W., on downstream right side of highway bridge in Elmwood, 2 miles upstream from Cady Creek.

Drainage area.--91.9 sq mi.

Records available.--October 1942 to December 1953.

Gage.--Staff and crest-stage gages. Altitude of gage is 840 ft (from topographic map).

Average discharge.--11 years (1942-53), 43.2 cfs.

Extremes.--1942-53: Maximum discharge, 4,900 cfs Mar. 15, 1945 (gage height, 11.3 ft); minimum observed, 9.6 cfs Mar. 10, 16-18, 1952.
Maximum stage known, 18.2 ft Sept. 18, 1942, from floodmarks (discharge, 39,000 cfs, by slope-area measurement).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	19.3	17.6	13.5	12.0	14.0	29.2	204	39.3	122	61.8	21.3	42.6	49.5
1952	25.5	33.0	25.1	22.7	24.0	14.5	255	29.5	42.4	36.0	62.3	27.6	49.5
1953	23.2	23.1	24.2	22.2	23.2	107	41.6	37.3	69.9	104	92.0	38.0	50.8
1954	23.3	23.5	25.0	-	-	-	-	-	-	-	-	-	-

* Not previously published; estimated on basis of record for station at Spring Valley.

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.24	0.21	0.17	0.15	0.16	0.37	2.48	0.49	1.48	0.78	0.27	0.52	7.32
1952	.32	.40	.31	.28	.28	.18	3.10	.37	.51	1.45	.78	.34	7.32
1953	.29	.28	.30	.28	.26	1.34	.51	.47	.85	1.51	1.15	.46	7.50
1954	.29	.29	.31	-	-	-	-	-	-	-	-	-	-

* Not previously published; see footnote to preceding table.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	43.4	6.40
1951	1,208	2,360	June 25, 1951	10	49.5	0.539	7.32	52.3	7.73
1952	1,238	2,690	Apr. 9, 1952	9.6	49.5	.539	7.32	48.4	7.16
1953	1,278	4,780	Aug. 31, 1953	16	50.8	.553	7.50	450.9	47.52

* Not previously published.

BUFFALO RIVER BASIN

3720. Buffalo River near Tell, Wis.

Location.--Lat 44°23'30", long 91°50'55", in NW $\frac{1}{4}$ sec.16, T.22 N., R.12 W., on downstream side of bridge, 0.3 mile north of Tell School, 1 mile northeast of Tell, and 6 miles northeast of Alma.

Drainage area.--406 sq mi.

Records available.--October 1932 to September 1951. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Chain gage. Datum of gage is 680.00 ft above mean sea level, adjustment of 1912. Prior to Mar. 13, 1936, staff gage at same site at datum 0.12 ft lower.

Average discharge.--19 years (1932-51), 254 cfs.

Extremes.--1932-51: Maximum discharge, 8,650 cfs Apr. 4, 1934 (gage height, 8.36 ft, from floodmarks, present datum); minimum observed, 59 cfs Aug. 16, 1933 (gage height, 1.87 ft, present datum).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	112	122	122	113	117	416	619	257	256	462	253	265	260

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.32	0.33	0.35	0.32	0.30	1.21	1.70	0.73	0.70	1.31	0.72	0.73	8.69

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	191	6.38
1951	1208,1438	1,640	July 11, 1951	96	260	0.640	8.69	-	-

3730. South Fork Zumbro River near Rochester, Minn.

Location.--Lat 44°04'00", long 92°27'55", in SE $\frac{1}{4}$ sec.14, T.107 N., R.14 W., on left bank 30 ft upstream from ford, a quarter of a mile downstream from sewage plant, 1.6 miles north of Rochester, 2 miles downstream from Cascade Creek, and $2\frac{1}{2}$ miles downstream from Silver Lake Dam.

Drainage area.--304 sq mi.

Records available.--January 1952 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 951.0 ft above mean sea level, datum of 1929 (levels by city of Rochester Sewage Department).

Average discharge.--8 years (1952-60), 104 cfs.

Extremes.--1952-60: Maximum discharge, 8,670 cfs Mar. 31, 1952; maximum gage height, 13.54 ft June 4, 1958; minimum discharge, 8.4 cfs Dec. 7, 1955.

Maximum stage known since at least 1908, about 17.5 ft July 21, 1951, from information by sewage-plant superintendent.

Remarks.--Slight regulation at times from Silver Lake and at very low flows from sewage-plant effluent.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	85.6	85.8	510	808	177	500	304	287	101	-
1953	69.0	63.1	59.9	54.5	50.0	283	206	259	176	275	381	77.0	165
1954	60.7	62.8	57.8	40.5	64.3	90.0	111	223	514	123	78.8	74.1	125
1955	104	75.4	61.2	47.4	42.5	257	151	70.3	86.4	56.6	37.5	25.2	84.9
1956	29.6	30.2	27.8	25.1	26.5	97.2	319	148	115	77.5	71.1	37.3	83.5
1957	40.3	36.8	34.2	26.3	56.6	73.1	44.4	74.5	78.7	101	88.7	49.4	58.8
1958	37.2	58.9	54.7	40.0	76.5	55.3	77.8	49.1	308	37.5	23.8	29.1	70.4
1959	30.4	30.9	25.0	25.7	22.8	288	131	103	210	87.5	100	84.3	95.2
1960	73.7	114	112	79.8	48.5	154	191	394	220	267	69.9	59.1	149

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	0.32	0.30	1.94	2.97	0.67	1.84	1.15	1.01	0.37	-
1953	0.26	0.23	0.23	.21	.17	1.10	.76	.98	1.04	1.45	.28	.28	7.36
1954	.23	.23	.22	.15	.22	.34	.41	.84	1.89	.47	.30	.27	5.57
1955	.39	.28	.23	.18	.15	.98	.55	.27	.32	.21	.12	.09	3.77
1956	.11	.11	.11	.10	.09	.37	1.17	.56	.42	.29	.27	.14	3.74
1957	.15	.14	.13	.10	.19	.28	.16	.28	.29	.38	.34	.18	2.62
1958	.14	.22	.21	.15	.26	.20	.28	.19	1.13	.14	.11	.11	3.14
1959	.12	.11	.09	.09	.08	1.09	.48	.39	.77	.35	.58	.31	4.24
1960	.28	.42	.43	.30	.17	.59	.70	1.49	.61	1.01	.26	.22	6.68

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-
1952	1278	a8,670	Mar. 31, 1952	-	-	-	-	252	11.29
1953	1278	3,700	Aug. 3, 1953	39	165	0.543	7.36	164	7.32
1954	1338	5,420	June 19, 1954	34	125	.411	5.57	130	5.79
1955	1388	2,140	Mar. 11, 1955	21	84.9	.279	3.77	72.0	3.20
1956	1438	2,400	Apr. 2, 1956	18	83.5	.275	3.74	85.5	3.83
1957	1508	1,050	July 28, 1957	23	58.8	.193	2.62	62.1	2.77
1958	1558	8,180	June 4, 1958	22	70.4	.232	3.14	65.0	2.89
1959	1628	3,560	June 26, 1959	21	95.2	.313	4.24	113	5.05
1960	1708	3,900	July 3, 1960	38	149	.490	6.68	-	-

a Maximum during period January to September.

3740. Zumbro River at Zumbro Falls, Minn.

Location.--Lat 44°17'12", long 92°25'56", in sec.36, T.110 N., R.14 W., on left bank in Zumbro Falls, 1,000 ft downstream from Spring Creek, 0.7 mile upstream from bridge on U.S. Highway 63, and 6.3 miles downstream from North Fork.

Drainage area.--1,130 sq mi, approximately.

Records available.--June 1909 to September 1917, April to November 1929, March 1930 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 811.26 ft above mean sea level, datum of 1929. Prior to Nov. 11, 1933, chain gage on bridge 800 ft downstream at same datum.

Average discharge.--38 years (1909-17, 1930-60), 477 cfs.

Extremes.--1909-17, 1929-60: Maximum discharge, 35,900 cfs (revised) July 22, 1951 (gage height, 30.80 ft, from floodmark); minimum, 27 cfs Jan. 12, 1935 (gage height, 6.30 ft). Flood in April 1888 reached a stage of about 30.5 ft at present site or 29.7 ft at original site. Flood in 1859 is known to have exceeded that in 1888 (gage height not determined).

Remarks.--Diurnal fluctuation caused by powerplant above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	102	124	109	119	187	299	3,435	623	749	1,783	1,292	1,029	821
1952	646	605	535	290	316	1,023	3,410	542	1,134	708	488	284	829
1953	200	215	194	195	197	815	593	764	568	1,375	1,483	255	584
1954	208	231	239	181	269	472	372	785	1,412	349	258	304	423
1955	755	346	266	214	228	1,202	717	264	355	283	171	121	412
1956	129	157	143	123	145	516	1,558	364	723	276	277	175	380
1957	151	172	152	116	222	482	225	241	494	968	764	340	362
1958	176	363	195	119	321	255	387	252	932	162	132	148	285
1959	129	145	119	111	105	985	424	260	848	463	458	844	408
1960	444	437	470	389	187	610	864	1,684	991	694	234	264	607

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.10	0.12	0.11	0.12	0.17	0.30	3.39	0.64	0.74	1.82	1.32	1.02	9.85
1952	.66	.60	.55	.30	.30	1.04	3.37	.55	1.12	.72	.50	.28	9.99
1953	.20	.21	.20	.20	.18	.93	.59	.78	.56	1.40	1.51	.25	7.01
1954	.21	.23	.24	.18	.25	.48	.37	.80	1.39	.36	.26	.30	5.07
1955	.77	.34	.27	.22	.21	1.23	.71	.27	.35	.29	.17	.12	4.95
1956	.13	.15	.15	.13	.14	.53	1.54	.37	.71	.28	.28	.17	4.58
1957	.15	.17	.16	.12	.20	.49	.22	.25	.49	.99	.78	.34	4.36
1958	.18	.36	.20	.12	.30	.26	.38	.26	.92	.17	.13	.15	3.43
1959	.13	.14	.12	.11	.10	1.01	.42	.27	.84	.47	.47	.83	4.91
1960	.45	.43	.48	.40	.18	.62	.85	1.72	.98	.71	.24	.26	7.32

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	419	5.03
1951	1208	*35,900	July 22, 1951	61	821	0.727	9.85	942	11.35
1952	1238	19,000	Apr. 1, 1952	145	829	.734	9.99	730	8.79
1953	1278	12,900	July 27, 1953	127	584	.517	7.01	590	7.08
1954	1338	12,100	June 20, 1954	115	423	.374	5.07	481	5.77
1955	1388	6,050	Mar. 12, 1955	88	412	.365	4.95	333	4.00
1956	1438	12,700	Apr. 2, 1956	64	380	.336	4.58	384	4.63
1957	1508	11,300	July 16, 1957	73	362	.320	4.36	384	4.62
1958	1558	14,100	June 5, 1958	64	285	.252	3.43	256	3.08
1959	1628	9,110	June 26, 1959	62	408	.361	4.91	489	5.88
1960	1708	15,500	May 22, 1960	71	607	.537	7.32	-	-

* Revised.

† Corrected.

3745. Zumbro River at Theilman, Minn.

Location.--Lat 44°17'15", long 92°11'25", in sec.36, T.110 N., R.12 W., on left bank at Theilman, a quarter of a mile upstream from highway bridge and 1 mile upstream from West Indian Creek.

Drainage area.--1,320 sq mi, approximately.

Records available.--April 1938 to October 1956.

Gage.--Water-stage recorder. Datum of gage is 700.00 ft above mean sea level, adjustment of 1912. Prior to Jan. 17, 1951, chain and staff gages at site half a mile downstream at same datum.

Average discharge.--18 years (1938-56), 613 cfs.

Extremes.--1938-56: Maximum discharge, 33,000 cfs July 22, 1951 (gage height, 43.43 ft), from rating curve extended above 10,000 cfs on basis of logarithmic plotting; minimum observed, 75 cfs Nov. 12, 1940.

Remarks.--Diurnal fluctuations caused by powerplant upstream.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	180	161	149	132	309	400	3,393	734	1,792	2,180	1,340	1,088	805
1952	700	624	577	348	356	1,010	3,743	639	1,198	785	562	330	903
1953	260	286	268	263	274	1,047	694	853	652	1,648	1,781	329	702
1954	268	301	311	255	352	633	405	861	1,623	462	347	369	†515
1955	913	444	343	279	270	1,347	787	346	449	440	242	185	506
1956	197	242	191	160	190	730	2,040	405	865	397	374	256	502
1957	209	-	-	-	-	-	-	-	-	-	-	-	-
1958	-	-	-	-	-	-	-	-	-	-	-	-	-
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

† Corrected.

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.16	0.14	0.13	0.12	0.24	0.35	2.87	0.64	0.67	1.90	1.17	0.92	9.31
1952	.61	.53	.50	.30	.29	.88	3.16	.56	1.01	.69	.49	.28	9.30
1953	.23	.24	.23	.23	.22	.91	.59	.75	.55	1.44	1.56	.28	7.25
1954	.23	.25	.27	.22	.28	.55	.34	.75	1.37	.40	.30	.31	†5.27
1955	.60	.37	.30	.24	.21	1.18	.67	.30	.38	.38	.21	.16	5.20
1956	.17	.20	.17	.14	.16	.64	1.72	.35	.73	.35	.33	.22	5.18
1957	.18	-	-	-	-	-	-	-	-	-	-	-	-
1958	-	-	-	-	-	-	-	-	-	-	-	-	-
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

† Corrected.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	558	5.76
1951	1208, 1238	33,000	July 22, 1951	120	905	0.686	9.31	†1,023	†10.52
1952	1238	20,800	Apr. 1, 1952	200	903	.684	9.30	-	8.36
1953	1278	15,200	July 27, 1953	188	702	.523	7.23	707	7.28
1954	1338	13,500	June 20, 1954	200	†515	†.390	†5.27	584	5.99
1955	1388	8,240	Oct. 3, 1954	151	506	.383	5.20	416	4.27
1956	1438	14,600	Apr. 2, 1956	130	502	.380	5.18	-	-
1957	-	-	-	-	-	-	-	-	-
1958	-	-	-	-	-	-	-	-	-
1959	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-

† Corrected.

3765. South Fork Whitewater River near Altura, Minn.

Location.--Lat 44°04'10", long 91°58'49", in SE $\frac{1}{4}$ sec.14, T.107 N., R.10 W., on left bank 500 ft upstream from highway bridge, 1.4 miles upstream from small tributary entering from the west, 2 miles west of Altura, and 2.4 miles upstream from Keefer Creek.

Drainage area.--76.8 sq mi.

Records available.--October 1939 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 761.80 ft above mean sea level, adjustment of 1912 (levels by Corps of Engineers).

Average discharge.--21 years (1939-60), 27.9 cfs.

Extremes.--1939-60: Maximum discharge, 5,460 cfs Aug. 31, 1947 (gage height, 10.61 ft); minimum, 3.8 cfs Mar. 24, 1940; minimum gage height, 0.74 ft Jan. 20, 1951.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	11.0	11.2	11.3	10.3	12.6	22.1	100	22.7	38.0	73.8	47.8	23.3	32.1
1952	22.8	26.7	22.1	15.4	15.3	119	118	28.0	58.6	39.9	66.0	23.5	46.3
1953	18.5	18.0	17.4	15.1	14.5	43.5	36.2	57.5	34.3	55.9	63.9	21.5	33.2
1954	17.8	19.2	18.5	16.5	19.4	31.1	29.4	39.2	38.8	29.6	16.8	20.3	24.7
1955	25.1	23.3	21.5	17.1	15.6	43.3	25.2	18.8	23.9	38.8	16.6	14.4	23.7
1956	14.0	14.0	12.6	14.0	14.0	24.1	94.6	26.9	27.4	32.2	23.4	14.7	25.9
1957	14.8	14.1	13.4	12.5	33.8	15.7	14.0	14.8	13.0	21.7	20.6	14.3	16.8
1958	13.7	13.7	12.6	11.5	25.2	12.9	13.4	14.1	17.4	12.7	11.6	11.4	14.1
1959	12.4	12.5	10.8	11.2	12.4	103	25.2	16.8	18.4	20.5	23.7	22.2	24.2
1960	20.4	24.2	21.2	16.6	13.2	43.8	25.6	58.6	37.5	31.2	16.5	14.0	27.0

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.17	0.16	0.17	0.15	0.17	0.33	1.46	0.34	0.55	1.11	0.72	0.34	5.67
1952	.34	.39	.33	.23	.22	1.78	1.71	.42	.85	.60	.99	.34	8.20
1953	.28	.26	.26	.23	.20	.65	.53	.86	.50	.84	.96	.31	5.88
1954	.27	.28	.28	.25	.26	.47	.43	.59	.56	.44	.25	.29	4.37
1955	.38	.34	.32	.26	.21	.65	.37	.28	.35	.58	.25	.21	4.20
1956	.21	.20	.19	.21	.20	.36	1.37	.40	.40	.48	.35	.21	4.58
1957	.22	.21	.20	.19	.46	.24	.20	.22	.19	.33	.31	.21	2.98
1958	.21	.20	.19	.17	.34	.19	.19	.21	.25	.19	.17	.17	2.48
1959	.19	.18	.16	.17	.17	1.54	.37	.25	.27	.31	.36	.32	4.29
1960	.31	.35	.32	.25	.19	1.36	.37	.88	.54	.47	.25	.20	5.49

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	32.5	5.73
1951	1208	4,250	July 21, 1951	9.0	32.1	0.418	5.67	35.3	6.23
1952	1238	3,520	Mar. 31, 1952	12	46.3	.603	8.20	44.8	7.94
1953	1278	1,480	May 10, 1953	13	33.2	.432	5.88	33.4	5.91
1954	1338	544	Apr. 26, 1954	14	24.7	.322	4.37	25.9	4.58
1955	1388	2,180	July 8, 1955	14	23.7	.309	4.20	21.2	3.76
1956	1438	2,250	Apr. 2, 1956	11	25.9	.337	4.58	26.1	4.61
1957	1508	1,440	July 16, 1957	12	16.8	.219	2.98	16.6	2.95
1958	1558	576	Feb. 25, 1958	8.7	14.1	.184	2.48	13.7	2.41
1959	1628	1,140	Mar. 25, 1959	10	24.2	.315	4.29	26.7	4.74
1960	1708	1,400	Mar. 27, 1960	12	27.0	.352	5.49	-	-

3785. Mississippi River at Winona, Minn.

Location.--Lat 44°03'20", long 91°38'15", in sec.23, T.107 N., R.7 W., on right bank at Winona pumping station in Winona, 9½ miles upstream from Trempealeau River and at mile 725.7 upstream from Ohio River.

Drainage area.--59,200 sq mi, approximately.

Records available.--June 1928 to September 1960. Gage-height records collected in this vicinity since 1878 are contained in reports of Mississippi River Commission.

Gage.--Water-stage recorder. Datum of gage is 639.64 ft above mean sea level, datum of 1929. June 10, 1928, to Apr. 15, 1931, staff gage at site 800 ft upstream. Prior to Oct. 1, 1929, at datum 0.20 ft higher and Oct. 1, 1929, to Apr. 15, 1931, at datum 0.12 ft lower. Apr. 16, 1931, to Nov. 12, 1934, staff gage at present site and datum. Since Mar. 31, 1937, auxiliary water-stage recorder 2.7 miles upstream at tailwater of navigation dam 5A.

Average discharge.--32 years (1928-60), 24,410 cfs.

Extremes.--1928-60: Maximum discharge, 190,000 cfs Apr. 20, 1952 (gage height, 17.91 ft); minimum, 2,250 cfs Dec. 29, 1933 (gage height, -1.18 ft); minimum gage height, -3.38 ft Aug. 31, 1934.

Remarks.--Some regulation by reservoirs, navigation dams, and powerplants at low and medium stages. Flood flow not materially affected by artificial storage.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	13,270	11,270	12,750	12,620	13,270	20,390	101,400	66,700	40,390	58,820	26,650	46,420	35,360
1952	37,170	36,880	31,510	22,950	20,320	25,200	133,600	60,180	30,350	53,990	46,190	23,330	43,460
1953	14,530	15,210	14,550	14,020	14,620	34,500	56,760	50,840	60,360	57,370	56,660	22,620	34,430
1954	15,910	17,270	17,520	15,510	17,650	26,050	42,680	85,080	155,450	46,770	18,780	24,050	151,690
1955	29,770	21,340	17,050	14,610	14,370	26,930	50,280	20,220	25,030	24,110	26,060	14,730	23,740
1956	14,750	15,290	14,700	12,450	12,230	16,410	66,750	30,300	30,190	22,080	27,060	12,840	22,890
1957	10,900	15,520	12,410	10,730	10,430	20,790	34,700	26,890	35,440	64,490	30,580	29,590	25,300
1958	19,200	22,040	16,920	13,320	14,100	19,520	33,490	18,530	21,700	26,250	10,590	15,190	19,240
1959	11,250	13,530	9,970	9,140	8,826	14,980	16,750	24,830	23,640	20,490	13,930	25,950	16,120
1960	24,330	17,290	15,310	16,890	12,010	14,890	55,540	59,120	41,790	18,920	12,880	24,170	26,080

† Corrected.

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.26	0.21	0.25	0.25	0.23	0.40	1.91	1.30	0.76	1.15	0.52	0.87	8.11
1952	.72	.70	.61	.45	.37	.49	2.52	1.17	.57	1.05	.90	.44	9.99
1953	.28	.29	.28	.27	.26	.67	1.07	.99	1.14	1.12	1.10	.43	7.90
1954	.31	.33	.34	.30	.31	.51	.80	1.66	1.05	.91	.37	.45	7.34
1955	.58	.40	.33	.28	.25	.52	.95	.39	.47	.47	.51	.28	5.43
1956	.29	.29	.29	.24	.22	.32	1.26	.59	.57	.43	.53	.24	5.27
1957	.21	.29	.24	.21	.18	.40	.65	.52	.67	1.26	.60	.56	5.79
1958	.37	.42	.33	.26	.25	.38	.63	.36	.41	.51	.21	.28	4.42
1959	.22	.25	.19	.18	.16	.29	.32	.48	.45	.40	.27	.48	3.70
1960	.47	.33	.30	.33	.22	.29	1.05	1.15	.79	.37	.25	.46	6.01

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year		
		Momentary		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches		
		Discharge	maximum Date								
1950	-	-	-	-	-	-	-	28,547	6.55		
1951	1208	178,000	Apr. 18, 1951	9,060	35,360	0.597	8.11	41,080	8.64		
1952	1238	190,000	Apr. 20, 1952	16,300	43,460	.734	9.99	38,337	8.81		
1953	1278	82,800	June 29, 1953	11,400	34,430	.582	7.90	34,950	8.03		
1954	1338	156,000	May 7, 1954	12,700	151,960	.540	7.34	153,450	7.67		
1955	1388	64,400	Apr. 12, 1955	11,300	23,740	.401	5.43	21,770	4.99		
1956	1438	91,700	Apr. 14, 1956	9,590	22,890	.387	5.27	22,390	5.14		
1957	1508	95,800	July 4, 1957	7,430	25,300	.427	5.79	26,917	6.17		
1958	1558	43,500	Apr. 14, 1958	8,450	19,240	.325	4.42	17,270	3.96		
1959	1628	41,900	July 13, 1959	8,050	16,120	.272	3.70	18,007	4.14		
1960	1708	70,000	June 3, 1960	9,400	26,080	.441	6.01	-	-		

† Corrected.

3790. Gilmore Creek at Winona, Minn.

Location.--Lat 44°02'40", long 91°41'25", in sec.29, T.107 N., R.7 W., on left bank at west edge of Winona, 1,500 ft upstream from bridge on U.S. Highway 14, 2½ miles upstream from Lake Winona, and 6½ miles upstream from mouth.

Drainage area.--8.95 sq mi.

Records available.--October 1939 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 672.92 ft above mean sea level, adjustment of 1912. Prior to Nov. 4, 1939, staff gage at same site and datum.

Average discharge.--21 years (1939-60), 3.66 cfs.

Extremes.--1939-60: Maximum discharge, 5,360 cfs July 21, 1951 (gage height, 9.47 ft), from rating curve extended above 260 cfs on basis of slope-area measurement at gage height 6.74 ft and logarithmic plotting; minimum, 0.4 cfs several days in July and August 1941.

Remarks.--Regulation at times by swimming pool three-quarters of a mile above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2.65	2.61	2.65	2.53	2.65	3.39	4.46	3.59	3.16	8.32	4.22	3.46	3.65
1952	4.05	3.94	3.64	3.42	3.52	4.45	4.38	4.53	4.04	4.07	3.98	3.82	3.99
1953	4.12	4.21	3.99	3.98	3.78	4.62	4.01	3.72	4.20	5.08	4.35	4.17	4.19
1954	3.95	3.60	3.69	4.08	4.16	4.55	4.42	4.32	3.85	3.44	3.55	3.53	3.93
1955	3.48	3.29	3.88	3.81	3.70	3.84	4.68	3.60	3.36	2.94	2.45	2.57	3.46
1956	2.88	2.99	3.01	3.00	2.96	3.71	4.80	3.99	3.25	2.87	2.91	2.83	3.26
1957	2.86	2.80	2.66	2.51	3.49	3.00	3.34	2.66	2.70	3.16	2.56	2.39	2.85
1958	2.47	2.69	2.78	2.65	2.77	2.39	2.53	2.72	2.47	2.08	2.12	2.25	2.49
1959	2.55	2.69	2.16	2.05	2.25	10.2	4.35	3.33	3.69	3.00	3.17	3.50	3.59
1960	6.91	3.00	3.43	3.38	2.70	3.72	3.29	3.88	3.03	2.81	3.28	2.93	3.54

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.34	0.33	0.34	0.33	0.31	0.44	0.56	0.46	0.39	1.07	0.54	0.43	5.54
1952	.52	.49	.47	.44	.42	.57	.55	.58	.50	.52	.51	.48	6.05
1953	.53	.53	.51	.51	.44	.60	.50	.48	.52	.65	.56	.52	6.35
1954	.51	.45	.48	.53	.48	.59	.55	.56	.48	.44	.46	.44	5.97
1955	.45	.41	.50	.49	.43	.49	.58	.46	.42	.38	.32	.32	5.25
1956	.37	.37	.39	.39	.36	.48	.60	.51	.40	.37	.38	.35	4.97
1957	.37	.35	.34	.34	.41	.39	.42	.34	.34	.41	.33	.30	4.34
1958	.32	.33	.36	.34	.32	.31	.31	.35	.31	.27	.27	.28	3.77
1959	.33	.34	.28	.26	.26	1.32	.54	.43	.46	.39	.41	.44	5.46
1960	.89	.37	.44	.44	.33	.48	.41	.50	.38	.36	.42	.37	5.39

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	3.76	5.69
1951	1208	5,360	July 21, 1951	1.7	3.65	0.408	5.54	3.96	6.01
1952	1238	156	July 19, 1952	3.2	3.99	.466	6.05	4.05	6.14
1953	1278	-	-	2.8	4.19	.468	6.35	4.10	6.22
1954	1338	53	June 20, 1954	2.8	3.93	.439	5.97	3.88	5.89
1955	1388	318	July 8, 1955	2.1	3.46	.387	5.25	3.32	5.02
1956	1438	73	Apr. 3, 1956	2.3	3.26	.364	4.97	3.22	4.90
1957	1508	196	July 20, 1957	2.1	2.85	.318	4.34	2.82	4.29
1958	1558	22	Oct. 19, 1957	1.8	2.49	.278	3.77	2.45	3.71
1959	1628	585	June 25, 1959	2.0	3.59	.401	5.46	4.09	6.21
1960	1708	201	Mar. 27, 1960	2.3	3.54	.396	5.39	-	-

3795. Trempealeau River at Dodge, Wis.

Location.--Lat 44°07'55", long 91°33'10", in sec.10, T.19 N., R.10 W., near left bank on downstream side of highway bridge in Dodge, 9 miles upstream from mouth.

Drainage area.--643 sq mi.

Records available.--December 1913 to September 1919, April 1934 to September 1960.

Gage.--Wire-weight gage. Datum of gage is 663.42 ft above mean sea level, datum of 1929. Prior to July 16, 1941, chain gage at same site and datum.

Average discharge.--31 years (1914-19, 1934-60), 391 cfs.

Extremes.--1913-19, 1934-60: Maximum discharge, 17,400 cfs Apr. 4, 1956 (gage height, 10.35 ft); minimum daily, 98 cfs Jan. 10, 1938.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	169	186	186	152	172	526	1,168	460	465	722	370	339	410
1952	362	381	299	280	308	413	1,425	423	535	466	497	283	472
1953	246	261	257	181	180	839	558	439	296	286	301	203	339
1954	200	243	248	215	280	454	393	752	933	795	384	457	446
1955	1,514	456	366	284	260	535	482	430	812	558	363	272	511
1956	289	298	240	227	213	342	1,727	439	311	295	363	241	414
1957	223	221	215	181	215	372	324	282	273	260	222	183	248
1958	194	252	186	183	260	416	363	237	254	213	161	163	240
1959	183	213	139	117	119	909	635	330	245	198	444	418	330
1960	385	364	408	360	237	317	368	711	486	287	235	233	367

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.30	0.32	0.33	0.27	0.28	0.94	2.03	0.83	0.81	1.29	0.66	0.59	8.65
1952	.65	.66	.54	.50	.52	.74	2.47	.76	.93	.84	.89	.50	10.00
1953	.44	.45	.46	.32	.29	1.50	.97	.79	.51	.51	.54	.33	7.14
1954	.36	.42	.44	.38	.45	.81	.68	1.35	1.62	1.43	.69	.73	9.41
1955	2.36	.79	.66	.47	.42	.96	.84	.77	1.41	1.00	.65	.47	10.80
1956	.52	.52	.43	.41	.38	.81	3.00	.79	.54	.53	.65	.42	8.78
1957	.40	.38	.38	.32	.35	.67	.56	.51	.47	.47	.40	.32	5.23
1958	.35	.44	.33	.33	.42	.75	.63	.42	.44	.38	.29	.23	5.07
1959	.33	.37	.25	.21	.19	1.63	1.10	.59	.42	.36	.80	.73	6.98
1960	.69	.63	.73	.65	.40	.57	.64	1.27	.84	.51	.42	.41	7.76

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	304	6.42
1951	1208	*4,840	July 10, 1951	130	410	0.638	8.65	452	9.55
1952	1238	*6,950	Apr. 2, 1952	208	472	.734	10.00	449	9.50
1953	1278	*4,040	Mar. 19, 1953	175	339	.527	7.14	333	7.01
1954	1338	5,710	June 21, 1954	188	446	.694	9.41	598	12.00
1955	1388	10,400	Oct. 4, 1954	230	511	.795	10.80	401	8.46
1956	1438	17,400	Apr. 4, 1956	200	414	.644	8.78	400	8.47
1957	1508	713	June 23, 1957	170	248	.386	5.23	246	5.19
1958	1558	1,140	Feb. 28, 1958	138	240	.373	5.07	232	4.90
1959	1628	8,000	Mar. 27, 1959	110	330	.513	6.98	383	8.08
1960	1708	1,480	Dec. 30, 1959	182	367	.571	7.76	-	-

* Revised.

3810. Black River at Neillsville, Wis.

Location.--Lat 44°33'35", long 90°36'50", in sec.15, T.24 N., R.2 W., on right bank at downstream side of bridge on U.S. Highway 10 in Neillsville, 1 mile downstream from O'Neill Creek and 2.6 miles upstream from Cunningham Creek.

Drainage area.--756 sq mi.

Records available.--April 1905 to March 1909, October 1913 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 962.77 ft above mean sea level, datum of 1929 (levels by U.S. Weather Bureau). Prior to Oct. 24, 1934, chain gage at same site and datum.

Average discharge.--50 years (1905-8, 1913-60), 575 cfs.

Extremes.--1905-9, 1913-60: Maximum discharge, 48,800 cfs Sept. 10, 1938 (gage height, 23.8 ft); minimum, 0.6 cfs Aug. 15, 1936 (gage height, 1.84 ft).

Remarks.--Water diverted periodically from the basin for cranberry culture.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	36.6	46.7	44.3	35.2	42.3	584	5,025	468	736	798	55.4	890	725
1952	548	418	411	90.7	83.0	323	4,468	228	354	597	536	60.8	673
1953	34.7	59.1	56.5	39.2	39.1	2,381	1,025	304	248	601	560	28.9	452
1954	24.4	52.1	83.7	37.6	77.8	515	1,019	1,769	771	493	61.6	501	452
1955	1,307	184	84.0	40.0	36.0	1,000	2,194	554	1,307	113	346	43.2	602
1956	90.0	160	61.8	57.0	46.0	58.6	3,255	676	767	461	203	45.3	486
1957	34.9	62.4	48.8	24.4	34.5	837	411	245	289	374	65.4	75.2	210
1958	55.9	147	87.1	43.6	169	413	1,353	201	1,140	234	61.7	165	336
1959	125	279	48.6	20.9	16.1	611	1,391	634	123	773	314	1,330	430
1960	797	260	515	244	49.6	303	1,663	3,046	444	110	350	591	701

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.06	0.07	0.07	0.05	0.06	0.89	7.42	0.71	1.09	1.22	0.08	1.32	13.04
1952	.84	.62	.63	.14	.12	.49	6.59	.35	.52	.91	.82	.09	12.12
1953	.05	.09	.09	.06	.05	3.63	1.51	.46	.37	.92	.85	.04	8.12
1954	.04	.08	.13	.06	.11	.79	1.50	2.70	2.44	.75	.09	.74	8.13
1955	1.99	.27	.13	.06	.05	1.52	3.24	.65	1.93	.17	.53	.06	10.80
1956	.14	.24	.09	.09	.07	.09	4.80	1.03	1.13	.70	.31	.07	8.76
1957	.05	.09	.07	.04	.05	1.28	.61	.37	.43	.57	.10	.11	3.77
1958	.09	.22	.13	.07	.23	.63	2.00	.31	1.68	.36	.09	.24	6.05
1959	.19	.41	.07	.03	.02	.93	2.05	1.27	.18	1.18	.48	1.97	8.78
1960	1.22	.38	.78	.37	.07	.46	2.45	4.65	.66	.17	.53	.87	12.61

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	502	9.02
1951	1208	21,300	Apr. 8, 1951	26	725	0.959	13.04	830	14.93
1952	1238	21,500	Apr. 2, 1952	31	673	.890	12.12	570	10.26
1953	1278	15,500	Mar. 23, 1953	21	452	.598	8.12	453	8.14
1954	1338	15,100	May 2, 1954	19	452	.598	8.13	572	10.27
1955	1388	9,700	May 29, 1955	29	602	.796	10.80	494	8.89
1956	1438	21,500	Apr. 3, 1956	28	486	.643	8.76	472	8.50
1957	1508	3,730	July 9, 1957	16	210	.278	3.77	222	4.00
1958	1558	15,500	June 5, 1958	23	336	.444	6.05	350	6.28
1959	1628	7,630	Sept. 28, 1959	15	490	.648	8.78	585	10.49
1960	1708	12,600	May 7, 1960	42	701	.927	12.61	-	-

3820. Black River near Galesville, Wis.

Location.--Lat 44°03'45", long 91°17'30", in sec.2, T.18 N., R.8 W., on left bank 30 ft downstream from bridge on State Highway 35, 4.5 miles southeast of Galesville, and 5 miles downstream from Fleming Creek.

Drainage area.--2,120 sq mi, approximately.

Records available.--December 1931 to September 1960.

Gage.--Water-stage recorder or wire-weight gage. Datum of gage is 653.43 ft above mean sea level, unadjusted. Prior to Apr. 2, 1941, chain gage on bridge 30 ft upstream at same datum.

Average discharge.--28 years (1932-60), 1,616 cfs.

Extremes.--1931-60: Maximum discharge observed, 58,000 cfs Sept. 11, 1938 (gage height, 14.31 ft); minimum observed, 180 cfs Dec. 20, 1932.

Remarks.--Flow regulated at Hatfield Dam powerplant where drainage area is 1,290 sq mi and storage capacity is 272,000,000 cu ft. Water diverted periodically from the basin for cranberry culture.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	348	352	349	326	365	1,638	10,220	1,614	1,840	2,711	651	1,342	1,807
1952	1,679	1,513	1,257	612	736	1,140	10,510	1,025	1,970	1,767	1,639	513	2,020
1953	415	428	467	339	371	5,143	3,896	1,855	786	978	1,722	421	1,394
1954	377	385	474	445	503	1,030	2,071	4,820	2,183	2,300	633	1,494	1,382
1955	4,374	1,085	706	464	461	2,073	4,914	2,143	4,328	865	811	396	1,888
1956	439	603	421	365	315	681	7,034	2,943	1,438	1,359	1,073	465	1,424
1957	378	408	425	362	376	1,528	1,315	1,361	1,203	927	391	361	755
1958	345	611	661	401	386	1,478	2,601	823	1,526	535	314	387	838
1959	277	546	320	268	263	1,334	4,347	2,000	895	1,402	927	2,297	1,239
1960	3,199	2,097	1,394	2,113	597	708	3,655	7,993	2,340	896	686	1,201	2,247

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.19	0.19	0.19	0.18	0.18	0.89	5.38	0.88	0.97	1.48	0.35	0.71	11.59
1952	.91	.80	.68	.33	.37	.62	5.53	.56	1.04	.96	.89	.27	12.96
1953	.23	.23	.25	.18	.18	2.80	1.95	1.01	.41	.53	.94	.22	8.93
1954	.20	.20	.26	.24	.25	.56	1.09	2.51	1.15	1.25	.34	.75	8.84
1955	2.38	.57	.38	.25	.23	1.13	2.58	1.17	2.28	.47	.44	.21	12.10
1956	.24	.32	.23	.20	.16	.37	3.70	1.60	.76	.74	.58	.25	9.15
1957	.21	.21	.23	.20	.18	.83	.69	.74	.63	.50	.21	.19	4.82
1958	.19	.32	.36	.22	.19	.80	1.37	.45	.80	.29	.17	.20	5.36
1959	.15	.29	.17	.15	.13	.73	2.29	1.09	.47	.76	.50	1.21	7.94
1960	1.74	1.10	.76	1.15	.30	.39	1.92	4.35	1.23	.48	.37	.63	14.42

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	1,313	8.42
1951	1208	29,100	Apr. 9, 1951	285	1,807	0.852	11.59	2,092	13.41
1952	1238	51,000	Apr. 3, 1952	413	2,020	.953	12.96	1,737	11.28
1953	1278	16,900	Mar. 25, 1953	327	1,394	.658	8.93	1,338	8.88
1954	1338	24,600	May 4, 1954	361	1,382	.652	8.84	1,738	11.51
1955	1388	20,500	May 31, 1955	340	1,888	.891	12.10	1,490	9.56
1956	1438	29,300	Apr. 6, 1956	290	1,424	.672	9.15	1,403	9.01
1957	1508	6,300	Mar. 18, 1957	296	755	.356	4.82	739	5.04
1958	1558	11,400	Apr. 9, 1958	247	828	.395	5.36	794	5.10
1959	1628	14,500	Sept. 30, 1959	212	1,239	.584	7.94	1,706	10.93
1960	1708	26,200	May 8, 1960	488	2,247	1.06	14.42	-	-

3825. Little La Crosse River near Leon, Wis.

Location.--Lat 43°53'45", long 90°50'25", in NE¼ sec.3, T.16 N., R.4 W., on left bank 1.1 miles downstream from Sand Creek, 1.5 miles northwest of Leon, and 4 miles upstream from mouth.

Drainage area.--77.1 sq mi.

Records available.--March 1934 to September 1960.

Gage.--Chain gage, and water-stage recorder above 1.0 ft gage height. Detum of gage is 760.28 ft above mean sea level, adjustment of 1912.

Average discharge.--26 years (1934-60), 46.1 cfs.

Extremes.--1934-60: Maximum discharge, 4,620 cfs Aug. 6, 1935 (gage height, 14.43 ft), from rating curve extended above 1,500 cfs; minimum, 14 cfs Feb. 25, 1935, caused by ice jam above gage; minimum daily, 18 cfs June 2, 3, 1934.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	30.9	30.7	29.0	28.7	35.6	57.0	84.2	44.5	47.7	59.5	39.6	36.5	43.7
1952	53.9	38.5	39.0	36.3	36.9	67.6	82.5	46.3	71.3	79.2	70.3	40.1	55.2
1953	38.8	48.8	44.2	40.7	38.9	75.3	74.3	58.4	52.3	55.1	51.1	39.1	51.5
1954	36.4	37.9	41.6	39.9	61.8	50.2	51.2	55.7	55.2	61.4	40.4	49.6	48.3
1955	56.3	39.4	38.2	35.7	44.7	59.7	56.7	52.9	98.8	42.9	31.3	30.7	48.9
1956	35.0	35.7	32.5	30.3	29.7	59.6	122	51.6	33.4	28.4	32.1	31.6	43.4
1957	30.8	32.0	29.1	25.1	35.1	35.8	39.7	35.2	46.9	29.4	27.6	27.5	32.4
1958	25.2	31.9	32.6	28.8	41.5	34.1	40.1	28.2	25.9	25.1	21.5	24.9	29.9
1959	25.3	29.1	25.7	23.5	22.6	64.3	118	60.7	32.5	29.0	52.7	75.3	46.6
1960	60.7	53.2	51.4	36.5	26.5	52.3	74.5	112	71.5	41.4	38.5	44.0	55.3

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.46	0.44	0.43	0.43	0.48	0.85	1.22	0.67	0.69	0.89	0.58	0.53	7.68
1952	.81	.56	.58	.54	.52	1.01	1.19	.69	1.03	1.18	1.05	.58	9.74
1953	.58	.71	.86	.61	.53	1.13	1.07	.87	.78	.92	.76	.57	9.07
1954	.54	.55	.62	.60	.83	.75	.74	.83	.80	.92	.60	.72	8.50
1955	.84	.57	.57	.53	.60	.89	.82	.79	1.43	.64	.47	.44	8.59
1956	.52	.52	.49	.45	.41	.89	1.77	.77	.48	.42	.48	.46	7.66
1957	.46	.46	.44	.38	.45	.51	.57	.53	.68	.44	.40	.40	5.72
1958	.38	.46	.49	.43	.56	.51	.58	.42	.37	.38	.33	.35	5.26
1959	.38	.42	.38	.35	.31	.96	1.71	.91	.47	.43	.75	1.09	8.20
1960	.91	.77	.77	.55	.37	.78	1.08	1.68	1.03	.62	.58	.64	9.78

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	42.5	7.49
1951	1208	532	July 21, 1951	27	43.7	0.567	7.68	47.1	8.30
1952	1258, 1508	1,190	July 20, 1952	31	55.2	.716	9.74	55.2	9.74
1953	1278	371	Apr. 10, 1953	31	51.5	.668	9.07	50.2	8.83
1954	1358	1,160	July 3, 1954	34	48.3	.626	8.50	49.9	8.77
1955	1388	2,100	June 2, 1955	25	48.9	.634	8.59	46.3	8.14
1956	1438	1,840	Apr. 2, 1956	27	43.4	.563	7.66	42.5	7.49
1957	1508	522	June 11, 1957	22	32.4	.420	5.72	32.2	5.69
1958	1558	426	Feb. 24, 1958	20	29.9	.388	5.26	29.0	5.11
1959	1628	1,380	Sept. 27, 1959	20	46.6	.604	8.20	53.7	9.47
1960	1708	1,160	June 28, 1960	22	55.3	.717	9.78	-	-

3830. La Crosse River near West Salem, Wis.

Location.--Lat 43°54'05", long 91°07'05", in SE¼ sec.32, T.17 N., R.6 W., on left bank 30 ft upstream from highway bridge, 2 miles west of West Salem, and 6 miles downstream from Dutch Creek.

Drainage area.--398 sq mi.

Records available.--December 1913 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 668.0 ft above mean sea level, adjustment of 1912. Prior to Oct. 19, 1938, chain gage at site 30 ft downstream at same datum.

Average discharge.--46 years (1914-60), 283 cfs.

Extremes.--1913-60: Maximum discharge observed, 8,200 cfs Aug. 6, 1935 (gage height, 12.2 ft), from rating curve extended above 3,000 cfs; minimum, 30 cfs (revised) Sept. 5, 1948 (gage height, 0.45 ft).

Remarks.--Diurnal fluctuation caused by powerplants a few miles above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	193	187	186	169	203	352	554	311	297	338	251	232	273
1952	337	266	234	242	258	411	507	291	340	398	310	215	318
1953	210	235	228	223	217	424	437	332	272	321	341	225	289
1954	221	233	239	198	287	280	280	305	264	367	232	280	265
1955	396	286	250	220	226	295	348	267	456	280	197	180	284
1956	203	210	187	175	149	270	619	305	214	202	202	188	243
1957	184	202	184	183	201	213	218	228	246	199	172	185	199
1958	171	179	192	164	220	207	234	173	161	164	129	162	182
1959	153	176	136	144	136	443	661	274	222	190	250	330	260
1960	320	323	280	245	204	259	307	529	329	258	233	243	295

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.56	0.52	0.54	0.49	0.53	1.02	1.55	0.90	0.83	0.98	0.73	0.65	9.30
1952	.98	.75	.68	.70	.70	1.19	1.42	.84	.95	1.15	.90	.60	10.86
1953	.61	.66	.66	.65	.57	1.23	1.22	.96	.76	.93	.39	.63	9.87
1954	.64	.65	.69	.57	.75	.81	.79	.88	.74	1.06	.67	.78	9.03
1955	1.15	.80	.72	.64	.59	.85	.97	.77	1.28	.81	.57	.50	9.65
1956	.59	.59	.54	.51	.40	.78	1.73	.88	.60	.59	.59	.53	8.33
1957	.53	.57	.53	.47	.53	.62	.61	.65	.69	.58	.50	.52	6.80
1958	.50	.59	.56	.48	.58	.60	.66	.50	.45	.47	.37	.46	6.22
1959	.44	.49	.40	.42	.36	1.28	1.85	.80	.62	.55	.72	.33	8.86
1960	.93	.90	.81	.71	.55	.75	.86	1.53	.92	.75	.68	.68	10.07

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	26 ³	9.15
1951	1208	1,630	Mar. 29, 1951	130	273	0.686	9.30	29 ⁵	10.09
1952	1238	2,470	July 20, 1952	164	318	.799	10.86	30 ⁴	10.58
1953	1278	1,320	Mar. 19, 1953	147	289	.726	9.87	291	9.92
1954	1338	1,730	July 5, 1954	174	265	.666	9.03	285	9.72
1955	1388	3,650	June 3, 1955	153	284	.714	9.65	256	8.70
1956	1438	5,710	Apr. 3, 1956	70	243	.611	8.33	241	8.24
1957	1508	984	Feb. 26, 1957	117	199	.500	6.80	199	6.82
1958	1558	1,310	Feb. 27, 1958	57	182	.457	6.22	173	5.90
1959	1628	3,270	Apr. 1, 1959	98	260	.653	8.86	290	10.17
1960	1708	1,780	May 8, 1960	132	295	.741	10.07	-	-

MISSISSIPPI RIVER MAIN STEM

3835. Mississippi River at La Crosse, Wis.

Location--Lat 43°48'45", long 91°15'25", in sec.31, T.16 N., R.7 W., on left bank 1,300 ft upstream from highway bridge at La Crosse, 0.4 mile downstream from La Crosse River, and at mile 697.8 above Ohio River.

Drainage area--62,800 sq mi, approximately.

Records available--June 1929 to September 1955. Gage-height records collected at same site since 1874 are contained in reports of U.S. Weather Bureau.

Gage--Water-stage recorder. Datum of gage is 626.32 ft above mean sea level, adjustment of 1912. Prior to Feb. 18, 1933, staff gage at same site at datum 0.00 ft lower. Feb. 18, 1933, to Nov. 16, 1934, staff gage and Nov. 17, 1934, to Aug. 15, 1939, water-stage recorder, at same site at datum 0.18 ft lower. Since June 9, 1937, auxiliary water-stage recorder at lock and dam 7, 4.7 miles upstream at datum 600.00 ft above mean sea level, adjustment of 1912.

Average discharge--26 years (1929-55), 27,600 cfs.

Extremes--1929-55: Maximum discharge, 196,000 cfs Apr. 20, 1952 (gage height, 15.32 ft); minimum daily, 3,300 cfs Dec. 30, 31, 1933; minimum gage height, -2.70 ft Aug. 19, 20, 1936, present datum.

Maximum stage known, 16.5 ft June 19, 1880, present datum, from floodmark.

Remarks--Some regulation by reservoirs, navigation dams, and powerplants at low and medium stages. Floodflow not materially affected by artificial storage.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	14,950	11,860	12,670	12,480	13,470	21,780	114,400	72,350	43,020	65,170	27,500	48,350	38,190
1952	39,380	38,970	31,990	24,450	22,000	28,050	143,600	66,630	34,090	58,130	52,020	25,150	47,020
1953	15,520	16,090	14,900	14,070	14,360	39,150	62,830	53,750	63,020	61,690	61,250	24,180	36,870
1954	16,090	17,940	18,250	15,620	18,320	29,140	46,470	92,010	59,120	52,660	21,300	26,190	34,530
1955	36,380	23,720	18,490	15,290	14,850	30,140	57,580	23,750	31,950	26,900	28,100	15,930	26,960

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.27	0.21	0.23	0.23	0.22	0.40	2.03	1.33	0.76	1.20	0.50	0.86	8.24
1952	.72	.69	.59	.45	.38	.51	2.55	1.22	.61	1.07	.95	.45	10.19
1953	.29	.29	.27	.26	.24	.72	1.12	.99	1.12	1.13	1.12	.43	7.98
1954	.30	.32	.34	.29	.30	.53	.83	1.69	1.05	.97	.39	.47	7.48
1955	.67	.42	.34	.28	.25	.55	1.02	.44	.57	.49	.52	.28	5.83

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year			
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches		
		Discharge	Date								
1950	-	-	-	-	-	-	-	30,670	6.61	-	-
1951	1208	184,000	Apr. 19, 1951	8,830	38,190	0.608	8.24	44,140	9.53	-	-
1952	1258	196,000	Apr. 20, 1952	16,900	47,020	.749	10.19	41,680	9.04	-	-
1953	1278	86,900	June 30, 1953	11,100	36,870	.587	7.98	37,350	8.09	-	-
1954	1358	166,000	May 7, 1954	13,800	34,530	.746	7.48	36,740	7.95	-	-
1955	1398	70,500	Apr. 11, 1955	12,000	26,960	.429	5.83	-	-	-	-

ROOT RIVER BASIN

3836. North Branch Root River tributary near Stewartville, Minn.

Location--Lat 43°51'20", long 92°26'50", near center of sec.36, T.105 N., R.14 W., on right bank just upstream from culvert on State Highway 30, 2 miles upstream from mouth and 2 miles east of Stewartville.

Drainage area--0.73 sq mi.

Records available--March 1959 to September 1960.

Gage--Water-stage recorder. Altitude of gage is 1,205 ft (from topographic map).

Extremes--1959-60: Maximum discharge, 328 cfs July 2, 1960 (gage height, 13.47 ft); no flow most of year.

Remarks--Records not previously published.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1959	-	-	-	-	-	2.84	0.71	0	1.31	0.36	1.50	0.78	-
1960	0.68	1.03	0.06	0	0	.15	.52	1.68	.52	1.23	0	0	0.49

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1959	-	-	-	-	-	4.48	1.09	0	2.01	0.57	2.37	1.19	-
1960	1.07	1.57	0.10	0	0	.23	.79	2.65	.79	1.94	0	0	9.14

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year			
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches		
		Discharge	Date								
1959	-	164	June 25, 1959	0	-	-	-	-	-	-	-
1960	-	328	July 2, 1960	0	0.49	0.671	9.14	-	-	-	-

a Maximum discharge during period March to September.

Note.--Records not previously published.

3840. Root River near Lanesboro, Minn.

Location.--Lat 43°44'58", long 91°58'43", in sec.1, T.103 N., R.10 W., on left bank half a mile upstream from highway bridge, $1\frac{1}{4}$ miles upstream from South Branch, and $\frac{3}{4}$ miles northeast of Lanesboro.

Drainage area.--615 sq mi.

Records available.--February to November 1910, February 1911 to September 1914, July 1915 to September 1917, August 1940 to September 1960. Published as North Branch Root River near Lanesboro, 1910-17.

Gage.--Water-stage recorder. Datum of gage is 791.84 ft above mean sea level, adjustment of 1912. Prior to Oct. 1, 1917, chain gage at site half a mile downstream at datum about 1.5 ft higher.

Average discharge.--25 years (1911-14, 1915-17, 1940-60), 324 cfs.

Extremes.--1910-17, 1940-60: Maximum discharge, 20,500 cfs Mar. 27, 1950 (gage height, 15.55 ft); minimum, 29 cfs Aug. 27, 1949 (gage height, 1.08 ft).

Remarks.--Diurnal fluctuation at times during medium and low flow caused by powerplant above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	75.8	67.8	62.6	63.4	73.7	195	1,990	323	524	860	440	215	407
1952	258	294	225	149	160	1,019	1,631	314	521	371	384	182	459
1953	148	141	142	124	117	587	349	772	493	684	1,056	224	407
1954	178	175	157	143	196	217	227	393	745	253	205	172	255
1955	223	185	168	144	143	507	299	180	207	188	107	92.0	204
1956	104	100	84.2	93.0	90.1	235	572	274	189	243	147	93.9	185
1957	95.4	96.9	84.5	85.4	158	161	108	127	131	374	215	109	146
1958	92.9	121	75.5	86.2	190	144	163	104	743	120	89.4	86.7	167
1959	72.6	75.6	58.8	51.5	56.7	608	656	131	696	298	407	248	280
1960	191	247	217	189	129	367	394	694	586	625	255	191	342

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.14	0.12	0.12	0.12	0.12	0.37	3.61	0.60	0.95	1.61	0.82	0.39	8.97
1952	.48	.53	.42	.28	.28	1.91	2.96	.59	.95	.69	.72	.33	10.14
1953	.28	.26	.27	.23	.20	1.10	.63	1.45	.89	1.28	1.98	.41	8.98
1954	.33	.32	.30	.27	.33	.41	.41	.74	1.35	.47	.38	.31	5.82
1955	.42	.34	.32	.27	.24	.95	.54	.34	.38	.35	.20	.17	4.52
1956	.19	.18	.16	.17	.16	.44	1.04	.51	.34	.45	.28	.17	4.09
1957	.18	.18	.16	.16	.27	.30	.20	.24	.24	.70	.40	.20	3.23
1958	.17	.22	.14	.16	.32	.27	.30	.19	1.35	.23	.17	.16	3.68
1959	.14	.14	.11	.10	.10	1.14	1.19	.25	1.26	.56	.76	.45	6.20
1960	.36	.45	.41	.35	.23	.69	.71	1.30	1.06	1.17	.48	.35	7.56

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year			
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches		
		Discharge	Date								
1950	-	-	-	-	-	-	-	288	6.34	-	-
1951	1208	16,400	July 21, 1951	52	407	0.662	8.97	455	10.02	-	-
1952	1238	20,400	Mar. 31, 1952	137	459	.745	10.14	430	9.52	-	-
1953	1278	8,570	July 26, 1953	110	407	.662	8.98	413	9.12	-	-
1954	1338	4,090	June 19, 1954	129	255	.415	5.62	260	5.75	-	-
1955	1388	4,090	Mar. 10, 1955	82	204	.332	4.52	160	3.97	-	-
1956	1438	5,430	Apr. 2, 1956	78	185	.301	4.09	164	4.08	-	-
1957	1508	4,530	July 21, 1957	76	146	.237	3.23	147	3.24	-	-
1958	1558	17,900	June 5, 1958	60	167	.272	3.68	120	3.54	-	-
1959	1628	8,170	June 26, 1959	50	280	.455	6.20	318	7.03	-	-
1960	1708	8,100	July 3, 1960	113	342	.556	7.56	-	-	-	-

3845. Rush Creek near Rushford, Minn.

Location.--Lat 43°50'00", long 91°46'40", on line between secs. 3 and 10, T.104 N., R.8 W., on downstream side near center of span of highway bridge, 1½ miles northwest of Rushford and 3 miles upstream from mouth.

Drainage area.--129 sq mi.

Records available.--August 1942 to September 1960.

Gage.--Chain gage. Datum of gage is 735.00 ft above mean sea level, adjustment of 1912. Prior to June 14, 1950, water-stage recorder at site 100 ft upstream; at datum 5 ft higher, Aug. 5, 1942, to Oct. 27, 1945; at datum 3 ft higher, Oct. 28, 1945, to Aug. 3, 1949; at present datum thereafter.

Average discharge.--18 years (1942-60), 53.8 cfs.

Extremes.--1942-60: Maximum discharge, 11,600 cfs Mar. 26, 1950 (gage height, 13.54 ft, from floodmark), from rating curve extended above 1,400 cfs on basis of contracted-opening measurements at gage heights 11.0 and 13.5 ft; minimum, 17 cfs May 22, 1959; minimum gage height, 3.09 ft Apr. 1, 1960.

Flood of June 28, 29, 1942, reached a discharge of 11,000 cfs (by slope-area measurement of peak flow).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	31.1	32.5	30.3	32.7	31.6	44.7	63.6	40.0	49.8	142	55.0	28.4	48.7
1952	53.5	40.4	33.9	38.6	38.5	199	168	52.3	78.6	69.0	59.2	45.2	73.0
1953	44.2	38.8	36.4	38.6	34.7	57.1	49.4	79.4	59.2	148	78.8	52.8	60.0
1954	51.9	50.3	53.9	43.9	61.1	55.7	47.1	50.8	65.2	51.5	48.8	47.6	52.1
1955	51.5	44.3	43.1	37.6	38.4	75.1	57.6	47.5	42.0	48.0	37.1	34.9	46.5
1956	35.4	36.2	39.0	38.8	40.1	49.0	105	49.5	39.5	37.3	36.1	32.6	44.8
1957	31.8	33.1	39.6	39.5	81.4	37.0	34.0	35.0	41.6	55.9	40.8	37.3	41.9
1958	31.2	33.1	32.0	31.4	51.1	35.7	35.5	36.2	31.5	31.1	28.6	30.2	33.7
1959	31.3	31.5	29.2	25.9	32.2	169	87.1	39.8	68.5	36.5	62.0	48.6	55.3
1960	39.1	40.2	41.0	37.3	36.5	81.8	37.3	48.3	65.4	73.1	62.8	45.8	50.8

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.28	0.28	0.27	0.29	0.26	0.40	0.55	0.36	0.43	1.27	0.49	0.25	5.13
1952	.48	.35	.30	.34	.32	1.78	1.44	.47	.68	.62	.53	.39	7.70
1953	.39	.34	.33	.35	.28	.51	.43	.71	.51	1.33	.69	.46	6.33
1954	.46	.43	.48	.39	.47	.50	.41	.45	.56	.46	.42	.41	5.48
1955	.46	.38	.38	.34	.31	.67	.50	.42	.36	.43	.33	.30	4.88
1956	.32	.31	.35	.35	.34	.44	.90	.44	.34	.33	.32	.28	4.72
1957	.28	.29	.35	.34	.66	.33	.29	.31	.36	.50	.36	.32	4.39
1958	.28	.29	.29	.28	.41	.30	.31	.32	.27	.28	.26	.26	3.55
1959	.28	.27	.26	.23	.26	1.51	.75	.36	.59	.33	.55	.42	5.81
1960	.35	.35	.37	.33	.31	.73	.32	.43	.57	.65	.56	.40	5.37

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	63.8	6.72
1951	1208	6,580	July 21, 1951	19	48.7	0.378	5.13	51.5	5.43
1952	1238	6,740	Mar. 31, 1952	22	73.0	.568	7.70	72.3	7.63
1953	1278	3,750	July 26, 1953	31	60.0	.465	6.33	63.0	6.64
1954	1338	920	June 19, 1954	32	52.1	.404	5.46	50.6	5.31
1955	1388	1,180	July 8, 1955	26	46.5	.380	4.88	44.1	4.64
1956	1438	1,390	Apr. 3, 1956	30	44.8	.347	4.72	44.3	4.66
1957	1508	1,980	Feb. 24, 1957	27	41.9	.325	4.39	41.2	4.33
1958	1558	420	Feb. 25, 1958	23	33.7	.261	3.55	33.3	3.50
1959	1628	2,000	Mar. 24, 1959	21	55.3	.429	5.81	57.7	6.07
1960	1708	3,460	July 3, 1960	30	50.8	.394	5.37	-	-

3850. Root River near Houston, Minn.

Location.--Lat 43°46'05", long 91°35'11", in sec.32, T.104 N., R.6 W., on right bank 1 mile west of Houston and 2½ miles upstream from South Fork.

Drainage area.--1,270 sq mi, approximately.

Records available.--May 1909 to September 1917, May to November 1929, March 1930 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 671.86 ft above mean sea level, datum of 1929. May 28, 1909, to Sept. 30, 1917, staff gage at site 1½ miles downstream at different datum. May 4, 1929, to Sept. 27, 1933, chain gage at present site and datum.

Average discharge.--38 years (1909-17, 1930-60), 648 cfs.

Extremes.--1909-17, 1929-60: Maximum discharge, 37,000 cfs Apr. 1, 1952 (gage height, 13.90 ft); maximum gage height, 14.9 ft Mar. 11, 1936 (backwater from ice); minimum discharge, 65 cfs Dec. 26, 1933, Feb. 25, 1935.

Remarks.--Slight diurnal fluctuation at low flows caused by powerplants above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	240	229	221	215	225	448	3,004	679	853	1,628	1,006	508	772
1952	575	625	515	417	427	1,509	3,361	711	858	778	679	416	904
1953	373	368	335	346	381	1,038	614	1,271	961	1,406	1,998	585	812
1954	511	475	421	399	544	484	491	718	1,300	680	589	494	591
1955	646	467	434	441	378	923	649	476	484	490	324	299	502
1956	299	278	263	261	257	643	1,270	559	437	461	374	285	449
1957	270	295	239	229	454	491	309	321	326	619	400	296	354
1958	271	288	229	258	416	360	354	278	887	294	231	246	341
1959	213	234	189	172	168	1,161	1,499	339	1,046	632	765	575	583
1960	455	546	491	409	292	775	783	1,198	992	988	680	538	691

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.22	0.20	0.20	0.20	0.18	0.41	2.64	0.62	0.75	1.48	0.91	0.45	8.26
1952	.52	.55	.47	.38	.36	1.37	2.95	.65	.75	.71	.62	.37	9.70
1953	.34	.32	.30	.31	.31	.94	.54	1.15	.84	1.28	1.81	.51	8.65
1954	.46	.41	.38	.36	.45	.44	.43	.65	1.14	.62	.53	.43	6.30
1955	.59	.41	.39	.40	.31	.84	.57	.43	.43	.44	.29	.26	5.36
1956	.27	.24	.24	.24	.22	.58	1.12	.51	.38	.42	.34	.25	4.81
1957	.25	.26	.22	.21	.37	.45	.27	.29	.29	.56	.36	.26	3.79
1958	.25	.25	.21	.23	.34	.33	.31	.25	.78	.27	.21	.22	3.65
1959	.19	.21	.17	.16	.14	1.05	1.32	.31	.92	.57	.69	.50	6.23
1960	.41	.48	.45	.37	.25	.70	.69	1.09	.87	.90	.62	.47	7.30

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches	
		Discharge	Date							
1950	-	-	-	-	-	-	-	614	6.57	
1951	1208	14,800	July 22, 1951	195	772	0.608	8.26	858	9.18	
1952	1238	37,000	Apr. 1, 1952	361	904	.712	9.70	851	9.12	
1953	1278	10,400	July 27, 1953	290	812	.639	8.65	839	8.94	
1954	1538	5,370	June 21, 1954	262	591	.465	6.30	603	6.44	
1955	1398	3,760	Mar. 10, 1955	291	502	.395	5.36	443	4.72	
1956	1438	9,660	Apr. 3, 1956	170	449	.354	4.81	446	4.79	
1957	1508	2,230	July 22, 1957	200	354	.279	3.79	352	3.77	
1958	1558	9,600	June 6, 1958	180	341	.269	3.65	328	3.51	
1959	1628	10,100	June 27, 1959	150	583	.459	6.23	655	7.00	
1960	1708	8,800	Aug. 29, 1960	256	681	.536	7.30	-	-	

3855. South Fork Root River near Houston, Minn.

Location.--Lat 43°44', long 91°34', in NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.9, T.103 N., R.6 W., on left bank 50 ft downstream from bridge on State Highway 76, half a mile upstream from Badger Creek, and $1\frac{1}{2}$ miles south of Houston.

Drainage area.--275 sq mi.

Records available.--January 1953 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 680.41 ft above mean sea level, datum of 1929.

Average discharge.--7 years (1953-60), 119 cfs.

Extremes.--1953-60: Maximum discharge, 5,270 cfs (revised) Mar. 28, 1960 (gage height, 12.30 ft); minimum daily, 44 cfs Jan. 17-21, 1959.
Flood of Mar. 26, 1950, reached a stage of 12.61 ft, from floodmarks.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	110	100	197	168	161	212	263	278	133	-
1954	119	116	115	106	130	115	114	149	153	140	127	114	125
1955	158	117	110	103	128	241	125	119	117	156	123	94.0	133
1956	87.9	88.1	86.8	88.4	110	265	342	136	103	106	98.2	82.7	133
1957	77.5	86.6	87.7	83.4	137	118	77.6	81.3	92.5	200	114	84.9	103
1958	73.5	76.9	78.1	76.3	115	76.7	78.7	72.1	71.8	63.6	60.5	63.6	75.3
1959	64.1	67.3	53.9	45.4	57.1	377	417	108	150	88.6	169	124	144
1960	85.5	95.1	82.7	74.3	78.7	*258	113	125	114	167	135	98.6	*119

* Revised.

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	0.46	0.38	0.82	0.68	0.68	0.86	1.10	1.17	0.54	-
1954	0.50	0.47	0.48	.44	.49	.48	.46	.63	.62	.59	.53	.46	6.15
1955	.66	.47	.46	.43	.49	1.01	.51	.50	.47	.66	.51	.38	6.55
1956	.37	.36	.36	.37	.43	1.11	1.39	.57	.42	.44	.41	.34	6.57
1957	.32	.35	.37	.35	.52	.49	.31	.34	.38	.84	.48	.34	5.09
1958	.31	.31	.33	.32	.43	.32	.32	.30	.29	.27	.25	.26	3.71
1959	.27	.27	.23	.19	.22	1.58	1.69	.45	.61	.37	.71	.50	7.09
1960	.36	.39	.35	.31	.31	*1.08	.46	.53	.46	.70	.57	.40	*5.92

* Revised.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-
1953	1278, 1388	2,580	July 27, 1953	-	-	-	-	165	9.14
1954	1338	878	May 1, 1954	91	125	0.455	6.15	128	6.29
1955	1388	2,050	July 9, 1955	80	133	.484	6.55	122	6.05
1956	1438	*4,580	Apr. 3, 1956	71	133	.484	6.57	132	6.52
1957	1508	2,110	July 17, 1957	72	103	.375	5.09	101	5.00
1958	1558	694	Feb. 26, 1958	57	75.3	.274	3.71	71.6	3.53
1959	1628	*4,010	Mar. 25, 1959	44	144	.524	7.09	150	7.42
1960	1708	*5,270	Mar. 28, 1960	57	*119	*.433	*5.92	-	-

* Revised.

3860. Root River below South Fork, near Houston, Minn.

Location.--Lat 43°46'13", long 91°32'03", in SE 1/4 sec. 34, T.104 N., R.6 W., on right bank 600 ft downstream from South Fork and 1 1/2 miles northeast of Houston.

Drainage area.--1,560 sq mi, approximately.

Records available.--March 1938 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 660.00 ft above mean sea level, adjustment of 1912. Prior to Oct. 1, 1938, chain gage and high-water staff gage at present site at datum 60.00 ft lower. Oct. 1, 1938, to Oct. 2, 1950, chain gage and high-water staff gage at present site and datum.

Average discharge.--22 years (1938-60), 801 cfs.

Extremes.--1938-60: Maximum discharge, 38,700 cfs Apr. 1, 1952 (gage height, 17.58 ft), from rating curve extended above 13,000 cfs; minimum, 197 cfs Nov. 23, 1950.

Remarks.--Slight diurnal fluctuation at low flows caused by powerplants above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	356	313	303	286	299	627	3,362	908	1,030	2,241	1,170	669	963
1952	778	712	595	540	542	1,603	3,571	912	1,087	929	823	559	1,052
1953	501	466	429	457	486	1,249	788	1,447	1,191	1,661	2,292	724	980
1954	635	607	554	507	690	636	622	883	1,525	860	753	609	739
1955	820	591	545	551	511	1,224	786	608	630	672	450	397	650
1956	397	376	359	365	371	948	1,650	727	588	626	493	375	605
1957	365	397	344	331	611	602	404	406	421	835	547	413	473
1958	358	370	309	341	534	442	431	347	936	372	297	318	418
1959	281	301	239	210	227	1,532	1,851	465	1,237	737	920	710	727
1960	542	644	556	481	371	984	913	1,338	1,146	1,163	824	638	802

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.25	0.22	0.22	0.21	0.20	0.46	2.40	0.67	0.74	1.66	0.86	0.48	8.37
1952	.57	.51	.44	.40	.37	1.18	2.55	.67	.78	.69	.61	.40	9.17
1953	.37	.33	.32	.34	.32	.92	.56	1.07	.85	1.23	1.69	.52	8.52
1954	.47	.43	.41	.37	.46	.47	.44	.65	1.09	.64	.56	.44	6.43
1955	.61	.42	.40	.41	.34	.90	.56	.45	.45	.50	.33	.28	5.65
1956	.29	.27	.27	.27	.26	.70	1.18	.54	.42	.46	.36	.27	5.29
1957	.27	.28	.25	.24	.41	.44	.29	.30	.30	.62	.40	.30	4.10
1958	.25	.26	.23	.25	.36	.33	.31	.26	.67	.28	.22	.23	3.65
1959	.21	.22	.18	.16	.15	1.13	1.32	.34	.88	.54	.68	.51	6.32
1960	.40	.46	.41	.36	.26	.73	.65	.99	.82	.86	.61	.46	7.01

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	874	7.58
1951	1208	32,400	July 21, 1951	260	963	0.617	8.37	1,058	9.20
1952	1238	38,700	Apr. 1, 1952	490	1,052	.674	9.17	995	8.67
1953	1278	10,800	July 27, 1953	395	980	.628	8.52	1,014	8.81
1954	1338	6,310	June 21, 1954	386	739	.474	6.43	753	6.55
1955	1388	5,880	Mar. 10, 1955	378	650	.417	5.65	581	5.05
1956	1438	11,200	Apr. 3, 1956	285	605	.388	5.29	603	5.26
1957	1508	3,240	July 22, 1957	285	473	.303	4.10	465	4.04
1958	1558	9,690	June 6, 1958	265	418	.268	3.65	401	3.52
1959	1628	11,500	Mar. 25, 1959	200	727	.466	6.32	804	6.98
1960	1708	9,420	Mar. 28, 1960	339	802	.514	7.01	-	-

3875. Upper Iowa River at Decorah, Iowa

Location.--Lat 43°18'20", long 91°48'05", in NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.16, T.98 N., R.8 W., on right bank 1,200 ft upstream from bridge on State Highway 52, 1,500 ft downstream from Dry Run cutoff, and 3 miles upstream from Trout Run.

Drainage area.--511 sq mi.

Records available.--August 1951 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 850.00 ft above mean sea level, datum of 1929.

Average discharge.--9 years (1951-60), 231 cfs.

Extremes.--1951-60: Maximum discharge, 11,600 cfs (revised) June 21, 1954 (gage height, 10.12 ft); minimum daily, 22 cfs Feb. 2-7, 1959.
Maximum flood known, probably since at least 1913, occurred May 29, 1941, at site of former gaging station near Decorah, 4 miles downstream (discharge, 28,500 cfs).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	228	-
1952	322	263	194	155	237	1,084	1,029	313	207	166	154	87.8	351
1953	73.6	70.8	63.6	69.0	71.0	494	346	390	517	673	1,353	190	363
1954	139	123	99.6	56.6	117	90.6	162	387	1,025	234	339	175	245
1955	378	179	127	91.5	109	423	366	225	234	171	102	66.1	207
1956	68.9	57.9	47.3	52.2	55.1	477	601	272	152	134	107	69.9	175
1957	49.6	60.1	49.4	41.8	60.4	150	89.6	92.4	158	362	167	169	121
1958	77.7	113	117	78.5	170	144	185	81.6	64.5	53.0	44.8	39.6	96.7
1959	37.2	48.0	40.2	25.7	25.2	621	667	165	237	205	178	247	208
1960	169	263	231	186	111	326	383	691	538	299	290	249	312

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	0.50	-
1952	0.73	0.58	0.44	0.35	0.50	2.45	2.25	0.71	0.45	0.38	0.35	.19	9.38
1953	.17	.15	.14	.16	.14	1.12	.76	.88	1.13	1.52	3.05	.42	9.64
1954	.31	.27	.22	.13	.24	.20	.35	.87	2.24	.53	.76	.38	6.50
1955	.85	.39	.29	.21	.22	.95	.80	.51	.51	.39	.23	.14	5.49
1956	.16	.13	.11	.12	.12	1.08	1.31	.61	.33	.30	.24	.15	4.66
1957	.11	.13	.11	.09	.12	.34	.20	.21	.35	.82	.39	.37	3.23
1958	.18	.25	.26	.18	.33	.40	.18	.14	.12	.11	.09	.258	2.58
1959	.08	.10	.09	.06	.05	1.40	1.46	.37	.52	.46	.40	.54	5.53
1960	.38	.58	.52	.42	.23	.74	.84	1.56	1.18	.68	.65	.54	8.32

Yearly discharge, in cubic feet per second

Year	WSF	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	1278	-	-	-	-	-	-	-	-
1952	1278	8,850	Mar. 31, 1952	74	351	0.687	9.38	303	8.09
1953	1278	*10,000	Aug. 3, 1953	50	363	.710	9.64	375	9.98
1954	1338	*11,600	June 21, 1954	41	245	.479	6.50	273	7.23
1955	1398	1,700	Aug. 1, 1955	57	207	.405	5.49	164	4.36
1956	1438	5,500	Mar. 28, 1956	36	175	.342	4.66	173	4.61
1957	1508	8,000	July 16, 1957	26	121	.237	3.23	154	3.57
1958	1558	1,200	Feb. 26, 1958	35	96.7	.189	2.58	81.4	2.16
1959	1628	5,400	Apr. 1, 1959	22	208	.407	5.53	254	6.74
1960	1708	5,880	(a)	70	312	.611	8.32	-	-

* Revised.

a Mar. 30, July 22, 1960.

3880. Upper Iowa River near Decorah, Iowa

Location.--Lat 43°18'20", long 91°45'00", in NE¼SE¼ sec.14, T.98 N., R.8 W., 500 ft upstream from highway bridge in Freeport, 1.2 miles downstream from Trout Run, and 3 miles downstream from Decorah.

Drainage area.--568 sq mi (revised).

Records available.--September 1913 to October 1914, June 1919 to September 1927, July 1933 to September 1951 (discontinued). Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 829.8 ft above mean sea level, datum of 1929 (Winnishiek County bench mark). Aug. 27, 1913, to Nov. 21, 1914, May 12, 1919, to Aug. 27, 1920, chain gage 500 ft downstream at datum 3.96 ft lower. Aug. 28, 1920, to June 30, 1927, water-stage recorder at present site and datum. July 1, 1933, to Oct. 29, 1936, staff gage 4 miles downstream at different datum.

Average discharge.--27 years (1913-14, 1919-27, 1933-51), 331 cfs.

Extremes.--1913-14, 1919-27, 1933-51: Maximum discharge, 28,500 cfs May 29, 1941 (gage height, 15.19 ft), from rating curve extended above 12,000 cfs on basis of slope-area measurement of peak flow; minimum daily, 10 cfs (regulated, at site then in use) on many days in 1933-34.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	93.1	69.5	75.6	76.0	123	631	2,744	620	751	610	779	262	567

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.19	0.14	0.15	0.15	0.23	1.28	5.39	1.26	1.44	1.24	1.58	0.52	13.57

Yearly discharge, in cubic feet per second

Runoff characteristics at gauge 5000 per second									
Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	371	8.85
1951	1208	9,900	Apr. 7, 1951	15	567	1.00	13.57	-	-

PAINT CREEK BASIN

3885. Paint Creek at Waterville, Iowa

Location.--Lat 43°12'35", long 91°18'20", in NW¼NW¼ sec.22, T.97 N., R.4 W., on right bank 20 ft downstream from bridge on State Highway 373 and 0.5 mile northwest of Waterville.

Drainage area.--42.8 sq mi.

Records available.--October 1952 to September 1960.

Gage.--Water-stage recorder and concrete control.

Average discharge.--8 years (1952-60), 13.7 cfs.

Extremes.--Maximum discharge, 2,840 cfs July 26, 1953 (gage height, 8.53 ft), from rating curve extended above 1,200 cfs by logarithmic plotting; minimum daily, 1.1 cfs for several days in August and September 1958.

Flood in August 1951 reached a stage of 17.35 ft from floodmarks by local resident (discharge not determined). A higher stage may have occurred during the spring of 1949.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	#10.8	#9.89	9.67	8.40	10.7	39.9	22.0	21.3	18.3	44.3	34.1	13.9	#20.4
1953	13.7	18.9	12.4	7.43	16.5	10.0	20.8	26.3	25.9	14.9	10.2	8.99	15.5
1954	14.8	8.64	6.94	5.78	11.1	28.8	13.0	12.0	19.9	22.8	7.28	6.17	13.1
1955	6.05	5.80	5.36	4.65	4.23	61.7	12.5	20.2	5.08	7.48	9.09	4.16	12.3
1956	3.57	3.67	3.01	6.35	5.11	9.51	6.08	4.71	34.8	19.1	7.26	5.44	9.05
1957	2.90	2.86	3.80	2.62	19.6	4.58	4.05	2.46	2.45	2.12	1.65	1.70	4.10
1958	1.86	1.96	1.77	1.30	1.50	108	46.5	14.4	22.1	9.47	10.3	17.0	19.8
1960	4.05	10.2	7.01	11.3	6.02	46.8	11.0	35.7	15.0	19.7	10.5	8.58	15.6

* Not previously published; partly estimated on basis of records for nearby stations.

PAINT CREEK BASIN

Monthly and yearly runoff, in inches, of Paint Creek at Waterville, Iowa

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	±0.29	±0.26	0.26	0.23	0.26	1.08	0.57	0.57	0.48	1.19	0.93	0.36	±6.47
1954	.37	.49	.33	.20	.40	.27	.54	.71	.68	.40	.27	.23	4.89
1955	.40	.23	.19	.16	.27	.78	.54	.32	.52	.61	.20	.16	4.18
1956	.16	.15	.14	.13	.11	1.66	.33	.55	.13	.20	.24	.11	3.91
1957	.10	.10	.08	.17	.12	.26	.16	.13	.91	.52	.20	.14	2.89
1958	.08	.07	.10	.07	.48	.12	.11	.07	.06	.06	.04	.04	1.30
1959	.05	.05	.05	.04	.04	2.92	1.21	.39	.58	.26	.28	.44	6.31
1960	.11	.27	.19	.30	.15	1.26	.29	.96	.59	.53	.28	.22	4.95

* Not previously published; see footnote to preceding table.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-
1953	1278	2,840	July 26, 1953	7.4	±20.4	±0.477	±6.47	21.6	6.85
1954	1338	1,300	May 1, 1954	5.0	15.5	.362	4.89	14.3	4.52
1955	1388	930	(a)	4.2	13.1	.306	4.18	12.0	3.81
1956	1438	1,210	May 6, 1956	3.0	12.3	.287	3.91	11.7	3.74
1957	1508	2,650	June 17, 1957	2.2	9.05	.211	2.89	8.99	2.86
1958	1558	1,030	Feb. 24, 1958	1.1	4.10	.096	1.30	3.77	1.20
1959	1628	2,710	June 28, 1959	1.2	19.8	.483	6.31	21.1	6.73
1960	1708	2,710	Mar. 27, 1960	2.6	15.6	.364	4.95	-	-

* Not previously published.
a Oct. 14, 1954, July 4, 1955.

YELLOW RIVER BASIN

3890. Yellow River at Ion, Iowa

Location.--Lat 43°06'35", long 91°15'55", in SE¼SW¼ sec.24, T.96 N., R.4 W., on downstream side of highway bridge at Ion, 7.5 miles northwest of McGregor, and 8.0 miles upstream from mouth.

Drainage area.--221 sq mi (revised).

Records available.--October 1934 to September 1951. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Wire-weight and crest-stages. Datum of gage is 664.65 ft above mean sea level, adjustment of 1912.

Average discharge.--17 years (1934-51), 140 cfs.

Extremes.--1934-51: Maximum discharge, 21,200 cfs May 29, 1941 (gage height, 15.2 ft, from floodmarks), from rating curve extended above 7,300 cfs on basis of slope-area measurement of peak flow; minimum observed, 14 cfs Dec. 30, 31 (corrected), 1939.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	49.7	42.2	47.3	31.8	256	572	757	206	172	325	266	133	238

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.26	0.21	0.25	0.17	1.21	2.98	3.82	1.07	0.87	1.69	1.39	0.67	14.59

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	186	11.40
1951	1208	10,500	Apr. 7, 1951	29	238	1.08	14.59	-	-

3895. Mississippi River at McGregor, Iowa

Location.--Lat 43°01'30", long 91°10'20", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.22, T.95 N., R.3 W., on right bank in city park at north end of Main Street in McGregor, 2.6 miles upstream from Wisconsin River, 4.3 miles downstream from Yellow River, and at mile 633.4 upstream from Ohio River.

Drainage area.--67,500 sq mi, approximately.

Records available.--August 1936 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 605.30 ft above mean sea level, adjustment of 1912. Prior to June 1, 1937, and since June 2, 1939, auxiliary water-stage recorder; June 1, 1937, to June 1, 1939, auxiliary staff gage 14.1 miles upstream in tailwater of dam 9, at datum 5.30 ft lower.

Average discharge.--24 years (1936-60), 32,200 cfs.

Extremes.--1936-60: Maximum daily discharge, 197,500 cfs Apr. 22, 1952; maximum gage height, 20.89 ft Apr. 23, 1952; minimum daily discharge, 6,200 cfs Dec. 9, 1936; minimum gage height, -0.86 ft Aug. 18, 1936.
Maximum stage known, about 21.0 ft in June 1880.

Remarks.--Stage-discharge relation affected by backwater from Wisconsin River and dam 10. Flow regulated by reservoirs and navigation dams.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	16,720	14,010	14,870	14,350	15,740	25,410	113,600	80,920	48,110	71,460	33,310	51,280	41,700
1952	44,440	42,730	33,460	26,300	23,890	32,580	142,000	76,660	38,380	57,650	57,420	27,640	50,270
1953	15,780	16,390	16,940	16,340	16,680	40,820	69,390	56,590	63,890	67,540	66,940	26,640	39,630
1954	17,470	19,520	19,950	17,770	20,700	29,610	46,150	100,400	59,150	55,470	21,580	27,180	36,360
1955	37,750	24,110	20,840	17,160	16,920	33,210	59,760	24,750	35,170	29,510	30,720	17,580	28,980
1956	17,240	17,790	17,050	14,480	14,520	21,120	83,750	37,850	34,220	27,520	32,700	15,540	27,780
1957	12,490	19,700	14,620	13,590	12,740	26,590	42,450	32,880	38,440	72,210	34,520	33,050	29,530
1958	22,620	26,970	19,710	16,170	15,510	25,050	40,740	21,030	26,170	32,210	12,860	18,850	23,160
1959	12,760	16,690	11,580	10,210	10,360	24,870	32,090	31,160	29,220	25,900	19,810	33,630	21,540
1960	32,730	22,790	19,450	20,780	14,590	19,320	60,150	75,300	54,870	24,740	15,600	28,770	32,420

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.29	0.23	0.25	0.25	0.24	0.43	1.88	1.38	0.80	1.22	0.57	0.85	8.39
1952	.76	.71	.57	.45	.38	.56	2.35	1.31	.63	.98	.98	.46	10.14
1953	.27	.27	.29	.28	.26	.70	1.15	.97	1.06	1.15	1.14	.44	7.98
1954	.30	.32	.34	.30	.32	.51	.76	1.72	.98	.95	.37	.45	7.32
1955	.64	.40	.36	.29	.26	.57	.99	.42	.58	.50	.52	.29	5.82
1956	.29	.29	.29	.25	.23	.36	1.38	.65	.57	.47	.56	.26	5.60
1957	.21	.33	.25	.23	.20	.45	.70	.56	.64	1.23	.59	.55	5.94
1958	.39	.45	.34	.28	.24	.43	.67	.36	.43	.55	.22	.31	4.67
1959	.22	.48	.20	.17	.16	.42	.53	.53	.48	.44	.34	.56	4.33
1960	.56	.38	.33	.35	.23	.33	.99	1.29	.91	.42	.27	.48	6.54

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	33,690	6.82
1951	1208	185,700	Apr. 22, 1951	9,900	41,700	0.618	8.39	47,990	9.66
1952	1238	197,500	Apr. 22, 1952	17,200	50,270	.745	10.14	44,290	8.95
1953	1278	86,200	July 3, 1953	13,500	39,630	.587	7.98	40,290	8.11
1954	1358	165,500	May 9, 1954	13,700	36,360	.539	7.32	38,530	7.76
1955	1388	73,700	Apr. 14, 1955	13,100	28,980	.429	5.82	26,400	5.29
1956	1438	105,000	Apr. 15, 1956	12,800	27,780	.412	5.60	27,350	5.52
1957	1508	95,800	July 8, 1957	10,200	29,530	.437	5.94	31,420	6.33
1958	1558	55,800	Apr. 14, 1958	9,300	23,160	.343	4.67	20,790	4.19
1959	1628	72,300	Apr. 3, 1959	8,640	21,540	.319	4.33	24,400	4.90
1960	1708	83,100	June 4, 1960	10,500	32,420	.480	6.54	-	-

3901. Lac Vieux Desert near Land O'Lakes, Wis.

Location.--Lat 46°07'20", long 89°09'10", in SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.17, T.42 N., R.11 E., head of Wisconsin River, 5 miles southeast of village of Land O'Lakes.

Drainage area.--28 sq mi, approximately.

Records available.--September 1938 to September 1960. January 1920 to September 1960, gage heights and contents, at weekly intervals, in files of Geological Survey.

Gage.--Staff gage. Datum of gage is 1,679.53 ft above mean sea level, datum of 1929.

Extremes.--1938-60: Maximum contents on last day of month, 556,000,000 cu ft Apr. 30, 1951 (gage height, 2 ft 6 $\frac{1}{2}$ in.) by capacity table now in use, 504,000,000 cu ft by capacity table in use at the time; no usable contents at times.

Remarks.--Dam was completed in 1870. Reservoir operation began in 1908. Usable capacity 652,000,000 cu ft between gage heights -0 ft 2 in. and 3 ft 0 in. (limits stipulated by Public Service Commission of Wisconsin). New capacity table put in use Oct. 1, 1955. Records prior to October 1955 published with other reservoir records showing change in contents of the group.

Contents, in millions of cubic feet, on last day of month												
Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	251	280	270	236	234	261	504	442	451	413	436	438
1952	453	444	407	343	257	188	290	286	339	411	319	184
1953	95	44	16	0	42	92	238	341	442	413	380	284
1954	174	112	98	60	22	90	358	396	419	403	373	356
1955	341	214	90	10	25	29	238	286	263	312	304	218
1956	al89	108	52	2	50	68	165	238	314	350	361	316
1957	227	216	174	104	64	74	208	210	212	165	165	165
1958	96	66	6	8	8	38	126	134	176	227	197	161
1959	104	84	40	4	2	58	124	152	136	106	178	352
1960	418	327	263	182	120	72	393	446	424	399	424	299

a Contents by capacity table used beginning Oct. 1, 1955; contents Oct. 31, 1955, by capacity table used prior to Oct. 1, 1955, was 154,000,000 cu ft.

3901.5. Twin Lakes near Phelps, Wis.

Location.--Lat 46°01'20", long 89°10'10", in SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.19, T.41 N., R.11 E., on Twin River 5 miles southwest of Phelps.

Drainage area.--26 sq mi, approximately.

Records available.--September 1938 to September 1960. January 1920 to September 1960, gage heights and contents, at weekly intervals, in files of Geological Survey.

Gage.--Staff gage. Altitude of gage is 1,640 ft (from river-profile map).

Extremes.--1938-60: Maximum contents on last day of month, 330,000,000 cu ft Apr. 30 1947 (gage height, 2 ft 5 $\frac{1}{2}$ in.) by capacity table now in use, 317,000,000 cu ft by capacity table in use at the time; no usable contents at times.

Remarks.--Reservoir operation began in 1908. Reservoir includes North and South Twin Lakes. Usable capacity Oct. 1 to May 31, 313,000,000 cu ft between gage heights 0 ft 4 in. and 2 ft 4 in. and June 1 to Sept. 30, 261,000,000 cu ft between gage heights 0 ft 8 in. and 2 ft 4 in. (limits stipulated by Public Service Commission of Wisconsin). New capacity table put in use Oct. 1, 1955. Records prior to October 1955 published with other reservoir records showing change in contents of the group.

Contents, in millions of cubic feet, on last day of month												
Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	65	6	0	3	14	27	179	256	274	268	299	284
1952	276	257	185	9	0	9	125	163	220	279	263	185
1953	102	17	0	0	9	58	140	221	296	282	281	208
1954	111	20	6	3	3	34	204	296	270	264	268	229
1955	282	201	3	25	25	47	151	193	207	245	256	182
1956	al07	4	0	0	0	3	73	156	250	288	301	200
1957	99	5	23	52	52	29	101	107	127	120	107	107
1958	52	0	0	0	0	3	65	81	126	172	162	143
1959	78	11	0	0	0	8	55	94	84	83	150	276
1960	286	193	65	0	0	6	177	289	283	278	291	268

a Contents by capacity table used beginning Oct. 1, 1955; contents Oct. 31, 1955, by capacity table used prior to Oct. 1, 1955, was 103,000,000 cu ft.

3902. Buckatabon Lakes near Conover, Wis.

Location.--Lat 46°01'15", long 89°18'35", in SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.24, T.41 N., R.9 E., on Buckatabon Creek, 3.3 miles southwest of Conover.

Drainage area.--14 sq mi, approximately.

Records available.--September 1938 to September 1960. January 1920 to September 1960, gage heights and contents, at weekly intervals, in files of Geological Survey.

Gage.--Staff gage. Datum of gage is 1,637.85 ft above mean sea level (levels by Wisconsin Valley Improvement Co.).

Extremes.--1938-60: Maximum contents on last day of month, 128 million cubic feet Sept. 30, 1943 (gage height, 3 ft 7 $\frac{1}{2}$ in.) by capacity table now in use, 140 million cubic feet by capacity table in use at the time; no usable contents at times.

Remarks.--Reservoir operation began in 1908. Reservoir includes Upper and Lower Buckatabon Lakes. Usable capacity, 130 million cubic feet between gage heights 0 ft 6 in. and 3 ft 8 in. (limits stipulated by Public Service Commission of Wisconsin). New capacity table put in use Oct. 1, 1955. Records prior to October 1955 published with other reservoir records showing changes in contents of the group.

Contents, in millions of cubic feet, on last day of month												
Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	39	22	16	10	14	25	102	136	131	132	138	132
1952	136	123	101	18	18	18	108	135	138	136	137	97
1953	44	29	27	27	27	51	104	134	138	132	134	110
1954	49	29	17	12	6	38	116	137	134	138	135	111
1955	135	87	36	9	9	56	130	134	132	138	136	101
1956	a54	18	9	6	0	12	64	105	122	121	120	†86
1957	41	31	9	3	0	18	64	84	101	111	114	76
1958	37	9	0	0	0	20	69	84	104	116	121	108
1959	93	22	0	0	0	19	59	88	100	110	122	122
1960	121	89	23	0	0	4	91	122	121	122	123	118

a Contents by capacity table used beginning Oct. 1, 1955; contents Oct. 31, 1955, by capacity table used prior to Oct. 1, 1955, was 58 million cubic feet.

† Corrected.

3902.5. Lower Ninemile Lake near Eagle River, Wis.

Location.--Lat 45°53'35", long 89°07'15", in NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.4, T.39 N., R.11 E., on Ninemile Creek, 6.6 miles southeast of village of Eagle River.

Drainage area.--25 sq mi, approximately.

Records available.--September 1938 to September 1960. January 1920 to September 1960, gage heights and contents, at weekly intervals, in files of Geological Survey.

Gage.--Staff gage. Datum of gage is 1,638.27 ft above mean sea level (levels of Wisconsin Valley Improvement Co.).

Extremes.--1938-60: Maximum contents on last day of month, 127 million cubic feet Aug. 31, 1941 (gage height, 6 ft 2 in.) by capacity table now in use, 98 million cubic feet by capacity table in use at the time; no usable contents at times.

Remarks.--Reservoir operation began in 1908. Usable capacity, 121 million cubic feet between gage heights 1 ft 5 in. and 6 ft 0 in. (limits stipulated by Public Service Commission of Wisconsin). New capacity table put in use Oct. 1, 1955. Records prior to October 1955 published with other reservoir records showing change in contents of the group.

Contents, in millions of cubic feet, on last day of month												
Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	26	8	2	2	6	24	87	88	88	92	93	91
1952	85	82	73	14	2	3	86	88	90	88	93	63
1953	20	3	2	2	2	30	88	90	90	88	88	63
1954	18	3	0	0	0	17	91	90	91	93	91	70
1955	91	48	2	2	2	49	89	91	92	93	93	58
1956	a34	87	33	0	0	3	101	115	121	116	118	102
1957	46	5	1	1	1	21	91	112	115	120	105	58
1958	21	4	1	1	-	39	82	92	120	115	115	103
1959	45	4	1	1	22	55	112	121	121	118	121	121
1960	124	80	16	1	0	0	122	124	124	121	125	121

a Contents by capacity table used beginning Oct. 1, 1955; contents Oct. 31, 1955, by capacity table used prior to Oct. 1, 1955, was 16 million cubic feet.

3903. Sevenmile Lake near Eagle River, Wis.

Location.--Lat 45°52'30", long 89°04'10", in SE¼NE¼ sec.11, T.39 N., R.11 E., on Sevenmile Creek, 9.1 miles southeast of village of Eagle River.

Drainage area.--14 sq mi, approximately.

Records available.--September 1938 to September 1960. January 1920 to September 1960, gage heights and contents, at weekly intervals, in files of Geological Survey.

Gage.--Staff gage. Datum of gage is 1,646.30 ft above mean sea level (levels by Wisconsin Valley Improvement Co.).

Extremes.--1938-60: Maximum contents on last day of month, 89 million cubic feet June 30 and Aug. 31, 1953 (gage height, 4 ft 8 in.) by capacity table now in use, 108 million cubic feet by capacity table in use at the time; no usable capacity at times.

Remarks.--Reservoir operation began in 1908. Usable capacity, 93 million cubic feet between gage heights 0 ft 6 in. and 4 ft 10 in. (limits stipulated by Public Service Commission of Wisconsin). New capacity table put in use Oct. 1, 1955. Records prior to October 1955 published with other reservoir records showing changes in contents of the group.

Contents, in millions of cubic feet, on last day of month

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	9	-	-	-	-	3	71	95	84	63	56	67
1952	88	49	12	-	-	17	58	71	99	90	81	60
1953	37	16	-	-	3	26	49	60	108	102	108	88
1954	66	7	-	-	0	22	96	98	101	91	96	80
1955	95	65	5	5	5	22	64	79	88	88	92	75
1956	a42	2	0	0	0	7	46	61	85	83	83	75
1957	39	6	4	4	4	16	41	58	81	74	61	39
1958	20	0	0	-	-	16	44	52	85	70	75	77
1959	40	6	0	0	9	22	46	67	77	87	87	85
1960	85	50	21	10	10	10	74	86	85	87	87	85

a Contents by capacity table used beginning Oct. 1, 1955; contents Oct. 31, 1955, by capacity table used prior to Oct. 1, 1955, was 42 million cubic feet.

3903.5. Burnt Rollways Reservoir near Eagle River, Wis.

Location.--Lat 45°53'40", long 89°08'30", in NE¼NW¼ sec.5, T.39 N., R.11 E., on Eagle River, 5.3 miles southeast of village of Eagle River.

Drainage area.--129 sq mi.

Records available.--September 1938 to September 1960. January 1920 to September 1960, gage heights and contents, at weekly intervals, in files of Geological Survey.

Gage.--Staff gage. Altitude of gage is 1,620 ft (from river-profile map).

Extremes.--1938-60: Maximum contents on last day of month, 633 million cubic feet at times (gage height, 1 ft 6 in.) by capacity table now in use; no usable contents at times.

Remarks.--Reservoir operation began in 1908. Reservoir includes Whitefish, Big, Dog, Deer, Mud, Big Stone, Moccasin, Spirit, Medicine, Little Fork, Fourmile, Big Fork, Island, Round, Town Line, Range Line, Planting Ground, and Long Lakes. Usable capacity Nov. 1 to Apr. 30, 633 million cubic feet between gage heights -1 ft 3 in. and 1 ft 6 in. and May 1 to Oct. 31, 418 million cubic feet between gage heights 0 ft 0 in. and 1 ft 6 in. (limits stipulated by Public Service Commission of Wisconsin). New capacity table put in use Oct. 1, 1955. Records prior to October 1955 published with other reservoir records showing change in contents of the group.

Contents, in millions of cubic feet, on last day of month

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	318	228	119	48	13	128	581	564	561	567	578	596
1952	555	549	485	186	7	137	573	573	573	549	549	458
1953	344	235	130	39	1	202	573	569	596	564	573	472
1954	349	233	128	37	1	83	590	575	561	546	533	502
1955	584	469	277	103	4	68	576	593	549	585	563	525
1956	a366	438	317	80	6	76	523	607	633	584	607	568
1957	416	276	149	49	8	84	545	601	604	549	504	474
1958	350	295	333	451	539	407	476	594	620	581	555	582
1959	421	270	92	13	0	70	399	633	601	591	633	633
1960	623	408	229	11	56	152	633	620	594	594	620	607

a Contents by capacity table used beginning Oct. 1, 1955; contents Oct. 31, 1955, by capacity table used prior to Oct. 1, 1955, was 349 million cubic feet.

3904. Long Lake near Phelps, Wis.

Location.--Lat 46°02'45", long 89°02'35", in NW¼SE¼ sec.7, T.41 N., R.12 E., on Deerskin River, 2.5 miles southeast of Phelps.

Drainage area.--35 sq mi, approximately.

Records available.--September 1938 to September 1960. January 1920 to September 1960, gage heights and contents, at weekly intervals, in files of Geological Survey.

Gage.--Staff gage. Datum of gage is 1,695.14 ft above mean sea level (levels by Wisconsin Valley Improvement Co.).

Extremes.--1938-60: Maximum contents on last day of month, 332 million cubic feet June 30, 1953 (gage height, 3 ft 5 in.) by capacity table now in use, 320 million cubic feet by capacity table in use at the time; no usable contents at times.

Remarks.--Reservoir operations began in 1908. Usable capacity Oct. 1 to May 31, 400 million cubic feet between gage heights 0 ft 4 in. and 4 ft 0 in. and June 1 to Sept. 30, 332 million cubic feet between gage heights 1 ft 0 in. and 4 ft 0 in. (limits stipulated by Public Service Commission of Wisconsin). New capacity table put in use Oct. 1, 1955. Records prior to October 1955 published with other reservoir records showing change in contents of the group.

Contents, in millions of cubic feet, on last day of month

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	40	6	2	8	27	18	290	284	296	284	260	266
1952	258	222	172	23	0	15	218	198	244	318	275	182
1953	99	29	4	0	4	92	213	235	320	273	253	189
1954	94	37	4	0	6	68	311	300	302	278	265	211
1955	275	198	45	8	8	56	239	257	243	252	240	168
1956	a100	21	8	0	0	10	160	203	273	281	274	194
1957	95	36	8	0	0	40	174	165	165	156	136	91
1958	46	9	0	0	0	15	127	130	142	200	178	154
1959	79	14	0	0	0	6	134	147	140	135	176	323
1960	290	212	78	21	8	0	275	290	294	274	281	274

a Contents by capacity table used beginning Oct. 1, 1955; contents Oct. 31, 1955, by capacity table used prior to Oct. 1, 1955, was 99 million cubic feet.

3906. Deerskin Lake near Eagle River, Wis.

Location.--Lat 45°59'05", long 89°09'40", in SE¼ sec.31, T.41 N., R.11 E., on Deerskin Creek, 6.3 miles northeast of village of Eagle River.

Drainage area.--5 sq mi, approximately.

Records available.--September 1938 to September 1960. January 1920 to September 1960, gage heights and contents, at weekly intervals, in files of Geological Survey. Published as Little Deerskin Lake 1938-50.

Gage.--Staff gage. Datum of gage is 1,640.16 ft above mean sea level (levels by Wisconsin Valley Improvement Co.).

Extremes.--1938-60: Maximum contents on last day of month, 22 million cubic feet Oct. 31, 1938, May 31 and June 30, 1939, Apr. 30 and May 31, 1941, Sept. 30, 1959 (gage height, 2 ft 0 in.) by capacity table now in use, 21.9 million cubic feet by capacity table in use prior to October 1955; no usable contents most winters.

Remarks.--The lake has been used as a reservoir since 1908. Usable capacity, 22 million cubic feet between gage heights 0 ft 4 in. and 2 ft 0 in. (limits stipulated by Public Service Commission of Wisconsin). New capacity table put in use Oct. 1, 1955. Records prior to October 1955 published with other reservoir records showing change in contents of the group.

Contents, in millions of cubic feet, on last day of month

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	12	10	-	-	-	-	10	16	11	10	14	19
1952	15	-	-	-	-	-	17	14	14	7	10	6
1953	3	2	-	-	-	5	6	11	13	10	11	7
1954	6	3	4	-	-	4	11	12	16	14	13	17
1955	11	5	-	-	-	-	8	9	10	16	13	9
1956	a6	4	2	0	0	0	6	8	14	14	14	10
1957	4	3	2	2	2	3	9	10	10	10	10	12
1958	6	4	2	-	-	2	7	8	8	11	10	11
1959	6	3	2	2	2	3	6	7	6	6	12	22
1960	16	9	4	3	1	2	11	16	15	15	18	13

a Contents by capacity table used beginning Oct. 1, 1955; contents Oct. 31, 1955, by capacity table used prior to Oct. 1, 1955, was 6 million cubic feet.

3906.5. Sugar Camp Reservoir near Eagle River, Wis.

Location.--Lat 45°52'15", long 89°23'35", in NE $\frac{1}{4}$ sec.17, T.39 N., R.9 E., on Sugar Camp Creek, 7.6 miles southwest of village of Eagle River.

Drainage area.--59 sq mi, approximately.

Records available.--September 1938 to September 1960. January 1920 to September 1960, gage heights and contents, at weekly intervals, in files of Geological Survey. Published as Sugar Camp Lake prior to 1943.

Gage.--Staff gage. Datum of gage is 1,591.94 ft above mean sea level (levels by Wisconsin Valley Improvement Co.).

Extremes.--1938-60: Maximum contents on last day of month, 471 million cubic feet Apr. 30, 1939, Sept. 30, Oct. 31, Nov. 30, Dec. 31, 1941, Sept. 30 and Nov. 30, 1942 (gage height, 6 ft 6 in.) by capacity table now in use, 335.4 million cubic feet by capacity table in use at the time; no usable contents at times.

Remarks.--Reservoir operation began in 1908. Reservoir includes Chain, Echo, Stone, Sand, and Dam Lakes. Usable capacity Sept. 15 to May 31, 471 million cubic feet between gage heights 1 ft 0 in. and 6 ft 6 in. and June 1 to Sept. 14, 180 million cubic feet between gage heights 4 ft 0 in. and 6 ft 0 in. (limits stipulated by Public Service Commission of Wisconsin). New capacity table put in use Oct. 1, 1955. Records prior to October 1955 published with other reservoir records showing change in contents of the group.

Contents, in millions of cubic feet, on last day of month

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	62	19	21	4	5	39	324	286	286	278	271	283
1952	331	327	225	76	9	8	265	295	278	277	275	107
1953	6	19	24	4	3	86	212	286	294	277	270	136
1954	31	24	77	6	7	33	265	284	277	249	222	294
1955	327	227	90	7	6	28	252	288	264	249	270	179
1956	a250	280	154	28	16	18	257	359	422	409	407	410
1957	313	186	70	6	54	142	359	418	399	407	415	299
1958	207	196	212	54	6	106	327	383	435	399	399	383
1959	280	358	190	0	83	118	288	415	415	403	415	407
1960	463	427	299	158	24	0	457	415	411	415	411	427

a Contents by capacity table used beginning Oct. 1, 1955; contents Oct. 31, 1955, by capacity table used prior to Oct. 1, 1955, was 138 million cubic feet.

3907. Little St. Germain Lake near Eagle River, Wis.

Location.--Lat 43°53'55", long 89°27'00", in SE $\frac{1}{4}$ sec.35, T.40 N., R.8 E., on Little St. Germain Creek, 9.6 miles west of village of Eagle River.

Drainage area.--19 sq mi, approximately.

Records available.--September 1938 to September 1960. January 1920 to September 1960, gage heights and contents, at weekly intervals, in files of Geological Survey.

Gage.--Staff gage. Datum of gage is 1,611.54 ft above mean sea level (levels by Wisconsin Valley Improvement Co.).

Extremes.--1938-60: Maximum contents on last day of month, 83 million cubic feet Aug. 31, 1941 (gage height, 3 ft 1 in.) by capacity table now in use, 146 million cubic feet by capacity table in use at the time; no usable contents at times.

Remarks.--The lake has been used as a reservoir since 1908. Usable capacity, 79 million cubic feet between gage heights 1 ft 2 in. and 3 ft 0 in. (limits stipulated by Public Service Commission of Wisconsin). New capacity table put in use Oct. 1, 1955. Records prior to October 1955 published with other reservoir records showing change in contents of the group.

Contents, in millions of cubic feet, on last day of month

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	108	92	66	65	70	70	118	137	135	135	140	136
1952	137	135	124	77	68	71	123	134	135	133	135	120
1953	98	83	67	67	67	84	120	132	138	138	139	130
1954	103	69	66	65	65	83	138	139	138	136	136	138
1955	135	131	80	68	66	89	135	136	136	140	138	128
1956	a40	45	32	5	3	12	46	69	73	70	71	66
1957	32	13	1	0	0	5	37	53	63	70	74	45
1958	29	9	4	4	6	10	36	48	63	72	72	65
1959	40	19	5	6	6	12	36	54	56	57	75	79
1960	76	45	23	5	5	7	71	74	75	74	77	74

a Contents by capacity table used beginning Oct. 1, 1955; contents Oct. 31, 1955, by capacity table used prior to Oct. 1, 1955, was 103 million cubic feet.

3907.5. Big St. Germain Lake near Lake Tomahawk, Wis.

Location.--Lat 45°55'10", long 89°31'55", in SE $\frac{1}{4}$ sec.30, T.40 N., R.8 E., on St. Germain River, 7.8 miles northeast of village of Lake Tomahawk.

Drainage area.--69 sq mi, approximately.

Records available.--September 1938 to September 1960. January 1920 to September 1960, gage heights and contents, at weekly intervals, in files of Geological Survey.

Gage.--Staff gage. Datum of gage is 1,588.32 ft (revised) above mean sea level (levels by Public Service Commission of Wisconsin).

Extremes.--1938-60: Maximum contents on last day of month, 202 million cubic feet Dec. 31, 1946 (gage height, 3 ft 6 in.); by capacity table now in use, 242.9 million cubic feet by capacity table in use at the time; no usable contents at times.

Remarks.--The lake has been used as a reservoir since 1908. Reservoir includes Lake Content, and Big St. Germain and Fawn Lakes. Usable capacity Sept. 15 to May 31, 202 million cubic feet between gage heights 0 ft 6 in. and 3 ft 6 in. and June 1 to Sept. 14, 91 million cubic feet between gage heights 1 ft 8 in. and 3 ft 0 in. (limits stipulated by Public Service Commission of Wisconsin). New capacity table put in use Oct. 1, 1955. Records prior to October 1955 published with other reservoir records showing change in contents of the group.

Contents, in millions of cubic feet, on last day of month.

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	86	49	11	0	14	23	232	170	181	166	173	182
1952	211	221	194	56	29	36	227	188	172	164	177	123
1953	59	65	63	63	24	37	214	181	180	166	166	155
1954	46	10	20	17	17	29	183	187	183	180	175	229
1955	223	148	26	17	17	29	181	188	183	179	177	175
1956	294	134	106	50	10	33	124	174	163	156	161	157
1957	122	108	22	8	12	18	140	172	155	158	162	128
1958	72	36	5	2	0	0	124	176	184	162	162	140
1959	126	67	52	0	13	0	90	152	175	155	162	188
1960	188	144	80	49	14	33	188	171	168	162	159	168

a Contents by capacity table used beginning Oct. 1, 1955; contents Oct. 31, 1955, by capacity table used prior to Oct. 1, 1955, was 98 million cubic feet.

3908. Pickerel Lake near Lake Tomahawk, Wis.

Location.--Lat 45°52'20", long 89°31'45", in NE $\frac{1}{4}$ sec.18, T.39 N., R.8 E., on St. Germain River, 5 miles northeast of village of Lake Tomahawk.

Drainage area.--78 sq mi, approximately.

Records available.--September 1938 to September 1960. March 1936 to September 1960, gage heights and contents, at weekly intervals, in files of Geological Survey.

Gage.--Stage gage. Datum of gage is 1,582.00 ft above mean sea level (levels by Wisconsin Valley Improvement Co.).

Extremes.--1938-60: Maximum contents on last day of month, 306 million cubic feet Dec. 31, 1938, Apr. 30, 1947, Sept. 30, 1959 (gage height, 9 ft 4 in.) by capacity table now in use, 231 million cubic feet by capacity table in use prior to October 1955; minimum, 15.1 million cubic feet Mar. 31, 1944 (gage height, 0 ft 10 1/8 in.), by capacity table now in use, 17.1 million cubic feet by capacity table in use at the time.

Remarks.--The dam was built in 1935. Usable capacity Sept. 15 to May 31, 338 million cubic feet between gage heights 0 ft 0 in. and 10 ft 0 in. and June 1 to Sept. 14, 93 million cubic feet between gage heights 8 ft 0 in. and 10 ft 0 in. (levels stipulated by Public Service Commission of Wisconsin). New capacity table put in use Oct. 1, 1955. Records prior to October 1955 published with other reservoir records showing change in contents of the group.

Contents, in millions of cubic feet, on last day of month

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	133	161	143	130	29	59	230	219	217	212	211	206
1952	221	214	207	153	140	50	207	207	206	208	209	176
1953	136	130	131	132	37	137	210	208	212	211	208	201
1954	165	138	137	135	78	78	227	224	227	227	222	222
1955	228	202	140	134	32	44	221	227	223	220	220	188
1956	2195	265	254	216	56	18	248	300	298	288	286	233
1957	151	172	162	150	20	76	245	274	259	261	265	251
1958	233	200	159	148	135	102	246	260	270	286	276	231
1959	240	171	147	141	132	44	249	282	291	270	278	306
1960	288	278	233	212	158	29	298	294	275	276	281	270

a Contents by capacity table used beginning Oct. 1, 1955; contents Oct. 31, 1955, by capacity table used prior to Oct. 1, 1955, was 159 million cubic feet.

3909. Rainbow Lake near Lake Tomahawk, Wis.

Location.--Lat 45°50'00", long 89°32'40", in SE $\frac{1}{4}$ sec.30, T.39 N., R.8 E., or Wisconsin River, 2.7 miles northeast of village of Lake Tomahawk.

Drainage area.--740 sq mi, approximately.

Records available.--March 1936 to September 1960. December 1935 to September 1960, gage heights and contents, at weekly intervals, in files of Geological Survey. Published as Rainbow Reservoir, 1939-55.

Gage.--Float-tape gage. Datum of gage is 1,570.00 ft above mean sea level (levels by Wisconsin Valley Improvement Co.).

Extremes.--1936-60: Maximum on last day of month, 2,197 million cubic feet Apr. 30, 1951 (gage height, 28 ft 1 in.) by capacity table now in use, 2,845 million cubic feet by capacity table in use at the time; no usable contents Mar. 28, 1937, Mar. 24, 31, 1940, and Mar. 7, 1948.

Remarks.--Dam was completed November 1935. Usable capacity was 1,639 million cubic feet between gage heights 6 ft 0 in. and 25 ft 0 in. until August 1949 when it was increased to 2,181 million cubic feet between gage heights 6 ft 0 in. and 28 ft 0 in. (limits stipulated by Public Service Commission of Wisconsin).

Contents, in millions of cubic feet, on last day of month

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	879	1,643	1,753	889	474	253	2,845	2,795	2,814	2,820	2,229	2,817
1952	2,782	2,648	2,087	1,995	815	185	2,497	2,808	2,782	2,708	2,318	1,863
1953	1,662	1,777	1,795	1,149	458	866	2,103	2,832	2,826	2,751	2,486	1,726
1954	1,678	1,819	2,079	1,400	659	172	1,810	2,820	2,779	1,714	1,099	2,400
1955	2,776	2,630	2,076	1,116	446	132	2,145	2,362	2,291	1,462	1,584	1,178
1956	†1,706	1,906	1,625	1,013	413	74	†980	1,308	2,097	2,009	1,878	1,156
1957	1,045	1,662	1,309	687	209	169	699	855	857	588	414	1,014
1958	1,148	1,746	1,771	1,263	518	22	693	677	649	1,465	816	1,020
1959	1,472	2,060	1,751	1,128	446	74	579	885	489	713	1,583	2,181
1960	2,137	2,101	1,960	1,590	644	115	1,902	2,143	2,123	1,874	1,778	1,982

† Corrected.

a Contents by capacity table used beginning Oct. 1, 1955; contents Oct. 31, 1955, by capacity table used prior to Oct. 1, 1955, was 2,119 million cubic feet.

3910. Wisconsin River at Rainbow Lake, near Lake Tomahawk, Wis.

Location.--Lat 45°50'00", long 89°32'50", in S $\frac{1}{2}$ SW $\frac{1}{4}$ sec.30, T.39 N., R.8 E., on right bank 400 ft upstream from Gilmore Creek, 800 ft downstream from Rainbow Lake Dam, and 2.5 miles northeast of village of Lake Tomahawk. Records include flow of Gilmore Creek.

Drainage area.--750 sq mi, approximately, includes that of Gilmore Creek.

Records available.--July 1936 to September 1960. Prior to October 1955, published as "at Rainbow Reservoir, near Lake Tomahawk."

Gage.--Water-stage recorder. Datum of gage is 1,570.05 ft above mean sea level (Public Service Commission of Wisconsin bench mark).

Average discharge.--24 years (1936-60), 712 cfs.

Extremes.--1936-60: Maximum discharge, 3,570 cfs Sept. 5, 1941 (gage height, 7.59 ft); minimum, 17 cfs Oct. 10-12, 1940; minimum daily, 35 cfs Apr. 6, 1955.

Remarks.--Flow regulated by Rainbow Lake and 12 smaller reservoirs above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	499	460	619	741	648	699	392	1,267	1,191	1,211	948	871	797
1952	1,445	1,158	1,010	1,088	1,161	883	337	706	846	989	1,005	772	951
1953	705	550	609	732	803	586	291	529	1,206	1,284	921	849	755
1954	744	676	698	813	857	719	378	1,183	921	784	704	449	745
1955	978	985	1,178	1,025	891	708	302	560	683	683	566	620	765
1956	512	608	776	878	801	563	301	429	438	932	849	788	657
1957	725	702	792	739	684	654	372	395	452	464	386	344	557
1958	443	437	546	632	693	601	254	377	385	411	529	434	478
1959	455	446	654	721	665	453	292	295	430	355	309	823	490
1960	1,381	1,051	1,026	1,041	1,000	681	260	1,703	1,066	764	612	805	950

Yearly discharge, in cubic feet per second, of Wisconsin River at Rainbow Lake,
near Lake Tomahawk, Wis.

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	646	-
1951	1208	2,170	May 19, 1951	135	797	-	-	968	-
1952	1238	2,300	Oct. 5, 1951	147	951	-	-	804	-
1953	1288	2,450	June 22, 23, 1953	232	755	-	-	777	-
1954	1338	2,250	May 10, 1954	177	745	-	-	631	-
1955	1388	1,840	Oct. 17, 1954	35	765	-	-	660	-
1956	1438	1,440	July 12, 13, 1956	120	657	-	-	684	-
1957	1508	886	Oct. 1, 1956	206	557	-	-	491	-
1958	1558	802	June 17, 1958	185	478	-	-	489	-
1959	1828	2,340	Sept. 28, 1959	110	490	-	-	650	-
1960	1708	2,450	Oct. 2, 1959	166	950	-	-	-	-

Note.--Monthly and yearly figures of discharge per square mile and runoff in inches, previously published in water-supply papers, may not represent natural flow because of uncertainty in the adjustments for effect of regulation, diversion, and evaporation. Those figures are not published herein.

3911. Pelican Lake near Pelican Lake, Wis.

Location.--Lat 45°31'45", long 89°12'20", in S $\frac{1}{2}$ sec. 11, T. 35 N., R. 10 E., on Pelican River, 2.8 miles northwest of village of Pelican Lake.

Drainage area.--22 sq mi, approximately.

Records available.--September 1938 to September 1960. January 1920 to September 1960, gage heights and contents, at weekly intervals, in files of Geological Survey. Published as "South Pelican Lake" 1939-50.

Gage.--Staff gage. Datum of gage is 1,589.98 ft above mean sea level (levels by Wisconsin Valley Improvement Co.).

Extremes.--1938-60: Maximum contents on last day of month, 331 million cubic feet June 30, 1939 (gage height, 2 ft 2 in.); no usable contents at times.

Remarks.--Reservoir operation began in 1909. No usable capacity Apr. 1 to Oct. 31. Usable capacity Nov. 1 to Mar. 31, 305 million cubic feet between gage heights 0 ft 0 in. and 2 ft 0 in. (limits stipulated by Public Service Commission of Wisconsin).

Contents, in millions of cubic feet, on last day of month

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	172	152	101	44	0	6	231	238	228	254	222	238
1952	238	216	168	120	44	42	207	228	260	241	238	216
1953	193	98	76	21	19	70	203	228	238	234	212	158
1954	136	101	63	10	13	57	200	228	231	210	178	228
1955	216	152	70	3	0	44	210	228	228	219	219	190
1956	222	162	106	41	0	5	114	136	164	210	222	190
1957	130	101	76	41	22	57	190	210	216	203	200	203
1958	152	101	63	25	0	38	168	181	190	210	172	172
1959	196	190	156	89	25	32	127	152	142	178	289	305
1960	318	225	165	120	44	0	184	295	234	231	238	216

3913. North Pelican Lakes near Rhinelander, Wis.

Location.--Lat 45°38'05", long 89°14'35", in SE $\frac{1}{4}$ sec.4, T.36 N., R.10 E., on North Branch Pelican River, 8 miles east of city limits of Rhinelander.

Drainage area.--71 sq mi, approximately.

Records available.--September 1938 to September 1960. January 1920 to September 1960, gage heights and contents, at weekly intervals, in files of Geological Survey.

Gage.--Staff gage. Datum of gage is 1,569.10 ft above mean sea level (levels by Wisconsin Valley Improvement Co.).

Extremes.--1938-60: Maximum contents on last day of month, 177 million cubic feet Mar. 31, 1945 (gage height, 0 ft 7 $\frac{1}{2}$ in.) by capacity table now in use, 160.8 million cubic feet by capacity table in use at the time; minimum, 11 million cubic feet Jan. 31 and Feb. 29, 1940 (gage height, -2 ft 3 $\frac{1}{2}$ in.) capacity table now in use, 6 million cubic feet by capacity table in use at the time.

Remarks.--The lakes have been used as a reservoir since 1908. Reservoir includes Moen, Second, Third, Fourth, and Fifth Lakes. Usable capacity, June 1 to Sept. 15, 19 million cubic feet between gage heights -0 ft 4 in. and 0 ft 0 in.; Sept. 16 to May 31, 218 million cubic feet between gage heights -2 ft 6 in. and 1 ft 4 in. (limits stipulated by Public Service Commission of Wisconsin). New capacity table put in use Oct. 1, 1955. Records prior to October 1955 published with other reservoir records showing change in contents of the group.

Contents, in millions of cubic feet, on last day of month

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	55	7	7	7	7	16	129	114	111	113	117	125
1952	122	81	22	7	7	8	116	122	108	117	119	74
1953	54	7	7	7	7	99	111	106	118	107	109	71
1954	28	14	7	7	7	46	144	124	122	112	123	90
1955	102	72	21	17	17	41	112	124	93	117	122	96
1956	a73	31	27	27	27	22	142	132	132	132	128	116
1957	70	54	31	27	27	59	152	153	154	128	139	115
1958	68	45	27	27	27	36	153	142	142	132	139	120
1959	62	45	27	27	27	34	138	158	139	139	139	151
1960	156	90	56	40	31	27	142	133	135	134	158	140

a Contents by capacity table used beginning Oct. 1, 1955; contents Oct. 1, 1955; contents Oct. 31, 1955, by capacity table used prior to Oct. 1, 1955, was 57 million cubic feet.

3920. Wisconsin River at Whirlpool Rapids, near Rhinelander, Wis.

Location.--Lat 45°33'15", long 89°30'25", in NW $\frac{1}{4}$ sec.4, T.35 N., R.8 E., on right bank at head of Whirlpool Rapids, 0.6 mile downstream from outlet of Crescent Lake and 10 miles southwest of Rhinelander.

Drainage area.--1,200 sq mi, approximately.

Records available.--October 1905 to September 1960. Monthly discharge only for some periods, published in WSP 1308. Prior to October 1915, published as "near Rhinelander."

Gage.--Water-stage recorder. Datum of gage is 1,492.14 ft above mean sea level, datum of 1929 (levels by Wisconsin Public Service Corp.). Prior to Oct. 1, 1915, chain gage at highway bridge 3 miles upstream at different datum.

Average discharge.--55 years (1905-60), 1,109 cfs.

Extremes.--1905-60: Maximum discharge, 5,590 cfs Sept. 6, 1941 (gage height, 5.91 ft); no flow Aug. 4, Sept. 15, 1907, June 21, July 5, 1908.

Remarks.--Flow regulated by 15 reservoirs and 3 powerplants above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	700	722	831	860	779	1,004	1,892	2,316	1,919	2,218	1,385	1,395	1,338
1952	2,219	1,707	1,426	1,397	1,429	1,094	1,472	1,271	1,370	1,737	1,506	1,032	1,473
1953	877	765	852	941	992	1,032	1,189	1,012	1,861	1,830	1,265	1,009	1,136
1954	885	895	1,001	1,081	1,042	933	1,262	2,132	1,331	999	844	976	1,116
1955	1,563	1,548	1,364	1,235	1,030	952	1,371	1,004	1,211	852	935	760	1,136
1956	804	954	1,035	1,084	947	713	1,053	903	965	1,425	1,264	1,044	1,017
1957	879	1,009	1,011	885	798	898	1,103	856	748	680	515	644	835
1958	634	778	783	815	850	771	943	726	678	900	676	784	778
1959	779	747	838	855	801	628	779	780	636	782	886	1,593	840
1960	2,515	1,659	1,354	1,286	1,174	858	1,229	3,433	1,783	1,057	963	1,298	1,553

Yearly discharge, in cubic feet per second, of Wisconsin River at Whirlpool Rapids near Rhinelander, Wis.

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	1,022	-
1951	1,208	4,200	May 21, 1951	532	1,338	-	-	1,599	-
1952	1,238	3,710	July 25, 1952	780	1,473	-	-	1,233	-
1953	1,278	4,120	June 22, 1953	661	1,136	-	-	1,160	-
1954	1,336	4,520	May 8, 1954	561	1,116	-	-	1,241	-
1955	1,388	2,900	Oct. 18, 1954	570	1,136	-	-	1,011	-
1956	1,438	2,340	July 14, 1956	420	1,017	-	-	1,025	-
1957	1,508	2,190	Apr. 22, 1957	427	835	-	-	776	-
1958	1,558	2,410	July 15, 1958	475	778	-	-	792	-
1959	1,628	4,740	Sept. 26, 1959	434	840	-	-	1,106	-
1960	1,708	5,040	May 8, 1960	540	1,553	-	-	-	-

Note.--Monthly and yearly figures of discharge per square mile and runoff in inches, previously published in water-supply papers, may not represent natural flow because of uncertainty in the adjustments for effect of regulation, diversion, and evaporation. Those figures are not published herein.

3921. Minocqua Lake near Minocqua, Wis.

Location.--Lat 45°52'35", long 89°43'40", on line between secs. 10 and 15, T.39 N., R.6 E., on Tomahawk River, 1 mile west of Minocqua.

Drainage area.--89 sq mi, approximately.

Records available.--September 1938 to September 1960. January 1920 to September 1960, gage heights and contents, at weekly intervals, in files of Geological Survey.

Gage.--Staff gage. Datum of gage is 1,584.56 ft above mean sea level (levels by Wisconsin Valley Improvement Co.).

Extremes.--1938-60: Maximum contents on last day of month, 619 million cubic feet July 31, 1950 (gage height, 0 ft 5 5/8 in.) by capacity table now in use 641.4 million cubic feet by capacity table in use at the time; no usable contents at times.

Remarks.--Dam was completed in 1890. Reservoir operation began in 1910. Reservoir includes Little Tomahawk, Tomahawk, Mid (published as Hawaii in WSP 1308), Minocqua, Baker, and Kewasokogan Lakes. Usable capacity Oct. 1 to May 31, 628 million cubic feet between gage heights -1 ft 10 in. and 0 ft 6 in., and June 1 to Sept. 30, 283 million cubic feet between gage heights -0 ft 6 in. and 0 ft 6 in. (limits stipulated by Public Service Commission of Wisconsin). New capacity table put in use Oct. 1, 1955. Records prior to October 1955 published with other reservoir records showing change in contents of the group.

Contents, in millions of cubic feet, on last day of month

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	330	235	105	0	11	38	269	509	613	607	558	470
1952	354	266	182	65	0	16	244	395	552	613	601	454
1953	280	172	77	0	5	92	246	372	596	607	610	515
1954	350	257	89	0	0	97	333	479	601	595	576	461
1955	576	470	255	87	0	105	324	436	530	607	552	558
1956	a318	202	101	0	15	0	162	266	446	538	535	433
1957	322	203	96	8	0	20	178	244	356	481	544	374
1958	244	88	10	8	10	25	167	244	356	426	454	448
1959	294	136	15	0	0	44	159	235	282	310	532	592
1960	583	590	235	30	0	0	250	614	580	484	550	532

a Contents by capacity table used beginning Oct. 1, 1955; contents Oct. 31, 1955, by capacity table used prior to Oct. 1, 1955, was 333 million cubic feet.

3922. Squirrel Lake near Minocqua, Wis.

Location.--Lat 45°50'35", long 89°54'15", in NE $\frac{1}{4}$ sec.30, T.39 N., R.5 E., on Squirrel River, 9.4 miles west of Minocqua.

Drainage area.--17 sq mi., approximately.

Records available.--September 1938 to September 1960, January 1920 to September 1960, gage heights and contents, at weekly intervals, in files of Geological Survey.

Gage.--Staff gage. Datum of gage is 1,560.93 ft above mean sea level (levels by Wisconsin Valley Improvement Co.).

Extremes.--1938-60: Maximum contents on last day of month, 193 million cubic feet Apr. 30, 1951 (gage height, 4 ft 1 $\frac{1}{2}$ in.) by capacity table now in use, 163 million cubic feet by capacity table in use at the time; no usable contents most winters.

Remarks.--Dam was built in 1890. Reservoir operation began in 1908. Usable capacity Oct. 1 to May 31, 182 million cubic feet between gage heights 1 ft 7 in. and 4 ft 0 in.; and June 1 to Sept. 30, 165 million cubic feet between gage heights 1 ft 10 in. and 4 ft 0 in. (limits stipulated by Public Service Commission of Wisconsin).

Contents, in millions of cubic feet, on last day of month

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	68	20	0	0	0	10	163	150	138	176	152	143
1952	111	72	49	15	0	0	108	148	140	143	142	91
1953	31	0	0	0	0	91	138	138	131	154	140	96
1954	39	2	0	0	0	10	142	143	148	145	145	117
1955	145	100	0	0	0	25	97	131	142	144	145	111
1956	a65	8	0	0	0	29	96	168	175	178	168	144
1957	74	5	0	0	0	44	112	142	172	178	168	122
1958	65	0	0	0	0	41	103	129	158	174	172	155
1959	84	53	0	0	0	20	83	116	142	178	175	175
1960	175	126	17	0	0	56	169	172	175	172	158	168

a Contents by capacity table used beginning Oct. 1, 1955; contents Oct. 31, 1955, by capacity table used prior to Oct. 1, 1955, was 39 million cubic feet.

3923. Willow Reservoir near Hazelhurst, Wis.

Location.--Lat 45°42'45", long 89°50'40", in NE $\frac{1}{4}$ sec.10, T.37 N., R.5 E., on Tomahawk River, 8.8 miles southwest of Hazelhurst.

Drainage area.--327 sq mi.

Records available.--September 1938 to September 1960. January 1927 to September 1960, gage heights and contents, at weekly intervals, in files of Geological Survey.

Gage.--Staff gage. Datum of gage is 1,505.87 ft above mean sea level (levels by Wisconsin Valley Improvement Co.).

Extremes.--1938-60: Maximum contents on last day of month, 3,316 million cubic feet June 30, 1954 (gage height, 23 ft 6 $\frac{1}{2}$ in.) by capacity table now in use, 3,364 million cubic feet by capacity table in use at the time; no usable contents at times.

Remarks.--Reservoir operation began in 1927. Usable capacity, 3,302 million cubic feet between gage heights 5 ft 0 in. and 23 ft 6 in. (limits stipulated by Public Service Commission of Wisconsin). New capacity table put in use Oct. 1, 1955. Records prior to October 1955 published with other reservoir records showing changes in contents of the group.

Contents, in millions of cubic feet, on last day of month

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	358	300	38	0	102	546	2,688	3,293	3,319	3,307	2,980	3,296
1952	3,350	3,190	2,840	1,865	663	144	2,595	3,350	3,322	3,315	3,259	2,502
1953	1,398	1,022	572	39	9	820	2,157	2,992	3,350	3,334	2,898	1,875
1954	1,293	998	763	217	31	419	1,860	3,350	3,364	2,922	2,267	2,700
1955	3,340	3,013	2,569	1,390	103	589	2,318	2,502	3,027	2,122	2,321	1,386
1956	a1,284	1,442	1,133	587	38	332	1,430	1,591	1,924	2,651	2,900	2,267
1957	1,288	1,189	558	2	23	595	1,430	1,821	1,882	1,289	699	990
1958	626	807	676	215	11	79	1,115	1,184	1,061	1,702	1,002	1,645
1959	1,964	2,565	1,819	802	17	319	1,381	1,764	1,440	1,652	1,937	3,302
1960	3,288	3,132	2,832	2,666	1,363	120	2,144	3,265	3,278	2,853	2,447	3,047

a Contents by capacity table used beginning Oct. 1, 1955; contents Oct. 31, 1955, by capacity table used prior to Oct. 1, 1955, was 1,339 million cubic feet.

3925. Lake Nokomis at Bradley, Wis.

Location.--Lat 45°32'20", long 89°44'45", in NW $\frac{1}{4}$ sec.9, T.35 N., R.6 E., on Tomahawk River, 0.4 mile east of Bradley.

Drainage area.--545 sq mi (revised).

Records available.--September 1938 to September 1960. January 1920 to September 1960, gage heights and contents, at weekly intervals, in files of Geological Survey. Published as "Rice Reservoir," 1939-53.

Gage.--Staff gage. Datum of gage is 1,448.24 ft above mean sea level, datum of 1929.

Extremes.--1938-60: Maximum contents on last day of month, 1,852 million cubic feet Sept. 30, 1959 (gage height, 15 ft 2 $\frac{1}{2}$ in.); minimum, 53 million cubic feet Mar. 31, 1956 (gage height, 2 ft 8 in.).

Remarks.--Reservoir operation began in 1912. Usable capacity, 1,808 million cubic feet between gage heights 0 ft 0 in. and 15 ft 0 in. (limits stipulated by Public Service Commission of Wisconsin). New capacity table put in use Oct. 1, 1955. Records prior to October 1955 published with other reservoir records showing change in contents of the group.

Contents, in millions of cubic feet, on last day of month.

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Avg.	Sept.
1951	1,131	1,294	1,423	926	396	582	1,774	1,784	1,786	1,776	1,670	1,796
1952	1,784	1,767	1,279	942	537	169	1,705	1,780	1,763	1,780	1,734	1,178
1953	1,340	1,310	1,371	849	243	448	1,167	1,541	1,786	1,780	1,670	1,355
1954	1,148	1,245	1,147	886	574	133	1,340	1,768	1,763	1,653	1,397	1,738
1955	1,788	1,709	1,344	720	324	60	1,585	1,786	1,651	1,714	1,624	1,485
1956	1,295	1,562	1,308	970	429	53	885	1,464	1,798	1,744	1,724	1,374
1957	1,278	1,325	1,061	643	127	247	1,235	1,555	1,340	1,282	1,070	1,220
1958	1,057	1,631	1,327	947	404	72	1,005	1,435	1,504	1,752	1,724	1,516
1959	1,692	1,764	1,260	848	520	119	980	1,555	1,406	1,460	1,750	*1,852
1960	1,814	1,784	1,646	1,192	408	155	1,516	1,778	1,808	1,866	1,800	1,682

* Revised.

a Contents by capacity table used beginning Oct. 1, 1955; contents Oct. 31, 1955, by capacity table used prior to Oct. 1, 1955, was 1,260 million cubic feet.

3930. Tomahawk River at Bradley, Wis.

Location.--Lat 45°32'20", long 89°44'45", in NW $\frac{1}{4}$ sec.9, T.35 N., R.6 E., at dam at outlet of Lake Nokomis, 0.5 mile east of Bradley, 4.0 miles upstream from Jersey powerplant, and 4.7 miles upstream from mouth.

Drainage area.--545 sq mi. At site used prior to October 1951, 554 sq mi.

Records available.--January 1930 to September 1960. Prior to October 1951, published as "at Tomahawk."

Gage.--Lake staff gage, read once daily, supplemented by frequent readings of taintor gate openings. Datum of gage is 1,448.24 ft, datum of 1929. Prior to October 1951, powerplant records at site 4.0 miles downstream.

Average discharge.--30 years (1930-60), 545 cfs.

Extremes.--1930-60: Maximum discharge, 2,690 cfs Oct. 2, 1959; no flow at times in 1931, 1934, 1940, 1957.

Remarks.--Flow completely regulated by four reservoirs operated by Wisconsin Valley Improvement Co.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	489	400	464	599	515	394	191	719	764	823	726	902	583
1952	1,041	873	886	957	1,017	820	123	352	673	655	707	805	742
1953	643	517	553	728	606	329	172	213	497	694	628	757	526
1954	623	438	553	587	527	374	48.9	247	596	506	607	389	458
1955	546	672	777	908	1,006	348	29.9	286	418	555	449	663	552
1956	537	383	607	663	700	347	139	169	294	293	377	609	426
1957	645	458	620	573	458	245	64.4	327	474	511	511	359	407
1958	474	264	482	519	496	398	27.8	156	294	265	477	351	350
1959	278	262	696	702	588	385	36.7	119	413	311	438	473	391
1960	1,136	711	722	768	1,194	1,005	85.4	782	626	651	619	506	734

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950		-	-	-	-	-	-	561	-
1951	1208	al. 460	Sept. 15, 1951	87	583	-	-	705	-
1952	1278	1,640	Oct. 7, 1951	71	742	-	-	850	-
1953	1278	1,570	July 2, 3, 1953	136	526	-	-	520	-
1954	1358	1,280	Aug. 8, 1954	10	458	-	-	490	-
1955	1388	1,240	Oct. 24-26, 1954	10	552	-	-	513	-
1956	1438	778	Sept. 8, 1955	5	426	-	-	442	-
1957	1508	767	Dec. 11, 1956	0	407	-	-	365	-
1958	1558	698	Aug. 24, 1958	15	350	-	-	352	-
1959	1628	2,460	Sept. 30, 1959	19	391	-	-	503	-
1960	1708	2,690	Oct. 2, 1959	47	734	-	-	-	-

a Maximum daily discharge.

Note.--Monthly and yearly figures of discharge per square mile and runoff in inches, previously published in water-supply papers, may not represent natural flow because of uncertainty in the adjustments for effect of regulation, diversion, and evaporation. Those figures are not published herein.

3935. Spirit River at Spirit Falls, Wis.

Location.--Lat 45°26'55", long 89°58'50", in NW $\frac{1}{4}$ sec.10, T.34 N., R.4 E., near center of span on downstream side of bridge, 0.2 mile south of town of Spirit Falls, 0.6 mile upstream from Squaw Creek, and 2.0 miles downstream from Richie Creek.

Drainage area.--82 sq mi, approximately.

Records available.--April 1942 to September 1960.

Gage.--Wire-weight gage. Altitude of gage is 1,450 ft (from dam and reservoir data). Prior to Oct. 19, 1955, chain gage at same site and datum.

Average discharge.--18 years (1942-60), 83.3 cfs.

Extremes.--1942-60: Maximum discharge observed, 4,180 cfs Sept. 18, 1942 (gage height, 10.00 ft), from rating curve extended above 2,000 cfs; minimum observed, 1.2 cfs Aug. 16, 1947 (gage height, 0.82 ft).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	9.82	11.2	12.1	11.5	13.1	61.0	697	250	142	52.8	43.4	232	130
1952	222	150	86.5	21.9	20.0	24.0	622	71.6	133	155	80.9	21.7	134
1953	9.54	11.3	14.6	10.7	11.0	210	286	107	216	94.7	59.0	7.66	86.5
1954	6.94	14.4	29.5	12.2	14.2	25.2	240	222	100	32.1	18.3	102	68.1
1955	195	38.8	17.1	13.9	11.9	35.0	404	90.8	133	15.1	43.2	10.1	83.7
1956	38.3	36.4	18.0	14.6	13.6	14.6	355	94.9	121	60.4	45.5	9.63	68.1
1957	7.87	18.0	12.9	6.14	7.09	75.4	153	64.3	46.6	17.6	8.43	16.6	36.3
1958	15.1	39.3	22.7	11.0	8.54	30.1	218	61.9	57.1	160	23.0	68.8	59.7
1959	58.6	81.0	11.0	6.82	5.40	35.5	237	122	16.5	52.8	91.1	226	78.5
1960	195	59.6	25.3	71.8	18.7	17.4	375	373	53.2	23.5	33.3	63.6	109

Monthly and yearly runoff, in inches, of Spirit River at Spirit Falls, Wis.

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.14	0.15	0.17	0.16	0.17	0.86	9.48	3.52	1.93	0.74	0.61	3.57	21.50
1952	5.13	2.04	1.22	.31	.26	.34	8.46	1.01	1.81	2.18	1.14	.29	22.19
1953	.13	.15	.20	.15	.14	2.95	3.89	1.50	2.93	1.33	.83	.10	14.30
1954	.10	.20	.41	.17	.18	.35	3.26	3.13	1.37	.45	.26	1.39	11.27
1955	2.74	.53	.24	.20	.15	.49	5.50	1.28	1.80	.18	.61	.14	13.86
1956	.54	.49	.25	.21	.18	.21	4.83	1.33	1.65	.85	.64	.13	11.31
1957	.11	.25	.18	.09	.09	1.06	2.08	.90	.63	.25	.12	.25	6.01
1958	.21	.54	.32	.17	.11	.42	2.97	.87	.78	2.24	.32	.94	9.89
1959	.82	1.10	.15	.10	.07	.50	3.22	1.71	.22	.74	1.28	3.07	12.98
1960	2.74	.81	.36	1.01	.25	.24	5.10	5.25	.72	.33	.47	.86	18.14

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	82.1	13.59
1951	1208	1,570	Apr. 12, 1951	6.1	130	1.59	21.50	166	27.52
1952	1238	1,700	Apr. 18, 1952	10	154	1.63	22.19	98.1	16.28
1953	1278	1,820	June 20, 1953	5.9	86.5	1.05	14.30	87.8	14.53
1954	1358	1,210	May 3, 1954	5.9	68.1	1.830	11.27	85.0	14.07
1955	1388	1,510	Oct. 15, 1954	3.8	83.7	1.02	13.66	70.3	11.63
1956	1438	1,600	Apr. 6, 1956	6.2	68.1	.830	11.31	63.6	10.57
1957	1508	478	May 15, 1957	1.6	36.3	.443	6.01	39.5	6.54
1958	1558	710	July 5, 1958	5.0	59.7	.728	9.89	65.8	10.89
1959	1628	1,520	Sept. 27, 1959	3.9	78.5	.957	12.98	89.5	14.82
1960	1708	1,290	Apr. 13, 1960	6.5	109	1.33	18.14	-	-

3936. Spirit River Flowage near Tomahawk, Wis.

Location.--Lat 45°26'20", long 89°44'30", in SE $\frac{1}{4}$ sec. 9, T. 34 N., R. 6 E., on Spirit River, 2 miles south of Tomahawk.

Drainage area.--174 sq mi.

Records available.--September 1938 to September 1960. April 1923 to September 1960, gage heights and contents, at weekly intervals, in files of Geological Survey. Published as Spirit Reservoir, 1939-55.

Gage.--Staff gage. Datum of gage is 1,420.53 ft above mean sea level, datum of 1929.

Extremes.--1938-60: Maximum contents on last day of month, 760 million cubic feet, June 30, 1953 (gage height, 17 ft $\frac{1}{2}$ in.) by capacity table now in use, 780 million cubic feet by capacity table in use at the time; no usable contents at times.

Remarks.--Reservoir operation began in 1923; rebuilt and enlarged from 500 to 775 million cubic feet capacity in 1943 by capacity table in use at the time. Usable capacity, 756 million cubic feet between gage heights, 0 ft 0 in. and 17 ft 0 in. (limits stipulated by Public Service Commission of Wisconsin) by capacity table put in use Oct. 1, 1955. Records prior to October 1955 published with other reservoir records showing change in contents of the group.

Contents, in millions of cubic feet, on last day of month

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	278	258	191	99	13	152	762	770	773	757	592	766
1952	775	634	434	142	24	0	766	775	762	775	698	426
1953	379	398	296	68	0	766	766	702	780	750	474	390
1954	379	392	180	5	0	92	748	682	755	331	232	740
1955	775	657	126	16	14	115	749	736	572	414	483	483
1956	a546	662	380	154	8	28	577	486	746	681	584	252
1957	230	279	146	25	8	308	744	620	411	255	168	223
1958	250	371	267	2	-	77	743	507	518	429	277	624
1959	726	662	210	3	1	118	744	590	207	299	628	741
1960	751	670	362	116	2	54	730	746	730	534	525	616

a Contents by capacity table used beginning Oct. 1, 1955; contents Oct. 31, 1955, by capacity table used prior to Oct. 1, 1955, was 544 million cubic feet.

3940. New Wood River near Merrill, Wis.

Location.--Lat 45°15'30", long 89°50'40", in E $\frac{1}{2}$ sec.15, T.32 N., R.5 E., near right bank on downstream side of county highway bridge, three-quarters of a mile downstream from Kelly Creek, $\frac{2}{3}$ miles upstream from mouth, and $\frac{9}{10}$ miles northwest of Merrill.

Drainage area.--83 sq mi, approximately.

Records available.--October 1952 to September 1960. Monthly discharge only for October to December 1952.

Gage.--Wire-weight gage. Altitude of gage is 1,380 ft (from topographic map).

Average discharge.--8 years (1952-60), 73.1 cfs.

Extremes.--1952-60: Maximum discharge, 1,370 cfs July 9, 1959 (gage height, 6.00 ft, from graph based on gage readings); maximum gage height observed, 8.40 ft Apr. 3, 1955 (backwater from ice); minimum daily discharge, 1 cfs Jan. 11 to Feb. 20, 1959.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	#9.0	#10.5	15.1	9.25	8.56	190	306	103	202	110	132	6.97	#92.2
1954	7.33	18.8	31.3	7.02	10.4	18.8	231	193	88.5	24.7	9.15	63.4	58.4
1955	135	38.5	14.3	9.84	7.86	62.9	361	88.3	182	10.3	61.4	10.8	83.4
1956	35.5	41.9	15.8	12.6	10.9	12.3	390	90.8	62.2	63.5	40.4	8.38	65.0
1957	8.95	21.8	12.5	4.95	5.77	81.3	132	93.9	34.6	9.92	4.95	7.74	35.0
1958	8.42	24.4	11.6	6.45	3.96	9.39	167	67.2	99.5	82.1	13.7	46.9	45.0
1959	51.1	68.2	5.95	1.31	1.3	16.9	280	153	18.7	102	43.3	232	81.0
1960	243	53.5	44.7	103	17.9	20.8	363	444	76.9	28.3	49.7	46.8	125

* Not previously published; discharge estimated on basis of weather records and records for nearby stations.

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	#0.13	#0.14	0.21	0.13	0.11	2.64	4.11	1.43	2.72	1.52	1.84	0.09	#15.07
1954	.10	.23	.44	.10	.13	.26	3.11	2.67	1.19	.34	.13	.85	9.55
1955	1.88	.52	.20	.14	.10	.87	5.12	1.23	2.45	1.4	.85	.15	13.65
1956	.49	.56	.22	.18	.14	.17	5.25	1.26	.84	.88	.56	.11	10.66
1957	.12	.29	.17	.07	.07	1.13	1.78	1.30	.47	.14	.07	.10	5.71
1958	.12	.33	.16	.09	.05	.13	2.24	.93	1.34	1.14	.19	.63	7.35
1959	.71	.92	.08	.02	.02	.23	3.76	2.12	.25	1.42	.60	3.12	13.25
1960	3.37	.72	.62	1.44	.23	.29	4.88	6.17	1.03	.39	.69	.63	20.46

* Not previously published; see footnote to preceding table.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-
1953	1278	*1,100	June 21, 1953	5.7	#92.2	#1.11	15.07	93.9	15.36
1954	1338	1,110	May 3, 1954	5.0	58.4	.704	9.55	69.6	11.38
1955	1388	916	Apr. 6, 1955	5.8	83.4	1.00	13.65	75.3	12.32
1956	1438	1,050	Apr. 11, 1956	6.2	65.0	.783	10.66	60.8	9.97
1957	1508	615	May 15, 1957	2.0	35.0	.422	5.71	35.1	5.74
1958	1558	530	Apr. 8, 1958	3	45.0	.542	7.35	51.7	8.45
1959	1628	1,370	July 9, 1959	1	81.0	.976	13.25	99.4	16.25
1960	1708	1,180	May 17, 1960	6	125	1.51	20.46	-	-

* Revised.

* Not previously published.

3945. Prairie River near Merrill, Wis.

Location.--Lat 45°14'10", long 89°38'50", on line between secs. 20 and 29, T.32 N., R.7 E., near center of span on downstream side of highway bridge, 1.5 miles upstream from Meadow Creek, 4.5 miles northeast of Merrill, and 8 miles upstream from mouth.

Drainage area.--181 sq mi, approximately.

Records available.--January 1914 to September 1931, August 1939 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Chain gage. Altitude of gage is 1,300 ft (from topographic map). January 1914 to June 1931 chain gage and August 1939 to June 28, 1949, wire-weight gage, at same site and datum.

Average discharge.--38 years (1914-31, 1939-60), 181 cfs.

Extremes.--1914-31, 1939-60: Maximum discharge, 5,800 cfs Aug. 31, 1941 (gage height, 9.45 ft, from floodmarks), from rating curve extended above 2,200 cfs; minimum observed, 34 cfs Oct. 26, 1947 (gage height, 1.39 ft).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	99.6	76.7	74.2	66.4	68.8	109	731	271	200	175	126	191	182
1952	214	176	165	97.6	90.6	89.0	569	165	186	261	195	124	194
1953	86.0	99.7	126	83.6	79.5	307	427	197	172	211	159	75.5	169
1954	80.6	96.3	102	73.9	92.0	101	329	267	246	116	99.4	184	149
1955	180	112	84.6	75.5	78.8	128	500	148	218	83.7	146	88.8	153
1956	131	126	83.8	69.9	67.2	68.2	402	153	130	152	117	74.1	131
1957	74.7	108.9	80.9	67.4	66.1	143	234	175	114	77.4	68.1	139	112
1958	88.8	148	97.8	70.8	70.1	111	290	136	142	235	77.4	115	137
1959	160	146	81.4	67.4	65.6	87.8	318	185	79.9	150	318	633	191
1960	472	194	131	169	104	97.2	495	723	241	144	193	201	264

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.63	0.47	0.47	0.42	0.40	0.70	4.51	1.73	1.23	1.12	0.80	1.18	13.66
1952	1.36	1.08	1.04	.62	.54	.57	3.51	1.05	1.15	1.67	1.24	.76	14.59
1953	.55	.61	.80	.53	.46	1.95	2.63	1.26	1.06	1.54	1.01	.47	12.67
1954	.61	.59	.65	.47	.53	.64	2.03	1.70	1.52	.74	.63	1.13	11.14
1955	1.15	.69	.54	.48	.45	.81	3.08	.94	1.35	.53	.93	.55	11.50
1956	.83	.78	.53	.45	.40	.43	2.48	.98	.80	.97	.74	.46	9.85
1957	.48	.66	.52	.43	.38	.91	1.44	1.11	.70	.49	.43	.86	8.41
1958	.57	.91	.62	.45	.40	.70	1.79	.87	.87	1.86	.49	.11	10.24
1959	1.02	.90	.52	.43	.38	.56	1.96	1.18	.49	.96	2.03	5.90	14.33
1960	3.01	1.20	.83	1.07	.62	.62	3.05	4.61	1.49	.92	1.23	1.24	19.89

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	148	11.09
1951	1,208	1,590	Apr. 12, 1951	61	182	1.07	13.66	207	15.57
1952	1,236	995	Apr. 11, 1952	82	194	1.07	14.59	174	13.07
1953	1,278	1,590	Mar. 23, 1953	70	169	.934	12.67	166	12.46
1954	1,338	1,050	June 26, 1954	66	149	.823	11.14	157	11.77
1955	1,388	1,020	Apr. 2, 1955	61	153	.845	11.50	150	11.26
1956	1,438	1,050	Apr. 7, 1956	64	131	.724	9.85	124	9.37
1957	1,508	567	May 16, 1957	54	112	.619	8.41	118	8.85
1958	1,558	1,160	July 6, 1958	60	137	.757	10.24	141	10.58
1959	1,628	3,000	Sept. 28, 1959	60	191	1.06	14.33	226	16.93
1960	1,708	2,620	May 7, 1960	76	264	1.46	19.89	-	-

3950. Wisconsin River at Merrill, Wis.

Location.--Lat 45°10'40", long 89°40'45", on line between secs. 12 and 13, T.31 N., R.6 E., on left bank 300 ft downstream from highway bridge at east end of Merrill and 0.5 mile downstream from Prairie River.

Drainage area.--2,780 sq mi, approximately.

Records available.--November 1902 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,228.85 ft above mean sea level, datum of 1929. Prior to June 18, 1903, staff gage at different datum. June 18, 1903, to Sept. 10, 1914, chain gage at present site and datum.

Average discharge.--57 years (1903-60), 2,714 cfs.

Extremes.--1902-60: Maximum discharge, 49,400 cfs Aug. 31, 1941 (gage height, 18.26 ft), from rating curve extended above 20,000 cfs; minimum, about 90 cfs Sept. 26, 1908 (gage height, 2.45 ft).

Remarks.--Flow regulated by 20 reservoirs and 9 powerplants above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,472	1,494	1,622	1,864	1,589	2,115	7,581	4,906	4,208	4,077	2,623	3,869	3,118
1952	4,821	3,899	3,202	2,866	2,898	2,377	5,850	2,582	3,443	4,355	3,229	2,386	3,491
1953	1,825	1,578	1,719	2,020	1,909	3,267	3,978	2,369	4,150	3,768	2,892	1,997	2,625
1954	1,652	1,596	2,012	2,037	1,969	1,808	3,231	4,453	3,053	2,127	1,785	2,315	2,337
1955	3,635	2,612	2,710	2,366	2,214	2,025	4,849	2,100	3,357	1,745	2,095	1,715	2,616
1956	1,834	1,844	2,104	2,149	2,045	1,445	4,134	2,087	2,193	2,601	2,333	2,068	2,234
1957	1,812	1,895	2,081	1,814	1,591	1,893	2,424	1,931	1,626	1,511	1,309	1,545	1,787
1958	1,418	1,606	1,675	1,748	1,620	1,602	2,532	1,668	1,760	2,454	1,508	1,910	1,791
1959	1,855	1,940	1,987	1,965	1,580	1,391	2,805	2,164	1,483	2,033	2,385	4,878	2,204
1960	6,138	3,326	2,693	2,787	2,786	2,152	4,217	8,755	3,665	2,325	2,443	2,715	3,674

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	2,476	-
1951	1208	17,400	Apr. 12, 1951	1,200	3,118	-	-	3,734	-
1952	1238	14,600	July 23, 1952	1,840	3,491	-	-	2,921	-
1953	1278	12,200	July 2, 1953	1,410	2,625	-	-	2,637	-
1954	1338	13,500	May 3, 1954	1,250	2,337	-	-	2,648	-
1955	1388	10,600	June 11, 1955	1,390	2,616	-	-	2,349	-
1956	1438	8,630	Apr. 10, 1956	1,100	2,234	-	-	2,254	-
1957	1506	5,150	May 15, 1957	933	1,787	-	-	1,695	-
1958	1558	7,270	July 5, 1958	1,150	1,791	-	-	1,882	-
1959	1628	19,600	Sept. 27, 1959	1,100	2,204	-	-	2,742	-
1960	1708	17,000	May 7, 1960	1,100	3,674	-	-	-	-

Location.--Lat 44°58'25", long 89°54'15", in NW¹ sec.27, T.29 N., R.5 E., near center of span on downstream side of highway bridge in village of Rib Falls, 6 miles downstream from Black Creek.

Records available.--May 1925 to September 1957.

Average discharge.--32 years (1925-57), 289 cfs.

Extremes.--1925-57: Maximum discharge, 23,800 cfs Aug. 31, 1938 (gage height, 16.2 ft, from floodmarks), from rating curve extended above 12,000 cfs; minimum, 3 cfs (estimated) Jan. 23, 1930.

[illegible][illegible][illegible]

3970. Eau Claire River near Antigo, Wis.

Location--Lat 45°11'40", long 89°13'15", in E½ sec.3, T.31 N., R.10 E., rear right bank on downstream side of highway bridge, 4.6 miles upstream from West Branch Eau Claire River and 4 miles northwest of Antigo.

Drainage area--75 sq mi, approximately.

Records available--January 1949 to September 1955.

Gage--Reference point. Altitude of gage is 1,460 ft (from Chicago and Northwestern Railway elevation of river).

Average discharge--6 years (1949-55), 42.0 cfs.

Extremes--1949-55: Maximum discharge, 377 cfs Mar. 22, 1953 (gage height, 2.1 ft, from graph based on gage readings); minimum observed, 6.8 cfs July 24, 1955.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	24.8	24.6	22.1	19.0	16.2	51.4	120	45.2	47.0	75.0	53.0	74.1	47.8
1952	64.3	79.8	59.5	26.7	26.2	26.8	114	42.4	44.5	90.4	45.7	24.9	53.8
1953	27.7	39.0	28.9	22.1	21.0	74.9	75.1	36.9	31.9	44.9	49.4	29.8	40.2
1954	20.7	26.3	26.6	17.3	22.9	26.9	81.3	64.0	46.1	38.5	29.4	34.7	36.2
1955	52.9	38.2	24.4	21.5	21.9	44.0	96.1	36.6	51.9	15.7	23.8	25.6	37.7

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.36	0.37	0.34	0.29	0.23	0.79	1.79	0.69	0.70	1.15	0.81	1.10	8.64
1952	.99	1.19	.91	.41	.38	.41	1.70	.65	.66	1.39	.70	.37	9.76
1953	.43	.58	.44	.34	.29	1.15	1.12	.57	.47	.69	.76	.44	7.28
1954	.32	.39	.41	.27	.32	.41	1.21	.98	.69	.59	.45	.52	6.56
1955	.81	.57	.37	.33	.30	.68	1.43	.56	.77	.24	.37	.38	6.81

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	35.2	6.37
1951	1208	*276	Apr. 5, 1951	9.8	47.8	0.637	8.64	58.8	10.64
1952	1238	*292	Apr. 1, 1952	18	53.8	.717	9.76	44.8	8.12
1953	1278	*377	Mar. 22, 1953	17	40.2	.536	7.28	38.4	6.95
1954	1338	332	May 2, 1954	17	36.2	.483	6.56	39.7	7.19
1955	1388	197	Apr. 1, 1955	6.8	37.7	.503	6.81	-	-

* Revised.

3975. Eau Claire River at Kelly, Wis.

Location--Lat 44°55'05", long 89°33'00", on line between secs. 9 and 10, T.28 N., R.8 E., on right bank 50 ft downstream from highway bridge, 0.7 mile northeast of Kelly, 1.3 miles upstream from Big Sandy Creek, 4.5 miles upstream from mouth, and 5 miles southeast of Wausau.

Drainage area--326 sq mi.

Records available--January 1914 to November 1926, August 1939 to September 1960.

Gage--Water-stage recorder. Datum of gage is 1,177.88 ft above mean sea level, datum of 1929. Prior to November 1926, chain gage and August 1939 to Sept. 16, 1953, wire-weight gage, at same site at datum 1.00 ft higher.

Average discharge--33 years (1914-26, 1939-60), 245 cfs.

Extremes--1914-26, 1939-60: Maximum discharge, 8,300 cfs Aug. 21, 1926 (gage height, 8.4 ft, from graph based on gage readings), from rating curve extended above 6,000 cfs; minimum observed, 8 cfs July 17, 1944 (gage height, 0.17 ft), probably result of temporary regulation.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	74.1	76.5	57.1	49.0	48.4	197	1,496	218	161	249	114	204	244
1952	269	298	205	76.6	77.1	138	1,239	201	209	458	127	72.0	280
1953	72.0	89.1	98.9	62.7	48.6	691	533	157	194	353	344	61.2	227
1954	66.3	74.4	81.6	57.2	98.0	191	590	393	427	137	72.7	191	198
1955	269	149	96.4	69.2	67.9	335	840	193	372	73.5	97.4	73.8	219
1956	114	118	67.4	56.6	50.0	51.1	810	284	154	339	143	76.6	188
1957	67.9	112	65.8	40.0	41.0	206	450	200	113	66.6	62.5	207	136
1958	87.1	245	77.4	44.1	59.2	135	664	160	134	311	71.8	127	176
1959	111	164	60.5	43.1	45.4	154	681	270	84.2	68.0	348	711	228
1960	608	235	152	179	103	147	912	1,140	266	125	298	216	367

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.26	0.26	0.20	0.17	0.15	0.70	5.12	0.77	0.55	0.88	0.40	0.70	10.16
1952	.95	1.02	.73	.27	.26	.49	4.24	.71	.72	1.62	.45	.25	11.71
1953	.25	.30	.35	.22	.16	2.45	1.82	.56	.66	1.25	1.22	.21	9.45
1954	.23	.25	.29	.20	.31	.68	2.02	1.39	1.46	.49	.26	.65	8.23
1955	.95	.51	.54	.25	.22	1.18	2.87	.68	1.27	.26	.34	.25	9.12
1956	.40	.40	.24	.20	.17	.18	2.77	1.01	.53	1.20	.51	.26	7.87
1957	.24	.38	.23	.14	.13	.73	1.54	.71	.39	.24	.22	.71	5.66
1958	.31	.84	.27	.16	.19	.48	2.27	.57	.46	1.10	.25	.43	7.33
1959	.39	.56	.21	.15	.14	.54	2.33	.95	.29	.24	1.23	2.43	9.46
1960	2.15	.80	.54	.63	.34	.52	3.12	4.05	.91	.44	1.06	1.74	15.30

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	207	8.63
1951	1208	4,090	Apr. 7, 1951	35	244	0.748	10.16	292	12.14
1952	1258	4,580	Apr. 1, 1952	62	280	.859	11.71	237	9.31
1953	1278	5,280	Mar. 23, 1953	45	227	.696	9.45	224	9.32
1954	1358	2,430	Apr. 27, 1954	56	198	.607	8.23	222	9.26
1955	1388	3,230	Apr. 3, 1955	51	219	.672	9.12	201	8.36
1956	1438	3,650	Apr. 7, 1956	50	188	.577	7.87	184	7.68
1957	1508	1,450	Apr. 22, 1957	34	136	.417	5.66	149	6.23
1958	1558	2,420	Apr. 6, 1958	31	176	.540	7.33	170	7.07
1959	1628	5,410	Sept. 27, 1959	33	228	.699	9.46	283	11.79
1960	1708	4,350	May 7, 1960	70	367	1.13	15.30	-	-

3980. Wisconsin River at Rothschild, Wis.

Location.--Lat 44°53'10", long 89°37'50", in sec.26, T.28 N., R.7 E., on left bank at Rothschild, 0.5 mile downstream from Rothschild Dam, 2 miles downstream from Eau Claire River, 5 miles upstream from Black Creek, and 5.5 miles south of bridge on State Highway 29 in Wausau.

Drainage area.--4,000 sq mi, approximately.

Records available.--October 1944 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,135.86 ft above mean sea level, datum of 1929. Auxiliary staff gage in Mosinee Pond 8 miles downstream.

Average discharge.--16 years (1944-60), 3,250 cfs.

Extremes.--1944-60: Maximum discharge, 47,000 cfs Sept. 27, 1959 (gage height, 17.81 ft); minimum daily, 680 cfs Oct. 17, 1948.

Flood of Sept. 1, 1941, reached a stage of 22.3 ft, from tailwater data at Rothschild Dam (discharge, 75,000 cfs, from rating curve extended above 45,000 cfs by logarithmic plotting).

Remarks.--Flow regulated by 20 reservoirs and 12 powerplants above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,658	1,563	1,739	2,084	1,890	3,107	13,660	5,447	4,957	5,248	2,900	4,516	4,058
1952	5,749	4,766	3,798	3,255	3,233	2,844	11,000	3,111	4,054	6,052	3,649	2,676	4,510
1953	1,935	1,714	1,916	2,220	2,016	6,012	6,080	3,155	4,445	5,608	4,424	2,241	3,491
1954	1,866	1,751	2,178	2,117	2,238	2,517	5,155	6,349	4,391	2,661	1,975	3,068	3,022
1955	4,952	3,004	2,875	2,696	2,525	3,524	8,585	2,568	4,785	2,030	2,629	1,978	3,509
1956	2,269	2,237	2,281	2,422	2,264	1,613	8,279	3,249	3,065	3,684	2,660	2,194	3,022
1957	1,944	2,150	2,184	1,921	1,710	2,865	3,678	2,548	2,094	1,874	1,405	1,929	2,176
1958	1,565	2,089	1,617	1,775	1,782	2,122	4,817	2,064	2,708	3,355	1,673	2,306	2,337
1959	2,205	2,511	2,107	2,010	1,654	1,999	5,788	3,185	1,617	2,242	3,280	7,856	3,034
1960	8,738	4,302	3,476	3,741	3,077	2,938	7,972	13,930	4,688	2,675	3,407	3,272	5,198

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	3,257	-
1951	1208	33,200	Apr. 8, 1951	1,140	4,058	-	-	4,844	-
1952	1238	31,400	Apr. 2, 1952	1,790	4,510	-	-	3,788	-
1953	1278	32,500	Mar. 23, 1953	1,350	3,491	-	-	3,510	-
1954	1338	27,600	May 3, 1954	1,180	3,022	-	-	3,447	-
1955	1388	19,200	Apr. 3, 1955	1,460	3,509	-	-	3,169	-
1956	1438	23,400	Apr. 6, 1956	1,200	3,022	-	-	2,978	-
1957	1508	8,500	Apr. 20, 1957	943	2,176	-	-	2,107	-
1958	1558	17,800	Apr. 7, 1958	1,200	2,337	-	-	2,451	-
1959	1628	47,000	Sept. 27, 1959	868	3,034	-	-	3,852	-
1960	1708	42,900	May 7, 1960	1,550	5,198	-	-	-	-

Note.--Monthly and yearly figures of discharge per square mile and runoff in inches, previously published in water-supply papers, may not represent natural flow because of uncertainty in the adjustments for effect of regulation, diversion, and evaporation. Those figures are not published herein.

3985. Bull Creek Jr. near Rothschild, Wis.

Location.--Lat 44°50'00", long 89°36'25", in sec.12, T.27 N., R.7 E., at downstream edge on left side of bridge on county road X, 4 miles south of Rothschild and 5 miles upstream from mouth.

Drainage area.--26.4 sq mi.

Records available.--March 1944 to December 1951.

Gage.--Staff gage. Altitude of gage is 1,190 ft (from topographic map).

Average discharge.--7 years (1944-51), 17.4 cfs.

Extremes.--1944-51: Maximum discharge, 671 cfs Mar. 18, 1945 (gage height, 4.2 ft, from graph based on gage readings); no flow Mar. 2, 1950.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2.72	2.32	1.34	0.82	1.42	7.61	144	33.1	27.5	23.3	3.86	4.15	20.9
1952	15.5	29.4	17.4	-	-	-	-	-	-	-	-	-	-

* Not previously published; estimated on basis of weather records and records for nearby stations.

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.12	0.10	0.06	0.04	0.06	0.33	6.08	1.44	1.16	1.02	0.17	0.18	10.76
1952	.68	1.24	.78	-	-	-	-	-	-	-	-	-	-

* Not previously published; see footnote to preceding table.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	6.90
1951	1208	484	Apr. 8, 1951	0.5	20.9	0.792	10.76	13.4	#13.16
1952	1208	-	-	-	-	-	-	#25.6	-

* Not previously published.

3990. Big Eau Pleine River near Colby, Wis.

Location.--Lat 44°54'10", long 90°12'45", in NW $\frac{1}{4}$ sec.24, T.28 N., R.2 E., near center of span on downstream side of bridge at Cherokee, 1.6 miles upstream from Randall Creek and 5 miles east of Colby.

Drainage area.--79 sq mi, approximately.

Records available.--July 1941 to September 1954.

Gage.--Chain gage. Altitude of gage is 1,270 ft (from topographic map). Prior to Sept. 7, 1943, wire-weight gage at same site and datum.

Average discharge.--13 years (1941-54), 57.1 cfs.

Extremes.--1941-54: Maximum discharge, 9,370 cfs June 27, 1943 (gage height, 11.05 ft); no flow at times in 1941, 1947-50, 1952-54.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1.75	1.45	1.15	1.15	3.58	30.5	514	14.3	68.9	136	2.52	51.1	68.5
1952	57.0	55.3	43.8	2.17	2.96	5.27	265	12.3	9.79	93.7	46.8	1.90	49.6
1953	.713	2.86	2.23	1.16	1.38	262	113	26.5	19.2	191	60.7	.473	57.5
1954	.671	2.29	2.82	.196	19.6	42.5	100	122	41.4	36.9	4.96	88.4	38.5

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.03	0.02	0.02	0.02	0.05	0.44	7.26	0.21	0.97	1.98	0.04	0.72	11.76
1952	.83	.78	.64	.03	.04	.08	3.75	.18	1.14	1.37	.68	.03	8.55
1953	.01	.04	.03	.02	.02	3.83	1.60	.39	.27	2.78	.89	.007	9.89
1954	.01	.03	.04	.01	.26	.62	1.41	1.78	.59	.54	.07	1.25	6.61

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	7.96
1951	1208	*3,300	Apr. 8, 1951	0.3	68.5	0.867	11.76	46.4	81.2
1952	1238	a1,500	Apr. 1, 1952	.7	49.6	.628	8.55	37.0	13.94
1953	1278	*3,300	Mar. 22, 1953	0	57.5	.728	9.89	57.5	6.38
1954	1338	3,880	May 3, 1954	0	38.5	.487	6.61	-	9.89

* Revised.

a Estimated maximum daily.

3995. Big Eau Pleine River near Stratford, Wis.

Location.--Lat 44°49'15", long 90°04'35", on line between sec.13, T.27 N., R.3 E., and sec.18, T.27 N., R.4 E., on left bank 15 ft upstream from bridge on State Highway 97, 1 mile north of Stratford, and 1.4 miles downstream from small tributary.

Drainage area.--224 sq mi.

Records available.--July 1914 to December 1925, April 1937 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Altitude of gage is 1,170 ft (from topographic map). July 24, 1914, to Dec. 31, 1925, staff gage at site 0.5 mile upstream at different datum. Apr. 30, 1937, to Sept. 15, 1938, chain gage at present site and datum.

Average discharge.--34 years (1914-25, 1937-60), 168 cfs.

Extremes.--1914-25, 1937-60: Maximum discharge, 41,000 cfs Sept. 9, 1938 (gage height, 24.5 ft, from floodmarks), from rating curve extended above 24,000 cfs; no flow Aug. 17, 1947.
Flood of June 5, 1914, reached a stage of 20.7 ft, from floodmarks (discharge, 40,000 cfs), former site and datum.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	8.16	5.35	6.10	5.03	14.6	128	1,551	48.0	133	321	8.53	63.2	180
1952	103	90.3	115	14.0	13.0	31.0	1,276	36.0	33.7	180	101	5.90	165
1953	5.77	12.8	9.07	5.46	6.84	915	307	71.0	35.0	441	111	1.50	162
1954	2.26	4.34	5.46	2.13	45.7	180	270	357	70.2	84.3	11.5	194	102
1955	391	35.9	16.4	8.77	6.57	546	536	40.2	244	15.8	110	5.47	164
1956	16.5	19.4	9.3	7.6	6.8	8.8	1,106	239	235	209	19.8	6.47	156
1957	4.48	11.5	8.96	2.67	3.56	276	79.2	60.7	31.2	71.6	10.7	11.2	48.1
1958	7.27	29.6	17.4	7.7	77.2	168	442	33.6	401	25.4	10.3	13.6	102
1959	36.2	90.4	4.32	1.0	1.0	291	578	163	17.6	44.6	200	485	159
1960	255	39.6	300	53.0	7.17	373	716	986	134	23.4	46.0	20.6	245

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.04	0.03	0.03	0.03	0.07	0.66	7.72	0.25	0.66	1.65	0.04	0.31	11.49
1952	.53	.45	.59	.07	.06	.16	6.35	.19	.17	.93	.52	.03	10.05
1953	.03	.06	.05	.03	.03	4.71	1.53	.37	.17	2.27	.57	.007	9.83
1954	.01	.02	.03	.01	.21	.92	1.34	1.84	.35	.43	.06	.97	6.19
1955	2.01	.18	.08	.05	.03	2.81	2.67	.21	1.22	.08	.57	.03	9.94
1956	.08	.10	.05	.04	.03	.05	5.51	1.23	1.17	1.08	.10	.03	9.47
1957	.02	.06	.05	.01	.02	1.42	.39	.31	.16	.37	.06	.06	2.93
1958	.04	.15	.09	.04	.36	.86	2.20	.17	2.00	.13	.05	.07	6.16
1959	.19	.45	.02	.005	.005	1.50	2.88	.84	.09	.23	1.03	2.42	9.66
1960	1.16	.20	1.54	.27	.03	1.92	.56	5.08	.67	.12	.24	.10	14.89

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	160	9.68
1951	1208	9,280	Apr. 7, 1951	2.8	190	0.848	11.49	214	12.96
1952	1238	11,500	Apr. 1, 1952	2.8	165	.737	10.05	142	8.62
1953	1278	10,600	Mar. 22, 1953	.4	162	.723	9.83	161	9.75
1954	1338	7,650	May 3, 1954	.4	102	.455	6.19	139	8.40
1955	1398	6,200	Oct. 14, 1954	3.3	164	.732	9.94	130	7.90
1956	1438	10,500	Apr. 5, 1956	2.7	156	.696	9.47	154	9.37
1957	1508	4,000	Mar. 15, 1957	1.8	48.1	.215	2.93	50.6	3.08
1958	1558	8,990	June 5, 1958	3.6	102	.455	6.16	108	6.54
1959	1628	5,610	Sept. 27, 1959	1.0	159	.710	9.66	196	11.90
1960	1708	8,460	Dec. 28, 1959	5.1	245	1.09	14.89	-	-

3996. Big Eau Pleine Reservoir near Knowlton, Wis.

Location.--Lat 44°43'50", long 89°45'35", in SW $\frac{1}{4}$ sec.14, T.26 N., R.6 E., on Big Eau Pleine River, 4 miles south of Moon and 4.0 miles west of Knowlton.

Drainage area.--365 sq mi, approximately.

Records available.--September 1938 to September 1960, April 1937 to September 1960, gage heights and contents at weekly intervals, in files of Geological Survey.

Gage.--Float gage. Datum of gage is 1,115.00 ft above mean sea level (levels by Wisconsin Valley Improvement Co.).

Extremes.--1938-60: Maximum contents observed, 4,496 million cubic feet Oct. 25, 1959 (gage height, 31 ft 7 $\frac{1}{2}$ in.) no usable contents at times.

Remarks.--Reservoir operation began March 1937. Capacity enlarged from 4,051 to 4,551 million cubic feet in 1942, by capacity tables in use at the time. Usable capacity, 4,457 million cubic feet between gage heights 0 ft 0 in. and 31 ft 6 in. (limits stipulated by Public Service Commission of Wisconsin) by capacity table now in use. New capacity table put in use Oct. 1, 1955. Records prior to October 1955 published with other reservoir records showing change in contents of the group.

Contents, in millions of cubic feet, on last day of month

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	2,003	1,061	329	92	144	820	4,547	4,547	4,558	4,505	3,692	3,825
1952	4,285	4,445	3,762	1,899	200	302	4,536	4,544	4,520	4,490	4,430	3,590
1953	2,230	1,415	586	75	27	3,791	4,543	4,479	4,344	4,543	4,162	3,026
1954	2,162	1,696	1,226	189	273	968	2,232	3,716	4,139	4,135	3,722	4,318
1955	4,551	4,543	4,068	1,969	41	2,232	4,551	4,456	4,438	3,750	3,544	2,747
1956	a2,300	1,817	883	88	106	68	4,437	4,448	4,467	4,352	3,702	2,740
1957	1,929	1,842	1,121	222	72	1,417	1,776	2,040	2,175	2,334	2,044	2,068
1958	1,950	1,842	1,241	271	306	1,263	2,899	2,854	3,925	3,505	2,782	2,785
1959	2,449	2,376	1,507	393	81	1,472	3,925	4,283	3,151	2,778	2,854	4,186
1960	4,454	4,438	4,434	4,149	2,022	1,099	3,561	4,421	4,451	4,142	3,950	3,759

a Contents by capacity table used beginning Oct. 1, 1955; contents Oct. 31, 1955, by capacity table used prior to Oct. 1, 1955, was 2,332 million cubic feet.

4005. Plover River near Stevens Point, Wis.

Location.--Lat 44°35'20", long 89°29'15", in SW $\frac{1}{4}$ sec.6, T.24 N., R.9 E., on left bank at downstream side of town road bridge just east of county road Y, 5 miles northeast of Stevens Point and 9 miles upstream from mouth.

Drainage area.--136 sq mi.

Records available.--January 1914 to December 1919, January 1944 to December 1951. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Staff gage. Altitude of gage is 1,110 ft (from river-profile map).

Average discharge.--12 years (1914-19, 1944-51), 143 cfs.

Extremes.--1914-19, 1944-51: Maximum discharge, 1,610 cfs June 5, 1914 (gage height, 4.8 ft, from graph based on gage readings); minimum observed, 32 cfs Aug. 5, 6, 1945 (gage height, 0.40 ft).

Remarks.--Flow occasionally regulated by two small dams above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	86.3	89.3	70.4	65.6	67.9	97.8	427	147	155	134	90.1	108	128
1952	147	155	*118	-	-	-	-	-	-	-	-	-	-

* Not previously published; estimated on basis of weather records and records for nearby stations.

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.73	0.73	0.60	0.56	0.52	0.83	3.50	1.24	1.27	1.14	0.76	0.89	12.77
1952	1.24	1.27	*1.00	-	-	-	-	-	-	-	-	-	-

* Not previously published; see footnote to preceding table.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	122	12.16
1951	1208	781	Apr. 9, 1951	58	128	0.941	12.77	*142	*14.22
1952	1208	-	-	-	-	-	-	-	-

* Not previously published.

4006.5. Little Plover River at Plover, Wis.

Location.--Lat 44°28'20", long 89°30'10", in SW $\frac{1}{4}$ sec.14, T.23 N., R.8 E., on right bank at bridge on town road, 1 mile northeast of Plover and 1.2 miles upstream from mouth.

Drainage area.--15 sq mi, approximately, of which a large portion is noncontributing.

Records available.--July 1959 to September 1960.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 1,068.34 ft above mean sea level, datum of 1929 (levels by Wisconsin Conservation Department). Prior to May 20, 1960, staff gage at same site at datum 0.88 ft lower.

Extremes.--1959-60: Maximum discharge, about 60 cfs May 7, 1960; minimum, 5.4 cfs Mar. 18, 1960.

Remarks.--Hydrologic studies were made in the Little Plover River basin and additional streamflow data at upstream sites are available for this period.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1959	-	-	-	-	-	-	-	-	-	5.56	5.63	7.21	-
1960	10.8	9.78	9.26	9.17	7.13	7.52	12.2	17.7	10.6	8.33	7.30	7.67	9.81

4008. Wisconsin River at Wisconsin Rapids, Wis.
(Formerly published as Wisconsin River near Nekoosa)

Location.--Lat 44°22'05", long 89°51'30", in SW $\frac{1}{4}$ sec.24, T.22 N., R.5 E., at Centralia powerplant of Nekoosa Edwards Paper Co., 1.6 miles downstream from Chicago and Northwestern Railway bridge in Wisconsin Rapids.

Drainage area.--5,400 sq mi, approximately.

Records available.--May 1914 to March 1950 (published as "near Nekoosa"), October 1957 to September 1960.

Gage.--Water-stage recorders on headwater and tailwater. Elevation of powerplant pond is 980 ft and datum of powerplant gages is 887.83 ft above mean sea level (levels by Wisconsin Valley Improvement Co.). May 1914 to March 1950, water-stage recorder at site 7.0 miles downstream at different datum.

Average discharge.--38 years (1914-49, 1957-60), 4,918 cfs.

Extremes.--1914-50, 1957-60: Maximum discharge, 70,400 cfs Sept. 12, 1938 (gage height, 19.10 ft), from rating curve extended above 58,000 cfs; minimum, 26 cfs Sept. 7, 1942; minimum daily, 165 cfs Aug. 12, 1934.

Remarks.--Discharge computed from powerplant records on basis of load-discharge rating of hydroelectric units as developed by Geological Survey and taintor-gate ratings and spillway ratings based on theoretical formulas and discharge measurements. Flow regulated by 21 reservoirs and many powerplants above station. Water diverted periodically from pond of Wisconsin Rapids powerplant 2.6 miles upstream into Cranberry Creek, a tributary of Yellow River, for cranberry culture. Probably most of the water diverted is lost by evaporation, transpiration, and infiltration to the ground-water reservoir.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1958	2,039	2,704	2,417	2,469	2,160	2,695	5,615	2,795	3,291	3,690	2,054	2,704	2,885
1959	2,599	3,172	2,515	2,509	2,122	2,365	9,457	4,857	2,521	2,954	3,678	9,240	3,992
1960	11,670	5,765	4,992	5,116	4,334	4,081	10,870	19,730	6,111	3,505	3,875	4,045	7,025

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1958	1558	17,400	Apr. 7, 1958	713	2,885	-	-	2,979	-
1959	1628	49,100	Sept. 29, 1959	608	3,992	-	-	5,185	-
1960	1708	59,400	May 8, 1960	820	7,025	-	-	-	-

4014. Petenwell Flowage near Necedah, Wis.

Location.--Lat 44°03'25", long 90°01'15", in SE $\frac{1}{4}$ sec.4, T.18 N., R.4 E., on Wisconsin River, 0.7 mile upstream from bridge on State Highway 21 and 3.5 miles northeast of Necedah.

Drainage area.--5,860 sq mi, approximately.

Records available.--April 1950 to September 1960.

Gage.--Staff gage. Datum of gage is 790.2 ft above mean sea level (levels by Wisconsin River Power Co.).

Extremes.--1950-60: Maximum contents on last day of month, 19,926 million cubic feet Oct. 31, 1954 (gage height, 136.05 ft); minimum, 11,262 million cubic feet Feb. 28, 1951 (gage height, 125.46 ft).

Remarks.--Dam was completed in 1949. Reservoir operation began in April 1950. Limits of operation are stipulated by Public Service Commission of Wisconsin as follows: maximum gage height, Mar. 16 to June 15, 136.00 ft (19,880 million cubic feet) and June 16 to Mar. 15, 135.00 ft (18,980 million cubic feet); minimum, Apr. 16 to Dec. 31, 134.00 ft (18,090 million cubic feet) and Jan. 1 to Apr. 15, 130.00 ft (14,690 million cubic feet).

Contents, in millions of cubic feet, on last day of month

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1950	-	-	-	-	-	-	18,354	18,944	18,800	18,935	18,908	18,728
1951	18,809	18,213	13,073	11,626	11,262	11,856	19,871	19,862	19,385	18,917	18,926	19,448
1952	19,772	19,205	19,016	17,307	15,512	13,204	19,799	19,160	19,826	19,637	18,710	18,543
1953	16,142	15,856	15,696	15,318	14,290	19,808	19,835	18,620	19,700	19,592	18,908	18,178
1954	18,090	17,949	17,245	16,259	15,026	14,739	19,232	19,358	19,754	18,629	18,728	18,628
1955	19,926	19,340	18,746	17,879	16,746	17,527	18,926	18,998	18,710	18,998	18,656	18,424
1956	19,250	18,917	17,861	16,276	15,075	14,186	19,700	19,475	18,980	18,530	18,818	18,416
1957	18,854	18,838	18,284	17,368	16,175	16,402	19,268	19,844	18,773	18,620	18,548	19,043
1958	18,782	18,935	18,372	17,360	15,856	16,116	19,349	19,016	18,512	18,248	18,196	18,764
1959	18,989	18,818	18,407	17,756	16,511	15,184	19,709	19,484	18,620	18,328	18,571	18,890
1960	18,990	18,900	19,053	17,688	16,654	15,461	19,903	19,754	18,863	18,284	18,556	18,512

4020. Yellow River at Babcock, Wis.

Location.--Lat 44°18'05", long 90°07'15", in NW $\frac{1}{4}$ sec.14, T.21 N., R.3 E., on right bank on downstream side of highway bridge at Babcock, 1.9 miles upstream from Hemlock Creek.

Drainage area.--223 sq mi.

Records available.--March 1944 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 954.75 ft above mean sea level, datum of 1929. Prior to Oct. 28, 1948, chain gage at same site and datum.

Average discharge.--16 years, 117 cfs.

Extremes.--1944-60: Maximum discharge, 11,600 cfs Apr. 2, 1952 (gage height, 17.38 ft); minimum observed, 1.0 cfs Oct. 1, 1948 (gage height, 1.22 ft).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	12.4	11.6	7.35	7.46	8.35	46.7	1272	64.5	102	102	39.4	29.9	141
1952	127	112	90.5	25.8	24.0	47.1	1319	41.3	98.6	94.9	198	18.8	182
1953	9.74	17.2	17.2	14.6	14.0	770	385	111	25.2	14.0	20.6	5.41	118
1954	6.30	8.55	9.77	15.30	18.4	92.2	167	340	100	141	11.7	124	85.8
1955	532	58.2	28.2	12.8	11.8	205	450	153	210	14.3	18.1	6.00	142
1956	12.8	19.5	8.3	7.2	6.5	8.1	933	223	142	78.3	41.7	9.03	123
1957	8.65	15.0	10.3	7.44	7.61	120	97.6	136	49.4	35.1	15.3	13.2	43.2
1958	10.2	32.3	13.6	12.3	32.0	124	312	38.3	26.7	13.2	9.37	11.6	52.6
1959	20.2	41.8	9.96	5.39	5.11	711	125	25.8	21.2	19.8	196	107	107
1960	184	117	218	104	14.1	113	396	831	102	30.4	13.7	14.9	179

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.06	0.06	0.04	0.04	0.04	0.24	6.36	0.33	0.51	0.53	0.20	0.15	8.56
1952	.66	.56	.47	.13	.12	.24	8.60	.21	.49	.49	1.02	.09	11.08
1953	.05	.09	.09	.08	.07	3.98	1.92	.57	.13	.07	.11	.03	7.19
1954	.03	.04	.05	.03	.09	.48	1.76	.50	.73	.06	.62	.523	5.23
1955	2.75	.29	.15	.07	.06	1.06	2.25	.79	1.05	.07	.09	.03	8.66
1956	.07	.10	.04	.04	.03	.04	4.67	1.15	.71	.40	.22	.05	7.52
1957	.04	.07	.05	.04	.04	.62	.49	.70	.25	.18	.08	.07	2.63
1958	.05	.16	.07	.06	.15	.64	1.56	.20	.13	.07	.05	.06	3.20
1959	.10	.21	.05	.03	.02	.60	5.65	.65	.13	.11	.10	.98	6.53
1960	.95	.59	1.13	.54	.07	.58	1.98	4.30	.51	.16	.07	.07	10.95

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	114	8.91
1951	1208	6,620	Apr. 8, 1951	6.0	141	0.632	8.56	166	10.09
1952	1238	11,600	Apr. 2, 1952	8.5	182	.816	11.08	158	9.62
1953	1278	7,130	Mar. 22, 1953	4.7	118	.529	7.19	116	7.08
1954	1338	3,760	May 3, 1954	5.2	85.8	.385	5.23	136	8.30
1955	1388	4,180	Oct. 4, 1954	4.7	142	.637	8.66	93.3	5.68
1956	1438	8,470	Apr. 5, 1956	5.0	123	.552	7.52	123	7.47
1957	1508	4,462	May 27, 1957	6.0	43.2	.194	2.63	45.1	2.75
1958	1558	3,080	Apr. 7, 1958	5.4	52.6	.236	3.20	53.9	3.28
1959	1628	3,400	Apr. 1, 1959	5	107	.480	6.53	145	8.84
1960	1708	5,460	May 7, 1960	5.4	179	.803	10.95	-	-

4030. Yellow River at Necedah, Wis.

Location.--Lat 44°01'30" (revised) long 90°04'15", in SW $\frac{1}{4}$ sec.18, T.18 N., R.4 E., at powerplant of Wisconsin Power and Light Co., at Necedah, and 5 miles downstream from Cranberry Creek.

Drainage area.--526 sq mi.

Records available.--October 1940 to September 1957.

Gage.--Staff gage. Datum of gage is 884.08 ft above mean sea level, datum of 1929.

Average discharge.--17 years (1940-57), 350 cfs.

Extremes.--1940-57: Maximum discharge, 12,800 cfs Apr. 3, 1952 (gage height, 17.10 ft); minimum observed, 1 cfs Aug. 22, Aug. 26 to Sept. 1, 1942, Aug. 12, 1943; minimum daily, 1.4 cfs Nov. 18, 21, 1953.

Remarks.--Record kept of hours of operation of single unit powerplant and used in computation of discharge. Water diverted periodically from Wisconsin River into Cranberry Creek basin for cranberry culture. Probably most of the water diverted is lost by evaporation, transpiration, and infiltration to the ground-water reservoir.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	66.4	40.8	38.9	36.5	34.6	235	2,897	397	316	409	149	133	394
1952	346	373	290	172	158	232	2,537	243	221	248	340	128	437
1953	69.0	64.5	95.9	71.2	63.6	1,223	1,007	508	165	99.9	124	43.2	296
1954	50.0	29.0	45.5	23.7	34.8	131	303	916	453	663	91.6	385	262
1955	1,369	476	193	131	90.0	377	1,145	466	846	128	96.4	46.0	450
1956	55.4	112	52.4	38.6	40.0	50.4	1,576	803	269	239	213	95.4	294
1957	67.9	84.1	70.7	46.5	49.4	222	315	441	284	130	69.8	49.1	153
1958	-	-	-	-	-	-	-	-	-	-	-	-	-
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.15	0.09	0.09	0.08	0.07	0.52	6.15	0.87	0.67	0.90	0.33	0.28	10.20
1952	.76	.79	.61	.38	.32	.51	5.58	.53	.47	.54	.75	.27	11.31
1953	.15	.14	.21	.16	.13	2.68	2.14	1.11	.55	.22	.27	.09	7.65
1954	.11	.06	.10	.05	.07	.29	.64	2.01	.96	1.45	.20	.82	6.76
1955	3.00	1.01	.42	.29	.18	.83	2.43	1.07	1.79	.28	.21	.10	11.61
1956	.12	.24	.11	.08	.08	.11	3.34	1.76	.57	.52	.47	.20	7.60
1957	.15	.18	.15	.10	.10	.49	.67	.97	.60	.28	.15	.10	3.94
1958	-	-	-	-	-	-	-	-	-	-	-	-	-
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	267	6.90
1951	1208	8,620	Apr. 9, 1951	10	394	0.749	10.20	466	12.03
1952	1238	12,800	Apr. 3, 1952	19	437	.831	11.31	373	9.65
1953	1278	8,020	Mar. 24, 1953	11	296	.563	7.65	287	7.42
1954	1338	4,120	May 6, 1954	1.4	262	.498	6.76	423	10.92
1955	1388	4,600	Oct. 6, 1954	7.0	450	.855	11.61	296	7.65
1956	1438	8,990	Apr. 7, 1956	2	294	.559	7.60	295	7.61
1957	1508	854	(a)	3	153	.291	3.94	-	-
1958	-	-	-	-	-	-	-	-	-
1959	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-

a May 31 to June 2, 1957.

4032. Castle Rock Flowage near Mauston, Wis.

Location.--Lat 43°51'50", long 89°57'35", in sec.13, T.16 N., R.4 E., 4½ miles upstream from Duck Creek, 2 miles south of Germantown, and 7 miles northeast of Mauston.

Drainage area.--6,860 sq mi, approximately.

Records available.--May 1950 to September 1960.

Gage.--Staff gage. Datum of gage is 790.2 ft above mean sea level (levels by Wisconsin River Power Co.).

Extremes.--1950-60: Maximum contents on last day of month, 7,786 million cubic feet June 30, 1954 (gage height, 94.20 ft); minimum, 3,439 million cubic feet Nov. 30, 1951 (gage height, 87.18 ft).

Remarks.--Dam was completed in 1950. Reservoir operation began in May 1950. Limits of operation are stipulated by Public Service Commission of Wisconsin as follows: maximum gage height, Mar. 16 to June 15, 94.00 ft (7,630 million cubic feet) and June 16 to Mar. 15, 93.00 ft (6,880 million cubic feet); minimum, May 1 to Jan. 31, 92.00 ft (6,180 million cubic feet) and Feb. 1 to Apr. 30, 87.00 ft (3,360 million cubic feet).

Contents, in millions of cubic feet, on last day of month												
Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1950	-	-	-	-	-	-	-	5,684	4,850	5,697	5,748	5,703
1951	5,837	5,850	5,995	4,417	3,540	3,686	7,072	7,198	6,657	6,635	6,055	4,980
1952	6,262	3,439	3,518	3,571	3,724	3,786	7,478	6,330	6,411	7,311	5,896	6,228
1953	6,262	6,693	4,781	4,518	3,919	7,372	7,228	6,221	7,493	7,191	6,432	5,632
1954	5,824	5,466	4,740	3,919	4,484	3,662	5,863	6,873	7,786	6,722	6,765	6,998
1955	7,265	6,466	6,167	5,824	4,980	4,361	7,708	7,622	6,736	6,714	6,563	6,520
1956	6,786	6,722	6,350	5,903	4,479	3,482	7,311	6,991	6,722	6,466	6,398	6,418
1957	6,452	6,729	6,895	6,241	4,833	3,580	5,294	7,132	6,722	6,880	6,493	6,180
1958	6,779	6,592	6,538	6,592	6,008	3,966	7,220	6,411	6,459	6,722	6,736	6,384
1959	6,750	6,343	6,650	6,534	5,418	3,448	7,455	7,265	6,592	6,357	6,865	6,844
1960	6,880	6,736	6,750	6,121	4,734	3,753	7,653	7,615	7,028	6,779	6,765	6,729

4035. Lemonweir River at New Lisbon, Wis.

Location.--Lat 43°52'50", long 90°09'40", in sec.8, T.16 N., R.3 E., near center of span on downstream side of bridge on State Highway 80 in New Lisbon, 200 ft downstream from recreation dam and 1 mile upstream from Webster Creek.

Drainage area.--500 sq mi (revised), approximately.

Records available.--March 1944 to September 1960.

Gage.--Wire-weight gage. Datum of gage is 867.05 ft above mean sea level, datum of 1929. Prior to May 5, 1948, chain gage at site 100 ft downstream at same datum. May 5, 1948, to June 30, 1958, chain gage at present site and datum.

Average discharge.--16 years (1944-60), 335 cfs.

Extremes.--1944-60: Maximum discharge, 6,880 cfs May 8, 1960 (gage height, 12.94 ft, from graph based on gage readings); minimum observed, 36 cfs Aug. 15, 1944 (gage height, -0.06 ft, caused by closure of dam upstream).

Remarks.--Occasional regulation by dam 200 ft above station. Water diverted periodically into the basin from the Yellow and Black River basins for cranberry culture.

Monthly and yearly mean discharge, in cubic feet per second													
Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	94.1	79.7	95.0	108	121	451	2,027	409	333	406	145	139	566
1952	402	333	238	188	201	450	1,766	264	495	298	244	132	416
1953	104	116	142	133	125	853	821	555	168	161	328	90.1	301
1954	78.1	80.5	94.9	69.2	117	171	323	706	575	877	122	423	304
1955	1121	414	269	166	145	310	1,001	684	779	269	215	74.8	455
1956	112	145	115	103	100	200	1,241	817	187	157	214	174	297
1957	114	166	146	109	111	170	350	496	402	167	92.1	117	207
1958	104	209	193	130	107	182	337	164	110	90.2	62.6	76.1	147
1959	76.7	94.2	82.8	62.5	63.2	227	1,201	713	243	167	282	496	309
1960	1101	832	433	486	180	234	847	1,946	698	229	125	166	609

Monthly and yearly runoff, in inches of Lemonweir River at New Lisbon, Wis.

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.22	0.18	0.22	0.25	0.25	1.04	4.52	0.94	0.74	0.94	0.33	0.31	9.94
1952	.93	.74	.55	.43	.43	1.04	3.94	.61	1.10	.69	.56	.30	11.32
1953	.24	.26	.33	.31	.26	1.97	1.83	1.28	.37	.37	.76	.20	8.18
1954	.18	.18	.22	.16	.24	.39	.72	1.63	1.28	2.02	.28	.94	8.24
1955	2.59	.92	.62	.38	.30	.71	2.23	1.58	1.74	.62	.50	.17	12.36
1956	.26	.32	.26	.24	.22	.46	2.77	1.88	.42	.36	.49	.39	8.07
1957	.26	.37	.24	.25	.23	.39	.87	1.14	.90	.39	.21	.26	5.61
1958	.24	.47	.44	.30	.22	.42	.75	.38	.25	.21	.14	.17	3.99
1959	.18	.21	.19	.14	.13	.52	2.68	1.64	.54	.38	.65	1.11	8.37
1960	2.54	1.86	1.00	1.12	.39	.54	1.89	4.49	1.56	.53	.29	.37	16.58

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	244	6.65
1951	1208	*3,720	Apr. 10, 1951	67	366	0.732	9.94	425	11.54
1952	1238	*5,300	Apr. 2, 1952*	100	416	.832	11.32	365	9.93
1953	1278	*2,480	Mar. 24, 1953	76	301	.602	8.18	292	7.93
1954	1358	3,140	July 8, 1954	60	304	.608	8.24	435	11.79
1955	1388	2,320	Oct. 6, 1954	65	455	.910	12.36	334	9.07
1956	1438	5,580	Apr. 5, 1956	80	297	.594	8.07	301	8.20
1957	1508	1,110	May 28, 1957	73	207	.414	5.61	213	5.79
1958	1558	710	Apr. 10, 1958	56	147	.294	3.99	126	3.42
1959	1628	3,300	Apr. 3, 1959	58	309	.618	8.37	486	13.19
1960	1708	6,880	May 8, 1960	87	609	1.22	16.58	-	-

* Revised.

4037. Dell Creek near Lake Delton, Wis.

Location.--Lat 43°33'05", long 89°51'55", in NW¼ sec.2, T.12 N., R.5 E., on right bank 50 ft upstream from highway bridge, 6 miles southwest of Lake Delton and 7 miles upstream from mouth.

Drainage area.--44.9 sq mi.

Records available.--September 1957 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 847.49 ft above mean sea level, datum of 1929. Prior to Oct. 4, 1957, wire-weight gage 50 ft downstream at same datum.

Extremes.--1957-60: Maximum discharge, 753 cfs May 11, 1959 (gage height, 8.04 ft); minimum, 10.9 cfs Aug. 1, 2, 1959 (gage height, 1.75 ft).

Remarks.--Records of suspended sediment loads for the period of October 1957 to September 1960 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1958	16.3	22.1	19.7	16.4	19.8	19.5	25.5	15.1	15.8	15.8	12.9	13.4	17.7
1959	15.1	14.9	12.1	12.3	13.2	27.8	72.8	39.1	18.2	17.2	17.1	19.2	23.3
1960	38.0	33.9	28.0	26.7	18.9	42.4	38.9	60.4	35.7	30.9	28.1	31.8	34.5

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1958	0.42	0.55	0.50	0.42	0.46	0.50	0.63	0.39	0.39	0.41	0.33	0.33	5.33
1959	.39	.37	.51	.32	.31	.71	1.81	1.00	.45	.44	.44	.48	7.03
1960	.97	.84	.72	.69	.45	1.09	.97	1.55	.89	.79	.72	.79	10.47

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1958	1558	98	Apr. 6, 1958	11.6	17.7	0.394	5.33	16.3	4.93
1959	1628	753	May 11, 1959	11	23.3	.519	7.03	28.1	8.49
1960	1708	485	Mar. 28, 1960	17	34.5	.768	10.47	-	-

4040. Wisconsin River near Wisconsin Dells, Wis.

Location.--Lat 43°36'20", long 89°45'25", in extreme western part of sec.14, T.13 N., (corrected) R.6 E., on right bank 0.5 mile downstream from Dell Creek and 3 miles downstream from Wisconsin Dells.

Drainage area.--7,830 sq mi, approximately.

Records available.--October 1934 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 810 ft (from topographic map).

Average discharge.--26 years (1934-60), 6,696 cfs (revised).

Extremes.--1934-60: Maximum discharge, 72,200 cfs Sept. 14, 1938 (gage height, 18.83 ft); minimum daily, 1,060 cfs Aug. 19, 1936.

Remarks.--Diurnal fluctuation caused by powerplant of Wisconsin Power & Light Co. at Wisconsin Dells. Flow regulated by 23 reservoirs since 1950 (21 reservoirs prior to 1950) and many powerplants above station.

Revisions.--The momentary minimum discharge published in WSP 1308 has been found to be unreliable and should not be used. That figure is not published herein.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	*2,957	*3,295	5,441	4,529	4,196	5,441	25,050	10,220	9,629	9,902	5,287	6,026	*7,657
1952	8,599	9,476	6,548	6,258	6,297	6,635	18,201	6,778	6,286	8,560	6,983	5,132	7,969
1953	4,102	3,847	4,600	4,539	4,922	8,354	12,940	8,212	5,476	7,533	8,357	*4,026	*6,419
1954	*3,172	*3,128	*4,271	4,448	4,291	4,753	5,371	11,060	7,345	8,361	*2,819	*4,655	*5,327
1955	11,450	6,816	5,875	5,323	5,561	6,445	13,640	6,230	10,140	*3,510	*3,923	*2,881	*6,810
1956	3,318	4,326	4,542	4,610	4,921	4,608	11,990	9,224	5,758	7,063	4,920	4,014	5,771
1957	3,230	3,996	4,215	4,106	4,337	5,276	5,044	4,911	5,313	2,875	2,333	2,680	4,022
1958	2,630	3,968	3,821	3,867	4,024	4,699	5,188	4,271	4,305	4,615	2,463	3,082	3,908
1959	2,893	4,100	3,132	3,184	3,664	4,242	9,633	7,768	4,396	4,065	3,973	9,262	5,017
1960	16,110	9,990	6,460	7,750	6,258	6,128	10,120	26,990	10,090	5,404	4,855	5,943	9,699

* Revised.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	*5,478	-
1951	1208	61,700	Apr. 11, 1951	*1,840	*7,657	-	-	8,737	-
1952	1238	28,600	Apr. 14, 1952	3,570	7,969	-	-	6,962	-
1953	1278	24,000	Apr. 13, 1953	*2,410	*6,419	-	-	*6,253	-
1954	1338	31,600	May 5, 1954	*2,380	*5,327	-	-	*6,469	-
1955	1388	29,700	June 13, 1955	*2,490	*6,810	-	-	*5,801	-
1956	1438	29,500	Apr. 11, 1956	2,400	5,771	-	-	*5,709	-
1957	1508	7,130	Mar. 18, 1957	1,630	4,022	-	-	3,935	-
1958	1558	8,240	July 9, 1958	1,220	3,908	-	-	3,883	-
1959	1628	43,800	Sept. 30, 1959	1,860	5,017	-	-	6,907	-
1960	1708	63,300	May 10, 1960	3,160	9,699	-	-	-	-

* Revised.

Note.--Monthly and yearly figures of discharge per square mile and runoff in inches, previously published in water-supply papers, may not represent natural flow because of uncertainty in the adjustments for effect of regulation, diversion, and evaporation. Those figures are not published herein.

4050. Baraboo River near Baraboo, Wis.

Location.--Lat 43°28'55", long 89°38'00", in NW¹ sec.35, T.12 N., R.7 E., near center of span on upstream side of highway bridge, 0.3 mile downstream from Rowley Creek and 4 miles east of Baraboo.

Drainage area.--600 sq mi (revised). At site used 1913-22, 578 sq mi (revised).

Records available.--December 1913 to March 1922. September 1942 to September 1967.

Gage.--Wire-weight and crest-stage gages. Datum of gage is 788.21 ft above mean sea level, datum of 1929. Dec. 18, 1913, to Mar. 31, 1922, chain gage at bridge 2.3 miles upstream at datum 7.6 ft higher. Sept. 24, 1942 (corrected), to Oct. 10, 1956, chain gage at present site and datum.

Average discharge.--25 years (1914-21, 1942-60), 377 cfs (revised).

Extremes.--1913-22, 1942-60: Maximum discharge observed, 7,900 cfs Mar. 26, 1917 (gage height, 17.5 ft, estimated, site and datum then in use), from rating curve extended above 6,000 cfs; minimum observed, 9 cfs Feb. 17, 1944 (gage height, 5.08 ft); minimum daily, 86 cfs Oct. 6, 1950.

Flood of Aug. 6, 1935, reached a stage of 15.8 ft, from floodmarks, site and datum in use in 1922 (discharge, 5,100 cfs).

Remarks.--Diurnal regulation from four powerplants at Baraboo.

Revisions.--Revised records for the water years 1948 and 1950, superseding those published in WSP 1308, are given herewith. Revised daily figures for the period affected are available and will be published in a subsequent water-supply paper.

Month	Mean	Per square mile	Runoff in inches	Momentary maximum		Minimum day
				Discharge	Date	
March 1948.....	1,759	2.93	3.38	-	-	217
Water year 1947-48.....	371	.818	8.41	5,340	Mar. 21, 1948	62
Calendar year 1948.....	349	.582	7.90	-	-	62
March 1950.....	1,338	2.23	2.57	-	-	140
Water year 1949-50.....	389	.648	8.80	5,760	Mar. 29, 1950	58

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	139	148	151	160	250	839	1,750	433	378	504	243	196	432
1952	391	348	231	258	234	881	1,216	284	708	644	372	216	482
1953	199	259	250	261	333	1,006	655	457	294	214	357	171	372
1954	173	200	205	163	347	351	503	359	493	697	313	310	342
1955	583	248	215	178	356	558	735	242	252	211	227	151	329
1956	181	192	154	151	139	575	*1,241	582	179	215	189	182	*331
1957	134	237	166	130	151	234	305	266	390	152	136	151	204
1958	133	204	157	118	183	235	310	138	112	116	95.8	100	158
1959	117	116	76.2	78.3	89.3	346	1,742	337	144	151	187	226	300
1960	613	446	304	397	141	405	860	1,302	297	397	201	299	473

* Revised.

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.27	0.27	0.29	0.31	0.43	1.61	3.25	0.83	0.70	0.97	0.47	0.36	9.76
1952	.75	.65	.44	.50	.42	1.69	2.28	.54	1.32	1.24	.71	.40	10.92
1953	.38	.48	.45	.50	.58	1.93	1.22	.88	.55	.41	.69	.32	8.42
1954	.33	.37	.39	.31	.60	1.67	.94	.69	.92	1.34	.60	.58	7.74
1955	1.12	.46	.41	.34	.62	1.07	1.37	.47	.47	.41	.44	.28	7.46
1956	.35	.36	.30	.29	.25	1.10	*2.31	1.12	.33	.41	.36	.34	*7.52
1957	.26	.44	.32	.25	.26	.45	.57	.51	.72	.29	.26	.28	4.61
1958	.26	.38	.30	.23	.32	.45	.58	.27	.21	.22	.18	.19	3.59
1959	.22	.22	.15	.15	.16	.67	3.24	.65	.27	.29	.36	.42	6.80
1960	1.18	.83	.58	.78	.25	.78	1.60	2.50	.55	.74	.39	.56	10.72

* Revised.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	*387	8.76
1951	1208	-	Mar. 31, 1951	26	432	0.720	9.76	477	10.77
1952	1238	3,550	Apr. 4, 1952	144	482	.803	10.92	460	10.42
1953	1278	2,020	Mar. 25, 1953	121	372	.620	8.42	361	8.17
1954	1338	2,150	July 8, 1954	122	342	.570	7.74	382	8.64
1955	1388	1,770	Apr. 25, 1955	95	329	.548	7.46	285	6.48
1956	1438	*5,340	Apr. 6, 1956	94	*331	*.552	*7.52	*332	*7.53
1957	1508	808	June 13, 1957	53	204	.340	4.61	200	4.53
1958	1558	940	Apr. 7, 1958	42	158	.263	3.59	143	3.24
1959	1628	5,910	Apr. 5, 1959	61	300	.500	6.80	398	8.80
1960	1708	4,220	May 10, 1960	101	473	.788	10.72	-	-

* Revised.

4060. Wisconsin River at Prairie du Sac, Wis.

Location--Lat 43°17'25", long 89°42'55", in sec.1, T.9 N., R.6 E., on downstream end of seventh pier from right bank of bridge on State Highway 60 in Prairie du Sac, 1.6 miles downstream from Prairie du Sac powerplant and 6.5 miles upstream from Foney Creek.

Drainage area--8,950 sq mi, approximately.

Records available--January 1946 to December 1953.

Gage--Water-stage recorder. Datum of gage is 729.64 ft above mean sea level, datum of 1929.

Average discharge--7 years (1946-53), 6,916 cfs.

Extremes--1946-53: Maximum discharge (revised), 67,700 cfs Apr. 13, 1951 (gage height, 17.10 ft, from graph based on gage readings); minimum observed, 298 cfs Sept. 5, 7, 1946 (gage height, 0.98 ft); minimum daily, 1,500 cfs Feb. 1, Aug. 8, 1948.

Remarks--Flow regulated by 21 reservoirs prior to 1950, 23 reservoirs since 1950, and many powerplants above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	3,572	3,652	5,914	5,075	4,937	7,381	28,680	11,380	10,600	10,590	5,726	6,651	8,670
1952	9,664	9,892	7,379	7,029	7,160	8,854	21,243	7,499	7,273	9,755	7,507	5,238	9,031
1953	4,341	4,114	5,165	4,733	5,494	9,678	14,570	9,407	5,489	7,831	9,781	4,485	7,103
1954	3,608	3,669	4,900	-	-	-	-	-	-	-	-	-	-

* Not previously published.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean
		Discharge	Date					Runoff in inches
1950	-	-	-	-	-	-	-	6,190
1951	1208	*67,700	Apr. 13, 1951*	2,300	8,670	-	-	9,824
1952	1238	32,300	Apr. 11, 15, 1952	3,050	9,031	-	-	7,919
1953	1278	27,300	Apr. 14, 1953	2,800	7,103	-	-	*6,982
1954	1278	-	-	-	-	-	-	-

* Revised.

* Not previously published.

Note.--Monthly and yearly figures of discharge per square mile and runoff in inches, previously published in water-supply papers, may not represent natural flow because of uncertainty in the adjustments for effect of regulation, diversion, and evaporation. Those figures are not published herein.

4065. Black Earth Creek at Black Earth, Wis.

Location--Lat 43°08'00", long 89°44'00", in SW $\frac{1}{4}$ sec.25, T.8 N., R.6 E., on right bank 0.7 mile east of Black Earth and 2.1 miles upstream from Vermont Creek.

Drainage area--45.9 sq mi.

Records available--February 1954 to September 1960.

Gage--Water-stage recorder. Altitude of gage is 810 ft (from topographic map).

Average discharge--6 years (1954-60), 30.2 cfs.

Extremes--1954-60: Maximum discharge, 1,750 cfs July 3, 1954 (gage height, 6.58 ft); minimum, 4.8 cfs Nov. 29, 1958, result of freezeup.

Remarks--Records of suspended sediment loads and water temperatures for the period February 1954 to September 1960, are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	-	-	-	-	24.5	22.7	27.8	27.6	46.7	64.3	28.1	29.3	-
1955	44.1	28.0	26.6	25.7	39.6	39.0	40.2	31.6	30.5	30.6	27.5	21.8	32.1
1956	24.5	23.1	21.1	20.0	24.1	42.8	30.2	39.6	24.4	22.3	19.8	19.7	28.0
1957	18.1	21.0	19.4	21.9	26.8	20.1	22.5	23.1	53.3	24.7	24.6	21.8	24.7
1958	21.9	26.8	22.9	18.6	25.6	19.5	22.8	21.0	20.7	17.4	15.5	15.3	20.6
1959	16.6	16.8	15.9	15.1	16.0	71.5	68.1	21.3	20.1	21.5	35.7	22.7	28.5
1960	47.1	38.7	34.2	42.8	27.8	47.5	51.0	83.9	46.7	76.7	48.4	47.2	49.1

Monthly and yearly runoff, in inches, of Black Earth Creek at Black Earth, Wis.

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	-	-	-	-	0.56	0.57	0.67	0.69	1.13	1.62	0.71	0.71	-
1955	1.11	0.68	0.67	0.64	.90	.98	.98	.79	.74	.77	.69	.53	9.48
1956	.61	.56	.53	.50	.57	1.07	.73	.99	.59	.56	.50	.48	7.69
1957	.46	.51	.49	.55	.61	.90	.55	.58	1.30	.62	.62	.53	7.32
1958	.55	.65	.58	.47	.58	.74	.55	.53	.50	.44	.39	.37	6.10
1959	.42	.41	.40	.38	.36	1.79	1.65	.54	.49	.54	.90	.55	8.43
1960	1.06	.94	.86	1.08	.65	1.19	1.24	2.11	1.14	1.93	1.21	1.15	14.56

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-
1954	1358	1,750	July 3, 1954	-	-	-	-	-	-
1955	1388	654	Feb. 20, 1955	20	32.1	0.699	9.48	29.5	8.72
1956	1438	408	May 13, 1956	18	26.0	.566	7.69	25.1	7.45
1957	1508	1,030	June 11, 1957	16	24.7	.538	7.32	25.8	7.64
1958	1558	266	Feb. 24, 1958	12	20.6	.449	6.10	18.8	5.55
1959	1628	1,120	Apr. 1, 1959	14	28.5	.621	8.43	34.0	10.06
1960	1708	1,020	July 3, 1960	23	49.1	1.07	14.56	-	-

4070. Wisconsin River at Muscoda, Wis.

Location.--Lat 43°12'00", long 90°26'25", in sec.1, T.8 N., R.1 W., on left bank at bridge on State Highway 80, 0.5 mile upstream from Eagle Mill Creek and 1 mile north of Muscoda.

Drainage area.--10,300 sq mi, approximately.

Records available.--December 1902 to December 1903 (gage heights and discharge measurements only), October 1913 to September 1960. Monthly discharge only for October and November 1913, published in WSP 1308. Gage-height records collected at same site November 1908 to December 1912 are contained in reports of U.S. Weather Bureau.

Gage.--Water-stage recorder. Datum of gage is 667.05 ft above mean sea level, datum of 1929. Prior to Nov. 22, 1929, chain gage on bridge 200 ft upstream at same datum. Nov. 22, 1929, to Mar. 15, 1930, chain gage at present site and datum.

Average discharge.--47 years (1913-60), 8,508 cfs.

Extremes.--1902-3, 1913-60: Maximum discharge, 80,800 cfs Sept. 16, 1938 (gage height, 11.48 ft); minimum daily, 2,000 cfs Feb. 11, 1918.

Remarks.--Flow regulated by 23 reservoirs and many powerplants above station. About 20 cfs diverted out of basin through Portage Canal to Fox River during most of the year since 1959 or earlier.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	4,120	4,007	6,726	5,803	5,259	7,565	29,150	12,940	11,370	11,850	6,668	7,403	9,400
1952	10,440	11,480	8,547	7,982	7,766	10,080	22,050	9,329	8,986	11,400	9,175	6,703	10,320
1953	4,925	4,770	6,022	5,978	6,921	10,900	15,860	10,470	6,321	8,351	11,070	5,158	8,071
1954	3,924	4,118	5,083	5,396	5,586	6,088	7,510	13,090	9,765	11,380	5,355	6,687	7,000
1955	14,450	8,791	7,496	6,734	7,123	9,132	16,300	7,787	11,940	5,003	5,182	3,781	8,638
1956	4,282	5,294	5,689	5,772	6,092	7,129	15,350	11,760	6,795	8,315	6,139	5,268	7,321
1957	4,284	5,476	5,690	5,214	5,918	6,729	6,519	6,206	7,906	4,549	3,707	3,872	5,498
1958	3,562	5,032	4,864	4,910	5,261	6,100	6,841	5,655	5,443	5,478	3,325	3,588	5,000
1959	3,519	5,225	4,119	4,186	4,466	6,538	15,240	9,908	5,846	5,211	4,913	7,897	6,415
1960	16,670	13,080	8,578	10,710	8,307	8,071	13,500	22,270	13,090	9,102	6,817	7,760	12,550

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	1208	64,800	Apr. 14, 1951	2,500	9,400	-	-	7,133	-
1952	1238	31,500	Apr. 15-16, 1952	4,880	10,320	-	-	10,710	-
1953	1278	24,600	Apr. 15-16, 1953	3,810	8,071	-	-	9,088	-
1954	1338	31,900	May 9, 1954	2,800	7,000	-	-	7,853	-
1955	1388	25,600	June 16, 1955	3,090	8,638	-	-	8,483	-
1956	1438	31,600	Apr. 15, 1956	3,200	7,321	-	-	7,334	-
1957	1508	12,000	June 12, 1957	3,300	5,498	-	-	7,337	-
1958	1558	10,700	July 11, 1958	2,320	5,000	-	-	5,330	-
1959	1628	25,300	Apr. 3, 1959	2,950	6,415	-	-	4,949	-
1960	1708	67,200	May 12, 1960	4,420	12,530	-	-	8,726	-

Note.--Monthly and yearly figures of discharge per square mile and runoff in inches, previously published in water-supply papers, may not represent natural flow because of uncertainty in the adjustments for effect of regulation, diversion, and evaporation. Those figures are not published herein.

4080. Kickapoo River at La Farge, Wis.

Location.--Lat 43°34'30", long 90°38'35", on east-west quarter section line in W $\frac{1}{2}$ sec.29, T.13 N., R.2 W., on left bank 10 ft upstream from bridge on State Highway 82, in La Farge, 0.3 mile upstream from Otter Creek, and 1 mile downstream from powerplant.

Drainage area.--266 sq mi.

Records available.--October 1938 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 782.00 ft above mean sea level, adjustment of 1912. Prior to Dec. 4, 1939, chain gage on highway bridge at same ditum.

Average discharge.--22 years (1938-60), 166 cfs.

Extremes.--1938-60: Maximum discharge, 6,750 cfs Apr. 4, 1956 (gage height, 12.35 ft); maximum gage height, 12.90 ft Mar. 8, 1950 (backwater from ice); minimum discharge, 1.8 cfs Mar. 24, 1951.

Remarks.--Considerable diurnal fluctuation caused by operation of powerplant 1 mile upstream.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	83.2	82.1	88.6	78.5	94.5	228	475	168	169	258	105	88.9	160
1952	210	154	119	140	141	353	459	158	267	214	183	110	207
1953	108	118	109	108	109	308	270	189	159	149	172	105	159
1954	111	117	111	84.2	178	175	184	186	159	290	103	142	153
1955	227	131	115	91.0	123	213	191	221	282	120	99.8	84.4	158
1956	108	106	94.1	89.6	89.2	216	604	202	109	97.7	112	98.7	160
1957	91.5	112	97.6	77.7	109	114	140	133	185	134	91.3	107	116
1958	84.9	119	108	86.4	137	118	140	80.4	80.9	77.8	60.4	77.3	97.1
1959	75.4	91.6	62.0	61.3	62.2	328	644	303	110	108	241	282	197
1960	317	210	184	139	98.4	249	302	475	228	225	176	168	232

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.36	0.34	0.38	0.34	0.37	0.99	2.00	0.73	0.71	1.12	0.46	0.37	8.17
1952	.91	.64	.52	.61	.57	1.44	1.93	.68	1.12	.93	.79	.46	10.60
1953	.47	.49	.47	.47	.43	1.33	1.13	.82	.67	.64	.74	.44	8.10
1954	.48	.49	.48	.36	.70	.76	.77	.61	.67	1.26	.45	.59	7.82
1955	.98	.55	.50	.39	.48	.92	.90	.96	1.18	.52	.43	.35	8.06
1956	.47	.45	.41	.39	.36	.94	2.53	.87	.46	.42	.49	.41	8.20
1957	.40	.47	.42	.34	.43	.49	.59	.58	.78	.58	.40	.45	5.93
1958	.37	.50	.47	.37	.54	.51	.59	.35	.34	.34	.26	.32	4.96
1959	.32	.54	.27	.27	.24	1.42	2.70	1.31	.46	.47	1.05	1.18	10.03
1960	1.37	.98	.80	.60	.40	1.08	1.27	2.06	.96	.98	.76	.70	11.86

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	157	8.00
1951	1208, 1388	6,600	July 21, 1951	59	180	0.802	8.17	179	9.16
1952	1238	5,480	Apr. 1, 1952	74	207	.778	10.60	195	9.96
1953	1278	1,560	Aug. 2, 1953	86	159	.598	8.10	159	8.12
1954	1339, 1388	4,370	July 3, 1954	71	153	.575	7.82	164	8.40
1955	1388	2,510	June 3, 1955	72	158	.594	8.06	144	7.36
1956	1438	6,750	Apr. 4, 1956	70	160	.602	8.20	160	8.16
1957	1508	1,570	July 21, 1957	68	116	.436	5.93	117	5.98
1958	1558	902	Apr. 6, 1958	37	97.1	.365	4.96	89.1	4.55
1959	1628	5,100	May 2, 1959	56	197	.741	10.03	238	12.15
1960	1708	4,350	Mar. 28, 1960	72	232	.872	11.86	-	-

4085. Knapp Creek near Bloomingdale, Wis.

Location.--Lat 43°40'05", long 90°46'55", in NW¹ sec.30, T.14 N., R.3 W., on right bank 0.4 mile upstream from confluence with West Fork Kickapoo River, 1.7 miles north of Bloomingdale, and 4 miles east of Westby.

Drainage area.--8.47 sq mi.

Records available.--October 1954 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 960 ft (from topographic map).

Average discharge.--6 years (1954-60), 5.16 cfs.

Extremes.--1954-60: Maximum discharge, 3,710 cfs Aug. 26, 1959 (gage height, 8.76 ft), from rating curve extended above 250 cfs on basis of slope-area measurement of peak flow; minimum daily, 0.6 cfs Jan. 8-10, 17-27, Jan. 30 to Feb. 1, 1959.
Flood in July 1954 reached a stage of about 10.5 ft from floodmarks.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	-	-	-	-	-	-	-	-	-	-	-	-	-
1955	5.4	2.68	2.34	1.91	10.4	18.2	6.64	7.42	11.4	2.83	1.62	1.73	6.02
1956	2.38	2.44	1.94	1.96	2.09	8.34	16.5	5.76	2.61	2.15	1.93	1.85	4.16
1957	1.82	2.38	1.63	2.86	4.16	3.17	3.20	2.97	7.96	2.53	1.81	3.12	3.12
1958	1.63	2.41	1.97	1.88	5.25	2.03	3.90	1.77	1.58	1.45	1.22	1.83	2.22
1959	1.68	1.60	1.02	.68	.88	10.6	24.0	10.9	2.39	2.82	22.6	16.5	8.00
1960	17.7	6.51	5.98	5.17	1.89	6.78	10.3	9.88	8.13	9.62	3.58	3.35	7.44

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	-	-	-	-	-	-	-	-	-	-	-	-	-
1955	0.74	0.35	0.32	0.26	1.28	2.47	0.87	1.01	1.50	0.39	0.22	0.24	9.65
1956	.32	.32	.26	.27	.27	1.13	2.18	.78	.34	.29	.26	.24	6.66
1957	.25	.31	.22	.39	.51	.43	.42	.40	1.05	.34	.25	.41	4.98
1958	.22	.32	.27	.26	.65	.28	.51	.24	.21	.20	.17	.25	3.58
1959	.23	.21	.14	.09	.11	1.45	3.16	1.48	.31	.38	3.08	2.17	12.81
1960	2.41	.86	.81	.70	.24	.92	1.35	1.34	1.08	1.31	.49	.44	11.95

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-
1954	-	-	-	-	-	-	-	-	-
1955	1,388	1,030	June 2, 1955	-	1.3	6.02	0.711	9.65	5.71
1956	1,438	401	Apr. 2, 1956	1.4	4.16	.491	6.66	4.03	6.54
1957	1,508	402	June 17, 1957	1.4	3.12	.368	4.98	3.13	5.01
1958	1,558	140	Feb. 24, 1958	1.1	2.22	.262	3.58	2.03	3.35
1959	1,628	3,710	Aug. 26, 1959	.6	8.00	.944	12.81	10.2	16.31
1960	1,708	734	Apr. 16, 1960	1.5	7.44	.878	11.95	-	-

4105. Kickapoo River at Steuben, Wis.

Location.--Lat 43°11'25", long 90°52'30", in NW $\frac{1}{4}$ sec. 8, T. 8 N., R. 4 W., on right bank 0.8 mile upstream from Duffy Creek, 1 mile northwest of Steuben, and 14 miles upstream from mouth.

Drainage area.--690 sq mi.

Records available.--May 1933 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 657.82 ft above mean sea level, adjustment of 1912. Prior to Oct. 20, 1938, chain gage at site 1 mile upstream at datum 1.3 ft higher.

Average discharge.--27 years (1933-60), 449 cfs.

Extremes.--1933-60: Maximum discharge, 10,300 cfs July 22, 1951 (gage height, 13.66 ft); minimum observed, 161 cfs Aug. 9, 1936 (gage height, 0.76 ft, site and datum then in use).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	296	280	290	262	313	588	1,224	568	569	1,072	559	400	536
1952	558	481	422	449	440	704	1,148	504	677	760	536	410	590
1953	395	409	415	401	412	616	664	529	440	429	551	354	485
1954	344	362	354	315	537	468	543	561	538	703	396	412	460
1955	567	386	341	308	449	622	800	513	663	380	301	264	449
1956	312	322	302	286	283	752	1,058	540	341	298	304	304	425
1957	279	311	281	252	312	345	373	341	458	346	273	290	321
1958	256	315	301	245	320	353	385	244	224	220	203	218	273
1959	208	223	172	172	184	661	1,748	497	475	361	626	628	497
1960	686	610	495	466	330	543	770	1,116	632	744	503	466	614

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.49	0.45	0.48	0.44	0.47	0.98	1.98	0.95	0.92	1.79	0.93	0.65	10.53
1952	.93	.78	.70	.75	.69	1.18	1.86	.84	1.10	1.27	.90	.66	11.66
1953	.66	.66	.69	.67	.62	1.36	1.07	.88	.71	.72	.92	.57	9.53
1954	.58	.58	.59	.53	.81	.78	.88	.94	.87	1.18	.66	.67	9.07
1955	.95	.62	.57	.52	.68	1.04	.97	.86	1.07	.63	.50	.43	8.84
1956	.52	.52	.50	.48	.44	1.26	1.71	.90	.55	.50	.51	.49	8.38
1957	.47	.50	.47	.42	.47	.58	.60	.57	.74	.58	.46	.47	6.33
1958	.43	.51	.50	.41	.48	.59	.62	.41	.36	.37	.34	.35	5.37
1959	.34	.36	.29	.29	.28	1.10	2.83	.83	.77	.64	1.05	1.02	9.80
1960	1.15	.99	.81	.78	.52	.91	1.25	1.87	1.02	1.24	.84	.75	12.13

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	497	9.77
1951	1208	10,300	July 22, 1951	214	536	0.777	10.53	586	11.52
1952	1238	4,470	Apr. 3, 1952	334	590	.855	11.66	570	11.26
1953	1278	1,430	Aug. 5, 1953	330	486	.703	9.53	472	9.27
1954	1338	2,570	July 7, 1954	276	460	.667	9.07	480	9.46
1955	1388	1,670	June 7, 1955	248	449	.651	8.84	419	8.24
1956	1438	6,310	Apr. 5, 1956	250	425	.616	8.38	420	8.28
1957	1508	972	June 19, 1957	210	321	.465	6.33	321	6.33
1958	1588	1,030	Mar. 1, 1958	176	273	.396	5.37	250	4.92
1959	1628	6,940	Apr. 3, 1959	165	497	.720	9.80	597	11.76
1960	1708	3,070	May 9, 1960	280	614	.690	12.13	-	-

4116. Turkey River at Spillville, Iowa

Location.--Lat 43°12'30", long 91°57'00", in SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.19, T.97 N., R.9 W., on right bank 60 ft downstream from highway bridge at north edge of Spillville, 150 ft downstream from old mill dam, and 3,000 ft upstream from Wonder Creek.

Drainage area.--177 sq mi.

Records available.--June 1956 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,034.77 ft above mean sea level, datum of 1929.

Extremes.--1956-60: Maximum discharge, 3,220 cfs Mar. 30, 1960 (gage height, 10.70 ft); maximum gage height, 11.48 ft Mar. 29, 1959 (backwater from ice); minimum daily discharge, 4.4 cfs Feb. 1-3, 1959.

Flood in June 1947 reached a stage of 18.4 ft, from floodmark (discharge not determined).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	-	-	-	-	-	-	-	-	43.1	36.8	49.3	26.9	-
1957	20.2	21.0	15.6	15.1	26.1	45.3	30.1	62.6	77.3	85.3	33.6	32.6	38.8
1958	23.6	31.4	26.1	20.7	61.1	46.5	53.5	25.6	20.1	31.2	13.9	12.5	30.3
1959	10.7	13.2	8.52	5.53	4.84	235	248	56.1	114	106	59.0	100	60.3
1960	70.8	136	98.0	64.2	36.2	146	207	304	286	100	62.9	101	134

* Not previously published; partly estimated on basis of records for nearby stations.

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	-	-	-	-	-	-	-	-	0.27	0.24	0.32	0.17	-
1957	0.13	0.13	0.10	0.10	0.15	0.29	0.19	0.41	.49	.56	.22	.21	2.98
1958	.15	.20	.17	.13	.36	.30	.34	1.17	.13	.20	.09	.08	2.32
1959	.07	.08	.06	.04	.03	1.53	1.56	.37	.72	.69	.38	.63	6.16
1960	.46	.85	.64	.42	.22	.95	1.30	1.98	1.80	.65	.41	.64	10.32

† Corrected.

* Not previously published; see footnote to preceding table.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1956	1508	a398	July 31, 1956	b19	-	-	-	-	-
1957	1508	1,230	July 16, 1957	9.6	38.8	0.219	2.98	40.9	3.14
1958	1558	500	Feb. 24, 1958	8.9	30.3	.171	2.32	26.2	2.01
1959	1628	2,100	Mar. 30, 1959	4.4	80.3	.454	6.16	103	7.90
1960	1708	3,220	Mar. 30, 1960	24	134	.757	10.32	-	-

a Maximum during period June to September.

b Minimum daily during period June to September.

4125. Turkey River at Garber, Iowa

Location.--Lat 42°44'20", long 91°15'45", in NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.36, T.92 N., R.4 W., on left bank 10 ft downstream from highway bridge at Garber, 800 ft upstream from Wayman Creek, 2,000 ft downstream from Elk Creek, and 1 mile downstream from Volga River.

Drainage area.--1,545 sq mi (revised).

Records available.--August 1913 to November 1916, May 1919 to September 1927, April 1929 to September 1930, October 1932 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 635.34 ft above mean sea level, adjustment of 1912. Prior to Feb. 7, 1935, chain gage at same site and datum.

Average discharge.--40 years (1913-16, 1919-27, 1929-30, 1932-60), 851 cfs.

Extremes.--1913-16, 1919-27, 1929-30, 1932-60: Maximum discharge, 32,300 cfs Feb. 23, 1922 (gage height, 28.06 ft, from floodmark); minimum daily, 49 cfs Jan. 28, 29, 1940. Maximum stage known since about 1890, that of Feb. 23, 1922.

Remarks.--Records of water temperatures and suspended sediment loads for the period October 1957 to September 1960 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	258	193	191	140	1,118	3,453	6,382	1,736	2,213	2,542	1,500	666	1,680
1952	931	830	662	1,278	1,413	2,617	2,490	1,256	939	568	793	330	1,176
1953	225	241	198	292	659	1,510	1,462	1,060	1,188	1,235	2,420	388	909
1954	286	264	239	117	270	251	754	1,642	1,683	543	347	282	557
1955	700	316	242	204	326	1,106	979	657	1,176	516	255	135	552
1956	209	139	105	124	146	1,552	949	710	369	384	440	233	448
1957	152	224	172	192	341	356	289	510	1,417	553	228	175	353
1958	159	201	180	125	369	348	374	270	314	296	245	108	250
1959	102	175	79.5	68.8	60.9	3,444	2,375	992	1,582	1,071	702	606	942
1960	521	1,245	813	1,185	451	1,862	2,259	3,703	1,732	762	491	459	1,293

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.19	0.14	0.14	0.10	0.75	2.58	4.61	1.30	1.60	1.90	0.97	0.48	14.76
1952	.69	.60	.49	.85	1.00	1.95	1.80	.94	.68	.42	.59	.24	10.35
1953	.17	.17	.15	.22	.44	1.13	1.06	.79	.86	.32	1.81	.28	8.00
1954	.21	.19	.18	.09	.18	.19	.54	1.23	1.22	.40	.26	.20	4.89
1955	.52	.23	.18	.15	.22	.83	.71	.49	.85	.38	.19	.10	4.85
1956	.16	.10	.08	.09	.10	1.16	.68	.53	.27	.29	.33	.17	3.96
1957	.11	.16	.13	.14	.23	.27	.21	.38	1.02	.41	.17	.13	3.36
1958	.12	.15	.13	.09	.26	.26	.27	.20	.23	.22	.16	.08	2.19
1959	.08	.13	.06	.05	.04	2.57	1.72	.74	1.14	.80	.52	.44	8.29
1960	.39	.90	.61	.88	.31	1.39	1.63	2.76	1.25	.57	.37	.33	11.39

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	1,069	9.40
1951	1208	21,900	Mar. 28, 1951	93	1,680	1.09	14.76	1,830	16.07
1952	1238	9,840	Apr. 1, 1952	160	1,176	.761	10.35	1,029	9.06
1953	1278	16,900	July 27, 1953	160	909	.588	8.00	920	8.09
1954	1338	16,400	June 21, 1954	98	557	.361	4.89	596	5.24
1955	1388	9,840	June 3, 1955	74	552	.357	4.85	484	4.26
1956	1438	12,300	Mar. 28, 1956	78	448	.290	3.96	456	4.02
1957	1508	7,320	June 19, 1957	100	393	.248	3.36	392	3.36
1958	1558	12,100	May 31, 1958	86	250	.162	2.19	234	2.06
1959	1628	17,000	Mar. 26, 1959	56	942	.610	8.29	1,128	9.91
1960	1708	20,000	Mar. 30, 1960	259	1,293	.837	11.39	-	-

4135. Grant River at Burton, Wis.

Location.--Lat 42°43'10", long 90°49'10", in sec.23, T.3 N., R.4 W., on right bank at downstream side of highway bridge at Burton, 6 miles northwest of Potosi and 9.5 miles upstream from mouth.

Drainage area.--267 sq mi.

Records available.--October 1934 to September 1960. Published as "near Burton" October 1934 to September 1947. Records published for both sites March to September 1947.

Gage.--Water-stage recorder. Datum of gage is 606.89 ft above mean sea level, adjustment of 1912. Oct. 17, 1934, to Sept. 30, 1947, wire-weight gage at site 6 miles upstream at datum 33.18 ft higher. Mar. 18, 1947, to July 27, 1949, wire-weight gage at present site and datum.

Average discharge.--26 years (1934-60), 161 cfs.

Extremes.--1934-60: Maximum discharge, 25,000 cfs July 16, 1950 (gage height, 24.82 ft), from rating curve extended above 18,000 cfs on basis of slope-area measurement of peak flow; minimum, 21 cfs Mar. 4, 1954, result of freezeup.

Revisions.--The momentary maximum discharge for the water year 1942 published in WSP 1308 has been revised to 3,990 cfs (gage height, 7.90 ft, from floodmarks).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	66.6	77.0	60.0	57.5	167	414	376	239	295	383	203	135	206
1952	197	200	134	280	232	428	285	191	147	160	150	105	206
1953	97.7	111	107	156	501	243	146	125	107	279	174	81.1	175
1954	78.5	77.8	83.4	70.7	89.1	76.8	120	233	605	149	93.3	98.4	148
1955	206	97.6	80.8	82.6	218	253	149	110	139	91.6	70.1	68.5	130
1956	74.1	68.6	78.7	61.5	91.8	202	91.6	105	66.7	66.9	68.5	63.1	86.7
1957	53.7	57.6	54.3	72.1	108	55.6	66.0	67.5	163	148	80.8	58.1	81.8
1958	53.1	61.4	57.2	45.1	111	55.3	78.1	46.8	61.8	53.0	51.8	42.2	59.3
1959	56.2	43.6	37.7	33.4	36.1	1,057	200	167	154	108	140	78.8	178
1960	128	189	122	342	107	570	220	323	167	134	119	116	212

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.29	0.32	0.26	0.25	0.65	1.79	1.57	1.03	1.23	1.65	0.88	0.56	10.48
1952	.85	.83	.58	1.12	.94	1.85	1.11	.82	.62	.69	.65	.44	10.50
1953	.42	.47	.46	.67	1.95	1.05	.61	.54	.45	1.20	.75	.34	8.91
1954	.34	.33	.36	.31	.35	.33	.50	1.01	2.53	.64	.40	.41	7.51
1955	.89	.41	.35	.36	.85	1.09	.62	.47	.58	.40	.30	.29	6.61
1956	.32	.29	.34	.27	.37	.87	.38	.45	.28	.29	.30	.26	4.42
1957	.23	.24	.23	.31	.42	.24	.28	.29	.68	.64	.35	.24	4.15
1958	.23	.26	.25	.19	.43	.24	.33	.20	.26	.23	.22	.18	3.02
1959	.24	.18	.16	.14	.14	4.56	.84	.72	.65	.47	.60	.33	9.03
1960	.55	.79	.53	1.48	.43	2.46	.92	1.39	.70	.58	.51	.49	10.83

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	216	10.97
1951	1208	11,700	July 8, 1951	45	206	0.772	10.48	234	11.07
1952	1238	7,280	Mar. 10, 1952	89	206	.772	10.50	188	9.59
1953	1278	12,300	Feb. 20, 1953	71	175	.655	8.91	169	8.59
1954	1338	23,800	June 22, 1954	60	148	.554	7.51	160	8.13
1955	1388	8,000	Feb. 20, 1955	47	130	.487	6.61	116	5.91
1956	1438	6,000	Mar. 2 or 3, 1956	45	96.7	.325	4.42	82.0	4.17
1957	1508	5,240	July 31, 1957	34	81.8	.306	4.15	92.3	4.19
1958	1558	1,200	Feb. 25, 1958	37	59.3	.222	3.02	56.4	2.86
1959	1628	11,000	Mar. 25, 1959	30	178	.667	9.03	203	10.32
1960	1708	10,700	Jan. 13, 1960	67	212	.794	10.83	-	-

4140. Platte River near Rockville, Wis.

Location (revised).--Lat 42°43'55", long 90°38'25", in SW $\frac{1}{4}$ sec.17, T.3 N., R.2 W., on right bank just downstream from highway bridge, 0.8 mile upstream from Blakely Branch, 2.2 miles east of Rockville, 4.5 miles northeast of Potosi, and 15.2 miles upstream from mouth.

Drainage area.--139 sq mi.

Records available.--October 1934 to September 1960. Monthly discharge only for October 1934, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 642.95 ft above mean sea level, adjustment of 1912. Prior to Oct. 1, 1941, chain gage at site 1.3 miles upstream at datum 12.55 ft higher. Oct. 1, 1941, to June 29, 1949, chain gage at present site and datum.

Average discharge.--26 years (1934-60), 94.4 cfs.

Extremes.--1934-60: Maximum discharge, 43,500 cfs July 16, 1950 (gage height, 17.26 ft), from rating curve extended above 7,000 cfs on basis of slope-area measurement of peak flow; no flow Nov. 24, 1950.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	25.3	32.0	36.4	36.3	100	195	184	146	190	194	179	87.8	117
1952	123	152	97.0	170	140	205	152	115	103	111	89.3	69.4	127
1953	61.4	71.9	65.8	77.4	233	130	109	82.8	67.2	57.3	62.3	44.7	87.6
1954	44.2	45.7	48.3	38.2	54.6	44.3	63.6	78.6	318	86.2	54.8	49.2	76.8
1955	98.4	56.6	47.3	53.7	106	133	119	76.5	123	61.6	49.5	42.8	80.4
1956	45.5	40.9	40.1	31.9	51.5	104	48.8	56.2	45.7	40.8	44.6	34.8	48.8
1957	29.2	39.5	30.7	50.1	57.2	33.4	44.8	51.3	104	94.9	44.7	41.4	51.7
1958	37.4	38.7	43.6	31.1	64.1	41.9	58.1	36.1	42.4	30.8	32.7	35.6	40.8
1959	39.4	30.2	23.7	22.1	24.3	483	169	124	77.5	62.0	133	60.9	105
1960	130	143	93.7	213	76.6	237	173	328	130	115	83.8	101	153

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.21	0.26	0.30	0.30	0.75	1.61	1.47	1.21	1.53	1.61	1.49	0.71	11.45
1952	1.02	1.22	.80	1.41	1.09	1.70	1.22	.95	.83	.92	.74	.56	12.46
1953	.51	.58	.55	.64	1.74	1.08	.88	.69	.54	.47	.52	.36	8.56
1954	.37	.37	.40	.32	.41	.37	.51	.65	2.55	.71	.45	.39	7.50
1955	.82	.45	.39	.45	.80	1.10	.96	.63	.99	.51	.41	.34	7.85
1956	.38	.33	.33	.26	.40	.86	.39	.47	.37	.34	.37	.28	4.78
1957	.24	.32	.25	.42	.43	.28	.36	.43	.84	.79	.37	.33	5.06
1958	.31	.31	.36	.26	.48	.35	.47	.30	.34	.26	.27	.29	4.00
1959	.33	.24	.20	.18	.18	4.01	1.36	1.03	.62	.51	1.10	.49	10.25
1960	1.08	1.15	.78	1.77	.59	1.96	1.39	2.72	1.05	.95	.70	.81	14.95

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	114	11.12
1951	1208	13,900	Aug. 6, 1951	16	117	0.842	11.45	140	13.72
1952	1238	1,660	Mar. 10, 1952	55	127	.914	12.46	113	11.06
1953	1278	7,290	Feb. 20, 1953	28	87.6	.630	8.56	82.5	8.06
1954	1338	16,400	June 21, 1954	33	76.8	.553	7.50	82.3	9.02
1955	1388	3,080	Feb. 20, 1955	35	80.4	.578	7.85	74.0	7.23
1956	1438	2,400	Mar. 1, 1956	26	48.8	.351	4.78	46.5	4.55
1957	1508	2,620	Jan. 21, 1957	19	51.7	.372	5.06	53.4	5.23
1958	1558	1,060	Sept. 3, 1958	24	40.8	.294	4.00	38.6	3.79
1959	1628	7,220	May 20, 1959	20	105	.755	10.25	128	12.49
1960	1708	7,550	Jan. 12, 1960	52	153	1.10	14.95	-	-

4145. Little Maquoketa River near Durango, Iowa

Location.--Lat 42°33'25", long 90°44'45", in NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.5, T.89 N., R.2 E., on left bank 10 ft upstream from highway bridge, $\frac{1}{2}$ miles east of Durango, 5 miles northwest of Dubuque, and 7.0 miles upstream from mouth.

Drainage area.--130 sq mi.

Records available.--October 1934 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 612.03 ft above mean sea level, datum of 1929. Prior to Jan. 5, 1939, wire-weight gage at same site and datum.

Average discharge.--26 years (1934-60), 77.8 cfs.

Extremes.--1934-60: Maximum discharge, 23,000 cfs June 13, 1947 (gage height, 21.23 ft), from rating curve extended above 6,300 cfs on basis of slope-area measurements at gage heights 17.05, 19.82, 20.75 and 22.1 ft; minimum daily, 5 cfs July 12, 13, 1936. Maximum stage known, about 22.1 ft June 15, 1925 (discharge, about 29,000 cfs, computed by Corps of Engineers).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	13.1	18.7	13.8	14.1	169	223	203	146	99.6	272	58.5	36.1	105
1952	177	132	57.4	123	147	276	135	85.5	47.5	35.0	85.4	24.5	111
1953	20.8	29.5	32.3	52.6	248	112	69.1	70.0	51.4	117	52.9	18.2	71.7
1954	17.8	20.8	22.5	13.8	25.5	20.6	84.3	117	251	28.9	20.1	17.6	53.1
1955	38.8	18.0	16.8	17.1	118	61.2	69.8	39.4	82.2	18.5	23.0	9.0	40.4
1956	14.1	11.7	17.2	10.4	65.3	50.2	34.3	49.8	16.0	44.9	28.7	14.9	29.7
1957	9.68	16.1	11.5	50.7	54.5	17.3	24.8	70.7	74.4	56.4	34.3	12.7	36.0
1958	12.6	17.7	15.4	11.6	53.0	19.1	41.7	13.8	48.3	22.5	29.9	8.41	24.2
1959	26.7	15.3	10.0	10.1	12.1	481	210	122	55.0	44.0	52.7	20.1	89.0
1960	65.3	104	86.3	281	53.3	258	293	503	98.0	42.3	33.6	51.0	156

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.12	0.18	0.12	0.13	1.36	1.98	1.74	1.30	0.85	2.41	0.52	0.3	11.00
1952	1.57	1.13	.51	1.09	1.22	2.45	1.16	.76	.41	1.31	.76	.21	11.58
1953	.18	.25	.29	.47	1.99	.99	.59	.62	.44	1.04	.47	.16	7.49
1954	.16	.18	.20	.12	.20	.18	.72	1.04	2.15	.26	.18	.15	5.54
1955	.34	.15	.15	.15	.95	.54	.60	.35	.53	.16	.20	.03	4.20
1956	.13	.10	.15	.09	.54	.44	.29	.44	.14	.40	.25	.13	3.10
1957	.09	.14	.10	.45	.44	.15	.21	.63	.64	.50	.30	.11	3.76
1958	.11	.15	.14	.10	.42	.17	.36	.12	.41	.20	.27	.07	2.52
1959	.24	.13	.09	.09	.10	4.26	1.81	1.08	.47	.39	.47	.17	9.30
1960	.58	.89	.77	2.49	.44	2.29	2.52	4.46	.84	.38	.30	.44	16.40

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches	
		Discharge	Date							
1950	-	-	-	-	-	-	-	73.7	7.70	
1951	1208	14,800	July 8, 1951	12	105	0.808	11.00	132	13.81	
1952	1258	6,180	Aug. 20, 1952	16	111	.854	11.58	86.8	9.09	
1953	1278	11,100	Feb. 20, 1953	17	71.7	.552	7.49	69.9	7.31	
1954	1338	6,460	June 1, 1954	11	53.1	.408	5.54	54.2	5.64	
1955	1388	5,120	Feb. 20, 1955	7.3	40.4	.311	4.20	37.8	3.94	
1956	1438	3,490	July 8, 1956	7.4	29.7	.228	3.10	29.2	3.05	
1957	1508	4,330	July 31, 1957	5.8	36.0	.277	3.76	36.7	3.83	
1958	1558	2,190	Feb. 24, 1958	5.2	24.2	.186	2.52	24.8	2.58	
1959	1628	8,200	Apr. 1, 1959	7.2	89.0	.685	9.30	106	11.08	
1960	1708	13,400	Jan. 12, 1960	16	156	1.20	16.40	-	-	

4150. Galena River at Buncombe, Wis.

Location.--Lat 42°30'50", long 90°22'40", near center of sec.33, T.1 N., R.1 E., on left bank at Buncombe, 0.6 mile upstream from Coon Branch, 1.5 miles upstream from Scrabble Branch, 2 miles upstream from Wisconsin-Illinois State line, and 3.5 miles southeast of Hazel Green.

Drainage area.--128 sq mi.

Records available.--September 1939 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 682.77 ft above mean sea level, adjustment of 1912 (Corps of Engineers bench mark). Prior to Dec. 1, 1939, wire-weight gage at same site and datum.

Average discharge.--21 years (1939-60), 74.1 cfs.

Extremes.--1939-60: Maximum discharge, 12,400 cfs Feb. 20, 1953 (gage height, 15.68 ft), from rating curve extended above 8,100 cfs on basis of slope-area measurement of peak flow; minimum, 0.8 cfs Mar. 3, 1954.

Flood in February 1937 reached a stage of about 17.1 ft, from information by local resident (discharge, 18,000 cfs, from rating curve extended above 8,100 cfs by logarithmic plotting and on basis of slope-area measurement at gage height 15.68 ft for peak of Feb. 20, 1953).

Remarks.--Figures of discharge for some months in 1955-58 include occasional pumpage from mine dewatering operations above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	35.3	36.9	34.1	29.2	89.7	121	109	92.7	105	205	75.0	56.7	82.5
1952	94.1	116	77.1	119	125	291	108	73.0	63.2	54.6	58.0	39.6	102.5
1953	39.2	48.0	43.4	70.1	288	124	59.6	53.0	39.4	32.9	38.8	24.1	70.2
1954	22.2	24.1	30.3	25.9	54.0	33.1	75.4	57.4	149	44.1	32.6	26.4	47.6
1955	45.2	29.2	24.9	32.0	163	50.1	52.8	35.3	61.1	40.1	31.5	17.9	47.7
1956	21.7	20.2	29.6	16.5	99.9	55.4	34.1	41.7	17.6	23.9	28.9	20.7	34.0
1957	16.6	19.5	19.8	40.5	62.4	21.3	22.1	40.1	67.3	163	30.0	22.2	43.7
1958	21.5	24.6	30.5	17.8	70.6	26.1	37.7	19.1	30.4	16.0	17.3	18.1	27.1
1959	35.0	30.9	15.6	14.6	17.9	576	186	72.1	35.5	38.5	71.6	34.2	94.9
1960	95.0	81.5	69.5	231	57.8	211	169	296	115	73.7	68.1	66.9	128

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.32	0.32	0.31	0.26	0.73	1.09	0.95	0.83	0.91	1.84	0.68	0.49	8.73
1952	.85	1.01	.69	1.07	1.05	2.63	.94	.66	.55	.49	.52	.35	10.81
1953	.35	.42	.39	.63	2.34	1.12	.52	.48	.34	.30	.35	.21	7.45
1954	.20	.21	.27	.23	.44	.30	.66	.52	1.30	.40	.29	.23	5.05
1955	.41	.25	.22	.29	1.33	.45	.46	.32	.53	.36	.28	.16	5.06
1956	.20	.18	.27	.15	.84	.50	.30	.38	.15	.22	.26	.18	3.63
1957	.15	.17	.18	.36	.51	.19	.36	.59	1.47	.27	.19	.19	4.63
1958	.19	.21	.27	.16	.57	.24	.33	.17	.26	.14	.16	.16	2.86
1959	.32	.27	.14	.13	.15	5.19	1.62	.65	.31	.35	.65	.30	10.08
1960	.86	.71	.63	2.08	.49	1.90	1.47	2.67	1.00	.66	.61	.58	13.66

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	90.6	9.63
1951	1208	6,800	July 8, 1951	24	82.5	0.645	8.73	97.6	10.33
1952	1238	6,200	Mar. 10, 1952	35	102	.797	10.81	88.6	9.42
1953	1278	12,400	Feb. 20, 1953	22	70.2	.548	7.45	65.7	6.97
1954	1358	5,010	June 22, 1954	17	47.6	.372	5.05	49.5	5.25
1955	1388	7,250	Feb. 20, 1955	15	47.7	.373	5.06	45.4	4.83
1956	1438	3,390	Feb. 24, 1956	11	34.0	.266	3.63	32.6	3.48
1957	1508	4,630	July 16, 1957	11	43.7	.341	4.63	45.4	4.80
1958	1558	2,890	Feb. 24, 1958	12	27.1	.212	2.86	27.5	2.92
1959	1628	6,460	Mar. 26, 1959	11	94.9	.741	10.08	109	11.55
1960	1708	8,430	Jan. 12, 1960	33	128	1.00	13.66	-	-

4155. East Fork Galena River at Council Hill, Ill.

Location.--Lat 42°28'05", long 90°20'20", in W $\frac{1}{2}$ sec.31, T.29 N., R.2 E., on left bank at Council Hill, 3 miles upstream from mouth and 6 miles northeast of Galena. Records include flow of unnamed creek which enters just below gage.

Drainage area.--20.1 sq mi, includes that of unnamed creek.

Records available.--September 1939 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 686.59 ft above mean sea level, adjustment of 1912 (Corps of Engineers bench mark). Prior to Dec. 1, 1939, wire-weight gage at same site and datum.

Average discharge.--21 years (1939-60), 12.2 cfs.

Extremes.--1939-60: Maximum discharge, 16,600 cfs Apr. 29, 1947 (gage height, 15.3 ft, from floodmarks), from rating curve extended above 1,500 cfs on basis of slope-area measurements at gage heights 9.33 and 15.3 ft and contracted-opening measurements at gage heights 9.85 and 15.3 ft; minimum, 0.3 cfs June 22, 1940.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	12.8	9.37	8.95	6.63	23.4	27.5	27.0	26.1	20.3	33.0	12.6	11.1	18.2
1952	28.2	27.5	17.6	30.3	22.0	56.6	22.1	17.5	15.8	11.2	20.5	11.7	21.8
1953	10.4	8.37	8.93	8.83	31.1	14.2	11.1	12.4	10.1	8.28	7.98	5.68	11.3
1954	5.89	5.87	6.24	6.68	10.8	5.20	16.3	13.1	27.5	6.80	5.14	4.29	9.43
1955	7.20	4.56	4.71	5.44	16.0	6.18	11.8	7.28	5.91	5.33	4.01	2.45	6.67
1956	3.27	3.44	4.14	3.77	17.1	7.62	5.31	8.03	3.76	6.53	8.56	4.00	6.26
1957	4.40	5.04	4.88	7.69	15.2	5.33	5.49	4.92	13.9	31.4	4.71	4.33	8.91
1958	3.95	4.67	5.54	3.72	14.7	11.8	12.3	7.66	12.6	6.86	7.49	6.94	8.12
1959	6.77	9.68	8.86	5.8	12.4	71.4	19.7	15.4	8.86	9.38	6.15	8.82	15.2
1960	22.1	16.0	16.4	40.5	14.4	28.7	33.1	50.0	18.0	11.9	10.8	10.8	22.8

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.73	0.52	0.51	0.38	1.21	1.58	1.50	1.50	1.13	1.89	0.72	0.62	12.29
1952	1.62	1.53	1.01	1.74	1.18	2.10	1.22	1.00	.88	.64	1.18	.65	14.75
1953	.59	.46	.51	.51	1.61	.82	.62	.71	.56	.47	.46	.32	7.64
1954	.34	.33	.36	.38	.56	.30	.90	.75	1.53	.39	.29	.24	6.37
1955	.41	.25	.27	.31	.83	.35	.65	.42	.33	.31	.23	.14	4.50
1956	.19	.19	.24	.22	.92	.44	.29	.46	.21	.37	.49	.22	4.24
1957	.25	.28	.28	.44	.79	.31	.30	.28	.77	1.80	.27	.24	6.01
1958	.23	.26	.32	.21	.76	.68	.68	.44	.70	.39	.43	.39	5.49
1959	.39	.54	.34	.33	.64	4.09	1.09	.88	.49	.54	.47	.49	10.29
1960	1.27	.89	.94	2.32	.77	1.65	1.84	2.87	1.00	.68	.62	.60	15.45

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	16.6	11.23
1951	1208	4,000	July 8, 1951	4.5	18.2	0.905	12.29	21.7	14.69
1952	1258	942	Oct. 20, 1951	5.8	21.8	1.08	14.75	18.0	12.15
1953	1278	2,770	Feb. 20, 1953	4.0	11.3	.562	7.64	10.5	7.11
1954	1338	652	June 20, 1954	3.7	9.43	.469	6.37	9.30	6.27
1955	1388	634	Feb. 20, 1955	2.1	6.67	.332	4.50	6.20	4.19
1956	1438	1,740	Aug. 30, 1956	2.3	6.26	.311	4.24	6.55	4.43
1957	1508	4,190	July 12, 1957	2.8	8.91	.443	6.01	8.89	6.01
1958	1558	858	Feb. 24, 1958	2.9	8.12	.404	5.48	8.80	5.95
1959	1628	1,250	May 20, 1959	4.0	15.2	.756	10.29	18.0	12.12
1960	1708	2,270	Jan. 12, 1960	7.4	22.6	1.13	15.45	-	-

4170. Maquoketa River near Manchester, Iowa

Location.--Lat 42°27'25", long 91°25'55", in NW 1/4 sec. 9, T.88 N., R.5 W., on left bank 2 miles southeast of Manchester and 4.7 miles downstream from Honey and Prairie Creeks.

Drainage area.--305 sq mi.

Records available.--April 1933 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Concrete control since June 1, 1935. Datum of gage is 895.06 ft above mean sea level, adjustment of 1912.

Average discharge.--27 years (1933-60), 187 cfs.

Extremes.--1933-60: Maximum discharge, 20,000 cfs June 13, 1947 (gage height, 21.36 ft, from floodmarks), from rating curve extended above 10,000 cfs by velocity-area studies; minimum daily, 6 cfs June 8, 29, 1934.

Maximum flood known at Manchester occurred June 15, 1925, stage unknown, discharge, 25,400 cfs (from determination of peak flow by Prof. F. A. Nagler, University of Iowa).

Remarks.--Diurnal fluctuation at low stages caused by powerplant 2 miles above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	68.2	55.6	50.6	43.9	513	937	1041	301	530	772	312	183	399
1952	383	282	184	272	284	613	361	251	114	81.7	153	66.4	251
1953	54.9	61.3	60.5	63.2	420	314	225	173	163	229	268	76.2	174
1954	61.2	61.4	58.0	37.6	48.4	54.5	180	366	363	105	76.9	63.5	123
1955	99.5	68.7	60.3	61.8	196	179	204	119	87.0	90.6	44.9	42.5	104
1956	43.7	41.5	37.3	36.5	44.7	66.9	59.0	143	71.2	41.0	39.8	45.5	55.8
1957	33.8	38.6	34.2	74.6	125	48.6	55.9	171	373	67.8	49.7	42.8	92.2
1958	41.6	51.2	48.4	36.1	44.9	56.2	71.3	35.6	166	40.4	37.8	32.1	55.0
1959	31.6	32.3	26.9	21.0	22.8	972	257	272	347	334	83.2	66.2	207
1960	88.1	284	241	423	130	607	817	1,131	336	191	151	147	380

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.26	0.20	0.19	0.17	1.75	3.54	3.81	1.14	1.94	2.92	1.18	0.67	17.77
1952	1.45	1.03	.70	1.03	1.00	2.32	1.32	.87	.42	.31	.50	.24	11.19
1953	.21	.22	.23	.24	1.43	1.19	.87	.65	.60	.87	1.01	.28	7.75
1954	.23	.22	.22	.14	.17	.21	.66	1.38	1.33	.40	.29	.23	5.48
1955	.38	.25	.23	.23	.67	.68	.75	.45	.32	.34	.17	.16	4.63
1956	.17	.15	.14	.14	.16	.25	.22	.54	.26	.16	.15	.17	2.51
1957	.13	.14	.13	.28	.43	.18	.20	.65	1.36	.26	.19	.16	4.11
1958	.16	.19	.18	.14	.15	.21	.26	.13	.61	.15	.14	.12	2.44
1959	.12	.12	.10	.08	.08	3.67	.94	1.03	1.27	1.26	.31	.24	9.22
1960	.33	1.04	.91	1.60	.46	2.30	2.99	4.28	1.23	.72	.57	.54	16.97

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches	
		Discharge	Date							
1950	-	-	-	-	-	-	-	180	-	8.02
1951	1208	16,800	July 9, 1951	28	399	1.31	17.77	456	20.30	
1952	1238	2,780	Mar. 11, 1952	53	251	.823	11.19	194	8.67	
1953	1278	4,260	Feb. 20, 1953	41	174	.570	7.75	174	7.76	
1954	1338	3,230	May 1, 1954	23	123	.403	5.48	127	5.67	
1955	1388	2,500	Feb. 20, 1955	26	104	.341	4.63	94.8	4.23	
1956	1438	2,060	May 28, 1956	23	55.8	.183	2.51	54.5	2.45	
1957	1508	4,160	June 16, 1957	20	92.2	.302	4.11	95.1	4.24	
1958	1558	2,620	June 1, 1958	21	55.0	.180	2.44	50.7	2.25	
1959	1628	5,990	Mar. 27, 1959	19	207	.679	9.22	251	11.16	
1960	1708	11,600	Mar. 30, 1960	55	380	1.25	16.97	-	-	

4177. Bear Creek near Monmouth, Iowa

Location.--Lat 42°02'30", long 90°53'00", in NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.31, T.84 N., R.1 E., on right bank 15 ft downstream from highway bridge, 1.6 miles upstream from Rat Run, 2.8 miles south of Monmouth, and 8.2 miles upstream from mouth.

Drainage area.--61.3 sq mi.

Records available.--October 1957 to September 1960.

Gage.--Water-stage recorder and concrete control. Datum of gage is 728.80 ft above mean sea level, datum of 1929.

Extremes.--1957-60: Maximum discharge, 2,440 cfs Jan. 12, 1960 (gage height, 11.56 ft); minimum daily, 1.8 cfs Dec. 8-12, 1958.

Maximum flood known, about 21.5 ft in June 1944, from floodmark, from information by local residents (discharge not determined).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1958	3.51	6.97	7.26	4.45	23.2	11.3	17.3	7.94	26.6	5.74	7.65	2.76	10.3
1959	3.97	3.99	2.35	2.52	61.3	178	44.1	28.6	50.6	49.0	27.5	11.7	38.5
1960	42.6	53.1	42.8	126	28.7	109	122	110	129	45.4	25.2	16.3	70.9

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1958	0.07	0.13	0.14	0.08	0.39	0.21	0.32	0.15	0.48	0.11	0.15	0.05	2.28
1959	.07	.07	.04	.05	1.04	3.34	.80	.54	.92	.92	.52	.21	8.52
1960	.80	.97	.80	2.37	.50	2.05	2.22	2.06	2.34	.85	.47	.50	15.73

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1958	1558	700	Feb. 24, 1958	2.2	10.3	0.168	2.28	9.65	2.12
1959	1628, 1708	2,120	Mar. 20, 1959	1.8	38.5	.628	6.52	49.5	10.91
1960	1708	2,440	Jan. 12, 1960	9.6	70.9	1.16	15.73	-	-

4185. Maquoketa River near Maquoketa, Iowa

Location.--Lat 42°05'05", long 90°37'55", in SW¹/₄NE¹/₄ sec.17, T.84 N., R.3 E., on right bank 500 ft upstream from bridge on State Highway 62, 1,200 ft upstream from Prairie Creek, 2.0 miles northeast of Maquoketa, and 2.2 miles downstream from North Fork.

Drainage area.--1,553 sq mi.

Records available.--September 1913 to September 1960. Prior to October 1939, published as "below North Fork Maquoketa River, near Maquoketa." Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 636.52 ft above mean sea level, adjustment of 1912. Prior to July 14, 1924, chain gage and July 14, 1924, to Dec. 8, 1934, water-stage recorder, at site 40 ft downstream at same datum.

Average discharge.--47 years (1913-60), 939 cfs.

Extremes.--1913-60: Maximum discharge, 48,000 cfs June 27, 1944 (gage height, 24.70 ft); minimum daily, 105 cfs Feb. 11-20, 1936.

A flood, probably in 1903, reached a stage of 23.5 ft (discharge, 43,000 cfs).

Remarks.--Diurnal fluctuation caused by powerplant 4 miles above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	386	351	247	236	2,556	2,792	2,441	1,705	1,421	2,739	1,065	893	1,395
1952	1,718	1,403	863	1,460	1,326	2,731	1,813	1,032	759	508	74C	372	1,212
1953	347	542	521	579	2,953	1,372	871	840	809	875	787	350	890
1954	317	331	367	349	467	314	583	950	1,403	489	594	350	540
1955	577	340	314	352	1,173	756	968	711	638	450	375	282	573
1956	280	250	196	207	764	542	396	861	581	350	447	311	431
1957	210	261	285	491	711	293	312	499	1,125	345	362	237	425
1958	226	239	243	201	501	339	354	212	567	393	227	182	306
1959	234	198	177	162	584	4,555	1,300	842	916	1,411	578	391	951
1960	654	991	903	2,851	801	1,953	3,427	3,646	1,842	893	654	630	1,607

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.29	0.25	0.18	0.18	1.71	2.07	1.75	1.27	1.02	2.03	0.79	0.64	12.18
1952	1.28	1.01	.64	1.08	.92	2.03	1.16	.77	.55	.38	.55	.27	10.64
1953	.28	.39	.39	.43	1.98	1.02	.63	.62	.58	.65	.58	.25	7.78
1954	.23	.24	.27	.26	.31	.23	.42	.71	1.01	.36	.44	.24	4.72
1955	.43	.24	.23	.26	.79	.56	.70	.53	.46	.33	.28	.20	5.01
1956	.21	.18	.15	.15	.53	.40	.28	.64	.42	.26	.33	.22	3.77
1957	.16	.19	.21	.36	.48	.22	.22	.37	.61	.26	.27	.17	3.72
1958	.17	.17	.18	.15	.34	.25	.26	.16	.41	.29	.17	.13	2.68
1959	.17	.14	.13	.12	.39	3.58	.93	.63	.66	1.05	.43	.28	8.31
1960	.49	.71	.67	2.12	.56	1.45	2.46	2.71	1.32	.66	.49	.45	14.09

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches	
		Discharge	Date							
1950	-	-	-	-	-	-	-	-	972	8.49
1951	1208	21,200	Feb. 26, 1951	190	1,395	0.898	12.18	1,647	14.39	14.39
1952	1238	14,000	Mar. 11, 1952	311	1,212	.780	10.64	996	8.75	8.75
1953	1278	33,900	Feb. 20, 1953	299	890	.573	7.78	857	7.48	7.48
1954	1338	4,980	Aug. 18, 1954	151	540	.348	4.72	559	4.88	4.88
1955	1388	13,000	Feb. 20, 1955	185	573	.369	5.01	531	4.65	4.65
1956	1438	8,170	Aug. 30, 1956	150	431	.278	3.77	433	3.79	3.79
1957	1508	5,140	May 31, 1957	152	425	.274	3.72	421	3.68	3.68
1958	1558	5,000	Feb. 24, 1958	140	306	.197	2.68	298	2.60	2.60
1959	1628	19,200	Mar. 21, 1959	130	951	.612	8.31	1,114	9.74	9.74
1960	1708	23,700	(a)	283	1,607	1.03	14.09	-	-	-

a Jan. 13, Mar. 30, 1960.

4190. Apple River near Hanover, Ill.

Location.--Lat 42°15'05", long 90°17'10", in NE¼NW¼ sec.16, T.26 N., R.2 E., on right bank 0.3 mile southwest of Hanover and 12 miles upstream from mouth.

Drainage area.--244 sq mi.

Records available.--October 1934 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 591.00 ft above mean sea level, adjustment of 1912. Prior to Oct. 1, 1945, wire-weight or staff gage at site 3.5 miles downstream at datum 9.48 ft lower.

Average discharge.--26 years (1934-60), 160 cfs.

Extremes.--1934-60: Maximum discharge, 12,000 cfs Jan. 5, 1946; maximum gage height, 26.12 ft Jan. 5, 1946 (ice jam); minimum discharge observed, 4 cfs July 26, 1941, July 10, 11, 1953.

Remarks.--Occasional regulation during low flow by dam at Hanover.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	48.5	42.3	35.5	31.4	482	380	352	304	219	572	146	93.5	224
1952	496	406	168	516	300	649	266	136	91.2	59.9	101	42.4	270
1953	37.3	77.8	71.5	58.3	487	170	148	125	83.4	79.0	53.3	33.1	116
1954	29.3	32.6	38.7	26.5	97.8	34.2	193	141	256	62.8	61.3	34.0	83.4
1955	134	53.1	49.8	72.5	389	94.5	249	142	133	64.9	57.2	32.2	121
1956	38.1	31.8	30.2	23.6	205	61.0	69.7	181	56.4	77.0	98.8	51.5	76.6
1957	23.3	42.7	32.5	83.3	148	44.6	57.5	52.9	134	311	74.3	35.8	86.4
1958	29.5	43.7	66.2	46.5	205	70.7	128	50.5	97.1	58.0	50.7	29.1	71.8
1959	55.6	65.4	33.5	27.1	189	945	260	148	69.7	94.4	79.9	126	175
1960	404	287	269	779	157	531	704	1,103	238	130	90.7	75.2	400

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.23	0.19	0.17	0.15	2.06	1.79	1.61	1.43	1.00	2.70	0.69	0.43	12.45
1952	2.35	1.86	.79	2.44	1.33	3.07	1.22	.64	.42	.28	.48	.19	15.07
1953	.18	.36	.34	.28	2.08	.80	.68	.59	.38	.37	.25	.15	6.46
1954	.14	.15	.18	.13	.42	.16	.88	.66	1.17	.30	.29	.16	4.64
1955	.63	.24	.24	.34	1.66	.45	1.14	.67	.61	.31	.27	.15	6.71
1956	.18	.15	.14	.11	.91	.29	.32	.85	.26	.36	.47	.24	4.28
1957	.11	.20	.15	.39	.63	.21	.26	.25	.61	1.47	.35	.16	4.79
1958	.14	.20	.31	.22	.87	.33	.59	.24	.44	.27	.24	.13	3.98
1959	.26	.30	.16	.13	.81	4.46	1.19	.70	.32	.45	.38	.58	9.74
1960	1.91	1.31	1.27	3.68	.70	2.51	3.22	5.21	1.09	.62	.43	.34	22.29

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches	
		Discharge	Date							
1950	-	-	-	-	-	-	-	173	9.62	
1951	1208	9,980	July 9, 1951	†26	224	0.918	12.45	303	16.86	
1952	1238	4,550	Oct. 21, Nov. 13	39	270	1.11	15.07	196	10.95	
1953	1278	9,300	Feb. 20, 1953	4.5	116	.475	6.46	109	6.05	
1954	1338	3,000	Apr. 25, 1954	20	83.4	.342	4.64	94.9	5.28	
1955	1588	8,380	Feb. 20, 1955	27	121	.496	6.71	109	6.07	
1956	1438	3,480	Feb. 25, 1956	19	76.6	.314	4.28	76.4	4.27	
1957	1508	3,870	July 12, 1957	19	86.4	.354	4.79	89.9	4.98	
1958	1558	3,870	Feb. 25, 1958	23	71.8	.294	3.98	75.0	4.05	
1959	1628	5,750	Mar. 21, 1959	23	175	.717	9.74	243	13.51	
1960	1708	11,300	May 7, 1960	57	400	1.64	22.29	-	-	

† Corrected.

4200. Plum River below Carroll Creek, near Savanna, Ill.

Location.--Lat 42°06'50", long 90°05'35", in NW1SW1 sec.31, T.25 N., R.4 E., on left bank 0.7 mile upstream from Camp Creek, 2.6 miles downstream from Carroll Creek, 3½ miles northeast of Savanna, and 13 miles upstream from mouth.

Drainage area.--231 sq mi.

Records available.--October 1940 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 580.00 ft above mean sea level, adjustment of 1912.

Average discharge.--20 years (1940-60), 137 cfs.

Extremes.--1940-60: Maximum discharge, 11,600 cfs Jan. 6, 1946 (gage height, 28.74 ft); no flow Apr. 26, 27, 1952, May 12-14, 1954 (backwater from Mississippi River); minimum during nonbackwater periods, 8 cfs for several days during period August to October 1949.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	33.0	34.6	24.1	22.4	468	367	347	266	152	516	159	81.7	204
1952	183	380	142	440	228	553	203	161	108	85.7	56.7	21.9	214
1953	21.2	59.3	73.0	49.8	358	159	116	95.0	65.1	44.9	38.3	18.7	89.6
1954	17.0	15.6	24.4	15.1	86.1	25.9	71.0	65.9	301	53.4	37.6	38.1	61.9
1955	148	46.9	52.4	122	316	110	215	155	69.6	54.0	56.5	34.4	114
1956	25.9	22.7	22.0	14.2	132	38.6	54.1	148	46.9	70.2	52.4	48.8	56.0
1957	15.1	22.7	23.0	76.5	87.9	48.8	57.1	91.0	97.1	297	53.2	21.4	74.2
1958	17.8	30.5	73.0	55.5	184	124	126	42.8	121	235	85.1	32.4	93.4
1959	45.0	88.2	36.2	26.1	239	756	211	114	51.0	94.8	76.9	110	154
1960	276	257	221	624	163	390	660	544	158	116	59.6	92.3	298

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.16	0.17	0.12	0.11	2.11	1.83	1.67	1.33	0.73	2.57	0.79	0.39	11.98
1952	.92	1.84	.71	2.20	1.07	2.76	.98	.80	.52	.43	.28	.11	12.62
1953	.11	.29	.36	.25	1.61	.79	.56	.47	.31	.22	.19	.09	5.25
1954	.08	.08	.12	.08	.39	.13	.34	.33	1.45	.27	.19	.18	3.64
1955	.74	.23	.26	.61	1.42	.55	1.04	.77	.34	.27	.28	.17	6.68
1956	.15	.11	.11	.07	.62	.19	.26	.74	.23	.35	.26	.24	3.31
1957	.07	.11	.11	.38	.40	.24	.28	.45	.47	1.48	.27	.10	4.36
1958	.09	.15	.36	.28	.83	.62	.61	.21	.59	1.17	.42	.16	5.49
1959	.22	.43	.18	.13	1.08	3.77	1.02	.57	.25	.47	.38	.53	9.03
1960	1.38	1.24	1.10	3.11	.76	1.94	3.19	2.72	.76	.58	.30	.45	17.53

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	138	8.11
1951	1208	7,780	July 9, 1951	20	204	0.883	11.98	255	15.00
1952	1238	3,590	Nov. 14, 1951	0	214	.926	12.62	168	9.91
1953	1278	4,200	Feb. 20, 1953	14	89.6	.388	5.25	81.5	4.77
1954	1338	a1,400	June 4, 1954	0	61.9	.268	3.64	78.0	4.59
1955	1388	5,290	Feb. 20, 1955	16	114	.494	6.68	98.6	5.80
1956	1438	a1,900	Feb. 25, 1956	9.4	56.0	.242	3.31	55.1	3.25
1957	1508	4,000	July 13, 1957	11	74.2	.321	4.36	79.5	4.67
1958	1558	2,850	July 15, 1958	33	85.4	.404	5.49	97.3	5.72
1959	1628	4,730	Mar. 20, 1959	20	154	.667	9.03	203	11.92
1960	1708	5,650	Jan. 13, 1960	38	298	1.29	17.53	-	-

a About.

4205. Mississippi River at Clinton, Iowa

Location.--Lat 41°46'50", long 90°15'07", in NW¼ sec.34, T.81 N., R.6 E., on right bank at foot of Eighth Avenue in Camanche, 5.0 miles upstream from Wapsipinicon River, 6.4 miles downstream from Clinton, 10.6 miles downstream from dam 13, and at mile 511.8 upstream from Ohio River.

Drainage area.--85,600 sq mi, approximately, at Fulton-Lyons Bridge (formerly U.S. Highway 30) where discharge measurements are made.

Records available.--June to August 1873 (fragmentary), October 1873 to September 1960 (October 1932 to September 1939, published as "at Le Claire").

Gage.--Water-stage recorder. Datum of gage is 562.68 ft above mean sea level, datum of 1929. June 1873 to May 31, 1934, staff gage in stone well and June 1, 1934, to Sept. 30, 1939, water-stage recorder 14.8 miles downstream at Le Claire, at datum 0.07 ft lower (revised). Oct. 1, 1939, to Sept. 30, 1955, water-stage recorder at 10.6 miles upstream at dam 13, at datum 5.48 ft higher. Auxiliary water-stage recorder at dam 13 since Oct. 1, 1958. Present gage used as auxiliary gage Oct. 1, 1939, to Sept. 30, 1955.

Average discharge.--87 years (1873-1960), 47,100 cfs.

Extremes.--1873-1960: Maximum daily discharge, 250,000 cfs June 25, 1880; maximum gage height, 14.5 ft June 25, 1880, site and datum then in use; minimum daily discharge, 6,500 cfs Dec. 25-27, 1933.

Remarks.--Flow regulated by reservoirs and navigation dams.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	22,660	19,190	21,500	20,370	26,660	47,680	143,100	117,300	64,950	94,740	46,590	57,790	56,970
1952	61,040	59,430	43,120	39,660	35,510	33,890	156,300	108,000	48,030	67,780	74,160	35,790	65,280
1953	24,230	25,160	26,850	22,250	30,220	51,780	91,390	68,440	82,970	82,050	84,110	35,310	51,540
1954	24,060	24,870	27,750	24,010	27,820	36,090	56,250	113,100	72,340	74,700	29,470	35,500	45,620
1955	57,470	36,840	31,340	25,230	26,080	45,900	79,130	37,950	53,150	37,140	34,670	22,520	40,660
1956	21,960	22,980	23,370	20,740	23,160	30,030	95,390	53,340	37,910	36,980	36,830	22,470	35,400
1957	17,450	25,890	20,770	20,070	19,370	33,560	47,990	41,320	48,380	76,950	58,430	34,380	35,440
1958	26,730	32,630	25,680	21,320	20,980	32,200	49,170	29,260	33,580	36,440	17,300	23,180	29,040
1959	17,830	23,500	15,710	14,550	15,580	40,950	57,340	41,790	39,060	33,480	26,370	40,440	30,550
1960	52,830	43,410	32,550	42,180	25,710	31,060	92,470	117,600	73,010	36,460	24,620	37,860	51,000

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.31	0.25	0.29	0.27	0.32	0.64	1.87	1.58	0.85	1.28	0.63	0.75	9.04
1952	.82	.77	.58	.55	.45	.73	2.04	1.45	.63	.91	1.00	.47	10.38
1953	.33	.33	.36	.30	.37	.70	1.19	.92	.95	1.11	1.13	.46	8.15
1954	.32	.32	.37	.32	.34	.49	.73	1.52	.94	1.01	.40	.46	7.22
1955	.77	.48	.42	.34	.32	.62	1.03	.51	.69	.50	.47	.29	6.44
1956	.30	.30	.31	.28	.29	.40	1.24	.72	.49	.50	.50	.29	5.62
1957	.23	.33	.28	.27	.24	.45	.63	.56	.63	1.04	.52	.45	5.63
1958	.36	.43	.35	.29	.25	.43	.64	.39	.44	.49	.23	.30	4.60
1959	.24	.30	.21	.20	.19	.35	.75	.56	.51	.45	.36	.53	4.85
1960	.71	.57	.44	.57	.32	.42	1.21	1.58	.96	.52	.33	.49	8.11

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Maximum day		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	1175	-	-	-	-	-	-	44,87C	7.13
1951	1208	221,500	Apr. 26, 1951	13,800	56,970	0.666	9.04	65,38C	10.38
1952	1238	225,400	Apr. 27, 1952	21,200	65,280	.763	10.38	57,97C	9.23
1953	1278	104,100	Apr. 5, 1953	19,900	51,340	.680	8.15	51,38C	8.14
1954	1338	175,900	May 14, 1954	20,900	45,620	.533	7.22	49,75C	7.88
1955	1388	96,900	Apr. 25, 1955	19,200	40,660	.475	6.44	35,83C	5.68
1956	1438	127,000	Apr. 20, 1956	16,500	35,400	.414	5.62	35,01C	5.55
1957	1508	103,000	July 14, 1957	13,400	35,440	.414	5.63	37,23C	5.93
1958	1558	64,500	Apr. 15-17, 1958	11,500	29,040	.339	4.60	26,67C	4.21
1959	1628	112,000	Apr. 3, 1959	13,400	30,550	.417	4.85	36,61C	5.82
1960	1708	151,000	May 18, 1960	20,800	51,000	.596	8.11	-	-

4205.6. Wapsipinicon River near Elma, Iowa

Location--Lat 43°14'35", long 92°31'50", in NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.8, T.97 N., R.14 W., on right bank 10 ft downstream from highway bridge, 0.2 mile downstream from unnamed creek, and 4.9 miles west of Elma.

Drainage area--95.2 sq mi.

Records available--October 1958 to September 1960.

Gage--Water-stage recorder. Datum of gage is 1,131.46 ft above mean sea level, datum of 1929.

Extremes--1958-60: Maximum discharge, 2,980 cfs June 24, 1960 (gage height, 13.44 ft); minimum daily, 1.9 cfs Feb. 4-8, 1959.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1959	5.97	5.83	4.16	2.55	1.99	120	100	12.4	20.9	17.9	22.1	34.8	29.1
1960	19.2	41.6	42.5	15.0	8.63	62.2	66.5	91.5	122	22.0	33.4	22.7	45.7

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1959	0.07	0.07	0.05	0.03	0.02	1.45	1.17	0.15	0.24	0.22	0.27	0.41	4.15
1960	.23	.49	.52	.18	.10	.75	.78	1.11	1.43	.27	.40	.27	6.53

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1959	1708	902	Mar. 30, 1959	1.9	29.1	0.306	4.15	36.5	5.20
1960	1708	2,980	June 24, 1960	5.8	45.7	.480	6.53	-	-

4210. Wapsipinicon River at Independence, Iowa

Location.--Lat 42°27'50", long 91°53'40", in SE $\frac{1}{4}$ sec.4, T.88 N., R.9 W., on right bank at Sixth Street in Independence, 1,800 ft downstream from Interstate Power Co.'s hydro-electric plant, 4 $\frac{1}{4}$ miles downstream from Otter Creek, and 10 $\frac{1}{4}$ miles upstream from Pine Creek.

Drainage area.--1,048 sq mi (revised).

Records available.--July 1933 to September 1960.

Gage.--Water-stage recorder and concrete control. Datum of gage is 882.85 ft above mean sea level, datum of 1929. Prior to May 24, 1941, staff gage in tailrace of powerplant 1,800 ft upstream at datum 80.00 ft lower.

Average discharge.--27 years (1933-60), 501 cfs.

Extremes.--1933-60: Maximum discharge, 21,500 cfs June 14, 1947 (gage height, 18.74 ft); minimum, about 7 cfs many times in period 1933-34.
Maximum stage since at least 1901, that of June 14, 1947.

Remarks.--Diurnal fluctuation caused by powerplant above station prior to April 1958.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	108	82.4	68.7	60.8	779	2,064	5,012	1,465	997	2,288	1,117	398	1,202
1952	659	469	287	343	610	1,595	2,016	870	529	309	242	110	688
1953	63.6	79.0	89.9	74.9	458	981	1,012	639	627	417	1,150	94.2	474
1954	68.6	80.2	99.6	44.5	78.1	110	339	912	852	277	160	140	264
1955	500	209	129	101	199	578	567	339	385	255	65.4	26.9	288
1956	71.1	51.9	28.7	18.0	19.0	301	649	420	117	84.9	119	93.3	164
1957	48.8	83.4	76.6	78.5	145	201	198	225	685	139	82.8	85.4	170
1958	67.4	136	171	113	144	267	299	101	200	253	188	85.9	169
1959	62.6	132	132.7	45.1	29.9	2,347	1,548	524	1,082	1,141	199	207	618
1960	295	603	463	603	236	968	2,368	2,165	447	287	135	192	751

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.12	0.09	0.08	0.07	0.77	2.27	5.34	1.61	1.06	2.52	1.23	0.42	15.58
1952	.70	.50	.29	.38	.63	1.76	2.15	.96	.56	.34	.27	.12	8.66
1953	.07	.08	.10	.08	.46	1.08	1.08	.70	.67	.46	1.27	.10	6.15
1954	.08	.09	.11	.05	.08	.12	.36	1.00	.91	.30	.18	.15	3.43
1955	.55	.22	.14	.11	.20	.64	.71	.37	.41	.28	.07	.03	3.75
1956	.08	.06	.03	.02	.02	.33	.69	.46	.12	.09	.13	.10	2.13
1957	.05	.09	.08	.09	.14	.22	.21	.25	.73	.15	.09	.09	2.19
1958	.07	.14	.19	.12	.14	.29	.32	.11	.21	.28	.21	.09	2.17
1959	.07	.14	.07	.05	.03	2.58	1.65	.58	1.15	1.26	.22	.22	8.02
1960	.32	.64	.51	.66	.24	1.07	2.52	2.38	.48	.32	.15	.20	9.49

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	497	6.44
1951	1208	20,800	Apr. 30, 1951	18	1,202	1.15	15.58	1,296	16.78
1952	1238	6,460	Apr. 3, 1952	10.5	666	.835	8.66	570	7.42
1953	1278	6,350	Aug. 8, 1953	24	474	.452	6.15	475	6.18
1954	1338	2,780	May 3, 1954	19	264	.252	3.43	314	4.06
1955	1388	1,560	Feb. 21, 1955	18	288	.275	3.73	230	2.99
1956	1438	2,100	Apr. 2, 1956	17	164	.156	2.13	169	2.18
1957	1508	3,270	June 19, 1957	12	170	.162	2.19	184	2.37
1958	1558	1,210	June 1, 1958	29	169	.161	2.17	159	2.05
1959	1628	11,800	Mar. 27, 1959	28	618	.690	8.02	711	9.21
1960	1708	15,200	Mar. 30, 1960	82	751	.698	9.49	-	-

4220. Wapsipinicon River near De Witt, Iowa

Location.--Lat 41°45'55", long 90°32'00", in SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.6, T.80 N., R.4 E., on left bank 15 ft downstream from bridge on U.S. Highway 61, 3 miles south of De Witt, 6.2 miles upstream from Brophy Creek, and 15.1 miles upstream from mouth.

Drainage area.--2,330 sq mi, revised (includes that of Silver Creek).

Records available.--June 1934 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 599.73 ft above mean sea level, adjustment of 1912.

Average discharge.--26 years (1934-60), 1,304 cfs.

Extremes.--1934-60: Maximum discharge, 26,000 cfs June 27, 1944 (gage height, 12.07 ft); minimum daily, 70 cfs Jan. 17-24, 1940.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	385	284	210	183	2,384	4,112	7,966	4,982	2,348	4,616	1,588	1,264	2,523
1952	1,366	2,078	1,004	1,900	1,892	4,118	3,366	1,912	1,753	767	500	394	1,751
1953	227	399	577	543	2,505	2,293	2,103	1,776	1,272	846	1,343	262	1,170
1954	198	220	252	136	262	301	618	1,622	1,895	707	709	417	612
1955	1,383	603	438	528	1,035	1,405	1,773	1,120	780	502	268	134	829
1956	198	168	112	102	349	470	1,004	1,256	610	254	313	265	425
1957	139	189	169	319	616	438	467	609	1,493	471	356	276	459
1958	187	323	506	262	487	877	719	340	965	461	373	207	475
1959	174	226	163	130	892	3,716	4,491	1,414	1,348	2,987	631	581	1,372
1960	933	1,471	1,333	2,961	1,181	1,529	7,496	5,682	2,780	1,251	639	449	2,307

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.19	0.14	0.10	0.09	1.07	2.03	3.81	2.47	1.12	2.28	0.79	0.61	14.70
1952	.68	1.00	.50	.94	.87	2.04	1.61	.95	.84	.38	.25	.19	10.25
1953	.11	.19	.29	.27	1.12	1.13	1.01	.88	.61	.42	.66	.13	6.92
1954	.10	.11	.12	.07	.12	.15	.30	.80	.91	.35	.85	.20	3.58
1955	.68	.29	.22	.26	.46	.70	.85	.55	.37	.25	.13	.06	4.82
1956	.10	.08	.06	.05	.16	.23	.48	.62	.29	.13	.15	.13	2.48
1957	.07	.09	.08	.16	.28	.22	.22	.30	.71	.23	.18	.13	2.67
1958	.09	.15	.25	.13	.22	.43	.34	.17	.46	.23	.18	.10	2.75
1959	.09	.11	.08	.06	.40	1.84	2.15	.70	.65	1.43	.31	.18	8.00
1960	.46	.70	.66	1.47	.55	.76	3.59	2.81	1.33	.62	.32	.21	13.48

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Meap	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	1208,1708	15,600	May 6, 1951	150	2,523	1.08	14.70	1,296	7.54
1952	1238,1708	10,800	Mar. 13, 1952	240	1,751	.752	10.25	1,481	8.66
1953	1278	9,350	Feb. 21, 1953	198	1,170	.502	6.82	1,125	6.56
1954	1338	3,940	Aug. 19, 1954	100	612	.263	3.58	760	4.44
1955	1388	5,620	Oct. 11, 1954	102	829	.356	4.82	665	3.87
1956	1438	3,720	May 30, 1956	90	425	.182	2.48	426	2.48
1957	1508	2,770	June 21, 1957	121	459	.197	2.67	503	2.92
1958	1558	5,620	June 14, 1958	144	475	.204	2.75	436	2.54
1959	1628	10,600	Apr. 4, 1959	100	1,372	.589	8.00	1,638	9.54
1960	1708	18,300	Apr. 4, 1960	339	2,307	.990	13.48	-	-

4230. West Branch Rock River near Waupun, Wis.

Location (revised).--Lat 43°40'05", long 88°39'10", in SW¹/₄ sec. 24, T.14 N., R.15 E., on right bank 700 ft downstream from bridge on U.S. Highway 151, 4 miles upstream from South Branch Rock River, and 4.5 miles northeast of Waupun.

Drainage area.--41.4 sq mi (revised).

Records available.--January 1949 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 870.53 ft above mean sea level, datum of 1929.

Average discharge.--11 years (1949-60), 21.4 cfs.

Extremes.--1949-60: Maximum discharge, 949 cfs Mar. 27, 1950 (gage height, 6.56 ft); no flow Dec. 5, 1949, Feb. 6-13, 1959.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	5.50	3.33	2.91	2.02	5.48	111	172	44.4	25.4	13.9	6.84	10.8	33.6
1952	44.3	32.6	23.1	20.4	11.0	129	115	19.0	9.95	26.1	12.6	4.54	37.4
1953	3.05	4.15	4.96	3.64	50.2	84.1	41.7	39.4	8.64	3.73	31.1	2.52	23.0
1954	1.84	1.55	2.37	1.21	3.82	5.78	12.2	8.09	5.06	7.61	1.98	5.49	4.74
1955	74.9	27.2	13.3	10.1	12.1	48.9	55.5	15.3	20.0	8.17	3.98	1.71	24.3
1956	3.21	2.45	1.36	1.00	1.17	12.2	72.9	62.0	17.0	7.74	12.4	13.6	17.2
1957	4.43	6.69	4.18	2.31	6.41	5.52	20.5	19.3	23.4	6.90	2.90	1.92	8.76
1958	1.42	5.29	3.17	1.86	3.28	5.36	8.26	3.02	1.79	1.13	.54	.36	2.94
1959	1.08	1.19	.41	.23	.16	3.90	142	21.2	6.48	2.24	1.51	.711	14.9
1960	4.63	12.1	23.9	20.0	7.8	50.7	79.8	103	24.1	79.8	108	72.2	49.0

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.15	0.09	0.08	0.06	0.14	3.09	4.63	1.24	0.68	0.39	0.19	0.29	11.03
1952	1.23	.88	.64	.57	.29	5.80	3.11	.53	.27	.73	.35	.12	12.32
1953	.08	.11	.14	.10	1.26	2.34	1.12	1.10	.23	.10	.87	.07	7.52
1954	.05	.04	.07	.03	.10	.16	.33	.23	.14	.21	.06	.15	1.57
1955	2.08	.73	.37	.28	.30	1.36	1.50	.43	.54	.23	.11	.05	7.98
1956	.09	.07	.04	.03	.03	.34	1.97	1.73	.46	.22	.35	.37	5.70
1957	.12	.18	.12	.06	.18	.18	.55	.54	.63	.19	.08	.05	2.86
1958	.04	.14	.09	.05	.08	.15	.22	.08	.05	.03	.02	.01	.96
1959	.03	.03	.01	.006	.004	.11	3.82	.59	.17	.06	.04	.02	4.89
1960	.13	.33	.67	.56	.20	1.41	2.15	2.86	.65	2.22	3.00	1.95	16.13

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	20.9	6.83
1951	1208	366	Mar. 29, 1951	1.8	33.6	0.812	11.03	41.0	13.46
1952	1238	602	Mar. 21, 1952	3.3	37.4	.903	12.32	30.1	9.90
1953	1278	509	Mar. 16, 1953	1.8	23.0	.556	7.52	22.4	7.35
1954	1338	80	May 31, 1954	1.0	4.74	.114	1.57	14.0	4.59
1955	1388	332	Oct. 4, 1954	1.3	24.3	.587	7.98	15.2	5.00
1956	1438	(a)	Apr. 1, 1956	1.0	17.2	.415	5.70	17.9	5.92
1957	1508	112	June 12, 1957	1.0	8.76	.212	2.86	8.30	2.71
1958	1558	37	Nov. 9, 1957	.08	2.94	.071	.96	2.34	.76
1959	1628	730	Apr. 3, 1959	0	14.9	.360	4.89	18.1	5.95
1960	1708	733	Mar. 30, 1960	1.0	49.0	1.18	16.13	-	-

a About 600 cfs.

4235. South Branch Rock River at Waupun, Wis.

Location.--Lat 43°38'30", long 88°43'15", in NW¹ sec.33, T.14 N., R.15 E., on left bank 100 ft upstream from U.S. Highway 151 at Waupun and 3 miles upstream from mouth.

Drainage area.--62.8 sq mi (revised).

Records available.--October 1948 to September 1960. Monthly discharge only for October 1948, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 863.46 ft above mean sea level, datum of 1929.

Average discharge.--12 years (1948-60), 25.4 cfs.

Extremes.--1948-60: Maximum discharge, 1,500 cfs Apr. 3, 1959 (gage height, 7.97 ft), from rating curve extended above 650 cfs; no flow at times in 1949, 1953-54, 1958-59.

Remarks.--Occasional regulation at dam two-thirds of a mile upstream.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	9.88	5.95	5.55	5.61	11.8	130	217	74.3	44.7	38.5	8.48	10.0	46.9
1952	45.3	39.1	25.9	22.7	12.8	176	124	22.0	8.59	23.0	12.6	4.05	43.2
1953	5.03	4.27	3.76	3.30	39.0	78.3	46.1	45.0	10.4	5.50	34.4	4.63	23.3
1954	2.46	2.51	3.61	3.90	5.11	7.26	13.2	8.94	16.4	17.7	3.24	6.15	7.28
1955	86.8	33.8	20.6	13.0	17.2	58.2	61.4	24.5	23.4	6.71	3.53	.58	29.2
1956	1.85	2.20	1.04	.63	.80	17.5	93.1	64.1	14.3	7.81	10.7	8.13	18.5
1957	2.83	4.80	3.83	1.78	6.83	8.80	23.1	16.5	30.2	6.94	2.45	2.33	9.15
1958	1.90	4.95	2.87	1.36	3.37	7.22	11.0	3.54	1.73	1.43	1.72	.93	3.49
1959	1.17	1.36	.16	.09	.08	10.0	241	21.5	7.02	2.76	1.29	.80	23.7
1960	7.90	13.9	38.1	27.6	8.5	64.4	89.9	107	29.4	139	115	76.2	60.1

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.18	0.11	0.10	0.10	0.20	2.39	3.85	1.36	0.79	0.71	0.16	0.18	10.13
1952	.83	.70	.48	.42	.22	3.23	2.21	.40	.15	.42	.23	.07	9.36
1953	.09	.08	.07	.06	.65	1.44	.82	.83	.18	.10	.63	.08	5.03
1954	.05	.04	.07	.02	.08	.13	.23	.16	.29	.32	.06	.11	1.56
1955	1.59	.60	.38	.24	.29	1.07	1.09	.45	.41	.12	.06	.01	6.31
1956	.03	.04	.02	.01	.01	.32	1.65	1.18	.25	.14	.20	.14	3.99
1957	.05	.09	.07	.03	.11	.16	.41	.30	.54	.13	.04	.04	1.97
1958	.03	.09	.05	.02	.06	.13	.20	.06	.03	.03	.03	.02	1.75
1959	.02	.02	.003	.002	.001	.18	4.28	.40	.12	.05	.02	.01	5.11
1960	.14	.25	.70	.51	.15	1.18	1.60	1.96	.52	2.56	2.11	1.35	13.03

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	28.9	6.26
1951	1208	584	Mar. 29, 1951	3.7	46.9	0.747	10.13	54.3	11.75
1952	1238	1,000	Mar. 21, 1952	1.2	43.2	.698	9.36	35.0	7.59
1953	1278	507	Feb. 21, 1953	.1	23.3	.371	5.03	22.9	4.95
1954	1338	168	July 7, 1954	.1	7.28	.116	1.56	18.5	3.97
1955	1388	570	Oct. 4, 1954	.2	29.2	.465	6.31	17.8	3.83
1956	1438	753	Apr. 2, 1956	.21	18.5	.295	3.99	19.0	4.11
1957	1508	170	June 11, 1957	.5	9.15	.146	1.97	9.00	1.93
1958	1558	51	Aug. 12, 1958	0	3.49	.056	.75	2.90	.62
1959	1628	1,500	Apr. 3, 1959	0	23.7	.377	5.11	28.5	6.15
1960	1708	1,150	Mar. 30, 1960	.2	60.1	.957	13.03	-	-

4240. East Branch Rock River near Mayville, Wis.

Location.--Lat 43°31'45", long 88°34'00" in NE $\frac{1}{4}$ sec.10, T.12 N., R.16 E., on left bank 500 ft downstream from Kekoskee Dam, 0.5 mile (revised) upstream from Gill Creek, and 2 miles northwest of railroad bridge in Mayville.

Drainage area.--179 sq mi (revised).

Records available.--May 1949 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 857.20 ft above mean sea level, datum of 1929.

Average discharge.--11 years (1949-60), 92.3 cfs.

Extremes.--1949-60: Maximum discharge, 3,400 cfs Apr. 3, 1959; maximum gage height, 11.02 ft Apr. 3, 1959 (backwater from ice); minimum discharge, 0.1 cfs June 6, 1949 (gage height, 2.09 ft).

Remarks.--Minor regulation by recreation dams.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	20.0	16.4	17.5	13.5	31.8	41.1	801	129	49.1	33.9	25.7	29.1	115
1952	146	111	67.8	84.5	62.0	567	332	55.1	41.6	352	104	38.5	164
1953	20.6	38.8	59.7	36.5	163	311	135	164	72.2	20.1	55.5	15.8	90.7
1954	12.8	15.9	20.9	8.57	40.5	38.9	85.9	41.7	108	116	20.8	25.6	44.5
1955	290	66.9	44.2	45.8	67.2	192	214	62.1	98.9	59.8	15.9	5.88	97.1
1956	14.4	17.7	10.4	8.43	10.8	91.5	222	223	33.6	104	52.8	72.8	72.0
1957	19.3	43.6	30.6	18.4	43.8	90.7	150	101	91.2	34.2	14.4	11.5	53.9
1958	6.99	38.9	31.1	12.7	15.9	78.9	82.7	15.3	14.9	5.77	3.84	4.08	24.5
1959	10.5	21.4	98	3.85	4.57	125	907	75.1	18.8	14.1	8.55	8.02	99.4
1960	82.4	105	103	125	33.9	165	414	442	72.0	131	166	161	167

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.13	0.10	0.11	0.09	0.18	2.65	3.74	0.83	0.31	0.22	0.17	0.18	8.71
1952	.94	.69	.44	.54	.37	3.85	2.07	.36	.26	2.27	.67	.24	12.50
1953	.13	.24	.38	.24	.35	2.00	.84	1.06	.45	.13	.36	.10	6.88
1954	.08	.10	.13	.06	.24	.25	.54	.27	.88	.75	.13	.16	3.39
1955	1.87	.42	.28	.29	.39	1.24	1.33	.40	.62	.38	.10	.04	7.36
1956	.09	.11	.07	.05	.06	.59	1.38	1.44	.21	.67	.34	.45	5.46
1957	.12	.27	.20	.12	.25	.58	.93	.65	.57	.22	.09	.07	4.07
1958	.05	.24	.20	.08	.11	.51	.39	.10	.09	.04	.02	.03	1.86
1959	.07	.13	.03	.02	.03	.80	5.68	.48	.12	.09	.06	.05	7.54
1960	.53	.66	.67	.81	.20	1.06	2.58	2.84	.45	.84	1.07	1.01	12.72

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	89.9	6.80
1951	1208	1,530	Mar. 30, 1951	8.2	115	0.642	8.71	138	10.44
1952	1238	2,080	Mar. 21, 1952	11	164	.916	12.50	147	11.18
1953	1278	700	Feb. 21, 1953	4.2	90.7	.507	6.88	84.8	6.44
1954	1338	733	July 7, 1954	5.0	44.5	.249	3.39	74.3	5.65
1955	1388	1,600	Oct. 3, 1954	2.8	97.1	.542	7.36	66.8	5.06
1956	1438	1,010	Apr. 3, 1956	.8	72.0	.402	5.46	76.3	5.78
1957	1508	405	Feb. 25, 1957	7.6	53.9	.301	4.07	52.5	3.97
1958	1558	296	Apr. 6, 1958	2.5	24.5	.137	1.86	21.1	1.60
1959	1628	3,400	Apr. 3, 1959	2.0	99.4	.555	7.54	121.1	9.17
1960	1708	1,880	Apr. 1, 1960	7.2	167	.933	12.72	-	-

4255. Rock River at Watertown, Wis.

Location.--Lat 43°11'25", long 88°43'35", in sec.4, T.8 N., R.15 E., on left bank at Watertown, 700 ft downstream from Milwaukee Street Bridge, and 1.1 miles downstream from Silver Creek.

Drainage area.--971 sq mi.

Records available.--June to September 1914 (gage heights and discharge measurements only), June 1931 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 792.58 ft above mean sea level, datum of 1929. Prior to Sept. 26, 1933, chain gage at site 700 ft upstream at different datum.

Average discharge.--29 years (1931-60), 432 cfs.

Extremes.--1931-60: Maximum discharge, 5,030 cfs Apr. 4, 1959 (gage height, 6.32 ft); minimum daily, 0.9 cfs Oct. 15, 1939, Sept. 9, 1944.

Remarks.--Slight intermittent regulation caused by a small feed mill 0.2 mile upstream; considerable diurnal regulation caused by powerplant 1.6 miles upstream.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	156	71.0	108	76.7	188	1,834	2,724	1,584	440	258	102	71.4	636
1952	471	701	483	701	629	1,861	2,605	539	246	789	1,014	206	854
1953	70.6	137	515	320	624	1,446	1,044	710	270	99.3	448	59.8	462
1954	32.4	45.2	74.7	49.7	176	203	364	313	457	831	202	145	242
1955	1,354	456	454	469	368	1,068	1,150	545	810	435	512	53.7	642
1956	80.0	124	81.2	63.5	79.9	431	1,065	1,322	300	256	175	287	356
1957	59.7	165	255	107	173	470	705	421	668	186	69.0	48.3	277
1958	40.0	110	110	98.0	130	333	265	58.2	73.5	32.9	15.1	21.5	107
1959	56.8	94.1	54.8	36.1	36.9	410	3,461	848	109	44.8	39.2	30.6	433
1960	132	433	326	726	264	381	2,369	2,278	658	279	1,540	1,142	878

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.19	0.08	0.13	0.09	0.20	2.18	3.14	1.88	0.51	0.31	0.12	0.08	8.91
1952	.56	.81	.57	.83	.70	2.21	2.99	.84	.28	.94	1.20	.24	11.97
1953	.08	.16	.37	.38	.67	1.72	1.20	.84	.31	.12	.53	.07	6.45
1954	.04	.05	.09	.06	.19	.24	.42	.57	.53	.99	.24	.17	3.39
1955	1.61	.52	.54	.56	.40	1.27	1.32	.65	.93	.52	.61	.06	8.99
1956	.09	.14	.10	.08	.09	.51	1.22	1.57	.34	.30	.21	.33	4.98
1957	.07	.19	.30	.13	.19	.56	.81	.50	.77	.22	.08	.06	3.88
1958	.05	.13	.13	.12	.14	.40	.30	.07	.08	.04	.02	.02	1.50
1959	.07	.11	.07	.04	.04	.49	3.98	1.01	.12	.05	.05	.04	6.07
1960	.16	.50	.39	.86	.29	.45	2.72	2.70	.76	.33	1.83	1.31	12.30

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	488	6.82
1951	1208	3,540	Apr. 29, 1951	31	636	0.655	8.91	746	10.45
1952	1238	4,190	Mar. 24, 1952	72	854	.880	11.97	760	10.64
1953	1278	1,810	Mar. 27, 1953	24	462	.476	6.45	430	6.02
1954	1338	1,640	July 7, 1954	7.0	242	.249	3.39	420	5.88
1955	1388	2,090	Aug. 2, 1955	24	642	.661	8.99	475	6.65
1956	1438	1,770	May 13, 1956	45	356	.367	4.98	372	5.21
1957	1508	1,190	June 6, 1957	21	277	.285	3.88	258	3.65
1958	1558	667	Mar. 8, 1958	5.3	107	.110	1.50	102	1.44
1959	1628	5,030	Apr. 4, 1959	13	433	.446	6.07	490	6.87
1960	1708	3,330	May 7, 1960	34	878	.904	12.30	-	-

4260. Crawfish River at Milford, Wis.

Location.--Lat 43°06'00", long 88°51'00", in sec.4, T.7 N., R.14 E., near left tank on upstream side of highway bridge in Milford, 1 mile downstream from Rock Creek and 8 miles upstream from mouth.

Drainage area.--732 sq mi.

Records available.--June 1931 to September 1960.

Gage.--Wire-weight gage. Altitude of gage is 780 ft (from topographic map). Prior to Nov. 19, 1959, chain gage at present site and datum.

Average discharge.--29 years (1931-60), 342 cfs.

Extremes.--1931-60: Maximum discharge, 6,140 cfs Apr. 6, 1959 (gage height, 11.15 ft); minimum observed, 0.2 cfs Sept. 15, 1958 (gage height, 1.11 ft).

Remarks.--Some diurnal fluctuation at low flow caused by powerplants above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	156	79.7	95.5	76.9	149	1,987	1,811	816	350	218	160	263	515
1952	533	708	379	598	547	1,949	1,941	335	308	692	727	139	738
1953	63.5	98.2	163	135	577	1,299	686	470	164	67.4	825	99.1	387
1954	67.5	62.2	84.9	39.5	84.1	185	249	209	370	993	180	123	222
1955	817	240	250	283	329	1,048	837	318	389	133	219	48.2	410
1956	51.5	77.7	64.2	57.1	68.8	409	781	748	195	99.3	79.7	259	242
1957	58.7	124	96.0	77.7	179	238	473	356	749	185	59.2	42.1	219
1958	57.0	161	139	90.8	148	496	270	73.8	54.6	24.9	18.6	8.11	128
1959	24.3	32.5	18.0	15.7	16.2	166	3,206	329	75.5	38.6	50.1	53.1	332
1960	249	473	271	811	259	286	2,010	1,785	312	203	599	421	†640

† Corrected.

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.25	0.12	0.15	0.12	0.21	3.12	2.78	1.28	0.53	0.34	0.25	0.40	9.53
1952	.84	1.06	.60	.94	.81	3.07	2.98	.53	.47	1.09	1.14	.21	13.74
1953	.10	.15	.26	.21	.82	2.05	1.05	.74	.25	.11	1.30	.15	7.19
1954	.11	.09	.13	.06	.12	.29	.38	.33	.56	1.56	.28	.19	4.10
1955	1.29	.37	.39	.45	.47	1.65	1.28	.50	.59	.21	.34	.07	7.61
1956	.08	.12	.10	.09	.10	.64	1.21	1.18	.30	.16	.13	.39	4.50
1957	.09	.19	.15	.12	.25	.37	.72	.56	1.14	.29	.09	.06	4.03
1958	.09	.24	.22	.14	.21	.78	.41	.12	.08	.04	.03	.01	2.37
1959	.04	.05	.03	.02	.02	.26	4.89	.52	.12	.06	.08	.08	6.17
1960	.39	.72	.43	1.28	.38	.45	3.06	2.81	.48	.32	.94	.64	11.90

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	42'	7.86
1951	1208	2,970	Mar. 10, 1951	21	515	0.704	9.53	623	11.53
1952	1238	3,940	Mar. 25, 1952	65	738	1.01	13.74	631	11.73
1953	1278	1,870	Aug. 8, 1953	37	387	.529	7.19	378	7.01
1954	1338	2,070	July 10, 1954	33	222	.303	4.10	314	5.82
1955	1388	1,520	Mar. 16, 1955	24	410	.560	7.61	316	5.86
1956	1438	1,700	Apr. 3, 1956	39	242	.331	4.50	249	4.63
1957	1508	1,260	June 13, 1957	27	219	.299	4.03	225	4.15
1958	1558	915	Mar. 3, 1958	3	128	.175	2.37	105	1.94
1959	1628	6,140	Apr. 6, 1959	7.2	332	.454	6.17	409	7.59
1960	1708	3,680	Apr. 3, 1960	98	†640	.874	11.90	-	-

† Corrected.

4265. Whitewater Creek near Whitewater, Wis.

Location.--Lat 42°46'40", long 88°41'40", in NW $\frac{1}{4}$ sec.26, T.4 N., R.15 E., on right bank at downstream end of highway culvert, 3,000 ft downstream from Whitewater Lake and 4 miles south of Whitewater.

Drainage area.--7.2 sq mi.

Records available.--March 1926 to July 1928, July 1946 to September 1954.

Gage.--Staff gage and Cippoletti weir control. Altitude of gage is 865 ft (from topographic map). Prior to July 3, 1946, staff gage with different control at datum 0.20 ft lower.

Extremes.--1926-28, 1946-54: Maximum discharge observed, 24.8 cfs May 28, 1957 (gage height, 1.99 ft, datum then in use); no flow July 18-28, 1954 (result of bridge construction).

Remarks.--Entire flow from 6.6 sq mi of drainage area impounded in Whitewater Lake, Jan. 29 to Feb. 3, 1928, and Jan. 29, 1947, to Sept. 30, 1954, but there may have been considerable seepage from the lake.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.865	0.835	0.881	0.795	1.71	2.54	1.63	1.86	1.54	1.28	1.32	1.04	1.36
1952	1.64	2.22	1.14	1.60	1.75	3.36	2.47	1.64	1.78	1.68	1.75	1.40	1.88
1953	.982	1.76	1.30	1.05	1.86	2.08	1.46	1.33	1.15	.866	.824	.568	1.26
1954	.656	.733	.738	.723	.984	1.30	1.69	1.05	1.77	.955	.824	.644	1.00

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	1.27	-
1951	1208	8.2	Feb. 26, 1951	0.24	1.36	-	-	1.56	-
1952	1238	12.6	(s)	.64	1.86	-	-	1.79	-
1953	1278	8.29	Feb. 20, 1953	.55	1.26	-	-	1.10	-
1954	1338	6.24	June 3, 1954	0	1.00	-	-	-	-

a Nov. 13, 1951, Mar. 18, 1952.

4270. Whitewater Creek at Whitewater, Wis.

Location.--Lat 42°49'00", long 88°42'30", in SW $\frac{1}{4}$ sec.10, T.4 N., R.15 E., rear right bank at upstream side of highway bridge, 0.5 mile upstream from Tripp Lake pond and 1 mile southeast of Whitewater.

Drainage area.--16.7 sq mi.

Records available.--June 1926 to July 1928. July 1946 to September 1954.

Gage.--Staff gage. Altitude of gage is 825 ft (from topographic map).

Extremes.--1926-28, 1946-54: Maximum discharge, 451 cfs June 13, 1950 (gage height, 5.1 ft, from floodmarks); minimum daily, 6.6 cfs Jan. 17, 1950.

Remarks.--Entire flow from 6.6 sq mi of drainage area impounded in Whitewater Lake Jan. 29 to Feb. 3, 1928, and Jan. 29, 1947, to Sept. 30, 1954, but there may have been considerable seepage from the lake.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	14.0	13.6	16.9	13.6	23.5	39.9	32.7	22.2	20.0	17.2	17.3	14.3	20.4
1952	26.0	43.4	16.7	31.0	20.1	46.5	31.3	21.6	22.3	20.7	22.3	19.5	26.8
1953	13.3	19.1	20.2	18.1	29.5	26.8	23.6	20.9	12.3	12.9	12.8	13.4	18.5
1954	13.6	14.0	13.8	13.0	15.5	15.7	17.9	13.2	22.4	17.6	15.4	12.5	15.4

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	18.0	-
1951	1208	98	Mar. 30, 1951	10	20.4	-	-	23.9	-
1952	1238	*347	Nov. 13, 1951	13	26.8	-	-	24.0	-
1953	1278	*157	Feb. 21, 1953	10	18.5	-	-	17.6	-
1954	1338	127	July 7, 1954	11	15.4	-	-	-	-

* Revised.

4295. Yahara River near McFarland, Wis.

Location.--Lat 43°00'30", long 89°18'15", in SW $\frac{1}{4}$ sec.3, T.6 N., R.10 E., on left bank just upstream from bridge on U.S. Highway 51, at dam at outlet of Lake Waubesa, 1 mile south-west of McFarland.

Drainage area.--351 sq mi.

Records available.--September 1930 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 840.40 ft above mean sea level, datum of 1929 (levels by Public Service Commission of Wisconsin). Prior to Dec. 23, 1934, chain gage at same site and datum.

Average discharge.--30 years (1930-60), 155 cfs.

Extremes.--1930-60: Maximum discharge, 867 cfs Apr. 10, 1959 (gage height, 5.82 ft); maximum gage height, 6.33 ft July 23, 24, 1950; minimum discharge, 6 cfs June 29, 30, 1936, Nov. 19, 1937.

Remarks.--Flow regulated by dams at outlets of Lakes Mendota and Waubesa. Effluent of Madison Metropolitan Sewerage District has been discharged into Badfish Creek since Dec. 29, 1958; this flow was previously included in the Yahara records.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	121	142	99.2	102	152	314	324	312	216	116	104	99.3	175
1952	192	260	224	218	226	362	455	228	248	259	286	166	260
1953	112	110	130	133	225	448	348	230	150	137	184	52.4	188
1954	80.9	98.1	127	104	110	144	90.3	134	257	417	210	85.7	155
1955	220	129	168	178	154	233	232	220	161	105	110	43.0	163
1956	52.0	117	85.8	75.3	95.5	141	138	270	124	127	114	132	123
1957	76.4	113	86.8	88.1	128	155	53.4	178	225	176	127	48.1	122
1958	76.6	93.3	159	145	127	165	57.9	42.1	158	47.5	40.2	27.9	94.9
1959	57.6	132	70.6	51.2	63.5	160	71.9	22.7	50.9	141	160	125	162
1960	275	256	185	272	261	275	394	341	161	432	235	194	274

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.40	0.45	0.33	0.34	0.45	1.03	1.03	1.02	0.69	0.38	0.34	0.32	6.78
1952	.63	.83	.74	.72	.69	1.19	1.45	.75	.79	.85	.94	.53	10.11
1953	.37	.35	.43	.44	.67	1.47	1.11	.76	.48	.45	.60	.17	7.30
1954	.27	.31	.42	.34	.33	.47	.29	.44	.82	1.37	.89	.27	6.02
1955	.72	.41	.55	.58	.46	.76	.74	.72	.51	.35	.36	.14	6.30
1956	.17	.37	.28	.25	.29	.46	.44	.89	.39	.42	.37	.42	4.75
1957	.25	.38	.29	.29	.38	.51	.17	.58	.72	.58	.42	.15	4.72
1958	.25	.30	.52	.47	.38	.54	.18	.14	.50	.16	.13	.09	3.66
1959	.19	.42	.23	.17	.19	.53	2.28	.73	.16	.46	.52	.40	6.28
1960	.90	.81	.61	.89	.80	.90	1.25	1.12	.51	1.42	.77	.62	10.60

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	204	7.89
1951	1208	416	Apr. 30, 1951	49	175	0.499	6.78	201	7.80
1952	1238	531	Apr. 2-4, 1952	89	260	.741	10.11	233	9.06
1953	1278	496	Mar. 16, 1953	27	188	.536	7.30	184	7.15
1954	1358	500	July 11-15, 1954	27	155	.442	6.02	173	6.70
1955	1388	391	Apr. 25, 1955	38	163	.464	6.30	141	5.44
1956	1438	338	May 18, 1956	42	123	.350	4.75	125	4.85
1957	1508	296	May 26, 1957	23	122	.348	4.72	126	4.87
1958	1558	282	June 1, 1958	26	94.9	.270	3.66	88.9	5.43
1959	1628	867	Apr. 10, 1959	20	162	.462	6.28	201	7.76
1960	1708	580	July 3, 4, 1960	56	274	.781	10.60	-	-

4301 (revised). Badfish Creek near Stoughton, Wis.

Location.--Lat 42°53'28", long 89°17'23", in SW $\frac{1}{4}$ sec.14, T.5 N., R.10 E., on left bank 10 ft downstream from highway bridge, 4 miles southwest of Stoughton, and 9 miles upstream from mouth.

Drainage area.--43.5 sq mi.

Records available.--May 1956 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 873.2 ft above mean sea level, unadjusted. Prior to May 25, 1956, staff gage at site 0.5 mile upstream at different datum.

Extremes.--1956-60: Maximum discharge, 871 cfs Jan. 13, 1960 (gage height, 4.60 ft); minimum, 3.4 cfs Nov. 26, 1958, result of freezeup.

Remarks.--Madison Metropolitan Sewerage District discharged an average of 21.71 million gallons per day into the basin since Dec. 29, 1958. Discharge into basin was at a rate of 9 million gallons per day during testing period, Dec. 9-18, 1958.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	-	-	-	-	-	-	-	-	8.87	8.20	10.3	10.5	-
1957	7.94	8.69	8.82	8.32	11.5	10.3	13.3	11.1	12.9	8.17	8.06	6.98	9.65
1958	7.39	10.5	10.2	7.65	15.4	10.4	14.4	8.79	8.75	7.38	6.32	6.40	9.42
1959	8.53	7.85	12.2	30.2	30.8	104	70.9	40.1	39.5	41.5	47.1	46.1	40.0
1960	55.5	47.1	46.6	66.6	47.7	72.6	62.6	84.3	54.8	61.8	54.8	70.8	60.5

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	-	-	-	-	-	-	-	-	0.23	0.22	0.27	0.27	-
1957	0.21	0.22	0.23	0.22	0.27	0.27	0.34	0.29	.33	.22	.21	.18	2.99
1958	.20	.27	.27	.20	.37	.28	.37	.23	.22	.20	.17	.16	2.94
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1956	1438	79	Aug. 31, 1956	-	-	-	-	-	-
1957	1508	68	June 11, 1957	6.4	9.65	0.222	2.99	9.87	3.07
1958	1558	252	Feb. 24, 1958	5.3	9.42	.217	2.94	9.47	-
1959	1628	682	Apr. 1, 1959	6.2	40.0	-	-	50.1	-
1960	1708	871	Jan. 13, 1960	32	60.5	-	-	-	-

4305. Rock River at Afton, Wis.

Location.--Lat 42°36'40", long 89°04'10", in sec.27, T.2 N., R.12 E., on right bank in Afton, 0.3 mile (revised) downstream from highway bridge and 0.8 mile upstream from Bass Creek.

Drainage area.--3,300 sq mi, approximately.

Records available.--January 1914 to September 1960. Monthly discharge only for January 1914, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 742.36 ft above mean sea level, datum of 1929. Prior to Aug. 21, 1932, chain gage and Aug. 21, 1932, to Sept. 30, 1933, water-stage recorder, at same site at datum 1 ft higher.

Average discharge.--46 years (1914-60), 1,738 cfs.

Extremes.--1914-60: Maximum discharge, 13,000 cfs Mar. 23, 24, 1929 (gage height, 11.81 ft, present datum); maximum gage height observed, 13.05 ft Feb. 5, 1916, present datum (backwater from ice); minimum discharge, 30 cfs June 19, 1959 (gage height, 1.68 ft); minimum daily, 42 cfs Aug. 25, 26, 1934; minimum gage height, 0.09 ft Aug. 26, 1934.

Remarks.--Diurnal fluctuation caused by powerplants above station. Records of water temperatures for the period September 1954 to September 1960 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,010	624	654	700	1,055	5,141	6,432	4,901	1,982	1,281	1,021	925	2,149
1952	2,010	3,580	2,392	3,095	2,605	5,525	7,818	2,457	1,822	2,058	3,242	1,152	5,110
1953	875	879	1,378	1,391	2,457	4,411	3,562	2,334	1,122	784	1,829	464	1,771
1954	372	508	714	547	771	855	1,235	1,345	1,663	3,273	1,302	843	1,123
1955	3,229	1,643	1,449	1,624	1,342	3,218	3,275	1,892	2,265	1,173	1,299	382	1,904
1956	456	794	668	555	585	1,213	2,881	3,682	1,250	871	670	1,065	1,225
1957	475	748	828	671	885	1,337	1,944	1,569	2,598	998	586	537	1,096
1958	454	842	908	809	745	1,538	1,231	389	618	259	241	307	1,694
1959	479	727	410	275	527	1,795	9,826	2,930	554	563	759	525	1,577
1960	1,691	2,524	1,624	3,558	1,851	1,422	7,241	6,664	2,623	1,897	3,296	2,812	3,083

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.35	0.21	0.23	0.24	0.33	1.80	2.18	1.72	0.67	0.45	0.36	0.31	8.85
1952	.70	1.14	.84	1.08	.85	1.93	2.64	.86	.55	.72	1.13	.39	12.83
1953	.24	.30	.48	.49	.78	1.54	1.20	.92	.38	.27	.64	.16	7.30
1954	.13	.17	.25	.19	.24	.30	.42	.47	.56	1.14	.46	.28	4.61
1955	1.13	.56	.51	.57	.42	1.12	1.11	.66	.77	.41	.45	.13	7.84
1956	.16	.27	.23	.19	.19	.42	.97	1.29	.42	.30	.23	.36	5.03
1957	.17	.25	.29	.23	.28	.47	.66	.55	.88	.35	.20	.18	4.51
1958	.16	.28	.32	.28	.24	.54	.42	.14	.21	.09	.08	.10	2.86
1959	.17	.25	.14	.10	.10	.63	3.25	1.02	.19	.20	.27	.18	6.50
1960	.59	.79	.57	1.24	.60	.50	2.45	2.33	.89	.66	1.15	.95	12.72

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950		-	-	-	-	-	-	1,967	8.11
1951	1208	7,850	May 4, 1951	342	2,149	0.651	8.85	2,606	10.74
1952	1258	9,810	Mar. 29, 1952	666	3,130	.942	12.93	2,708	11.17
1953	1278	6,200	Feb. 20, 1953	167	1,771	.537	7.30	1,659	6.83
1954	1338	4,620	July 14, 1954	215	1,123	.340	4.61	1,521	6.26
1955	1388	4,480	Oct. 11, 1954	207	1,904	.577	7.84	1,532	6.30
1956	1438	4,460	May 16, 1956	242	1,225	.371	5.03	1,236	5.08
1957	1508	3,460	June 14, 1957	230	1,096	.352	4.51	1,109	4.56
1958	1558	2,250	Mar. 6, 1958	116	694	.210	2.86	644	2.66
1959	1828	12,100	Apr. 10, 1959	47	1,577	.478	6.50	1,914	7.89
1960	1708	8,840	Apr. 6, 1960	957	3,083	.934	12.72	-	-

4315. Turtle Creek near Clinton, Wis.

Location.--Lat 42°35'55", long 88°51'50", in SE $\frac{1}{4}$ sec.29, T.2 N., R.14 E., on left bank 15 ft downstream from highway bridge, 2.5 miles north of Clinton, 11 miles northeast of Beloit, and 14 miles upstream from mouth.

Drainage area.--186 sq mi.

Records available.--September 1939 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 817.00 ft above mean sea level (levels by Corps of Engineers).

Average discharge.--21 years (1939-60), 103 cfs.

Extremes.--1939-60: Maximum discharge, 6,560 cfs Feb. 24, 1949 (gage height, 10.22 ft); minimum, 8 cfs Dec. 29, 1956 (gage height, 2.04 ft), result of freezeup.
Maximum stage known, 12.09 ft in February 1938, from floodmarks (discharge, 10,700 cfs, from rating curve extended above 5,500 cfs by logarithmic plotting).

Remarks.--Some seasonal regulation caused by dams used to maintain levels of Turtle and Delavan Lakes.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	55.5	61.9	72.0	46.5	300	320	219	160	134	104	101	61.0	135
1952	139	197	120	168	166	393	207	115	149	184	180	81.2	174
1953	86.9	94.7	124	91.4	251	177	110	108	67.4	68.9	79.1	53.8	106
1954	54.3	48.6	52.8	40.9	76.1	55.4	124	88.1	155	99.5	77.2	53.8	76.9
1955	207	78.5	77.1	121	194	127	122	71.2	119	75.3	58.1	48.2	108
1956	67.3	57.2	46.8	42.2	40.7	55.9	81.0	101	73.7	41.3	39.1	29.4	56.4
1957	31.8	40.1	37.0	46.3	88.9	57.0	65.3	89.7	53.9	36.4	37.6	32.1	50.9
1958	30.1	65.7	58.6	34.6	58.9	74.6	52.7	31.6	45.6	24.8	21.5	19.6	43.0
1959	32.1	55.6	38.8	24.5	30.4	664	37.2	95.7	43.3	52.0	88.1	55.4	108
1960	214	138	131	313	99.9	215	357	296	146	139	95.1	86.2	187

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.34	0.37	0.45	0.29	1.68	1.98	1.32	0.99	0.80	0.64	0.63	0.37	9.86
1952	.86	1.18	.74	1.04	.97	2.37	1.24	.70	.90	1.14	1.12	.49	12.75
1953	.54	.57	.77	.57	1.41	1.10	.66	.67	.40	.43	.49	.32	7.93
1954	.34	.29	.33	.25	.43	.34	.74	.55	.93	.62	.48	.32	5.62
1955	1.28	.47	.48	.75	1.08	.79	.73	.44	.71	.47	.36	.29	7.65
1956	.42	.34	.29	.26	.24	.35	.49	.63	.44	.26	.24	.18	4.14
1957	.20	.24	.23	.29	.50	.35	.38	.56	.32	.23	.23	.19	3.72
1958	.19	.39	.36	.21	.33	.46	.32	.20	.27	.15	.13	.12	3.13
1959	.20	.33	.24	.15	.17	4.12	.58	.59	.26	.32	.55	.33	7.84
1960	1.33	.85	.81	1.94	.58	1.33	2.14	1.83	.88	.86	.58	.53	13.65

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	117	6.56
1951	1208	2,060	Mar. 3, 1951	44	135	0.726	9.86	158	11.48
1952	1238	1,930	Mar. 12, 1952	56	174	.935	12.75	162	11.85
1953	1278	2,350	Feb. 20, 1953	43	108	.581	7.93	95.9	7.01
1954	1338	756	Apr. 25, 1954	40	76.9	.413	5.62	94.4	6.89
1955	1388	2,270	Feb. 20, 1955	42	108	.581	7.85	91.4	6.67
1956	1438	590	June 21, 1956	27	56.4	.303	4.14	51.1	3.76
1957	1508	800	Feb. 10, 1957	26	50.9	.274	3.72	54.7	3.89
1958	1558	320	Feb. 26, 1958	16	43.0	.231	3.13	40.7	2.96
1959	1628	3,020	Mar. 20, 1959	17	108	.581	7.84	138	10.04
1960	1708	3,400	Mar. 30, 1960	68	187	1.01	13.65	-	-

4325. Pecatonica River at Darlington, Wis.

Location.--Lat 42°40'30", long 90°06'55", in NE $\frac{1}{4}$ sec.3, T.2 N., R.3 E., on right bank in Darlington, 3 miles upstream from Otter Creek.

Drainage area.--274 sq mi.

Records available.--September 1939 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 801.90 ft above mean sea level, adjustment of 1912. Prior to Dec. 19, 1939, staff gage at same site and datum.

Average discharge.--21 years (1939-60), 185 cfs.

Extremes.--1939-60: Maximum discharge, 22,000 cfs July 16, 1950 (gage height, 20.71 ft), from rating curve extended above 11,000 cfs on basis of slope-area measurement of peak flow; minimum, 19 cfs Mar. 4, 1954 (gage height, 1.92 ft), result of freezeup. Flood of Feb. 21, 1937, reached a stage of 17.6 ft, from floodmarks.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	83.0	77.3	68.5	63.2	246	322	374	298	361	603	564	176	270
1952	259	285	200	329	331	731	327	197	222	152	127	111	273
1953	94.0	119	103	189	738	300	182	127	97.7	89.7	91.7	64.6	179
1954	85.3	70.3	74.8	57.4	98.9	84.1	139	110	475	154	87.2	78.0	122
1955	208	93.0	73.0	74.0	280	308	200	134	154	80.0	60.5	55.5	142
1956	68.9	63.9	57.7	47.6	121	155	83.7	94.8	56.0	47.8	55.0	49.0	74.9
1957	40.9	55.1	47.8	121	215	60.9	69.8	103	271	125	71.2	58.4	102
1958	56.2	72.2	68.9	45.0	164	65.5	107	51.1	58.5	39.3	42.1	38.3	66.5
1959	64.2	47.6	34.6	31.6	38.3	951	731	124	148	119	181	90.2	214
1960	229	244	191	546	157	517	417	780	273	217	166	216	331

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.35	0.31	0.29	0.27	0.94	1.36	1.52	1.26	1.47	2.54	2.38	0.72	13.41
1952	1.09	1.16	.84	1.58	1.30	3.08	1.33	.83	.90	.64	.53	.45	13.53
1953	.40	.48	.43	.80	2.80	1.26	.74	.53	.40	.38	.39	.26	8.87
1954	.27	.29	.31	.24	.38	.27	.57	.46	1.93	.65	.37	.32	6.06
1955	.87	.38	.31	.31	1.06	1.30	.81	.56	.63	.34	.25	.23	7.05
1956	.29	.26	.24	.20	.48	.65	.34	.40	.23	.20	.23	.20	3.72
1957	.17	.22	.20	.51	.82	.28	.28	.43	1.11	.53	.30	.24	5.07
1958	.24	.29	.29	.19	.62	.28	.43	.22	.24	.17	.18	.16	3.31
1959	.27	.19	.15	.13	.15	4.00	2.98	.52	.60	.50	.76	.37	10.62
1960	.96	.99	.80	2.30	.62	2.17	1.70	3.28	1.11	.91	.70	.88	16.42

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	240	11.91
1951	1208	7,750	July 8, 1951	52	270	0.985	13.41	313	15.55
1952	1238	3,650	Mar. 19, 1952	91	273	.996	13.53	237	11.75
1953	1278	8,380	Feb. 20, 1953	59	179	.653	8.87	170	8.43
1954	1358	6,930	June 22, 1954	46	122	.445	6.06	136	6.75
1955	1389	3,340	Feb. 21, 1955	45	142	.518	7.05	127	6.28
1956	1438	1,500	Mar. 3, 1956	34	74.9	.273	3.72	71.0	3.52
1957	1508	1,450	Jan. 22, 1957	30	102	.372	5.07	107	5.30
1958	1558	1,600	Feb. 25, 1958	31	66.5	.243	3.31	62.2	3.10
1959	1628	10,700	Apr. 1, 1959	29	214	.781	10.62	258	12.76
1960	1708	7,770	Mar. 30, 1960	70	331	1.21	16.42	-	-

4330. East Branch Pecatonica River near Blanchardville, Wis.

Location.--Lat 42°47'10", long 89°51'40", in SE¹/₄ sec. 26, T.4 N., R.5 E., on left bank at downstream side of bridge on State Highway 78, 1.5 miles south of Blanchardville and 3.5 miles upstream from Sawmill Creek.

Drainage area.--221 sq mi.

Records available.--September 1939 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 796.8 ft above mean sea level, unadjusted. Prior to Dec. 20, 1939, wire-weight gage at bridge 50 ft upstream at same datum. Auxiliary staff gage 2.7 miles upstream at same datum.

Average discharge.--21 years (1939-60), 139 cfs.

Extremes.--1939-60: Maximum discharge, 11,700 cfs Feb. 28, 1948 (gage height, 15.74 ft); minimum, 23 cfs Nov. 28, 1940, Dec. 8, 1949.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	85.0	71.4	69.0	65.7	119	255	329	267	251	175	159	112	163
1952	169	176	133	203	187	449	230	151	247	145	122	107	193
1953	98.5	108	100	109	517	205	169	135	111	192	129	91.3	161
1954	87.6	88.8	92.0	75.9	95.4	86.2	126	108	250	162	104	87.2	113
1955	158	93.3	77.4	58.3	218	202	195	141	124	107	80.6	73.0	127
1956	79.2	73.6	78.7	71.6	149	149	81.4	84.1	65.0	58.6	82.4	64.3	86.2
1957	56.5	64.7	59.2	95.5	165	62.7	71.5	89.8	352	99.5	82.7	69.5	105
1958	67.3	78.9	75.5	63.1	159	73.9	84.7	54.5	59.6	48.2	43.7	44.6	70.4
1959	62.4	57.6	47.6	46.4	52.1	472	547	100	118	117	101	84.0	151
1960	176	178	154	354	136	311	330	501	229	190	145	169	240

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.43	0.36	0.36	0.34	0.56	1.33	1.66	1.40	1.27	0.91	0.83	0.57	10.02
1952	.88	.89	.69	1.06	.91	2.34	1.16	.79	1.25	.76	.64	.54	11.91
1953	.51	.54	.52	.57	2.44	1.07	.85	.70	.56	1.00	.68	.46	9.90
1954	.46	.45	.48	.40	.45	.45	.64	.56	1.26	.84	.54	.44	6.97
1955	.82	.47	.40	.30	1.03	1.05	.99	.74	.63	.56	.42	.37	7.78
1956	.41	.37	.41	.37	.73	.78	.41	.44	.33	.31	.43	.32	5.31
1957	.29	.33	.31	.50	.78	.33	.36	.47	1.78	.52	.43	.35	6.45
1958	.35	.40	.39	.33	.75	.39	.43	.28	.30	.25	.23	.22	4.32
1959	.33	.29	.25	.24	.25	2.46	2.76	.52	.59	.61	.52	.42	9.24
1960	.92	.90	.81	1.85	.66	1.62	1.66	2.61	1.15	.99	.75	.85	14.77

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	10.62
1951	1208	1,070	Apr. 29, 1951	52	163	0.738	10.02	173	11.33
1952	1238	3,250	Mar. 19, 1952	98	193	.873	11.91	179	11.02
1953	1278	8,750	Feb. 20, 1953	74	161	.729	9.90	158	9.72
1954	1338	3,300	June 22, 1954	71	113	.511	6.97	119	7.27
1955	1398	1,830	Oct. 11, 1954	44	127	.575	7.78	119	7.28
1956	1438	1,070	Mar. 7, 1956	49	86.2	.390	5.31	81.9	5.05
1957	1508	2,820	June 11, 1957	44	105	.475	6.45	108	6.66
1958	1558	1,700	Feb. 25, 1958	41	70.4	.319	4.32	65.9	4.05
1959	1628	9,680	Apr. 1, 1959	41	151	.683	9.24	179	11.00
1960	1708	6,960	Mar. 30, 1960	79	240	1.09	14.77	-	-

4335. Yellowstone River near Blanchardville, Wis.

Location.--Lat 42°46'55", long 89°59'50", in NE $\frac{1}{4}$ sec.34, T.4 N., R.4 E., on right bank 0.6 mile upstream from highway bridge, 7 miles southwest of Blanchardville, and about 9 miles upstream from mouth.

Drainage area.--29.1 sq mi.

Records available.--July 1954 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 840 ft (from topographic map).

Average discharge.--6 years (1954-60), 14.7 cfs.

Extremes.--1954-60: Maximum discharge, 2,240 cfs Mar. 29, 1960 (gage height, 10.47 ft); minimum, 1.6 cfs Nov. 30, 1957 (gage height, 1.12 ft), result of freezeup.

Remarks.--Records of water temperatures and suspended sediment loads for the period July 1954 to September 1960 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	-	-	-	-	-	-	-	-	-	15.9	9.60	9.48	-
1955	16.0	9.19	8.95	9.29	32.2	24.5	17.6	13.0	11.0	7.56	6.06	6.36	13.3
1956	7.70	6.65	6.11	5.25	19.0	12.2	7.93	8.13	5.52	4.51	5.51	5.13	7.76
1957	4.60	5.33	4.90	6.13	19.2	6.33	7.73	10.3	35.2	9.95	7.55	6.47	10.2
1958	6.78	6.88	7.68	5.57	21.5	6.73	8.35	6.40	5.16	3.97	4.49	3.96	7.19
1959	6.19	6.06	3.61	3.13	3.96	103	50.6	9.87	17.5	12.8	18.0	10.5	20.5
1960	21.4	19.6	18.8	46.2	13.6	47.5	35.8	52.3	30.8	24.3	19.6	23.4	29.5

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	-	-	-	-	-	-	-	-	-	-	-	-	-
1955	0.63	0.35	0.35	0.37	1.15	0.97	0.68	0.51	0.42	0.63	0.38	0.36	6.21
										.30	.24	.24	
1956	.30	.26	.24	.21	.71	.48	.30	.32	.21	.18	.22	.20	3.63
1957	.18	.20	.19	.24	.69	.25	.30	.41	1.35	.39	.30	.25	4.75
1958	.27	.27	.30	.22	.77	.27	.32	.25	.20	.16	.18	.15	3.36
1959	.25	.23	.14	.12	.14	4.07	1.94	.39	.67	.51	.71	.40	9.57
1960	.85	.75	.75	1.83	.50	1.88	1.37	2.07	1.18	.96	.78	.90	13.82

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-
1954	1338	a178	Sept. 30, 1954	-	-	-	-	-	-
1955	1388	1,740	Feb. 20, 1955	5.2	13.3	0.457	6.21	12.2	5.68
1956	1438	539	Feb. 26, 1956	3.4	7.76	.267	3.63	7.28	3.40
1957	1508	1,820	June 11, 1957	3.8	10.2	.351	4.75	10.7	5.02
1958	1558	1,320	Feb. 24, 1958	2.2	7.19	.247	3.36	6.72	3.14
1959	1628	2,000	Apr. 1, 1959	2.5	20.5	.704	9.57	24.2	11.30
1960	1708	2,240	Mar. 29, 1960	9.7	29.5	1.01	13.82	-	-

a Maximum during period July to September.

ROCK RIVER BASIN

4345. Pecatonica River at Martintown, Wis.

Location.--Lat 42°30'35", long 89°48'00", in SE $\frac{1}{4}$ sec. 32, T.1 N., R.6 E., on right bank about 400 ft downstream from highway bridge in Martintown, 0.3 mile upstream from Wisconsin-Illinois State line and 9 miles downstream from Skinner Creek.

Drainage area.--1,040 sq mi, approximately.

Records available.--October 1939 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 757.9 ft above mean sea level, datum of 1929. Prior to Jan. 6, 1940, wire-weight gage at same site and datum.

Average discharge.--21 years (1939-60), 694 cfs.

Extremes.--1939-60: Maximum discharge, 14,200 cfs Apr. 3, 1959 (gage height, 20.23 ft); maximum gage height, 20.24 ft Feb. 29, 1948; no flow for part of Dec. 14, 1939; minimum daily discharge, 132 cfs Nov. 7, 1949.

Remarks.--Diurnal fluctuation caused by powerplant above station until December 1951; slight diurnal fluctuation thereafter from powerplant farther upstream.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	324	294	279	263	536	1,342	1,355	1,248	1,126	2,127	1,531	669	928
1952	1,124	1,166	798	1,285	1,304	2,755	1,229	768	1,029	625	571	441	1,091
1953	395	465	451	615	2,512	1,041	741	562	427	452	451	304	687
1954	292	297	320	260	446	298	535	473	1,265	601	378	304	454
1955	717	366	290	312	1,048	893	729	526	488	331	241	228	511
1956	269	255	251	215	565	666	328	391	243	330	264	334	342
1957	187	243	228	316	640	259	328	442	1,051	620	335	290	409
1958	257	325	392	263	626	406	417	234	268	189	167	166	307
1959	241	212	162	147	192	3,095	2,761	506	472	520	555	402	774
1960	928	998	783	2,049	669	1,091	2,943	3,100	1,201	1,030	716	797	1,360

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.36	0.32	0.31	0.29	0.54	1.49	1.45	1.38	1.20	2.36	1.70	0.72	12.12
1952	1.25	1.25	.88	1.42	1.35	3.05	1.32	.85	1.10	.69	.63	.47	14.26
1953	.44	.52	.48	.68	2.51	1.15	.80	.62	1.46	.50	.48	.33	8.97
1954	.32	.32	.35	.29	.45	.33	.57	.32	1.36	.67	.42	.33	5.95
1955	.79	.40	.32	.35	1.05	.99	.78	.58	.52	.37	.27	.24	6.66
1956	.30	.27	.28	.24	.59	.74	.35	.43	.26	.37	.29	.36	4.48
1957	.21	.26	.25	.35	.64	.29	.35	.49	1.13	.69	.37	.31	5.34
1958	.29	.35	.43	.29	.63	.45	.45	.26	.29	.21	.18	.18	4.01
1959	.27	.23	.18	.16	.18	3.43	2.96	.56	.51	.58	.61	.43	10.10
1960	1.03	1.06	.87	2.27	.69	1.21	3.16	3.44	1.29	1.14	.79	.85	17.80

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	1208	8,580	July 11, 1951	214	328	0.892	12.12	877	11.45
1952	1238	7,250	Mar. 13, 1952	392	1,091	1.05	14.26	1,112	14.51
1953	1278	10,600	Feb. 23, 1953	280	687	.661	8.97	653	8.52
1954	1338	4,180	June 25, 1954	238	454	.437	5.93	494	6.45
1955	1388	3,700	Feb. 21, 1955	192	511	.491	6.66	460	6.00
1956	1438	2,280	Feb. 29, 1956	160	342	.329	4.48	332	4.35
1957	1508	2,720	June 15, 1957	140	409	.393	5.34	436	5.69
1958	1558	4,500	Feb. 27, 1958	143	307	.295	4.01	276	3.62
1959	1628	14,200	Apr. 3, 1959	140	774	.744	10.10	949	12.89
1960	1708	12,800	Apr. 1, 1960	340	1,360	1.31	17.80	-	-

4350. Cedar Creek near Winslow, Ill.

Location.--Lat 42°28'00", long 89°50'02", in SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.32, T.29 N., R.6 E., on right bank at downstream side of highway bridge, 3 miles southwest of Winslow and 3 miles upstream from mouth.

Drainage area.--1.29 sq mi.

Records available.--March 1951 to September 1960.

Gage.--Water-stage recorder and concrete control. Datum of gage is 912.57 ft above mean sea level, datum of 1929.

Average discharge.--9 years (1951-60), 0.436 cfs.

Extremes.--1951-60: Maximum discharge, about 120 cfs Mar. 20, 1959 (gage height, 5.50 ft, backwater from ice); no flow for many days 1953-60.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	1.18	1.64	0.874	0.300	1.75	0.833	0.227	-
1952	2.02	1.98	0.927	1.89	1.57	3.51	1.49	.655	1.09	.354	1.26	.249	1.42
1953	.152	.176	.182	.166	2.17	.587	.643	.425	.161	.106	.073	.036	.394
1954	.016	.005	.009	.003	.562	0	.230	.168	.674	.059	.044	.013	.144
1955	.878	.174	.127	.282	1.81	.279	.725	.434	.615	.115	.067	.014	.449
1956	.025	.015	0	0	1.48	.273	.017	.230	.001	.105	.32	.011	.202
1957	0	.001	.011	.314	2.07	0	.014	0	.028	.063	0	0	.195
1958	0	0	.034	0	0	0	.087	0	.008	.007	0	0	.011
1959	0	0	0	0	0	3.02	.235	.084	.024	.066	.045	.032	.297
1960	.241	.430	.533	1.90	.18	1.25	1.59	2.27	.648	.263	.232	.110	.808

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	1.06	1.42	0.78	0.26	1.56	0.74	0.20	-
1952	1.80	1.71	0.83	1.69	1.31	3.13	1.29	.59	.95	.32	1.13	.22	14.97
1953	.14	.15	.16	.15	1.75	.52	.58	.38	.14	.09	.07	.03	4.14
1954	.01	.004	.008	.003	.45	0	.20	.15	.58	.05	.04	.01	1.50
1955	.78	.15	.11	.25	1.46	.25	.63	.39	.53	.10	.06	.01	4.72
1956	.02	.01	0	0	1.24	.24	.01	.21	.0006	.09	.29	.01	2.12
1957	0	.0009	.01	.28	1.67	0	.01	0	.02	.06	0	0	2.05
1958	0	0	.03	0	0	0	.08	0	.007	.006	0	0	.12
1959	0	0	0	0	0	2.70	.20	.07	.02	.06	.04	.03	3.12
1960	.22	.37	.48	1.70	.15	1.11	1.38	2.03	.56	.24	.21	.10	8.55

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	1558	91	July 8, 1951	-	-	-	-	-	-
1952	1558	101	June 13, Aug. 3	0.12	1.42	1.10	14.97	1.05	11.08
1953	1558	103	Feb. 20, 1953	.01	.394	.305	4.14	.353	3.72
1954	1558	12	June 3, 1954	0	.144	.112	1.50	.742	2.52
1955	1558	84	Feb. 20, 1955	0	.449	.348	4.72	.553	3.71
1956	1558	78	Aug. 30, 1956	0	.202	.157	2.12	.199	2.10
1957	1558	29	Feb. 12, 1957	0	.195	.151	2.05	.197	2.07
1958	1558	5.2	Dec. 22, 1957	0	.011	.0085	.12	.008	.09
1959	1628	a120	Mar. 20, 1959	0	.297	.230	3.12	.798	4.19
1960	1708	96	Mar. 29, 1960	0	.808	.626	8.55	-	-

a About.

4355. Pecatonica River at Freeport, Ill.

Location.--Lat 42°18'13", long 89°36'57", in SE $\frac{1}{4}$ sec.30, T.27 N., R.8 E., on right bank on property of Public Service Co. of Northern Illinois at Freeport, 0.3 mile upstream from Stephenson Street Bridge and 5 miles upstream from Yellow Creek.

Drainage area.--1,330 sq mi, approximately.

Records available.--September 1914 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 743.18 ft above mean sea level, datum of 1929. Prior to Jan. 15, 1935, chain gage at site 0.9 mile downstream at datum 4.2 ft lower. Since July 13, 1943, auxiliary wire-weight gage read once daily 0.9 mile downstream.

Average discharge.--46 years (1914-60), 884 cfs.

Extremes.--1914-60: Maximum discharge, 18,400 cfs Mar. 16, 1929 (gage height, 19.76 ft, site and datum then in use); minimum, 82 cfs Dec. 11, 1957, result of freezeup.

Remarks.--Some diurnal regulation caused by powerplants above station.

Correction.--In WSP 1238, the annual runoff in inches was listed in error; it should be 13.66 inches.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	418	364	305	294	768	1,630	1,554	1,464	1,268	2,478	1,723	864	1,098
1952	1,371	1,447	902	1,612	1,544	3,299	1,499	969	1,196	799	813	572	1,336
1953	492	614	667	615	2,843	1,349	939	727	523	523	542	377	837
1954	347	364	389	292	543	377	657	571	1,228	742	487	368	531
1955	944	517	453	565	1,640	1,169	974	720	642	464	337	287	720
1956	350	348	302	289	697	848	450	594	357	583	334	444	466
1957	241	339	303	311	540	356	396	513	1,094	713	374	360	460
1958	293	406	450	278	396	700	561	321	356	343	242	218	380
1959	296	282	201	163	324	3,887	3,234	683	506	636	648	550	954
1960	1,164	1,161	927	2,547	901	1,005	3,522	3,315	1,447	1,168	784	615	1,565

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.36	0.31	0.26	0.26	0.60	1.41	1.30	1.27	1.06	2.15	1.49	0.72	11.19
1952	1.19	1.21	.78	1.40	1.25	2.86	1.26	.84	1.00	.69	.70	.48	113.66
1953	.43	.52	.58	.53	2.23	1.17	.79	.63	.44	.45	.47	.32	8.56
1954	.30	.31	.34	.25	.43	1.33	.55	.49	1.03	.64	.42	.33	5.42
1955	.82	.43	.39	.49	1.28	1.01	.82	.62	.54	.40	.29	.24	7.33
1956	.30	.29	.26	.25	.56	.74	.38	.51	.30	.51	.29	.37	4.76
1957	.21	.28	.26	.27	.42	.31	.33	.44	.92	.62	.32	.30	4.68
1958	.25	.34	.39	.24	.31	.61	.47	.28	.30	.30	.21	.18	3.88
1959	.26	.24	.17	.14	.25	3.37	2.71	.59	.42	.55	.56	.46	9.72
1960	1.01	.97	.80	2.21	.73	.87	2.95	2.87	1.21	1.01	.68	.68	15.99

† Corrected.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	1,032	10.54
1951	1208	7,820	July 12, 1951	173	1,098	0.826	11.19	1,318	13.44
1952	1238	7,220	Mar. 14, 1952	501	1,336	1.00	115.66	1,173	12.01
1953	1278	8,820	Feb. 24, 1953	320	837	.629	8.56	781	7.98
1954	1338	2,730	June 27, 1954	200	531	.399	5.42	599	6.11
1955	1388	5,700	Feb. 21, 1955	242	720	.541	7.33	643	6.54
1956	1438	2,600	Feb. 28, 1956	190	466	.350	4.76	456	4.66
1957	1508	2,600	June 15, 1957	146	480	.346	4.68	483	4.91
1958	1558	83,000	Mar. 1, 1958	138	380	.286	3.88	349	3.57
1959	1628	12,000	Apr. 5, 1959	150	954	.717	9.72	1,182	11.83
1960	1708	11,000	Apr. 2, 1960	359	1,565	1.18	15.99	-	-

† Corrected.

a About.

4360. Mount Vernon Creek near Mount Vernon, Wis.

Location.--Lat 42°55'20", long 89°37'30", in SW $\frac{1}{4}$ sec. 12, T.5 N., R.7 E., on right bank 400 ft downstream from bridge on State Highway 92, 0.9 mile upstream from West Branch Sugar River, and 2.5 miles southeast of Mount Vernon.

Drainage area.--16.1 sq mi.

Records available.--January 1954 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 875 ft (from topographic map).

Average discharge.--6 years (1954-60), 16.4 cfs.

Extremes.--1954-60: Maximum discharge, 940 cfs Apr. 1, 1959 (gage height, 6.38 ft); maximum gage height, 7.00 ft Jan. 12, 1960, from floodmark (backwater from ice); minimum discharge, 7.1 cfs Jan. 31, 1959, result of freezeup.

Remarks.--Records of water temperatures and suspended sediment loads for the period January 1954 to September 1960 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	-	-	-	13.0	14.1	13.5	19.4	17.1	26.2	23.5	16.1	15.7	-
1955	21.8	15.4	14.6	15.5	22.3	22.9	23.3	17.2	20.6	17.1	14.8	14.0	18.3
1956	15.1	13.4	13.0	12.8	17.8	17.2	14.9	14.5	13.3	11.1	18.0	13.5	14.5
1957	12.3	13.2	12.5	13.6	16.1	12.4	13.8	14.3	16.1	13.5	12.7	12.2	13.7
1958	11.9	12.9	12.5	10.0	18.4	12.3	13.3	10.6	11.1	10.7	9.80	9.60	11.9
1959	11.0	10.8	10.0	9.69	9.39	39.8	36.2	12.4	14.6	14.5	15.2	13.1	16.4
1960	18.7	18.3	18.3	29.0	17.0	28.9	27.6	35.1	24.1	24.2	19.7	19.1	23.4

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	-	-	-	0.93	0.91	0.96	1.34	1.23	1.82	1.68	1.15	1.09	-
1955	1.56	1.07	1.05	1.11	1.44	1.64	1.61	1.23	1.43	1.23	1.06	.97	15.40
1956	1.08	.93	.93	.91	1.19	1.23	1.03	1.04	.92	.80	1.29	.94	12.29
1957	.88	.92	.90	.97	1.04	.89	.96	1.02	1.25	.97	.88	.85	11.53
1958	.85	.90	.90	.72	1.19	.88	1.92	.76	.77	.76	.70	.67	10.02
1959	.79	.75	.72	.69	1.61	2.85	2.51	.89	1.01	1.03	1.09	.91	13.85
1960	1.34	1.27	1.31	2.07	1.14	2.07	1.91	2.52	1.67	1.73	1.41	1.32	19.76

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-
1954	1338, 1628	602	June 22, 1954	-	-	-	-	17.5	14.79
1955	1388, 1628	471	Feb. 20, 1955	12	18.3	1.14	15.40	17.4	14.66
1956	1438, 1628	230	Feb. 24, 1956	9.5	14.5	.901	12.29	14.3	12.05
1957	1508	164	June 13, 1957	11	13.7	.851	11.53	13.6	11.48
1958	1558, 1628	528	Feb. 24, 1958	8.8	11.9	.739	10.02	11.4	9.63
1959	1628	940	Apr. 1, 1959	8.5	16.4	1.02	13.85	18.4	15.51
1960	1708	900	Mar. 30, 1960	13	23.4	1.45	19.76	-	-

4365. Sugar River near Brodhead, Wis.

Location.--Lat 42°36'40", long 89°23'50", in SW¼ sec.26, T.2 N., R.9 E., or left bank at downstream side of highway bridge, 2 miles upstream from Jordan Creek and 2 miles southwest of Brodhead.

Drainage area.--527 sq mi.

Records available.--January 1914 to September 1960. Monthly discharge only for January 1914, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 768.14 ft above mean sea level, datum of 1929. Prior to Oct. 17, 1938, chain gage at same site and datum.

Average discharge.--46 years (1914-60), 338 cfs.

Extremes.--1914-60: Maximum discharge, 14,800 cfs Sept. 13, 1915 (gage height, 11.4 ft, from floodmarks), from rating curve extended above 7,500 cfs; minimum, 35 cfs Sept. 19, 1959 (gage height, -0.16 ft).

Remarks.--Considerable diurnal fluctuation caused by powerplant at Brodhead.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	221	191	229	199	387	621	707	542	420	367	362	261	375
1952	555	495	322	541	470	1,215	542	342	665	344	388	246	511
1953	221	322	355	323	1,083	557	424	327	260	235	299	195	379
1954	190	198	210	171	257	196	353	265	481	476	262	200	270
1955	509	257	225	233	545	419	571	294	268	304	186	154	350
1956	189	190	120	89.4	144	268	250	257	158	136	143	200	179
1957	131	168	155	160	234	198	245	231	332	179	154	155	195
1958	143	197	202	160	361	236	237	140	144	117	105	106	178
1959	151	160	122	109	127	1,384	926	206	144	164	141	165	318
1960	488	389	366	769	284	643	828	919	402	425	329	404	522

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.48	0.40	0.50	0.43	0.76	1.36	1.50	1.19	0.89	0.80	0.79	0.55	9.65
1952	1.21	1.05	.71	1.18	.96	2.66	1.15	.75	1.41	.75	.85	.52	13.20
1953	.48	.68	.78	.71	2.14	1.22	.90	.72	.55	.51	.66	.41	9.76
1954	.41	.42	.46	.37	.51	.43	.70	.58	1.02	1.04	.57	.42	6.93
1955	1.11	.54	.49	.51	1.08	.92	1.21	.64	.61	.67	.41	.33	8.52
1956	.41	.40	.26	.20	.30	.59	.53	.56	.34	.30	.31	.42	4.62
1957	.29	.36	.34	.35	.46	.43	.52	.51	.70	.39	.34	.33	5.02
1958	.31	.42	.44	.35	.71	.52	.50	.31	.30	.26	.23	.23	4.58
1959	.33	.34	.27	.24	.25	3.03	1.96	.45	.30	.36	.31	.35	8.19
1960	1.07	.82	.80	1.68	.58	1.41	1.75	2.01	.85	.93	.72	.86	13.48

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	420	10.83
1951	1208	2,400	Feb. 28, 1951	111	375	0.712	9.65	437	11.24
1952	1238	4,380	Mar. 19, 1952	200	511	.970	13.20	471	12.17
1953	1278	8,500	Feb. 21, 1953	127	379	.719	9.76	353	9.11
1954	1338	1,760	July 9, 1954	154	270	.512	6.93	303	7.78
1955	1388	4,400	Feb. 21, 1955	96	330	.626	8.52	289	7.45
1956	1438	775	Apr. 29, 1956	60	179	.340	4.62	175	4.54
1957	1508	826	June 14, 1957	98	195	.370	5.02	202	5.20
1958	1558	2,830	Feb. 27, 1958	76	178	.338	4.58	168	4.35
1959	1628	7,150	Apr. 2, 1959	62	318	.603	8.19	386	9.94
1960	1708	10,200	Mar. 31, 1960	140	522	.990	13.48	-	-

4370. Pecatonica River at Shirland, Ill.

Location.--Lat 42°26'10", long 89°11'50", in SW $\frac{1}{4}$ sec.11, T.28 N., R.11 E., near left bank on downstream side of highway bridge over mouth of Sugar River, half a mile south of Shirland and 7 $\frac{1}{2}$ miles upstream from mouth.

Drainage area.--2,540 sq mi, approximately.

Records available.--October 1939 to September 1958, water years 1959-60 (annual maximum).

Gage.--Crest-stage gage. Datum of gage is 711.79 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Oct. 1, 1958, wire-weight gage at same site and datum.

Average discharge.--19 years (1939-58), 1,513 cfs.

Extremes.--1939-60: Maximum discharge, 16,600 cfs Apr. 4, 1959 (gage height, 17.45 ft).
1939-58: Minimum discharge, 335 cfs Sept. 7, 14, 15, 1958; minimum gage height, 2.44 ft July 24, 1940.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	886	708	677	648	1,895	3,694	3,020	2,801	2,198	3,901	2,705	1,391	2,047
1952	2,598	3,142	1,732	2,890	3,125	6,744	4,550	2,132	2,862	1,944	1,315	1,096	2,825
1953	951	1,258	1,412	1,348	4,463	3,179	1,941	1,544	1,124	909	1,017	685	1,632
1954	626	678	794	646	1,137	789	1,405	1,169	2,561	1,540	965	766	1,086
1955	2,167	1,024	925	1,252	2,829	2,648	2,037	1,499	1,272	1,002	688	563	1,484
1956	655	680	571	548	983	1,514	940	1,420	805	1,190	610	866	899
1957	476	609	559	645	1,174	861	941	1,695	1,184	666	660	977	977
1958	548	738	861	601	660	1,572	1,097	604	723	743	442	394	749
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.40	0.31	0.31	0.29	0.78	1.68	1.33	1.27	0.96	1.77	1.23	0.61	10.94
1952	1.18	1.38	0.79	1.22	1.33	3.06	2.00	0.97	1.26	0.88	0.60	0.48	15.15
1953	0.43	0.55	0.64	0.61	1.85	1.44	0.85	0.70	0.49	0.41	0.46	0.29	8.70
1954	0.28	0.30	0.36	0.29	0.47	0.36	0.62	0.53	1.13	0.70	0.44	0.34	5.82
1955	0.98	0.45	0.42	0.57	1.16	1.20	0.89	0.68	0.56	0.45	0.31	0.25	7.92
1956	0.30	0.30	0.26	0.25	0.42	0.69	0.41	0.64	0.35	0.54	0.28	0.38	4.82
1957	0.22	0.27	0.25	0.29	0.48	0.39	0.41	0.50	0.74	0.54	0.30	0.29	4.68
1958	0.25	0.32	0.39	0.27	0.27	0.71	0.48	0.27	0.32	0.34	0.20	0.17	3.99
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	1208	8,600	July 15, 16, 1951	500	2,047	0.806	10.94	1,632	9.80
1952	1238	11,600	Mar. 21, 1952	930	2,825	1.11	15.15	2,482	13.27
1953	1278	10,200	Feb. 23, 1953	580	1,632	0.643	8.70	2,504	13.42
1954	1338	4,610	June 6, 1954	560	1,086	0.428	5.82	1,505	8.02
1955	1388	8,960	Feb. 22, 1955	490	1,484	0.584	7.92	1,257	6.73
1956	1438	8,360	Mar. 1, 1956	450	899	0.354	4.82	1,297	6.93
1957	1508	3,490	June 17, 1957	400	877	0.345	4.68	877	4.70
1958	1558	8,800	Mar. 1, 1958	335	749	0.295	3.99	520	4.90
1959	-	116,600	Apr. 4, 1959	-	-	-	-	-	-
1960	-	16,000	Apr. 3, 1960	-	-	-	-	-	-

† Corrected.

a About.

4375. Rock River at Rockton, Ill.

Location.--Lat 42°27'05", long 89°04'20", in SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.24, T.46 N., R.1 E., on left bank at upstream side of bridge on State Highway 2 in Rockton, three-quarters of a mile downstream from Pecatonica River.

Drainage area.--6,290 sq mi, approximately.

Records available.--June 1903 to July 1906, October 1906 to March 1909, July 1914 to September 1919, October 1939 to September 1960. Published as "below mouth of Pecatonica River at Rockton" 1903-9; as "at Rockford" 1914-19. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 707.94 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Oct. 1, 1906, chain gage at same site at datum about 1 ft higher. Oct. 1, 1906, to Mar. 31, 1909, chain gage at same site at datum about 2 ft higher. July 30, 1914, to Apr. 30, 1919, chain gage at site at Rockford about 21 miles downstream, at different datum.

Average discharge.--28 years (1903-5, 1914-19, 1939-60), 3,761 cfs (discharge for site at Rockford adjusted for difference in drainage area).

Extremes.--1903-9, 1914-19, 1939-60: Maximum discharge, 32,500 cfs Mar. 30, 1916 (gage height, 13.06 ft, site and datum then in use); minimum daily, 501 cfs Sept. 14, 1958. Flood in February 1937 reached a stage of 14.6 ft (backwater from ice, from painted floodmark).

Remarks.--Low flow regulated by powerplants above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2,146	1,681	1,608	1,406	3,256	9,453	9,793	8,058	4,517	5,244	4,109	2,493	4,489
1952	4,799	6,917	3,810	5,490	5,812	12,630	11,020	4,696	4,989	4,554	5,670	2,664	6,086
1953	1,705	2,399	3,056	2,431	6,768	7,927	5,675	4,052	2,307	1,676	2,941	1,341	3,503
1954	1,225	1,288	1,636	1,247	2,025	1,692	2,939	2,765	4,694	5,053	2,402	1,594	2,380
1955	5,756	2,817	2,521	2,917	4,085	6,075	5,575	3,598	3,723	2,305	2,121	1,129	3,548
1956	1,302	1,601	1,341	1,277	1,739	2,755	3,842	5,046	2,099	2,170	1,365	1,963	2,209
1957	1,067	1,461	1,505	1,605	2,704	2,227	2,953	2,824	4,366	2,227	1,342	1,302	2,123
1958	1,093	1,705	1,817	1,512	1,548	3,409	2,476	1,103	1,475	1,109	793	780	1,568
1959	1,091	1,397	1,004	812	1,575	9,501	16,440	4,970	1,712	2,053	2,235	1,719	3,709
1960	4,665	5,128	3,867	9,432	4,143	3,804	15,110	13,040	5,732	4,454	5,047	4,570	6,584

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.39	0.30	0.29	0.26	0.54	1.73	1.74	1.48	0.80	0.96	0.75	0.44	9.68
1952	.88	1.23	.70	1.01	1.00	2.31	1.95	.86	.88	.83	1.04	.47	13.16
1953	.31	.43	.56	.45	1.12	1.45	1.01	.74	.41	.31	.54	.24	7.57
1954	.22	.23	.30	.23	.34	.31	.52	.51	.83	.93	.44	.28	5.14
1955	1.05	.50	.46	.53	.68	1.11	.99	.66	.66	.42	.39	.20	7.65
1956	.24	.28	.25	.23	.30	.50	.68	.92	.37	.40	.25	.35	4.77
1957	.20	.26	.28	.29	.45	.41	.52	.52	.77	.41	.25	.23	4.59
1958	.20	.30	.33	.28	.26	.62	.44	.20	.26	.20	.15	.14	3.38
1959	.20	.25	.18	.15	.26	1.74	2.92	.91	.30	.38	.41	.30	8.00
1960	.85	.91	.71	1.73	.71	.70	2.68	2.39	1.02	.82	.93	.81	14.26

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	4,081	8.80
1951	1208	14,000	Mar. 4, 1951	1,000	4,489	0.714	9.68	5,332	11.51
1952	1238	19,800	Mar. 22, 1952	1,500	6,086	.968	13.16	5,389	11.65
1953	1278	14,000	Feb. 24, 1953	923	3,503	.557	7.57	3,250	7.02
1954	1358	7,450	July 11, 1954	880	2,380	.378	5.14	2,964	6.40
1955	1388	12,400	Feb. 20, 1955	827	3,548	.564	7.65	2,972	6.41
1956	1438	6,340	May 11, 1956	844	2,209	.351	4.77	2,192	4.74
1957	1508	6,880	June 17, 1957	630	2,123	.358	4.59	2,172	4.68
1958	1558	6,340	Mar. 1, 1958	501	1,568	.249	3.38	1,473	3.18
1959	1628	25,400	Apr. 4, 1959	546	3,709	.590	8.00	4,562	9.84
1960	1708	23,800	Apr. 2, 1960	2,450	6,584	1.05	14.26	-	-

4385. Kishwaukee River at Belvidere, Ill.

Location.--Lat 42°15'20", long 88°51'45", near southeast corner of sec.27, T.44 N., R.3 E., on left bank at Belvidere sewage-treatment plant, 1½ miles downstream from State Street Bridge in Belvidere and 3.0 miles downstream from Piscasaw Creek.

Drainage area.--525 sq mi.

Records available.--October 1939 to September 1960.

Gage.--Staff gage. Datum of gage is 738.34 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark). Prior to Oct. 1, 1942, wire-weight gage at site 1½ miles upstream at datum 3.99 ft higher.

Average discharge.--21 years (1939-60), 285 cfs.

Extremes.--1939-60: Maximum discharge, 10,300 cfs Mar. 16, 1943 (gage height, 13.10 ft); minimum observed, 15 cfs Dec. 30, 1939, Jan. 7, 1940.

Flood of Jan. 24, 1938, reached a stage of 16.9 ft (backwater from ice), from information by sewage-plant employees.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	153	112	126	131	995	906	871	483	434	569	311	149	433
1952	259	566	283	716	474	1,245	710	305	534	641	234	170	508
1953	98.3	131	206	139	363	414	274	285	424	158	152	68.3	225
1954	61.2	86.5	83.6	61.6	152	182	621	308	605	378	151	53.8	230
1955	483	227	276	530	461	651	424	218	406	162	103	59.8	333
1956	89.8	90.9	71.3	65.1	130	120	167	305	132	85.0	65.2	52.3	114
1957	40.3	50.1	54.2	94.0	221	197	280	410	195	154	122	85.7	158
1958	69.9	156	151	104	145	391	240	116	190	230	55.5	44.9	158
1959	56.7	74.6	48.5	36.7	316	1,279	410	243	117	98.7	119	61.0	240
1960	446	415	485	923	323	653	1,342	1,006	391	281	156	121	546

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.33	0.24	0.28	0.29	1.97	1.99	1.85	1.06	0.92	1.25	0.68	0.32	11.18
1952	.57	1.20	.62	1.57	.97	2.75	1.51	.67	1.14	1.41	.51	.26	13.16
1953	.22	.28	.45	.31	.72	.91	.58	.63	.90	.35	.33	.15	5.83
1954	.13	.14	.18	.14	.30	.40	1.32	.68	1.29	.83	.33	.20	5.94
1955	1.06	.48	.61	1.16	.92	1.43	.90	.48	.86	.36	.23	.13	8.62
1956	.20	.19	.16	.14	.27	.26	.36	.67	.28	.19	.14	.11	2.97
1957	.09	.11	.12	.21	.44	.43	.59	.90	.41	.34	.27	.18	4.09
1958	.15	.33	.33	.23	.29	.86	.51	.26	.40	.51	.12	.10	4.09
1959	.12	.16	.11	.08	.63	2.81	.87	.53	.25	.22	.26	.17	6.21
1960	.98	.88	1.06	2.03	.66	1.43	2.85	2.21	.83	.62	.34	.26	14.15

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	372	9.64
1951	1208	6,410	Feb. 26, 1951	58	433	0.825	11.18	492	12.72
1952	1238	6,690	Mar. 12, 1952	100	508	.968	13.16	452	11.72
1953	1278	1,850	June 12, 1953	43	225	.429	5.83	206	5.33
1954	1359	3,290	Apr. 26, 1954	44	230	.438	5.94	295	7.64
1955	1398	2,140	Feb. 21, 1955	42	333	.634	8.62	271	7.02
1956	1438	935	Apr. 30, 1956	36	114	.217	2.97	105	2.74
1957	1508	1,070	May 21, 1957	24	158	.301	4.09	177	4.58
1958	1558	1,270	Feb. 28, 1958	33	158	.301	4.09	141	3.67
1959	1628	3,330	Mar. 20, 1959	29	240	.457	6.21	338	8.74
1960	1708	8,250	Mar. 31, 1960	97	546	1.04	14.15	-	-

4395. South Branch Kishwaukee River near Fairdale, Ill.

Location.--Lat 42°06'40", long 88°54'00", on line between and near south boundary of secs. 16 and 17, T.42 N., R.3 E., on left bank at upstream side of highway bridge, 1.2 miles downstream from Owens Creek, 1 $\frac{1}{4}$ miles northeast of Fairdale, and 9 $\frac{1}{2}$ miles upstream from mouth.

Drainage area.--386 sq mi.

Records available.--October 1939 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 733.90 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to May 1, 1940, wire-weight gage at same site and datum.

Average discharge.--21 years (1939-60), 215 cfs.

Extremes.--1939-60: Maximum discharge, 6,840 cfs Jan. 5, 1946; maximum gage height, 10.00 ft Feb. 24, 1949 (ice jam); minimum discharge, 2.1 cfs Jan. 20, 1940.

A stage of 11.9 ft occurred in March 1937, from information by local resident.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	28.1	26.6	52.5	58.6	1,110	511	548	437	245	633	207	175	325
1952	184	426	174	534	335	885	569	149	313	233	83.8	24.3	326
1953	17.0	23.8	63.3	35.7	226	281	174	179	252	40.4	29.4	12.3	110
1954	11.3	12.6	16.9	10.8	69.8	83.5	216	136	443	182	140	34.8	115
1955	1,318	263	271	588	489	676	455	199	275	104	25.5	15.0	391
1956	43.8	32.3	27.7	19.5	137	70.2	107	445	69.3	125	34.9	18.3	94.3
1957	12.4	15.7	13.5	43.5	140	153	383	402	138	118	104	23.8	129
1958	21.5	73.0	102	64.3	174	383	253	89.2	583	621	74.4	27.1	205
1959	23.2	28.7	23.8	20.2	394	955	371	229	58.8	34.9	41.5	15.0	182
1960	217	279	325	673	240	484	1,320	807	301	242	67.0	30.6	416

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.08	0.08	0.16	0.17	3.00	1.53	1.59	1.31	0.71	1.89	0.62	0.30	11.44
1952	.55	1.23	.52	1.59	.93	2.64	1.65	.45	.91	.69	.25	.07	11.48
1953	.05	.07	.19	.11	.61	.84	.50	.53	.73	.12	.09	.04	3.88
1954	.03	.04	.05	.03	.19	.25	.62	.41	1.28	.54	.42	.10	3.96
1955	3.94	.76	.81	1.76	1.32	2.02	1.32	.59	.80	.31	.08	.04	13.75
1956	.13	.09	.08	.06	.38	.21	.31	1.33	.20	.37	.10	.05	3.31
1957	.04	.05	.04	.13	.38	.46	1.11	1.20	.40	.35	.31	.07	4.54
1958	.06	.21	.30	.19	.47	1.14	.73	.27	1.68	1.85	.22	.08	7.20
1959	.07	.08	.07	.06	1.06	2.85	1.07	.68	.17	.10	.12	.04	6.37
1960	.65	.81	.97	2.01	.67	1.45	3.82	2.41	.87	.72	.20	.09	14.67

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year			
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches	Mean	Runoff in inches
		Discharge	Date								
1950	-	-	-	-	-	-	-	-	-	274	9.64
1951	1208	6,670	July 9, 1951	21	325	0.842	11.44	381	13.42		
1952	1238	4,690	Mar. 11, 1952	15	326	.845	11.48	269	9.49		
1953	1278	1,290	June 10, 1953	9.5	110	.285	3.88	105	3.69		
1954	1338	2,340	June 3, 1954	9.0	113	.293	3.96	266	9.35		
1955	1388	5,910	Oct. 12, 1954	11	391	1.01	13.75	243	8.54		
1956	1438	1,740	May 10, 1956	11	94.3	.244	3.31	89.1	3.14		
1957	1508	2,000	Apr. 26, 1957	8.5	129	.334	4.54	142	4.98		
1958	1558	4,290	July 3, 1958	16	205	.531	7.20	195	6.85		
1959	1628	2,900	Feb. 23, 1959	8.3	182	.472	6.37	244	8.58		
1960	1708	5,240	Mar. 30, 1960	19	416	1.08	14.67	-	-		

^a About.

4400. Kishwaukee River near Perryville, Ill.

Location.--Lat 42°11'45", long 88°59'55", in northeast corner of sec.21, T.43 N., R.2 E., on left bank at upstream side of Forest Preserve road bridge, 1½ miles downstream from South Branch, 2 miles southwest of Perryville, 7½ miles upstream from Killbuck Creek, and 9½ miles upstream from mouth.

Drainage area.--1,090 sq mi, approximately.

Records available.--October 1939 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 692.13 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Apr. 30, 1940, wire-weight gage at same site and datum.

Average discharge.--21 years (1939-60), 589 cfs.

Extremes.--1939-60: Maximum discharge, 16,400 cfs Jan. 6, 1946 (gage height, 19.50 ft); minimum, 46 cfs Oct. 6, 7, 10, 1956.

Flood in January 1938 reached a stage of 23.85 ft, from information by Corps of Engineers.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	243	190	279	232	2,771	1,627	1,626	1,034	771	1,301	596	319	903
1952	547	1,171	553	1,630	953	2,480	1,428	552	1,042	1,203	396	196	1,014
1953	178	233	368	247	778	817	548	522	732	257	216	120	415
1954	115	124	153	113	293	308	889	517	1,107	606	325	164	392
1955	1,867	485	565	1,122	1,039	1,375	888	448	678	299	171	114	754
1956	164	159	151	121	305	230	300	880	228	218	135	101	250
1957	75.5	95.8	102	184	434	426	755	877	594	292	263	137	334
1958	110	267	319	204	344	920	556	237	896	942	157	84.3	420
1959	104	134	88.1	68.8	688	2,584	858	536	214	170	190	121	479
1960	742	768	877	1,805	704	1,306	2,975	2,012	811	615	281	223	1,094

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.26	0.19	0.50	0.24	2.65	1.72	1.66	1.08	0.79	1.38	0.63	0.33	11.24
1952	.58	1.20	.58	1.72	.94	2.62	1.46	.58	1.07	1.27	.42	.20	12.64
1953	.19	.24	.59	.26	.74	.86	.56	.55	.75	.27	.23	.12	5.16
1954	.12	.13	.16	.12	.28	.53	.91	.55	1.13	.64	.34	.17	4.88
1955	1.97	.50	.60	1.19	.99	1.45	.91	.47	.69	.32	.18	.12	9.39
1956	.17	.16	.16	.13	.30	.24	.31	.93	.23	.23	.14	.10	3.10
1957	.08	.10	.11	.19	.41	.45	.75	.93	.40	.31	.28	.14	4.15
1958	.12	.27	.34	.22	.33	.97	.57	.25	.92	1.00	.17	.09	5.25
1959	.11	.14	.09	.07	.66	2.73	.88	.57	.22	.18	.20	.12	5.97
1960	.78	.79	.93	1.91	.70	1.58	3.05	2.13	.83	.65	.30	.23	13.68

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	765	9.54
1951	1208	11,900	Feb. 26, 1951	140	903	0.828	11.24	1,032	12.85
1952	1258	10,900	Mar. 13, 1952	163	1,014	.930	12.64	890	11.10
1953	1278	2,620	June 10, 1953	106	415	.381	5.16	383	4.75
1954	1358	4,680	June 4, 1954	90	392	.360	4.88	605	7.54
1955	1388	8,190	Oct. 13, 1954	100	754	.692	9.39	546	6.81
1956	1458	2,340	May 10, 1956	73	250	.229	3.10	233	2.90
1957	1508	2,360	Apr. 27, 1957	49	354	.306	4.15	366	4.59
1958	1558	4,650	July 3, 1958	75	420	.385	5.25	588	4.86
1959	1628	5,890	Mar. 2, 1959	56	479	.439	5.97	653	8.13
1960	1708	14,100	Mar. 31, 1960	198	1,094	1.00	13.68	-	-

4405. Killbuck Creek near Monroe Center, Ill.

Location.--Lat 42°05'55", long 89°03'10", in NW1SW1 sec.19, T.42 N., R.2 E., on right bank 800 ft downstream from Chicago, Milwaukee, St. Paul and Pacific Railroad bridge, 800 ft upstream from bridge on State Highway 72, 3 miles west of Monroe Center, and 8 miles upstream from mouth.

Drainage area.--114 sq mi.

Records available.--October 1939 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 734.27 ft above mean sea level, datum of 1929. Prior to May 1, 1940, staff gage at same site and datum.

Average discharge.--21 years (1939-60), 59.4 cfs.

Extremes.--1939-60: Maximum discharge, 6,100 cfs July 9, 1951, Oct. 10, 1954; maximum gage height, 11.41 ft July 9, 1951; minimum discharge, 2.0 cfs July 25, 1940.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	12.4	11.4	25.2	15.5	375	120	131	110	80.6	295	131	32.1	110
1952	47.0	103	55.9	230	89.9	249	148	51.1	84.0	149	34.5	16.1	103
1953	13.1	17.6	31.5	17.0	86.6	83.2	46.8	37.7	53.1	12.2	8.86	5.83	34.1
1954	5.57	6.62	8.28	6.15	36.1	14.2	30.5	17.6	76.3	27.2	28.1	7.16	21.8
1955	369	56.7	67.4	142	167	135	96.4	45.2	42.6	20.8	9.65	6.68	96.5
1956	12.5	10.5	10.3	7.12	77.2	13.1	22.8	85.2	10.6	70.3	9.94	6.22	27.9
1957	4.85	5.14	5.70	17.6	89.8	34.1	68.9	56.3	21.5	24.7	35.7	7.28	30.5
1958	6.33	17.1	27.4	16.2	83.7	69.6	52.2	19.0	149	112	20.5	8.76	48.1
1959	7.85	9.59	6.29	5.20	280	239	92.2	48.2	12.4	9.30	14.7	5.60	59.4
1960	68.4	59.8	81.8	204	63.6	213	291	187	81.8	68.5	35.2	16.5	115

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.13	0.11	0.25	0.16	3.43	1.21	1.28	1.11	0.79	2.98	1.33	0.31	13.09
1952	.48	1.00	.57	2.32	.66	2.52	1.45	.52	.82	1.51	.35	.16	12.36
1953	.13	.17	.32	.17	.79	.84	.46	.38	.52	.12	.09	.06	4.05
1954	.06	.06	.08	.06	.33	.14	.30	.18	.75	.27	.28	.07	2.58
1955	3.73	.55	.68	1.44	1.53	1.36	.94	.46	.42	.21	.10	.07	11.49
1956	.13	.10	.10	.07	.73	.13	.22	.86	.10	.71	.10	.06	3.31
1957	.05	.05	.06	.18	.82	.35	.67	.57	.21	.25	.36	.07	3.84
1958	.06	.17	.28	.16	.76	.70	.51	.19	1.46	1.13	.21	.09	5.72
1959	.08	.09	.06	.05	2.56	2.42	.90	.49	.12	.09	.15	.05	7.06
1960	.69	.59	.83	2.06	.60	2.16	2.84	1.89	.80	.69	.36	.16	13.67

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	85.3	10.18
1951	1208,1338	6,100	July 9, 1951	9.3	110	0.965	13.09	123	14.65
1952	1208,1338	4,030	July 19, 1952	13	103	.904	12.36	91.8	10.93
1953	1278	770	Feb. 6, 1953	4.8	34.1	.299	4.05	30.5	3.63
1954	1338	620	June 3, 1954	4.8	21.8	.191	2.58	61.7	7.34
1955	1388	6,100	Oct. 10, 1954	5.1	96.5	.846	11.49	57.6	6.86
1956	1438	3,050	July 13, 1956	4.5	27.9	.245	3.31	26.4	3.14
1957	1508	1,450	Feb. 9, 1957	3.0	30.5	.268	3.64	33.5	3.99
1958	1558	2,490	July 3, 1958	5.4	48.1	.422	5.72	45.8	5.44
1959	1628	3,610	Feb. 23, 1959	3.6	59.4	.521	7.06	75.1	8.94
1960	1708	2,630	Mar. 30, 1960	4.8	115	1.01	13.67	-	-

4410. Leaf River at Leaf River, Ill.

Location.--Lat 42°07'40", long 89°23'25", in NW¼ sec.31, T.25 N., R.10 E., near left bank on downstream side of bridge on State Highway 72, 0.4 mile downstream from Chicago, Milwaukee, St. Paul and Pacific Railroad bridge, 0.6 mile east of town of Leaf River, and 0.8 mile downstream from Mud Creek.

Drainage area.--102 sq mi.

Records available.--October 1939 to September 1958, water year 1959-60 (annual maximum).

Gage.--Crest-stage gage. Datum of gage is 685.64 ft above mean sea level, datum of 1929. Prior to Oct. 1, 1958, wire-weight and crest-stage gages at same site and datum.

Average discharge.--19 years (1939-58), 55.7 cfs.

Extremes.--1939-60: Maximum discharge, 6,510 cfs Feb. 27, 1948 (gage height, 14.44 ft), from rating curve extended above 2,900 cfs.

1939-58: Minimum discharge observed, 7.6 cfs Jan. 5, 1940.

Maximum stage known, 15.9 ft Feb. 4, 1938, from information by local residents.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	30.8	22.9	22.5	20.7	213	136	125	105	78.3	295	154	71.1	106
1952	69.8	123	72.3	136	88.8	210	116	79.9	82.2	189	60.3	36.6	105
1953	31.8	45.2	57.5	40.4	147	72.7	55.2	52.1	40.7	26.1	21.6	18.1	50.0
1954	17.3	18.7	21.3	17.6	41.6	23.2	35.4	27.6	75.5	27.2	21.1	18.7	28.6
1955	86.0	33.6	40.6	72.7	150	113	137	85.6	87.4	46.8	39.0	25.4	75.9
1956	24.2	20.7	19.2	18.4	44.2	22.2	29.5	49.8	42.3	45.3	26.5	14.4	29.7
1957	13.8	16.3	14.6	35.5	47.1	31.5	28.3	28.8	20.6	24.9	14.9	9.20	23.6
1958	9.68	14.7	22.0	16.0	36.8	41.3	38.0	20.0	76.5	49.1	28.9	17.1	30.7
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.35	0.25	0.25	0.23	2.18	1.54	1.37	1.18	0.86	3.33	1.74	0.78	14.06
1952	.79	1.34	.82	1.53	.94	2.37	1.27	.90	.90	2.14	.68	.40	14.08
1953	.36	.49	.65	.46	1.50	.82	.60	.59	.45	.29	.24	.20	6.65
1954	.20	.20	.24	.20	.42	.26	.39	.31	.83	.31	.24	.20	3.80
1955	.97	.37	.46	.82	1.53	1.28	1.50	.97	.96	.53	.44	.28	10.11
1956	.27	.23	.22	.21	.47	.25	.32	.56	.46	.51	.30	.16	3.96
1957	.16	.18	.16	.40	.48	.36	.31	.33	.23	.28	.17	.10	3.16
1958	.11	.16	.25	.18	.38	.47	.42	.23	.84	.56	.33	.19	4.12
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches	
		Discharge	Date							
1950	-	-	-	-	-	-	-	61.2	8.15	
1951	1208	6,080	July 8, 1951	16	106	1.04	14.06	121	16.16	
1952	1258	6,080	July 19, 1952	31	105	1.03	14.08	94.7	12.63	
1953	1276	3,980	Feb. 20, 1953	15	50.0	.490	6.65	43.5	5.79	
1954	1358	797	June 1, 1954	14	28.6	.280	3.80	37.3	4.96	
1955	1388	4,680	Mar. 3, 1955	22	75.9	.744	10.11	67.8	9.03	
1956	1458	1,810	June 22, 1956	12	29.7	.291	3.96	28.0	3.74	
1957	1508	1,020	Jan. 21, 1957	7.8	23.6	.231	3.16	23.8	3.18	
1958	1558	2,560	June 13, 1958	7.8	30.7	.301	4.12	-	-	
1959	-	4,500	Feb. 23, 1959	-	-	-	-	-	-	
1960	-	3,210	Mar. 30, 1960	-	-	-	-	-	-	

4420. Kyte River near Flagg Center, Ill.

Location.--Lat 41°56', long 89°09', in sec.18, T.40 N., R.1 E., near left bank on downstream side of county highway bridge, 2 miles west of Flagg Center and 3 miles downstream from Chicago & Northwestern Railroad bridge.

Drainage area.--125 sq mi.

Records available.--October 1939 to September 1951.

Gage.--Wire-weight and crest-stage gages. Altitude of gage is 750 ft (from topographic map).

Average discharge.--12 years (1939-51), 64.6 cfs.

Extremes.--1939-51: Maximum discharge, 2,630 cfs Feb. 20, 1951 (gage height, 7.70 ft); minimum observed, 1.8 cfs Jan. 2, 1940.

Flood in February 1937 reached a stage of about 8.5 ft, from information by local residents.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	15.0	15.2	18.6	14.6	44.1	124	150	156	64.3	213	75.7	41.8	109

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.14	0.14	0.17	0.13	3.67	1.14	1.34	1.44	0.57	1.96	0.70	0.37	11.77

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	84.3	9.16
1951	1208,1438	2,630	Feb. 20, 1951	9.4	109	0.872	11.77	-	-

4435. Rock River at Como, Ill.

Location.--Lat 41°47'00", long 89°44'58", in NE¹ sec.25, T.21 N., R.6 E., on left bank 1 mile upstream from Como, 3 miles downstream from Rock Falls, and 3½ miles upstream from Elkhorn Creek.

Drainage area.--8,700 sq mi, approximately.

Records available.--March to December 1905, October 1914 to September 1960. Published as "at Sterling" 1905-6 and as "at Lyndon" 1914-34. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 606.83 ft above mean sea level, datum of 1929. Jan. 6, 1905, to Feb. 14, 1906, chain gage at site at Sterling, 3 miles upstream, at different datum, Nov. 24, 1914, to Sept. 30, 1934, chain gage at site at Lyndon, 16½ miles downstream at datum 22.46 ft lower.

Average discharge.--46 years (1914-60), 5,093 cfs (discharge for site at Lyndon adjusted for difference in drainage area).

Extremes.--1914-60: Maximum discharge, 51,000 cfs Feb. 22, 1937, at lower dam at Rock Falls, from rating curve extended above 21,000 cfs by logarithmic plotting; maximum gage height, 17.51 ft Feb. 7, 1938 (ice jam); minimum daily discharge, 498 cfs Aug. 20, 1934 (site then in use).

Remarks.--About 80 cfs diverted above gage to Illinois and Mississippi Canal. Some diurnal fluctuation caused by powerplants above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2,805	2,077	2,035	1,823	7,264	12,000	12,200	10,130	5,926	9,033	5,631	3,351	6,184
1952	5,619	9,366	5,205	8,268	8,442	17,040	14,190	6,270	7,511	8,256	7,029	3,452	8,384
1953	2,413	3,227	4,195	3,516	8,724	10,140	7,115	5,458	3,924	2,475	3,607	1,821	4,692
1954	1,636	1,739	2,198	1,734	2,879	2,439	4,375	3,852	6,357	6,029	3,219	2,111	3,212
1955	9,633	4,244	3,929	5,485	6,730	9,095	7,497	5,009	5,122	3,170	2,685	1,406	5,329
1956	1,803	2,096	1,772	1,659	2,522	3,362	4,322	6,668	2,869	2,965	1,789	2,326	2,849
1957	1,232	1,723	1,761	2,022	3,672	3,084	4,058	4,051	4,974	2,890	1,871	1,629	2,736
1958	1,305	2,204	2,549	2,052	2,065	5,023	3,305	1,652	3,152	2,631	1,197	999	2,346
1959	1,440	1,785	1,417	1,173	3,845	13,600	17,900	6,089	2,192	2,401	2,660	1,979	4,700
1960	5,824	6,380	5,044	13,030	5,636	5,328	21,100	16,660	7,674	5,827	5,619	4,987	8,592

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	5,703	-
1951	1208	34,400	Feb. 26, 1951	1,300	6,184	-	-	7,291	-
1952	1238	35,800	July 20, 1952	2,000	8,384	-	-	7,524	-
1953	1278	17,800	Feb. 22, 1953	1,160	4,692	-	-	4,354	-
1954	1338	12,900	June 5, 1954	1,300	3,212	-	-	4,244	-
1955	1388	34,000	Oct. 11, 1954	1,030	5,329	-	-	4,307	-
1956	1438	-	(a)	1,120	2,849	-	-	2,767	-
1957	1508	7,330	June 17, 1957	640	2,736	-	-	2,849	-
1958	1558	10,900	Mar. 1, 1958	752	2,346	-	-	2,227	-
1959	1628	26,200	Apr. 5, 1959	803	4,700	-	-	5,753	-
1960	1708	34,800	Apr. 1, 1960	3,180	8,592	-	-	-	-

a Not determined.

4440. Elkhorn Creek near Penrose, Ill.

Location.--Lat 41°54'10", long 89°41'40", in SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.9, T.22 N., R.7 E., on left bank 50 ft upstream from highway bridge, 2 miles northwest of Penrose, 2.2 miles downstream from Buffalo Creek, and 5 miles upstream from Sugar Creek.

Drainage area.--153 sq mi.

Records available.--October 1939 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 657.85 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Apr. 6, 1940, staff gage at same site and datum.

Average discharge.--21 years (1939-60), 82.8 cfs.

Extremes.--1939-60: Maximum discharge, 5,980 cfs Jan. 5, 1946 (gage height, 17.75 ft); minimum, 2.2 cfs Nov. 17, 1955, result of freezeup.

Flood in June 1938 reached a stage of 19.6 ft, from high-water mark 909, Corps of Engineers.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	26.5	25.0	26.4	24.0	556	123	105	93.5	107	401	149	70.3	140
1952	72.1	136	50.6	180	80.3	313	127	85.8	189	222	117	51.9	136
1953	45.4	63.1	75.0	53.2	284	103	75.7	66.8	44.7	34.8	30.3	77.8	
1954	29.7	29.5	32.1	24.9	66.0	34.6	52.3	42.7	92.1	30.8	104	35.0	47.6
1955	134	49.5	66.1	119	263	157	180	108	93.0	57.7	69.5	35.5	110
1956	36.6	32.6	30.9	26.0	98.1	33.6	43.4	64.2	33.5	34.0	31.3	19.4	40.1
1957	17.3	19.5	19.9	45.5	92.8	40.6	34.7	31.7	25.8	80.0	63.5	14.7	40.3
1958	15.6	21.4	34.7	32.5	135	56.8	49.4	30.1	84.5	29.1	41.5	24.4	45.5
1959	21.1	26.4	15.4	14.6	514	426	92.7	55.9	31.5	28.6	24.8	22.2	103
1960	46.5	48.1	55.0	203	63.2	195	262	231	99.7	84.4	52.0	51.4	116

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.20	0.18	0.20	0.18	3.78	0.92	0.77	0.70	0.78	3.03	1.12	0.51	12.37
1952	.54	.99	.38	1.36	.57	2.36	.93	.65	1.38	1.67	.88	.38	12.09
1953	.35	.46	.56	.40	1.94	.77	.56	.57	.49	.34	.26	.22	6.90
1954	.22	.22	.24	.19	.45	.26	.38	.32	.67	.23	.78	.25	4.21
1955	1.01	.36	.50	.90	1.79	1.18	1.31	.92	.68	.43	.52	.26	9.76
1956	.28	.24	.23	.20	.69	.25	.32	.48	.24	.26	.24	.14	3.57
1957	.13	.14	.15	.34	.63	.31	.25	.24	.19	.60	.48	.11	3.57
1958	.12	.16	.26	.24	.92	.43	.36	.23	.62	.22	.51	.18	4.05
1959	.16	.19	.12	.11	3.50	3.21	.68	.42	.23	.22	.19	.16	9.19
1960	.35	.35	.41	1.53	.45	1.47	1.91	1.74	.73	.64	.39	.37	10.34

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	88.4	7.85
1951	1208	4,880	July 9, 1951	18	140	0.915	12.37	155	13.70
1952	1238	5,680	June 13, 1952	34	136	.889	12.09	130	11.53
1953	1278	4,110	Feb. 20, 1953	26	77.8	.508	6.90	70.2	6.23
1954	1338	4,220	Aug. 18, 1954	19	47.6	.311	4.21	61.0	5.40
1955	1388	3,560	Feb. 20, 1955	30	110	.719	9.76	97.4	8.64
1956	1438	1,570	Feb. 24, 1956	14	40.1	.262	3.57	36.4	3.24
1957	1508	2,850	Aug. 3, 1957	14	40.3	.263	3.57	41.5	3.69
1958	1558	1,810	Feb. 25, 1958	14	45.5	.297	4.05	44.7	3.98
1959	1628	4,750	Feb. 23, 1959	10	103	.673	9.19	111	9.83
1960	1708	3,350	Mar. 29, 1960	21	116	.758	10.34	-	-

4455. Rock Creek near Morrison, Ill.

Location.--Lat 41°49'50", long 89°58'00", in SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 6, T.21 N., R.5 E., or right bank just downstream from small tributary on right bank, 1 $\frac{1}{2}$ miles north of Morrison and $\frac{1}{2}$ miles downstream from Little Rock Creek.

Drainage area.--143 sq mi.

Records available.--October 1942 to September 1958, water years 1959-60 (annual maximum).

Gage.--Crest-stage gage. Datum of gage is 620.41 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Oct. 1, 1958, water-stage recorder and concrete control.

Average discharge.--16 years (1942-58), 85.6 cfs.

Extremes.--1942-60: Maximum discharge, 5,770 cfs Jan. 6, 1946 (gage height, 16.04 ft).

1942-58: Minimum discharge, 6.0 cfs Dec. 11, 1957, result of freezeup.

Maximum stage known, 17.7 ft in June 1937, from information by local residents.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	23.4	22.8	27.3	24.2	520	117	98.0	106	110	342	135	67.6	130
1952	78.9	162	86.4	247	126	335	129	97.7	141	128	84.7	35.9	138
1953	30.4	91.0	86.6	42.8	327	141	78.1	79.5	86.9	59.5	31.3	21.3	88.1
1954	21.3	24.7	29.6	20.2	48.3	31.9	54.5	44.5	122	24.5	118	37.7	48.0
1955	125	45.0	55.2	110	278	142	132	73.4	57.7	44.9	75.6	30.1	96.3
1956	36.4	30.6	27.3	23.3	99.4	30.0	46.3	88.6	27.1	63.6	62.7	20.6	46.2
1957	17.2	22.8	19.8	35.3	140	48.7	42.4	40.3	26.2	50.5	65.8	16.8	43.2
1958	19.9	30.0	48.2	28.1	174	61.2	46.0	24.4	89.9	23.5	23.1	18.3	47.9
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.19	0.18	0.22	0.20	3.79	0.94	0.76	0.86	0.86	2.76	1.09	0.53	12.38
1952	.64	1.27	.70	2.00	.95	2.70	1.01	.79	1.10	1.04	.68	.28	13.16
1953	.24	.71	.71	.35	2.38	1.14	.61	.64	.68	.48	.25	.17	8.36
1954	.17	.19	.24	.16	.35	.26	.43	.36	.96	.20	.95	.29	4.56
1955	1.01	.35	.45	.89	2.02	1.14	1.03	.59	.45	.36	.61	.24	9.14
1956	.29	.24	.22	.19	.75	.24	.36	.71	.21	.51	.51	.16	4.39
1957	.14	.18	.16	.28	1.02	.39	.33	.33	.20	.41	.53	.13	4.10
1958	.16	.23	.39	1.27	.49	.49	.36	.20	.70	.19	.19	.14	4.55
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	95.9	8.92
1951	1208	3,540	Feb. 20, 1951	17	130	0.909	12.38	151	14.40
1952	1238	2,100	Mar. 12, 1952	29	139	.965	13.16	128	12.21
1953	1278	2,900	Feb. 20, 1953	18	88.1	.618	8.36	76.8	7.30
1954	1338	2,180	Aug. 18, 1954	13	48.0	.336	4.56	60.7	5.77
1955	1388	2,740	Feb. 20, 1955	19	96.3	.673	9.14	85.2	8.08
1956	1438	1,460	Feb. 24, 1956	14	46.2	.323	4.39	43.3	4.12
1957	1508	1,710	Feb. 9, 1957	12	43.2	.302	4.10	46.4	4.40
1958	1558	1,770	Feb. 25, 1958	13	47.9	.335	4.55	-	-
1959	-	2,500	Feb. 24, 1959	-	-	-	-	-	-
1960	-	2,460	Mar. 29, 1960	-	-	-	-	-	-

4465. Rock River near Joslin, Ill.

Location.--Lat 41°33'35", long 90°10'55", in NE¹/₄ sec.18, T.18 N., R.3 E., on right bank at downstream side of bridge on State Highway 92, 1¹/₂ miles east of Joslin, 12 miles downstream from Rock Creek, and 27 miles upstream from mouth.

Drainage area.--9,520 sq mi, approximately.

Records available.--October 1939 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 564.06 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Apr. 6, 1940, wire-weight gage at same site and datum.

Average discharge.--21 years (1939-60), 5,321 cfs.

Extremes.--1939-60: Maximum discharge, 46,200 cfs Mar. 22, 1948 (gage height, 14.46 ft); maximum gage height, 16.23 ft Mar. 3, 1948 (backwater from ice); minimum daily discharge, 834 cfs Jan. 3, 1940.

Maximum stage known since 1892, that of Mar. 3, 1948.

Remarks.--Some diurnal fluctuation caused by powerplants above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	3,114	2,441	2,548	2,029	8,462	14,210	13,910	12,130	7,161	11,280	6,727	4,031	7,316
1952	6,130	10,590	6,069	9,432	9,746	17,650	15,900	7,309	8,495	8,799	7,735	3,842	9,302
1953	2,800	3,616	4,704	3,970	9,510	10,970	7,725	6,000	4,330	2,541	3,636	1,874	5,112
1954	1,665	1,864	2,385	2,000	3,300	2,803	4,528	5,247	6,741	6,582	3,862	2,431	3,527
1955	10,440	4,648	4,315	6,055	7,275	10,280	8,374	5,785	5,533	3,464	2,769	1,550	5,872
1956	1,916	2,285	1,984	1,847	2,843	3,935	4,694	7,194	3,128	3,036	1,953	2,415	3,104
1957	1,381	1,887	1,986	2,234	4,290	3,732	4,474	4,485	5,413	3,218	2,224	1,808	3,081
1958	1,436	2,379	2,924	2,535	2,271	6,083	3,903	2,032	3,611	2,876	1,549	1,084	2,710
1959	1,523	1,935	1,519	1,258	3,975	14,280	18,710	7,240	2,699	2,760	2,897	2,065	5,066
1960	6,055	7,011	5,532	14,430	6,355	5,197	23,950	18,100	9,093	6,425	6,011	5,162	9,440

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.38	0.29	0.28	0.25	0.93	1.72	1.63	1.47	0.84	1.37	0.81	0.47	10.44
1952	.74	1.24	.73	1.14	1.10	2.14	1.86	.89	1.00	1.07	.94	.45	13.30
1953	.34	.42	.57	.48	1.04	1.33	.91	.73	.51	.31	.44	.22	7.30
1954	.20	.22	.29	.24	.36	.34	.53	.51	.79	.79	.47	.28	5.02
1955	1.26	.54	.52	.73	.80	1.24	.98	.70	.65	.42	.34	.18	8.36
1956	.23	.27	.24	.22	.32	.48	.55	.87	.37	.37	.24	.28	4.44
1957	.17	.22	.24	.27	.47	.45	.52	.54	.63	.39	.27	.21	4.38
1958	.17	.28	.35	.31	.25	.74	.46	.25	.42	.35	.16	.13	3.87
1959	.18	.23	.18	.15	.43	1.73	2.19	.88	.32	.33	.35	.24	7.21
1960	.73	.82	.67	1.75	.72	.63	2.81	2.19	1.07	.78	.73	.60	13.50

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	6,361	9.08
1951	1208	32,800	Feb. 28, 1951	1,700	7,316	0.768	10.44	8,558	12.20
1952	1258	29,500	Mar. 15, 1952	2,500	9,302	.977	13.30	8,332	11.92
1953	1278	17,800	Feb. 22, 1953	1,550	5,112	.532	7.30	4,675	6.68
1954	1358	13,000	June 6, 1954	1,330	3,527	.370	5.02	4,666	6.63
1955	1388	28,000	Oct. 13, 1954	1,230	5,872	.617	8.36	4,756	6.78
1956	1438	9,710	May 12, 1956	1,370	3,104	.326	4.44	3,026	4.33
1957	1508	7,480	June 18, 1957	1,000	3,081	.324	4.38	3,207	4.55
1958	1558	all, 200	Mar. 4, 1958	910	2,710	.285	3.87	2,562	3.66
1959	1628	26,000	Feb. 7, 1959	850	5,066	.532	7.21	6,209	8.84
1960	1708	36,400	Apr. 3, 1960	3,600	9,440	.992	13.50	-	-

a About.

4470. Green River at Amboy, Ill.

Location.--Lat 41°42'35", long 89°19'28", in SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.22, T.20 N., R.10 E., on left bank at downstream side of bridge on U.S. Highway 52, at southeast edge of Amboy.

Drainage area.--199 sq mi.

Records available.--December 1939 to September 1958, water years 1959-60 (annual maximum).

Gage.--Crest-stage gage. Datum of gage is 724.14 ft above mean sea level, datum of 1929 [levels by Corps of Engineers). Prior to Apr. 3, 1940, wire-weight gage at same site and datum. Apr. 3, 1940, to Sept. 30, 1958, water-stage recorder at same site and datum.

Average discharge.--19 years (1939-58), 93.0 cfs.

Extremes.--1939-60: Maximum discharge, 6,120 cfs Oct. 10, 1954 (gage height, 12.26 ft). 1939-58: Minimum discharge, 1.3 cfs Dec. 10, 1957, result of freezeup.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	17.8	18.7	17.5	35.5	350	159	228	297	105	358	152	95.5	152
1952	116	206	102	287	149	460	297	97.7	210	49.5	29.9	14.4	168
1953	14.8	15.0	17.4	13.5	67.1	86.6	58.0	86.0	85.6	27.2	16.0	10.3	41.2
1954	9.34	10.3	9.96	7.70	25.2	35.7	89.7	45.1	196	30.2	74.7	18.6	45.8
1955	726	137	130	267	253	225	168	104	141	64.5	37.0	12.6	189
1956	21.2	18.0	11.2	9.48	78.6	23.7	22.9	87.6	38.2	32.7	19.5	8.46	30.8
1957	8.74	9.98	10.4	13.7	50.1	58.7	130	109	53.6	30.1	26.5	12.8	42.7
1958	11.8	18.5	38.0	33.8	102	117	77.7	43.3	186	263	41.2	18.9	79.1
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.10	0.11	0.10	0.21	1.83	0.92	1.28	1.72	0.59	2.07	0.88	0.54	10.35
1952	.67	1.15	.59	1.66	.81	2.66	1.67	.57	1.18	.29	.17	.08	11.50
1953	.09	.08	.10	.08	.35	.50	.32	.50	.48	.16	.09	.06	2.81
1954	.05	.06	.06	.04	.13	.21	.50	.28	1.10	.17	.43	.10	3.11
1955	4.21	.77	.75	1.55	1.32	1.31	.94	.60	.79	.37	.21	.07	12.89
1956	.13	.10	.06	.05	.43	.14	.13	.51	.21	.19	.11	.05	2.10
1957	.05	.06	.06	.08	.28	.34	.73	.63	.30	.17	.15	.07	2.90
1958	.07	.10	.22	.20	.53	.69	.44	.25	1.04	1.52	.24	.11	5.40
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	141	9.66
1951	1208	2,770	Feb. 19, 1951	13	152	0.764	10.35	182	12.45
1952	1238	2,560	Mar. 11, 1952	12	168	.844	11.50	137	9.36
1953	1278	615	June 5, 1953	8.3	41.2	.207	2.81	39.8	2.71
1954	1338	1,350	June 3, 1954	4.5	45.8	.230	3.11	127	8.67
1955	1388	6,120	Oct. 10, 1954	11	189	.950	12.89	109	7.44
1956	1438	1,790	Feb. 24, 1956	6.0	30.8	.155	2.10	29.0	1.99
1957	1508	593	Feb. 9, 1957	5.3	42.7	.215	2.90	46.0	3.12
1958	1558	1,910	July 3, 1958	9.5	79.1	.397	5.40	-	-
1959	-	3,740	Apr. 28, 1959	-	-	-	-	-	-
1960	-	4,240	Mar. 31, 1960	-	-	-	-	-	-

4475. Green River near Geneseo, Ill.

Location.--Lat 41°29'20", long 90°09'30", in NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 4, T.17 N., R.3 E., on right bank at upstream side of bridge on State Highway 82, 1.4 miles upstream from Geneseo Creek and 2.4 miles north of Geneseo.

Drainage area.--958 sq mi.

Records available.--March 1936 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 580.66 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Oct. 1, 1939, wire-weight gage at same site at datum 30.00 ft lower. Oct. 1, 1939, to Apr. 3, 1940, wire-weight gage at present site and datum.

Average discharge.--24 years (1936-60), 538 cfs.

Extremes.--1936-60: Maximum discharge, 8,900 cfs Oct. 11, 1954 (gage height, 14.69 ft); maximum gage height, 16.14 ft Feb. 20, 1951 (backwater from ice); minimum daily discharge, 27 cfs Jan. 2, 1940, Jan. 17, 18, 1954.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	114	114	97.6	173	1,385	804	1,212	1,978	985	1,846	1,073	660	867
1952	735	1,029	547	1,253	887	2,037	1,233	585	964	418	177	97.2	830
1953	88.2	108	156	131	444	471	378	399	408	337	98.2	49.3	254
1954	48.8	60.4	68.4	47.3	131	234	546	273	785	180	309	110	232
1955	1,719	581	551	1,098	1,045	902	1,190	624	1,106	302	135	60.1	774
1956	198	131	87.3	85.6	441	198	174	324	155	200	201	91.6	190
1957	55.0	78.6	88.3	107	290	411	672	424	239	159	110	60.6	224
1958	64.7	110	286	190	502	622	385	225	770	516	234	107	333
1959	86.9	81.8	57.1	52.3	1,554	966	917	831	331	221	148	74.4	435
1960	400	458	543	1,522	695	1,057	3,166	1,621	1,210	496	495	198	987

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.14	0.13	0.12	0.21	1.51	0.97	1.41	2.38	1.15	2.22	1.79	0.77	12.30
1952	.88	1.20	.66	1.51	1.00	2.45	1.44	.70	1.12	.50	.21	.11	11.78
1953	.11	.13	.19	.16	.48	.57	.44	.48	.48	.41	.12	.06	3.63
1954	.06	.07	.08	.06	.14	.28	.64	.33	.91	.22	.77	.13	3.29
1955	2.07	.68	.66	1.32	1.14	1.09	1.39	.75	1.29	.36	.16	.07	10.98
1956	.24	.15	.11	.10	.50	.24	.20	.39	.18	.24	.11	.11	2.70
1957	.07	.09	.11	.13	.31	.49	.78	.51	.28	.19	.13	.07	3.16
1958	.08	.13	.34	.23	.55	.75	.45	.27	.90	.62	.78	.12	4.72
1959	.10	.10	.07	.06	1.69	1.16	1.07	1.00	.39	.27	.18	.09	6.18
1960	.48	.53	.65	1.83	.78	1.27	3.69	1.95	1.41	.60	.60	.23	14.02

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year				
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches		
		Discharge	Date								
1950	-	-	-	-	-	-	-	581	-	8.25	-
1951	1208	6,940	Aug. 29, 1951	82	867	0.905	12.30	1,033	14.65	-	-
1952	1238	5,230	Mar. 11, 1952	84	830	.866	11.78	668	9.47	-	-
1953	1278	3,970	July 6, 1953	44	254	.265	3.63	240	3.41	-	-
1954	1338	2,850	June 3, 1954	27	232	.242	3.29	458	6.49	-	-
1955	1388	8,900	Oct. 11, 1954	48	774	.808	10.98	569	8.07	-	-
1956	1438	3,790	Feb. 25, 1956	50	190	.198	2.70	174	2.47	-	-
1957	1508	1,340	Apr. 6, 1957	50	224	.234	3.16	244	3.44	-	-
1958	1558	3,320	June 10, 1958	48	333	.348	4.72	313	4.44	-	-
1959	1628	7,100	Feb. 24, 1959	45	435	.454	6.18	534	7.57	-	-
1960	1708	8,500	Mar. 31, 1960	78	987	1.03	14.02	-	-	-	-

4480. Mill Creek at Milan, Ill.

Location.--Lat 41°26'35", long 90°33'15", in SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.24, T.17 N., R.2 W., on left bank at upstream side of Knoxville Road Bridge, 1 mile southeast of Milan.

Drainage area.--62.5 sq mi.

Records available.--October 1939 to September 1940 (fragmentary), July 1941 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 566.23 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Apr. 5, 1940, wire-weight gage on downstream side of bridge at same datum.

Average discharge.--19 years (1941-60), 39.0 cfs.

Extremes.--1939-60: Maximum discharge, 8,980 cfs Oct. 10, 1954 (gage height, 9.36 ft); no flow at times in 1940-41, 1953-57.

Remarks.--Occasional pumpage of about 1 cfs from quarry into creek above gage.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2.90	1.28	1.48	14.2	162	50.9	98.0	132	79.9	71.9	30.0	14.5	54.1
1952	22.7	56.3	18.1	76.1	49.1	154	60.9	27.6	47.0	15.8	9.20	1.54	43.3
1953	1.10	3.00	6.32	3.31	70.6	29.8	32.4	26.0	13.7	20.3	1.65	.35	16.9
1954	.37	.71	1.35	1.06	8.52	12.6	31.0	19.8	77.2	5.20	14.1	1.73	14.4
1955	209	20.0	18.6	93.8	106	47.2	106	45.2	31.3	8.84	2.55	.36	57.2
1956	3.23	1.03	.81	1.40	38.3	3.95	3.17	3.44	1.86	40.5	11.0	.18	8.99
1957	.11	.51	.47	1.43	13.2	8.71	35.6	22.8	15.1	5.89	.89	.27	8.67
1958	.76	1.85	8.05	4.88	41.7	23.8	20.3	12.6	81.2	17.8	9.74	5.18	18.7
1959	2.94	2.67	1.03	1.98	223	50.4	60.6	91.5	25.5	35.5	20.8	11.6	42.6
1960	121	33.7	50.0	223	41.2	299	169	96.0	170	26.6	18.3	8.57	105

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.05	0.02	0.03	0.26	2.70	0.94	1.75	2.43	1.43	1.33	0.55	0.26	11.75
1952	.42	.65	.33	1.40	.85	2.84	1.09	.51	.64	.29	.17	.03	9.42
1953	.02	.05	.12	.06	1.18	.53	.58	.48	.25	.37	.03	.006	3.68
1954	.007	.01	.02	.02	.14	.23	.55	.37	1.38	.10	.26	.03	3.12
1955	3.85	.36	.34	1.73	1.77	.87	1.90	.83	.56	.16	.05	.006	12.43
1956	.06	.02	.01	.03	.66	.07	.06	.06	.03	.75	.20	.003	1.95
1957	.002	.009	.009	.03	.22	.16	.63	.42	.27	.11	.02	.005	1.88
1958	.01	.03	.15	.09	.69	.44	.36	.23	1.45	.33	.18	.09	4.05
1959	.05	.05	.02	.04	3.71	.93	1.08	1.69	.45	.65	.38	.21	9.26
1960	2.23	.60	.92	4.11	.71	5.52	3.02	1.77	3.03	.49	.34	.15	22.89

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches	
		Discharge	Date							
1950	-	-	-	-	-	-	-	44.0	9.54	
1951	1208	5,960	Feb. 19, 1951	0.2	54.1	0.866	11.75	60.1	13.05	
1952	1238	850	Mar. 22, 1952	.3	43.3	.693	9.42	37.7	8.21	
1953	1278	2,610	Feb. 20, 1953	0	16.9	.270	3.68	16.2	3.52	
1954	1338	1,770	June 1, 1954	.1	14.4	.230	3.12	35.1	7.63	
1955	1388	8,980	Oct. 10, 1954	.1	57.2	.915	12.43	36.7	7.97	
1956	1438	4,320	July 8, 1956	0	8.99	.144	1.95	8.65	1.88	
1957	1508	865	Feb. 9, 1957	.1	8.67	.139	1.88	9.48	2.06	
1958	1558	2,980	June 10, 1958	.1	18.7	.299	4.05	18.4	3.98	
1959	1628	8,100	Feb. 23, 1959	.6	42.6	.682	9.26	59.4	12.89	
1960	1708	6,580	Mar. 29, 1960	5.8	105	1.68	22.89	-	-	

4490. East Branch Iowa River near Klemme, Iowa

Location.--Lat 43°00'30", long 93°37'35", in NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.36, T.95 N., R.24 W., or left bank 15 ft downstream from highway bridge, 1.0 mile west of Klemme, and 15.4 miles upstream from confluence with West Branch Iowa River.

Drainage area.--133 sq mi.

Records available.--April 1948 to September 1960. Prior to October 1958, published as East Fork Iowa River near Klemme.

Gage.--Water-stage recorder. Datum of gage is 1,179.02 ft above mean sea level, datum of 1929. Prior to Oct. 1, 1955, wire-weight gage at site 0.6 mile upstream at datum 1.11 ft higher.

Average discharge.--12 years (1948-60), 39.7 cfs.

Extremes.--1948-60: Maximum discharge, 5,960 cfs June 19, 1954 (gage height, 11.2 ft, from floodmark, site and datum then in use); minimum daily, 0.2 cfs Feb. 22-26, 1959. Maximum stage known, that of June 19, 1954. Flood in June 1944 reached a stage of about 10 ft, former site and datum, from information by local residents.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	11.4	7.13	3.61	4.07	59.8	119	502	131	304	164	56.3	65.0	118
1952	52.8	42.3	25.0	15.0	101	201	184	43.0	101	98.8	14.8	11.8	72.2
1953	8.90	7.88	2.79	3.67	4.65	61.4	73.3	79.5	76.5	34.5	44.4	8.40	34.0
1954	6.74	7.28	8.50	3.91	10.3	10.4	11.7	27.0	637	112	118	42.8	82.6
1955	63.5	30.6	18.5	12.0	11.8	44.3	42.2	19.2	21.1	47.9	6.19	5.25	27.0
1956	5.21	4.72	1.92	1.79	1.58	40.0	17.0	15.4	7.00	17.2	18.6	5.85	11.4
1957	5.14	4.99	4.20	2.00	3.52	18.2	7.41	31.3	41.5	16.5	7.79	5.44	12.2
1958	5.75	6.77	5.84	2.98	9.50	13.1	14.6	20.1	45.0	8.85	5.92	3.63	11.8
1959	3.17	3.06	.98	.58	.28	24.5	31.1	136	81.3	14.8	6.61	6.90	25.9
1960	6.99	9.29	17.7	12.3	7.00	89.6	48.5	55.2	20.9	6.82	6.38	4.62	25.7

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.10	0.06	0.03	0.04	0.48	1.05	4.51	1.16	2.61	1.46	0.50	0.56	12.36
1952	.47	.36	.22	.13	.84	1.78	1.40	.40	.86	.88	.13	.10	7.57
1953	.08	.07	.02	.03	.04	.54	.63	.71	.66	.31	.39	.07	3.55
1954	.06	.06	.08	.03	.08	.09	.10	.24	5.47	.99	1.05	.37	8.82
1955	.56	.26	.16	.11	.09	.39	.36	.17	.18	.42	.05	.05	2.80
1956	.05	.04	.02	.02	.01	.35	.14	.13	.06	.15	.16	.05	1.18
1957	.04	.04	.04	.02	.03	.14	.06	.27	.35	.14	.07	.05	1.25
1958	.05	.06	.05	.03	.07	.11	.12	.17	.38	.08	.05	.03	1.20
1959	.03	.03	.008	.003	.002	.21	.26	1.18	.68	.13	.06	.06	2.65
1960	.06	.08	.15	.11	.06	.78	.41	.46	.18	.06	.06	.04	2.45

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	26.3	2.74
1951	1208	3,440	June 26, 1951	2.0	118	0.908	12.36	127	13.22
1952	1238	900	Mar. 30, 1952	9.0	72.2	.555	7.57	63.8	6.69
1953	1278	385	June 8, 1953	1.2	34.0	.262	3.55	34.2	3.58
1954	1358	5,960	June 19, 1954	2.8	82.6	.635	8.62	90.2	9.40
1955	1388	348	July 5, 1955	4.5	27.0	.208	2.80	18.5	1.93
1956	1438	150	Mar. 26, 1956	1.2	11.4	.086	1.18	11.6	1.19
1957	1508	178	June 23, 1957	1.6	12.2	.092	1.25	12.5	1.29
1958	1558	355	June 4, 1958	1.5	11.8	.089	1.20	10.9	1.11
1959	1628	1,100	May 21, 1959	.2	25.9	.195	2.65	28.2	2.88
1960	1708	1,100	Mar. 28, 1960	2.3	23.7	.178	2.45	-	-

4495. Iowa River near Rowan, Iowa

Location.--Lat 42°45'35", long 93°37'15", in NW¼NE¼ sec.25, T.92 N., R.24 W., on left bank 10 ft downstream from highway bridge, 3.8 miles northwest of Rowan, and 9.4 miles downstream from confluence of East and West Branches.

Drainage area.--429 sq mi.

Records available.--October 1940 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,143.35 ft above mean sea level, datum of 1929. Prior to Oct. 14, 1948, wire-weight gage at same site and datum.

Average discharge.--20 years (1940-60), 165 cfs.

Extremes.--1940-60: Maximum discharge, 8,460 cfs June 21, 1954 (gage height, 14.88 ft); minimum daily, 2.9 cfs Jan. 21-23, 1959.

Remarks.--Records of water temperatures and suspended sediment loads for the period October 1957 to September 1960 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	47.8	27.5	15.6	14.4	211	531	1,679	522	860	913	264	210	440
1952	174	125	77.3	59.0	380	576	595	166	311	352	69.9	46.7	243
1953	29.7	26.3	20.0	21.3	27.2	221	266	278	171	83.8	129	24.3	109
1954	21.6	24.0	25.2	12.1	23.7	43.4	58.1	147	1,828	381	306	123	248
1955	263	108	65.5	58.5	41.0	150	139	72.8	81.8	106	18.5	13.9	92.0
1956	19.5	16.9	8.29	7.01	7.82	83.8	55.0	49.7	21.1	34.8	43.4	15.7	30.4
1957	14.9	16.2	15.3	8.05	12.2	47.8	32.4	91.5	190	48.6	20.7	16.8	42.9
1958	16.6	20.5	24.8	15.2	34.5	40.9	50.3	63.8	136	48.8	14.6	8.83	39.4
1959	9.19	12.0	6.30	3.63	3.54	115	85.0	304	270	62.3	32.7	35.7	78.6
1960	41.7	61.4	80.0	105	50.1	230	259	203	77.8	24.8	18.8	17.9	97.7

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.13	0.07	0.04	0.04	0.51	1.43	4.37	1.40	2.24	2.45	0.71	0.55	13.94
1952	.47	.33	.21	.16	.95	1.55	1.55	.45	.81	.95	.19	.12	7.74
1953	.08	.07	.05	.06	.07	.59	.69	.75	.44	.23	.35	.06	3.44
1954	.06	.06	.07	.03	.06	.12	.15	.39	4.75	1.02	.82	.32	7.85
1955	.71	.28	.18	.10	.10	.40	.36	.20	.21	.28	.05	.04	2.91
1956	.05	.04	.02	.02	.02	.23	.14	.13	.05	.09	.12	.04	.95
1957	.04	.04	.04	.02	.03	.13	.08	.25	.49	.13	.06	.04	1.35
1958	.04	.05	.07	.04	.08	.11	.13	.17	.35	.13	.04	.02	1.23
1959	.02	.03	.02	.01	.009	.31	.22	.82	.70	.17	.09	.09	2.49
1960	.11	.16	.21	.28	.13	.62	.67	.55	.20	.07	.05	.05	3.10

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches	
		Discharge	Date							
1950	-	-	-	-	-	-	-	101	3.20	
1951	1208	5,610	June 28, 1951	6.7	440	1.03	13.94	464	14.71	
1952	1238	2,200	Mar. 31, 1952	35	243	.566	7.74	218	6.93	
1953	1278	645	May 2, 1953	10	109	.254	3.44	108	3.43	
1954	1358	8,460	June 21, 1954	5.9	248	.578	7.85	279	8.83	
1955	1388	551	July 7, 1955	10	92.0	.214	2.91	58.9	1.85	
1956	1438	300	Mar. 28, 1956	6.4	30.4	.071	.95	30.6	.96	
1957	1508	492	May 31, 1957	6.0	42.9	.100	1.35	44.2	1.39	
1958	1558	530	May 27, 1958	6.4	39.4	.092	1.23	36.5	1.14	
1959	1628	1,540	June 2, 1959	2.9	78.6	.183	2.49	91.7	2.90	
1960	1708	2,900	Mar. 30, 1960	12	97.7	.228	3.10	-	-	

4515. Iowa River at Marshalltown, Iowa

Location.--Lat 42°04'05", long 92°54'05", in NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.24, T.84 N., R.18 W., on right bank in city park in Marshalltown, 300 ft upstream from Burnett Creek, 0.2 mile downstream from bridge on State Highway 14, 2.0 miles upstream from Linn Creek, and at mile 189. Records include flow of Burnett Creek.

Drainage area.--1,564 sq mi, including that of Burnett Creek.

Records available.--October 1902 to September 1903, October 1914 to September 1927, October 1932 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 853.10 ft above mean sea level, datum of 1929. Oct. 25, 1902, to Aug. 8, 1903, staff gage at site 1 mile upstream at different datum. May 21, 1915, to Sept. 30, 1927, and Feb. 1, 1933, to May 8, 1934, chain gage and May 9 to Sept. 1, 1934, staff gage, at site 1,000 ft upstream at present datum. Sept. 2-20, 1934, staff gage at site 1,000 ft downstream at different datum.

Average discharge.--42 years (1902-3, 1914-27, 1932-60), 711 cfs.

Extremes.--1902-3, 1914-27, 1932-60: Maximum discharge, 42,000 cfs June 4, 1918 (gage height, 17.74 ft, from floodmark), from rating curve extended above 19,000 cfs on basis of velocity-area study; minimum daily, 9 cfs Jan. 9-10, 1940.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	262	107	63.2	55.5	946	2,558	4,279	1,828	2,782	2,663	1,072	810	1,450
1952	774	556	567	634	954	2,235	2,096	989	1,177	1,346	266	128	960
1953	86.0	94.1	82.9	97.1	1,148	953	862	953	875	435	354	65.9	495
1954	57.0	76.8	68.0	45.2	86.1	136	168	516	4,026	769	1,221	587	651
1955	1,114	488	232	197	458	561	559	363	202	411	79.0	48.2	395
1956	130	59.9	37.0	33.6	31.0	258	199	243	73.0	65.1	147	159	120
1957	40.5	52.6	47.3	78.4	146	198	150	562	1,352	712	160	92.7	299
1958	85.5	150	234	202	399	356	529	232	1,195	1,170	585	297	452
1959	143	193	97.3	67.3	58.4	2,683	771	753	901	496	147	240	550
1960	215	416	394	543	300	1,028	3,553	2,782	869	341	236	371	920

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.19	0.08	0.05	0.04	0.63	1.89	3.05	1.35	1.98	1.96	0.79	0.56	12.59
1952	.57	.40	.27	.47	.66	1.65	1.50	.73	.84	.99	.20	.08	8.37
1953	.06	.07	.06	.07	.76	.70	.61	.70	.62	.32	.25	.05	4.28
1954	.04	.05	.05	.03	.06	.10	.13	.38	2.87	.57	.94	.42	5.64
1955	.82	.35	.17	.14	.30	.43	.40	.27	.14	.30	.06	.03	3.41
1956	.10	.04	.03	.02	.02	.19	.14	.18	.05	.05	.11	.11	1.04
1957	.03	.04	.03	.06	.10	.15	.11	.41	.96	.52	.12	.07	2.60
1958	.06	.11	.17	.15	.27	.26	.38	.17	.85	.86	.43	.21	3.92
1959	.11	.14	.07	.05	.04	1.98	.55	.56	.64	.37	.11	.17	4.79
1960	.16	.30	.29	.40	.21	.76	2.53	2.05	.62	.25	.17	.26	8.00

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	668	5.80
1951	1208	15,200	Mar. 29, 1951	46	1,450	0.927	12.59	1,557	13.51
1952	1238	6,500	Mar. 11, 1952	93	960	.614	8.37	840	7.32
1953	1278	7,000	Feb. 21, 1953	46	495	.316	4.28	459	4.23
1954	1338	11,500	Aug. 28, 1954	34	651	.416	5.64	769	6.84
1955	1388	3,290	Feb. 20, 1955	23	395	.253	3.41	259	2.24
1956	1438	2,160	May 13, 1956	25	120	.077	1.04	113	.97
1957	1508	7,800	June 16, 1957	22	299	.191	2.60	327	2.84
1958	1558	5,550	June 13, 1958	67	452	.289	3.92	449	3.90
1959	1628	10,000	Mar. 27, 1959	45	550	.352	4.79	600	5.22
1960	1708	21,500	Mar. 31, 1960	107	920	.588	8.00	-	-

4517. Timber Creek near Marshalltown, Iowa

Location.--Lat 42°00'25", long 92°51'30", in SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.8, T.83 N., R.17 W., on left bank 20 ft downstream from bridge on U.S. Highway 30, 2.7 miles upstream from mouth and 3.0 miles southeast of Marshalltown.

Drainage area.--118 sq mi.

Records available.--October 1949 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 849.44 ft above mean sea level, datum of 1929.

Average discharge.--11 years (1949-60), 48.5 cfs.

Extremes.--1949-60: Maximum discharge, 4,940 cfs June 18, 1950 (gage height, 15.77 ft); no flow July 24-26, Oct. 4-12, 1956.
Flood in June 1947 reached a stage of 16.8 ft (discharge not determined).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1950	4.54	3.12	2.14	10.0	144	346	7.75	59.2	172	12.5	2.45	1.21	63.2
1951	.76	1.11	.71	.78	116	95.3	132	103	172	127	58.9	27.9	69.0
1952	47.7	49.4	30.5	77.6	63.0	232	109	100	102	47.6	15.2	4.90	73.4
1953	3.11	9.43	6.98	26.6	184	41.8	60.0	74.8	53.0	20.7	7.69	2.41	39.8
1954	1.63	2.00	2.08	.40	3.07	5.41	17.7	28.7	175	14.0	28.2	14.1	24.2
1955	62.4	25.8	18.3	16.3	128	54.8	41.1	45.2	15.3	30.9	2.51	1.92	36.1
1956	1.43	1.32	.60	.41	4.30	5.11	2.84	10.7	1.27	1.03	1.16	3.99	2.84
1957	1.28	1.21	.76	12.7	58.9	5.90	6.00	33.3	93.0	165	14.2	5.01	33.0
1958	5.24	7.42	10.4	8.78	39.6	22.4	34.0	16.0	47.4	29.6	9.10	18.6	20.5
1959	5.40	11.4	6.10	4.16	72.2	330	73.7	205	73.6	38.1	9.37	7.19	70.0
1960	5.06	21.7	18.1	142	37.3	197	235	345	99.9	59.5	21.1	21.8	101

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1950	0.04	0.03	0.02	0.10	1.27	3.38	0.07	.58	1.62	0.12	0.02	0.01	7.26
1951	.007	.01	.007	.008	1.02	.93	1.24	1.01	1.63	1.24	.58	.26	7.94
1952	.47	.47	.30	.76	.58	2.27	1.03	.98	.96	.46	.15	.05	8.48
1953	.03	.09	.07	.26	1.62	.41	.57	.73	.50	.20	.08	.02	4.58
1954	.02	.02	.02	.004	.03	.05	.17	.28	1.66	.14	.28	.13	2.80
1955	.61	.24	.18	.16	1.13	.54	.39	.42	.14	.30	.02	.02	4.15
1956	.01	.01	.006	.004	.04	.05	.03	.10	.01	.01	.01	.04	.32
1957	.01	.01	.007	.12	.52	.06	.06	.33	.88	1.61	.14	.05	3.80
1958	.05	.07	.10	.09	.35	.22	.32	.16	.45	.29	.09	.18	2.37
1959	.05	.11	.06	.04	.64	3.22	.70	2.00	.70	.37	.09	.07	8.05
1960	.05	.21	.18	1.39	.34	1.92	2.23	3.37	.94	.58	.21	.21	11.63

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	1508,1708	4,940	June 18, 1950	1.0	63.2	0.536	7.26	62.6	7.19
1951	1508,1708	1,390	June 1, 1951	.4	69.0	.585	7.94	79.5	9.16
1952	1508,1708	2,770	Mar. 10, 1952	2.5	73.4	.622	8.48	64.4	7.43
1953	1508,1708	4,030	Feb. 20, 1953	1.6	39.8	.337	4.58	38.6	4.45
1954	1508,1708	2,450	June 10, 1954	.4	24.2	.205	2.80	32.7	3.77
1955	1508	1,500	Feb. 19, 1955	.9	36.1	.306	4.15	27.4	3.15
1956	1508	150	May 13, 1956	0	2.84	.024	.32	2.83	.32
1957	1508,1708	4,420	July 3, 1957	0	33.0	.280	3.80	34.6	3.99
1958	1558,1708	800	Feb. 24, 1958	2.6	20.5	.174	2.37	20.5	2.37
1959	1628,1708	3,420	Mar. 20, 1959	2.4	70.0	.593	8.05	71.8	8.27
1960	1708	3,420	Mar. 30, 1960	3.4	101	.856	11.63	-	-

4519. Richland Creek near Haven, Iowa

Location.--Lat 41°53'55", long 92°28'35", in SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.21, T.82 N., R.14 W., on right bank 5 ft upstream from highway bridge, 0.5 mile north of Haven, and 3.0 miles upstream from mouth.

Drainage area.--56.1 sq mi.

Records available.--October 1949 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 798.69 ft above mean sea level, datum of 1929.

Average discharge.--11 years (1949-60), 24.7 cfs.

Extremes.--1949-60: Maximum discharge, 3,650 cfs Mar. 30, 1960 (gage height, 12.39 ft); minimum daily, 0.1 cfs on several days in 1949, 1953-54, 1956.

Flood in June 1916 reached a stage of 14.3 ft (present gage datum); discharge not determined.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.32	0.31	0.48	1.99	79.2	37.5	58.1	56.4	59.3	56.8	20.0	6.51	31.0
1952	23.6	24.8	9.97	27.9	28.8	95.9	54.9	51.3	58.0	22.5	4.23	3.16	33.8
1953	1.36	4.35	3.29	15.1	116	27.0	40.2	45.9	37.7	5.97	.93	.91	24.2
1954	.45	.64	.60	.10	.42	1.17	15.3	15.0	29.7	1.80	33.7	15.3	9.54
1955	56.1	15.9	6.76	7.15	61.9	19.7	27.8	21.4	9.05	7.65	.76	.80	19.3
1956	.39	.70	.32	.25	1.30	1.05	.85	2.04	.25	8.13	12.0	2.38	2.49
1957	.24	.47	.25	5.64	10.5	1.80	1.42	33.9	20.2	34.0	15.6	3.24	10.6
1958	3.13	5.02	4.54	3.39	14.1	9.39	15.9	6.07	21.1	34.1	10.3	66.6	16.0
1959	6.56	41.2	8.56	4.54	69.9	152	98.5	96.6	41.2	29.6	8.84	10.2	47.1
1960	9.48	37.9	23.0	104	29.2	137	107	115	40.4	28.9	9.21	8.72	54.4

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.007	0.006	0.01	0.04	1.47	0.77	1.16	1.18	1.17	0.41	0.13	0.13	7.51
1952	.48	.49	.20	.57	.55	1.97	1.09	1.05	1.15	.46	.09	.06	8.16
1953	.03	.09	.07	.31	2.15	.56	.80	.94	.75	.12	.02	.02	5.86
1954	.009	.01	.01	.002	.008	.02	.31	.31	.59	.04	.69	.30	2.30
1955	1.15	.32	.14	.15	1.15	.41	.55	.44	.18	.16	.02	.02	4.69
1956	.008	.01	.006	.005	.02	.02	.02	.04	.005	.17	.25	.05	.60
1957	.005	.009	.005	.12	.20	.04	.03	.70	.40	.70	.32	.06	2.59
1958	.06	.10	.09	.07	.26	.19	.32	.12	.42	.70	.21	1.33	3.87
1959	.13	.82	.18	.09	1.30	3.12	1.96	1.98	.82	.61	.18	.20	11.39
1960	.19	.75	.47	2.14	.56	2.82	2.12	2.37	.80	.59	.19	.17	13.17

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	23.1	5.60
1951	1508,1708	935	July 8, 1951	0.2	31.0	0.553	7.51	35.8	8.66
1952	1508,1708	870	Mar. 10, 1952	1.4	33.8	.602	8.16	29.7	7.18
1953	1508,1708	2,100	Feb. 20, 1953	.1	24.2	.431	5.86	23.6	5.70
1954	1508,1708	1,170	Aug. 26, 1954	.1	9.54	.170	2.30	16.0	3.88
1955	1508,1708	1,290	Feb. 19, 1955	.3	19.3	.344	4.69	12.8	3.10
1956	1508,1708	364	Aug. 1, 1956	.1	2.49	.044	.60	2.46	.60
1957	1508,1708	509	May 31, 1957	.1	10.6	.189	2.59	11.6	2.82
1958	1558,1708	1,580	Sept. 3, 1958	1.0	16.0	.285	3.87	19.6	4.75
1959	1628,1708	1,730	Apr. 28, 1959	2.6	47.1	.840	11.39	48.3	11.67
1960	1708	3,650	Mar. 30, 1960	3.9	54.4	.970	13.17	-	-

4520. Salt Creek near Elberon, Iowa

Location.--Lat 41°57'45", long 92°18'55", in NW¼NW¼ sec.36, T.83 N., R.13 W., near center of span on downstream side of bridge on U.S. Highway 30, 1.2 miles northwest of Irving 2.5 miles south of Elberon, and 9.0 miles upstream from mouth.

Drainage area.--201 sq mi.

Records available.--October 1945 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 781.58 ft above mean sea level (Iowa Highway Commission bench mark). Prior to Oct. 15, 1945, and June 14, 1947, to Feb. 10, 1949, wire-weight gage on upstream side of bridge at present datum. Oct. 15, 1945, to June 13, 1947, water-stage recorder (destroyed by flood) at upstream side of bridge at present datum.

Average discharge.--15 years (1945-60), 110 cfs.

Extremes.--1945-60: Maximum discharge observed, 35,000 cfs June 13, 1947 (gage height, 17.6 ft), from rating curve extended above 17,000 cfs by logarithmic plotting; minimum daily, 2.4 cfs Jan. 16-29, 1954.

Flood of June 16, 1944, reached a stage of 19.9 ft, from floodmark at downstream side of bridge (discharge, 30,000 cfs, estimated).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	4.85	4.08	3.79	3.53	3.59	293	175	112	394	169	149	60.7	141
1952	65.5	82.8	60.1	142	125	414	164	167	140	42.1	21.2	11.0	120
1953	8.62	13.2	13.5	41.3	285	132	123	165	322	89.2	18.5	9.60	100
1954	6.81	7.44	8.85	4.14	9.32	11.7	51.1	97.4	120	14.3	246	82.1	55.2
1955	215	56.7	38.4	35.7	118	90.4	98.9	84.2	35.4	51.2	29.6	8.74	71.7
1956	10.8	7.30	5.14	3.70	15.9	14.9	33.6	86.1	16.7	60.6	138	37.9	36.1
1957	11.7	8.43	6.94	34.5	94.9	15.0	24.3	187	230	32.4	62.9	19.7	60.3
1958	17.2	31.8	29.7	25.7	68.8	37.0	61.2	42.5	130	368	197	189	100
1959	41.6	80.7	34.0	24.2	124	719	199	284	105	79.1	32.3	32.3	147
1960	35.2	105	73.5	274	102	355	494	448	144	86.3	38.9	42.8	184

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.03	0.02	0.02	0.02	1.76	1.68	0.97	0.64	2.18	0.97	0.86	0.34	9.49
1952	.38	.46	.34	.82	.67	2.37	.91	.96	.78	.24	.12	.06	8.11
1953	.05	.07	.08	.24	1.48	.76	.68	.95	1.79	.51	.11	.05	6.77
1954	.04	.04	.05	.02	.05	.07	.28	.56	.67	.08	1.41	.46	3.73
1955	1.23	.31	.22	.20	.61	.52	.55	.48	.20	.29	.17	.05	4.83
1956	.06	.04	.03	.02	.09	.09	.19	.49	.09	.35	.79	.21	2.45
1957	.07	.05	.04	.20	.49	.09	.13	1.07	1.28	.19	.36	.11	4.08
1958	.10	.18	.17	.15	.36	.21	.34	.24	.72	2.11	1.13	1.05	6.76
1959	.24	.45	.20	.14	.64	4.12	1.11	1.63	.58	.45	.19	.18	9.93
1960	.20	.58	.42	1.57	.55	2.04	2.74	2.57	.80	.49	.22	.24	12.42

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	84.7	5.72
1951	1208	4,250	June 2, 1951	2.9	141	0.701	9.49	157	10.60
1952	1238	4,050	Mar. 11, 1952	7.5	120	.597	8.11	105	7.13
1953	1278	7,000	Feb. 20, 1953	6.7	100	.498	6.77	99.0	6.70
1954	1338	5,410	Aug. 28, 1954	2.4	55.2	.275	3.73	79.4	5.36
1955	1389	1,560	Oct. 10, 1954	5.5	71.7	.357	4.83	47.5	3.20
1956	1438	3,610	Aug. 1, 1956	2.5	36.1	.180	2.45	36.5	2.48
1957	1508	2,810	May 31, 1957	3.8	60.3	.300	4.08	64.6	4.37
1958	1558	6,800	July 15, 1958	10	100	.498	6.76	106	7.20
1959	1628	6,580	Mar. 20, 1959	13	147	.731	9.93	152	10.24
1960	1708	6,400	Jan. 13, 1960	17	184	.915	12.42	-	-

4522. Walnut Creek near Hartwick, Iowa

Location.--Lat 41°50'10", long 92°23'20", in SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.8, T.81 N., R.13 W., on left bank 5 ft upstream from highway bridge, 1.2 miles downstream from North Walnut Creek, 4.0 miles northwest of Hartwick, and 6.5 miles upstream from mouth.

Drainage area.--70.9 sq mi.

Records available.--October 1949 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 786.59 ft above mean sea level, datum of 1929.

Average discharge.--11 years (1949-60), 33.6 cfs.

Extremes.--1949-60: Maximum discharge, 4,930 cfs Sept. 3, 1958 (gage height, 15.67 ft), from rating curve extended above 2,600 cfs on basis of contracted-opening and flow-over-embankment measurement at peak flow; no flow at times for most years.
Flood in June 1947 reached a stage of 17.7 ft, from information by local residents (discharge not determined).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.34	0.38	0.79	3.55	103	58.3	86.6	87.2	105	76.4	15.8	6.62	44.9
1952	20.8	40.2	24.3	78.1	48.2	161	71.4	72.5	63.6	18.4	5.08	2.02	50.6
1953	.83	4.29	4.90	13.8	94.7	48.9	49.7	69.6	49.8	9.31	1.35	.28	28.5
1954	.31	.59	.43	.11	1.40	1.64	8.59	17.4	39.1	1.01	53.8	22.9	12.3
1955	53.3	11.6	7.91	11.8	64.2	23.1	51.2	27.8	7.44	9.90	.38	2.75	22.3
1956	.39	.29	.18	.006	4.44	3.53	2.18	1.95	.76	17.0	22.1	3.91	4.76
1957	.003	.41	.63	8.47	10.5	1.86	1.03	31.8	17.9	18.3	6.85	1.11	8.25
1958	1.08	2.37	1.88	2.21	22.1	7.02	11.9	6.26	26.2	51.4	18.2	159	25.6
1959	23.1	23.8	6.88	4.91	78.2	236	129	126	55.4	38.5	10.9	6.74	61.5
1960	8.48	82.5	37.3	179	43.0	180	147	162	50.0	36.1	8.71	5.86	78.6

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.005	0.006	0.01	0.06	1.52	0.95	1.36	1.42	1.66	1.24	0.26	0.10	8.59
1952	.34	.63	.39	1.27	.73	2.62	1.12	1.18	1.00	.30	.08	.03	9.69
1953	.01	.07	.08	.22	1.39	.80	.78	1.13	.78	.15	.02	.004	5.43
1954	.005	.009	.007	.002	.02	.03	.14	.28	.62	.02	.87	.36	2.36
1955	.87	.18	.13	.19	.94	.38	.81	.45	.12	.16	.006	.04	4.28
1956	.006	.005	.003	.0001	.07	.06	.03	.03	.01	.28	.36	.06	.91
1957	.00005	.006	.010	.14	.15	.03	.02	.52	.28	.30	.11	.02	1.59
1958	.02	.04	.03	.04	.32	.11	.19	.10	.41	.84	.30	2.50	4.90
1959	.38	.38	.11	.08	1.15	3.83	2.02	2.04	.87	.63	.18	.11	11.78
1960	.14	1.30	.61	2.91	.65	2.93	2.32	2.64	.79	.59	.14	.09	15.11

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	31.6	6.05
1951	1508,1558	1,450	(a)	0.1	44.9	0.633	8.59	51.9	9.93
1952	1508,1558	1,820	Mar. 10, 1952	1.2	50.6	.714	9.69	44.3	8.49
1953	1508,1558	2,000	Feb. 20, 1953	.1	28.5	.402	5.43	27.7	5.50
1954	1508,1558	1,450	Aug. 26, 27, 1954	0	12.3	.173	2.36	16.3	3.52
1955	1508,1558	952	Apr. 23, 1955	0	22.3	.315	4.28	16.2	3.11
1956	1508,1558	895	July 21, 1956	0	4.76	.067	.91	4.78	.92
1957	1508,1558	684	May 30, 1957	0	8.25	.116	1.59	8.61	1.66
1958	1558	4,930	Sept. 3, 1958	.3	25.6	.361	4.90	29.6	5.68
1959	1628	3,230	Mar. 20, 1959	2.8	61.5	.867	11.78	67.6	12.96
1960	1708	3,500	Jan. 12, 1960	3.3	78.6	1.11	15.11	-	-

a June 3, July 9, 1951.

4525. Iowa River near Belle Plaine, Iowa

Location.--Lat 41°51'30", long 92°16'50", in SW¹/₄NW¹/₄ sec.5, T.81 N., R.12 W., on right bank 5 ft downstream from bridge on State Highway 212, 1.0 mile downstream from Salt Creek, 1.1 miles downstream from Walnut Creek and 2.7 miles south of Belle Plaine.

Drainage area.--2,455 sq mi.

Records available.--September 1939 to September 1959 (discontinued).

Gage.--Water-stage recorder. Datum of gage is 749.82 ft above mean sea level, datum of 1929. Prior to Mar. 13, 1940, wire-weight gage at same site and datum.

Average discharge.--20 years (1939-59), 1,156 cfs.

Extremes.--1939-59: Maximum discharge, 34,000 cfs June 14, 1947 (gage height, 17.07 ft); minimum daily, 19 cfs Jan. 6, 1940.

Maximum discharge since at least 1902, 43,000 cfs June 5, 1918 (gage height, 17.85 ft, from information by Corps of Engineers).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	312	149	88.3	87.4	1,224	2,993	6,320	2,938	4,319	3,786	1,440	1,100	2,060
1952	1,016	947	610	1,217	1,529	3,834	3,012	1,640	1,845	1,637	401	193	1,490
1953	135	165	160	265	1,712	1,491	1,454	1,691	1,653	773	426	113	829
1954	81.3	103	92.4	52.9	118	193	421	903	4,556	1,219	1,411	1,243	864
1955	1,837	788	440	396	984	1,155	926	707	372	548	149	83.7	698
1956	142	82.8	51.2	46.1	86.3	317	288	416	138	148	350	262	195
1957	75.5	85.0	82.8	140	411	252	229	*831	*2,253	*1,291	498	264	*534
1958	170	262	359	279	513	559	760	352	1,538	2,062	1,170	1,246	774
1959	341	459	234	158	460	*5,075	*2,169	*2,105	*1,564	*996	323	344	*1,192
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

* Revised.

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.15	0.07	0.04	0.04	0.52	1.41	2.87	1.38	1.96	1.78	0.68	0.50	11.40
1952	.48	.43	.29	.57	.67	1.80	1.37	.77	.84	.77	.19	.09	8.27
1953	.06	.08	.08	.12	.73	.70	.66	.79	.75	.36	.20	.05	4.58
1954	.04	.05	.04	.02	.05	.09	.19	.42	2.07	.57	.68	.57	4.77
1955	.86	.36	.21	.19	.42	.54	.42	.33	.17	.26	.07	.04	3.67
1956	.07	.04	.02	.02	.04	.15	.13	.20	.06	.07	.16	.12	1.08
1957	.04	.04	.04	.07	.17	.12	.10	*.39	*1.02	*.61	.23	.12	*2.95
1958	.08	.12	.17	.13	.22	.26	.35	.17	.70	.97	.55	.57	4.29
1959	.16	.21	.11	.07	.20	*2.58	.99	*.99	*.71	*.47	.15	.16	*6.60
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

* Revised.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	1,000	5.53
1951	1208	20,100	Mar. 31, 1951	64	2,060	0.839	11.40	2,230	12.34
1952	1238	11,300	Mar. 14, 1952	140	1,490	.607	8.27	1,313	7.29
1953	1278	6,500	Feb. 21, 1953	80	829	.338	4.58	814	4.49
1954	1338	10,700	June 28, 1954	41	864	.352	4.77	1,099	6.07
1955	1388	3,600	Oct. 11, 1954	52	698	.284	3.87	463	2.57
1956	1438	*2,590	May 14, 1956	35	195	.079	1.08	192	1.07
1957	1508	6,950	June 20, 1957	50	*534	*.218	*2.95	*580	*3.20
1958	1558	7,200	July 16, 1958	110	774	.315	4.29	794	4.40
1959	1628	14,100	Mar. 23, 1959	110	*1,192	*.486	*6.60	-	-
1960	-	-	-	-	-	-	-	-	-

* Revised.

4530. Bear Creek at Ladora, Iowa

Location.--Lat 41°45'00", long 92°11'00", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.7, T.80 N., R.11 W., on right bank 10 ft downstream from highway bridge, a quarter of a mile south of Ladora, and $2\frac{1}{2}$ miles upstream from Little Bear Creek.

Drainage area.--189 sq mi.

Records available.--October 1945 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 759.28 ft above mean sea level, datum of 1929. Prior to June 26, 1946, wire-weight gage at same site and datum.

Average discharge.--15 years (1945-60), 105 cfs.

Extremes.--1945-60: Maximum discharge, 10,500 cfs Mar. 30, 1960 (gage height, 14.60 ft); no flow Jan. 22 to Feb. 8, 1956.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	4.05	3.57	0.755	3.93	239	145	257	282	285	220	41.7	23.9	124
1952	96.6	140	63.6	210	119	349	190	188	1.52	64.9	16.2	5.99	133
1953	4.51	14.0	11.0	48.0	190	140	135	253	290	86.6	11.7	4.01	98.1
1954	3.10	3.68	4.31	1.38	7.62	9.57	27.0	28.1	71.4	6.70	99.2	29.6	24.4
1955	93.2	21.0	19.0	25.8	109	60.5	108	75.5	20.9	10.9	2.36	5.46	45.5
1956	2.55	1.68	.33	.17	4.59	7.75	4.17	2.25	2.94	44.7	25.7	1.34	8.26
1957	.49	2.04	1.13	14.8	12.2	5.99	6.88	111	56.7	91.2	20.9	8.46	27.9
1958	7.57	15.1	15.4	8.96	48.4	26.8	30.4	25.8	95.5	94.2	60.6	350	64.4
1959	62.1	61.7	31.0	20.6	131	554	309	335	136	153	28.5	18.8	154
1960	32.2	161	103	432	130	719	504	480	178	129	31.5	18.6	244

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.02	0.02	0.005	0.02	1.32	0.88	1.52	1.72	1.68	1.34	0.25	0.14	8.92
1952	.59	.83	.39	1.26	.68	2.13	1.12	1.15	.90	.40	.10	.04	9.61
1953	.03	.08	.07	.29	1.05	.85	.79	1.55	1.71	.53	.07	.02	7.04
1954	.19	.02	.03	.008	.04	.06	.16	.17	.42	.04	.61	.17	1.92
1955	.57	.12	.12	.16	.60	.37	.64	.46	.12	.07	.01	.03	3.27
1956	.02	.01	.002	.001	.03	.05	.02	.01	.02	.27	.16	.008	.60
1957	.003	.01	.007	.09	.07	.04	.04	.68	.33	.56	.13	.05	2.01
1958	.05	.09	.09	.05	.27	.16	.18	.16	.55	.57	.37	2.07	4.62
1959	.38	.36	.19	.13	.72	3.38	1.82	2.05	.80	.93	.17	.11	11.04
1960	.20	.95	.63	2.63	.74	4.38	2.98	2.93	1.05	.79	.19	.11	17.58

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	89.0	6.38
1951	1208	3,950	July 8, 1951	0.6	124	0.656	8.92	149	10.68
1952	1238	3,050	Mar. 10, 1952	4.2	133	.704	9.61	111	7.98
1953	1278	5,800	May 24, 1953	2.7	98.1	.519	7.04	96.5	7.10
1954	1358	4,010	Aug. 26, 1954	1.3	24.4	.129	1.92	34.7	2.49
1955	1388	1,560	Oct. 10, 1954	.4	45.5	.241	3.27	34.6	2.49
1956	1438	2,950	July 7, 1956	0	8.26	.044	.60	8.19	.59
1957	1508	4,600	May 30, 1957	.1	27.9	.148	2.01	30.8	2.22
1958	1558	5,290	Sept. 4, 1958	3.0	64.4	.341	4.62	74.2	5.32
1959	1628	4,670	Mar. 20, 1959	5.1	154	.815	11.04	166	11.89
1960	1708	10,500	Mar. 30, 1960	11	244	1.29	17.58	-	-

4531. Iowa River at Marengo, Iowa

Location.--Lat 41°48'35", long 92°04'20", in NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.24, T.81 N., R.11 W., on right bank at downstream side of abandoned county highway bridge, 0.7 mile downstream from Bear Creek, 0.8 mile north of Marengo, and 4.9 miles upstream from Hilton Creek.

Drainage area.--2,794 sq mi.

Records available.--October 1956 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 725.06 ft above mean sea level, datum of 1929.

Extremes.--1956-60: Maximum discharge, 30,800 cfs Mar. 31, 1960 (gage height, 19.21 ft); minimum daily, 54 cfs (estimated) Oct. 11, 12, 1956.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957	*80.8	*90.0	*84.7	191	424	289	269	818	2,486	1,453	538	289	*584
1958	185	278	592	512	621	672	856	390	1,742	2,330	1,326	2,094	932
1959	446	543	269	183	630	6,286	3,037	2,785	1,832	1,334	357	371	1,514
1960	437	1,162	877	3,015	956	2,300	7,328	6,254	2,219	1,094	456	532	2,220

* Not previously published; partly estimated on basis of records for nearby stations.

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957	*0.03	*0.04	*0.03	0.08	0.16	0.12	0.11	0.34	0.99	0.60	0.22	0.12	*2.84
1958	.08	.11	.16	.13	.23	.28	.34	.16	.70	.96	.55	.84	4.54
1959	.18	.22	.11	.08	.23	2.59	1.21	1.15	.73	.55	.15	.15	7.35
1960	.18	.46	.36	1.24	.37	.95	2.93	2.58	.89	.45	.19	.21	10.81

* Not previously published; see footnote to preceding table.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1957	1508,1558	7,060	June 22, 1957	*54	*584	*0.209	*2.84	634	3.09
1958	1558	11,000	Sept. 4, 1958	120	932	.334	4.54	966	4.70
1959	1628	15,400	Mar. 24, 1959	130	1,514	.542	7.35	1,616	7.84
1960	1708	30,800	Mar. 31, 1960	241	2,220	.795	10.81	-	-

* Revised.

* Not previously published.

4540. Rapid Creek near Iowa City, Iowa

Location.--Lat 41°42'00", long 91°29'05", in NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.36, T.80 N., R.6 W., on left bank 80 ft upstream from bridge on State Highway 261, 3 miles northeast of Iowa City, and 4.0 miles upstream from mouth.

Drainage area.--24.6 sq mi.

Records available.--October 1937 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder and concrete control with sharp-crested weir. Datum of gage is 673.72 ft above mean sea level, datum of 1929.

Average discharge.--23 years (1937-60), 12.5 cfs.

Extremes.--1937-60: Maximum discharge, 3,890 cfs May 20, 1944; maximum gage height, 13.05 ft Feb. 20, 1953; no flow at times during most years.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.190	0.320	0.704	7.22	75.7	26.1	37.4	25.9	18.2	16.1	2.97	1.07	17.1
1952	5.33	10.8	4.92	15.6	17.2	60.5	24.4	27.7	23.0	4.68	2.19	1.55	16.4
1953	2.00	10.0	11.7	11.2	77.5	25.0	21.9	33.2	9.48	22.9	1.81	1.029	18.3
1954	0	.092	.256	.020	.942	1.45	4.07	7.30	6.99	.120	4.05	.449	2.15
1955	8.62	1.15	1.03	5.73	21.8	7.24	28.3	13.1	1.94	.62	.03	0	7.34
1956	0	0	0	0	4.73	.416	1.25	2.14	.213	23.5	37.2	1.57	5.98
1957	0	.41	.09	1.82	1.60	1.20	2.19	2.52	.92	0	2.26	.07	1.09
1958	.023	1.08	1.73	.40	12.9	3.86	2.55	2.87	6.21	1.84	1.10	2.72	3.03
1959	11.7	1.28	.19	.24	77.3	65.5	27.4	25.6	6.07	5.79	4.20	1.77	18.5
1960	13.8	13.9	16.4	47.1	10.4	39.9	43.2	51.0	48.6	23.4	1.89	1.30	26.0

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.009	0.01	0.03	0.34	3.12	1.22	1.70	1.21	0.83	0.76	0.14	0.05	9.42
1952	.25	.49	.23	.73	7.75	2.84	1.11	1.30	1.04	.22	.10	.007	9.07
1953	.009	.46	.55	.52	3.28	1.17	.99	1.55	.43	1.07	.08	.001	10.11
1954	0	.004	.01	.001	.04	.07	.18	.34	.32	.006	.19	.02	1.18
1955	.40	.05	.05	.27	.92	.34	1.28	.61	.09	.03	.002	0	4.04
1956	0	0	0	0	.21	.02	.06	.10	.01	1.10	1.75	.07	3.32
1957	0	.02	.004	.09	.07	.06	.10	.12	.04	0	.11	.003	.62
1958	.001	.05	.08	.02	.55	.18	.12	.13	.28	.09	.05	.12	1.67
1959	.55	.06	.009	.01	3.27	3.07	1.24	1.20	.28	.27	.20	.08	10.24
1960	.64	.63	.77	2.21	.45	1.87	1.96	2.39	2.21	1.10	.09	.06	14.58

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	18.1	9.95
1951	1208, 1708	1,460	Feb. 25, 1951	0.11	17.1	0.695	9.42	18.7	10.84
1952	1238, 1708	1,220	May 23, 1952	.05	16.4	.667	9.07	16.5	9.12
1953	1278	3,800	Feb. 20, 1953	0	18.3	.744	10.11	16.5	9.11
1954	1358	216	Aug. 26, 1954	0	2.15	.087	1.18	3.03	1.67
1955	1388	750	Apr. 24, 1955	0	7.34	.298	4.04	6.42	3.54
1956	1438	3,000	Aug. 30, 1956	0	5.98	.243	3.32	6.02	3.34
1957	1508	326	Aug. 28, 1957	0	1.09	.044	.62	1.23	.72
1958	1558	509	June 13, 1958	0	3.03	.123	1.67	3.91	2.16
1959	1628	2,300	Mar. 19, 1959	0	18.5	.752	10.24	21.1	11.66
1960	1708	2,340	Mar. 29, 1960	0	26.0	1.06	14.38	-	-

4543. Clear Creek near Coralville, Iowa

Location.--Lat 41°40'35", long 91°35'55", in NW 1/4 sec. 6, T.79 N., R.6 W., on left bank about 50 ft upstream from highway bridge, 1.2 miles west of Coralville, and 2.2 miles above mouth.

Drainage area.--98.1 sq mi.

Records available.--October 1952 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 648.43 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Jan. 7, 1957, wire-weight gage at present site and datum.

Average discharge.--8 years (1952-60), 37.9 cfs.

Extremes.--1952-60: Maximum discharge, 3,060 cfs Jan. 13, 1960 (gage height, 11.79 ft); minimum daily, 0.1 cfs July 1, 1956.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	*1.33	*30.8	*15.7	*24.6	*177	*70.3	*73.4	95.8	50.9	20.6	1.94	0.69	*45.9
1954	2.11	3.46	.63	.35	2.79	4.49	8.95	23.3	23.7	1.69	12.7	2.66	7.24
1955	19.6	2.32	1.75	2.85	56.6	26.6	46.7	37.1	6.84	13.4	8.10	1.94	18.4
1956	1.05	.95	.54	.63	21.4	9.88	4.15	3.79	.83	21.1	68.3	6.47	11.6
1957	1.63	2.19	1.35	11.9	18.7	6.09	11.2	8.00	9.59	2.09	6.31	.88	6.57
1958	.55	3.09	2.05	1.21	24.6	8.67	6.82	7.05	68.1	54.7	13.6	78.4	22.2
1959	40.4	15.0	5.12	4.79	229	280	138	151	56.4	54.8	16.4	6.33	82.3
1960	34.9	72.0	69.1	206	54.5	151	237	134	154	166	17.1	7.41	109

* Not previously published; estimated on basis of gage-height record and discharge measurements at site 1 1/2 miles upstream.

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	*0.02	*0.35	*0.19	*0.28	*1.06	*0.83	*0.83	1.13	0.58	0.24	0.02	0.008	*6.36
1954	.02	.04	.007	.004	.03	.05	.10	.27	.27	.02	.15	.03	.99
1955	.23	.03	.02	.03	.60	.31	.53	.44	.08	.16	.10	.02	2.55
1956	.01	.01	.006	.007	.23	.12	.05	.04	.009	.25	.80	.07	1.60
1957	.02	.02	.02	.14	.20	.07	.13	.09	.11	.02	.07	.01	.90
1958	.007	.04	.02	.01	.26	.10	.08	.08	.77	.64	.16	.89	3.06
1959	.48	.17	.06	.06	2.43	3.30	1.57	1.78	.64	.64	.19	.07	11.59
1960	.41	.82	.81	2.42	.60	1.77	2.69	1.58	1.75	1.97	.20	.06	15.10

* Not previously published.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-
1953	1508	*1,800	Feb. 20, 1953*	*0.3	*45.9	*0.468	*6.36	*42.5	*5.87
1954	1508	730	Aug. 26, 1954	.3	7.24	.074	.99	8.72	1.20
1955	1508	850	Feb. 21, 1955	.5	18.4	.188	2.55	16.6	2.30
1956	1508	900	Aug. 30, 1956	.1	11.6	.118	1.60	11.8	1.64
1957	1508	300	Jan. 22, 1957	.6	6.57	.067	.90	6.61	.91
1958	1558	1,020	Sept. 5, 1958	.2	22.2	.226	3.06	26.8	3.70
1959	1628	2,680	Mar. 20, 1959	2.4	82.3	.839	11.39	92.0	12.72
1960	1708	3,060	Jan. 13, 1960	4.1	109	1.11	15.10	-	-

* Not previously published.

4545. Iowa River at Iowa City, Iowa

Location.--Lat 41°39'25", long 91°32'25", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.9, T.79 N., R.6 W., on right bank 25 ft downstream from University of Iowa Hydraulics Laboratory in Iowa City, 175 ft downstream from university dam, 0.9 mile upstream from Ralston Creek, 3.6 miles downstream from Clear Creek, and at mile 66.6.

Drainage area.--3,271 sq mi.

Records available.--June 1903 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 39.00 ft above Iowa City datum, and 627.27 ft above mean sea level, datum of 1929. June 1, 1903, to July 21, 1906, chain gage 1,200 ft upstream at datum 3.05 ft higher. Nov. 29, 1907, to Oct. 29, 1913, staff gage 200 ft upstream at different datum. Oct. 30, 1913, to Nov. 18, 1921, chain gage 2,600 ft downstream at datum 0.2 ft higher. Nov. 19, 1921, to Sept. 30, 1922, water-stage recorder at present site at datum 1.0 ft higher. Oct. 1, 1930, to Sept. 30, 1934, at present site at Iowa City datum.

Average discharge.--57 years (1903-60), 1,500 cfs.

Extremes.--1903-60: Maximum discharge, 42,500 cfs June 8, 1918 (gage height, 19.6 ft, from graph based on gage readings, site and datum then in use); minimum daily, 29 cfs Oct. 21, 22, 1916 (regulated).

Flood of July 17, 1881, reached a stage of 21.1 ft, from floodmarks at site and datum in use 1913-21; from information by local resident (discharge, 51,000 cfs).

Maximum stage known since at least 1850, about 3 ft higher than that of July 17, 1881, occurred in June 1851 (discharge, 70,000 cfs, estimated).

Remarks.--Diurnal fluctuation at low stages caused by powerplants above station. Flow regulated by Coralville Reservoir (capacity, 492,000 acre-ft) beginning Sept. 17, 1958. Records of chemical analyses for the periods September 1906 to September 1907, January 1944 to September 1954; suspended sediment loads for the periods October 1943 to September 1960; and water temperatures for the period January 1944 to September 1960 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	322	161	108	117	1,340	3,017	8,185	4,487	5,042	4,596	1,645	1,535	2,543
1952	1,643	1,698	991	1,750	2,269	5,448	3,946	2,564	2,409	1,950	588	261	2,126
1953	165	324	306	375	2,728	2,329	2,146	2,591	2,243	1,322	571	166	1,261
1954	120	127	122	78.8	170	235	466	1,116	3,741	1,915	1,062	1,777	910
1955	2,212	980	593	528	1,226	1,566	1,530	1,149	572	749	243	136	957
1956	189	109	64.5	59.8	152	332	402	519	216	245	681	326	275
1957	116	114	113	230	542	364	341	699	2,409	1,362	625	376	606
1958	209	312	403	308	457	895	844	427	1,762	2,370	1,539	2,145	974
1959	706	590	313	260	959	4,347	6,089	3,619	2,233	1,545	167	167	1,750
1960	648	1,377	1,086	4,097	1,737	1,178	8,612	6,418	4,772	1,337	1,862	522	2,799

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.11	0.05	0.04	0.04	0.43	1.06	2.79	1.58	1.72	1.62	0.58	0.52	10.54
1952	.58	.58	.35	.62	.75	1.92	1.35	.90	.82	.69	.21	.09	8.86
1953	.06	.11	.11	.13	.87	.82	.73	.91	.77	.47	.20	.06	5.24
1954	.04	.04	.04	.03	.06	.08	.16	.39	1.28	.68	.37	.61	3.77
1955	.78	.33	.21	.19	.59	.55	.52	.41	.19	.26	.09	.05	3.97
1956	.07	.04	.02	.02	.05	.12	.14	.18	.07	.09	.24	.11	1.15
1957	.04	.04	.04	.08	.17	.13	.12	.25	.82	.48	.22	.13	2.52
1958	.07	.11	.14	.11	.15	.32	.29	.15	.60	.84	.54	.73	4.05
1959	.25	.20	.11	.09	.31	1.53	2.08	1.28	.76	.54	.06	.08	7.27
1960	.23	.47	.38	1.44	.57	.42	2.94	2.26	1.63	.47	.66	.18	11.65

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches	
		Discharge	Date							
1950	-	-	-	-	-	-	-	1,375	5.70	
1951	1208	15,700	Apr. 3, 1951	80	2,543	0.777	10.54	2,857	11.85	
1952	1238	10,400	Mar. 17, 1952	73	2,126	.650	8.86	1,837	7.63	
1953	1278	11,900	Feb. 20, 1953	68	1,261	.386	5.24	1,223	5.08	
1954	1338	7,680	July 3, 1954	47	910	.278	3.77	1,197	4.97	
1955	1388	4,600	Apr. 24, 1955	94	957	.293	3.97	667	2.78	
1956	1438	3,100	Aug. 31, 1956	32	275	.084	1.15	274	1.14	
1957	1458	4,700	June 25, 1957	57	606	.185	2.52	655	2.72	
1958	1558	5,000	Sept. 7, 1958	91	974	.298	4.05	1,031	4.29	
1959	1628	9,380	Apr. 4, 1959	81	1,750	.535	7.27	1,873	7.79	
1960	1708	10,700	Apr. 16, 1960	204	2,799	.856	11.65	-	-	

4550. Ralston Creek at Iowa City, Iowa

Location.--Lat 41°39'50", long 91°30'45", in SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.11, T.79 N., R.6 W., on left bank 10 ft upstream from bridge on State Highway 1, at east edge of Iowa City, and 2.2 miles upstream from mouth.

Drainage area.--3.01 sq mi.

Records available.--September 1924 to September 1960.

Gage.--Water-stage recorder and sharp-crested weir. Datum of gage is 663.81 ft above mean sea level, datum of 1929 (University of Iowa bench mark).

Average discharge.--36 years (1924-60), 1.46 cfs.

Extremes.--1924-60: Maximum discharge, 1,690 cfs July 18, 1956 (gage height, 9.06 ft); no flow at times during most years.

Remarks.--Records of suspended sediment loads for period April 1952 to September 1960 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.024	0.161	0.127	1.01	8.76	3.13	3.39	2.37	2.09	2.21	0.325	0.171	1.93
1952	.596	1.04	.546	2.06	2.01	7.17	2.33	2.84	2.41	.460	.356	.048	1.83
1953	.031	2.19	1.04	.608	7.60	3.41	2.37	2.71	.781	.388	.025	0	1.72
1954	0	.004	.020	0	.107	.180	.528	.349	.193	.047	.491	.080	.167
1955	.723	.014	.035	.477	5.58	.535	1.99	.671	.060	.055	.048	0	.814
1956	0	0	0	0	.604	.006	.010	.054	0	4.02	3.69	.058	.712
1957	0	.025	0	.265	.205	.039	.120	.161	.015	0	.126	.011	.080
1958	.033	.109	.203	0	1.55	.125	.063	.197	.948	1.66	.270	.786	.488
1959	1.75	.228	.031	.034	10.5	6.85	4.00	4.51	.826	1.00	.986	.181	2.52
1960	2.15	1.48	2.25	5.32	1.22	4.46	5.56	4.50	5.90	3.28	.252	.295	3.06

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.009	0.06	0.05	0.39	3.03	1.20	1.26	0.91	0.78	0.84	0.12	0.06	8.71
1952	.23	.39	.21	.79	.72	2.75	.86	1.09	.89	.18	.14	.02	8.27
1953	.01	.81	.40	.23	2.63	1.31	.88	1.04	.29	.15	.01	.00	7.76
1954	.00	.001	.008	.00	.04	.07	.20	.13	.07	.02	.19	.03	.76
1955	.28	.005	.01	.18	1.93	.21	.74	.26	.02	.02	.02	.00	3.68
1956	.00	.00	.00	.00	.22	.002	.004	.02	.00	1.54	1.41	.02	3.22
1957	.00	.009	.00	.10	.07	.02	.04	.06	.006	.00	.05	.004	.36
1958	.01	.04	.08	.00	.54	.05	.02	.08	.35	.64	.10	.29	2.20
1959	.67	.08	.01	.01	3.62	2.63	1.48	1.73	.31	.38	.38	.07	11.37
1960	.82	.55	.86	2.04	.44	1.71	2.06	1.72	2.19	1.25	.10	.11	13.85

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	2.22	10.03
1951	1208, 1508	328	July 8, 1951	0.01	1.93	0.641	8.71	2.09	9.42
1952	1238, 1508	220	May 23, 1952	.005	1.83	.608	8.27	1.91	8.66
1953	1279, 1508	312	Feb. 19, 1953	.00	1.72	.571	7.76	1.45	6.55
1954	1338, 1508	107	Aug. 25, 1954	.00	.167	.055	.76	.230	1.05
1955	1388, 1508	166	Apr. 23, 1955	.00	.814	.270	3.68	.748	3.38
1956	1438, 1508	1,690	July 18, 1956	.00	.712	.237	3.22	.714	3.22
1957	1508	40	Jan. 21, 1957	.00	.080	.027	.36	.107	.48
1958	1558	296	July 14, 1958	.00	.488	.162	2.20	.629	2.83
1959	1628	755	Oct. 8, 1958	.00	2.52	.837	11.37	2.85	12.84
1960	1708	558	June 4, 1960	.02	3.06	1.02	13.85	-	-

4555. English River at Kalona, Iowa

Location.--Lat 41°28'10", long 91°43'00", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.13, T.77 N., R.8 W., on right bank 30 ft upstream from bridge on State Highway 1, 1 mile south of Kalona, 4.5 miles downstream from Smith Creek, and 14.5 miles upstream from mouth.

Drainage area.--573 sq mi.

Records available.--September 1939 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 633.45 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Dec. 27, 1939, wire-weight gage at same site and datum.

Average discharge.--21 years (1939-60), 309 cfs.

Extremes.--1939-60: Maximum discharge, 18,500 cfs Mar. 31, 1960 (gage height, 19.89 ft); minimum daily, 1.1 cfs Jan. 20-27, 1956.

Flood in June 1930 reached a stage of 19.9 ft, from floodmark from information by local residents (discharge, 18,500 cfs, revised).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	5.45	7.93	4.73	29.4	736	492	1,063	913	1,056	858	422	84.7	469
1952	356	675	202	503	373	1,511	525	477	489	110	45.6	11.6	441
1953	8.88	139	97.3	106	993	679	511	424	403	124	15.5	5.61	287
1954	2.98	5.94	5.48	2.58	13.8	10.8	47.0	114	149	7.31	126	15.2	41.7
1955	270	29.6	22.9	73.2	258	194	717	220	67.5	52.8	6.34	3.10	158
1956	4.71	2.38	2.19	1.93	38.9	20.5	5.35	9.62	35.9	171	239	45.4	48.4
1957	4.15	10.1	3.32	25.3	54.9	14.8	42.4	124	121	162	92.0	23.6	56.5
1958	15.7	51.5	39.6	20.8	205	106	52.7	69.2	239	209	227	167	117
1959	71.1	56.7	17.2	12.0	772	1,508	819	913	364	594	76.8	70.3	421
1960	208	486	473	1,366	343	1,178	1,606	1,097	989	982	79.3	33.9	740

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.01	0.02	0.01	0.06	1.34	0.99	2.07	1.84	2.06	1.73	0.85	0.16	11.14
1952	.72	1.32	.41	1.01	.70	3.04	1.02	.96	.95	.22	.09	.02	10.46
1953	.02	.27	.20	.21	1.80	1.37	1.00	.85	.78	.25	.03	.01	6.79
1954	.006	.01	.01	.005	.03	.02	.09	.23	.29	.01	.25	.03	.98
1955	.54	.06	.05	.15	.47	.39	1.40	.44	.13	.11	.01	.006	3.76
1956	.009	.005	.004	.004	.07	.04	.01	.02	.07	.34	.48	.09	1.14
1957	.008	.02	.007	.05	.10	.05	.08	.25	.24	.33	.19	.05	1.56
1958	.03	.10	.08	.04	.37	.21	.12	.14	.47	.42	.46	.32	2.76
1959	.14	.11	.03	.02	1.40	3.03	1.60	1.84	.71	.79	.15	.14	9.98
1960	.42	.95	.95	2.79	.65	2.37	3.13	2.21	1.93	1.98	.16	.07	17.61

Yearly discharge, in cubic feet per second

Year	WSF	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	232	5.50
1951	1208	6,130	Aug. 26, 1951	3.7	469	0.818	11.14	571	13.55
1952	1238	6,840	Mar. 12, 1952	8.4	441	.770	10.46	358	8.50
1953	1278	5,860	Feb. 21, 1953	2.2	287	.501	8.79	268	6.33
1954	1338	2,270	Aug. 27, 1954	1.6	41.7	.073	.98	67.8	1.60
1955	1388	5,020	Apr. 25, 1955	1.9	158	.276	3.76	132	3.12
1956	1438	2,730	Aug. 31, 1956	1.1	48.4	.084	1.14	49.1	1.16
1957	1508	2,000	July 5, 1957	1.3	56.5	.099	1.56	64.0	1.53
1958	1558	2,200	May 31, 1958	4.8	117	.204	2.76	120	2.83
1959	1628	8,960	Mar. 21, 1959	10	421	.735	9.96	507	12.00
1960	1708	18,500	Mar. 31, 1960	19	740	1.29	17.61	-	-

4557. Iowa River near Lone Tree, Iowa

Location.--Lat 41°25'35", long 91°28'20", in NW¼NE¼ sec.6, T.76 N., R.5 W., on left bank 10 ft downstream from county highway bridge, 5 miles southwest of Lone Tree, and 6 miles downstream from English River.

Drainage area.--4,293 sq mi.

Records available.--October 1956 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 588.16 ft above mean sea level, datum of 1929. Prior to Dec. 28, 1956, wire-weight gage at same site and datum.

Extremes.--1956-60: Maximum discharge, 28,100 cfs Apr. 1, 1960 (gage height, 17.90 ft); minimum daily, 75 cfs Dec. 8, 1956.

Flood of May 25, 1944, reached a stage of 19.94 ft, from information by Corps of Engineers.

Remarks.--Flow regulated by Coralville Reservoir (capacity, 492,000 acre-ft) beginning Sept. 17, 1958.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sect.	The year
1957	124	125	126	253	695	587	404	853	2,505	1,533	775	477	686
1958	237	361	497	558	641	1,158	968	599	2,391	2,615	1,932	2,447	1,183
1959	757	734	423	304	2,162	7,011	7,641	5,073	3,139	2,254	394	272	2,512
1960	1,083	2,135	1,883	6,020	2,443	2,435	11,910	8,120	6,406	2,816	1,936	586	3,975

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sect.	The year
1957	0.03	0.03	0.03	0.07	0.17	0.10	0.11	0.23	0.65	0.41	0.21	0.12	2.16
1958	.06	.09	.13	.10	.16	.31	.25	.16	.62	.70	.52	.64	3.74
1959	.20	.19	.11	.08	.52	1.88	1.99	1.36	.82	.61	.11	.07	7.94
1960	.29	.55	.51	1.62	.61	.65	3.09	2.18	1.66	.76	.52	.15	12.59

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year			
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches		
		Discharge	Date								
1957	1508	4,550	June 25, 1957	75	686	0.160	2.16	746	2.35		
1958	1558	6,810	Sept. 7, 1958	149	1,183	.276	3.74	1,251	3.96		
1959	1628, 1708	16,600	Mar. 21, 1959	136	2,512	.585	7.94	2,779	8.79		
1960	1708	28,100	Apr. 1, 1960	305	3,975	.926	12.59	-	-		

4565. Turtle Creek near Austin, Minn.

Location.--Lat 43°41'05", long 93°02'15", in NE¼NW¼ sec.31, T.103 N., R.18 W., on up-stream side of bridge on county road 3 miles west of Austin and 5.6 miles upstream from mouth.

Drainage area.--144 sq mi.

Records available.--October 1947 to September 1951. Monthly discharge only prior to April 1948, published in WSP 1308.

Gage.--Wire-weight gage. Datum of gage is 1,180.79 ft above mean sea level, datum of 1929.

Extremes.--1948-51: Maximum discharge, 2,000 cfs Mar. 26, 1950 (gage height, 11.18 ft); minimum daily, 2.1 cfs Oct. 5, 1948.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.07	0.07	0.05	0.05	0.04	0.09	5.97	1.77	1.30	0.33	0.29	0.69	10.72

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	9.00	9.49	6.79	6.75	6.16	11.3	771	221	168	41.8	36.4	89.2	114

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year			
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches		
		Discharge	Date								
1950	-	-	-	-	-	-	-	35.5	3.14		
1951	1208	1,860	Apr. 7, 1951	5.2	114	0.792	10.72	-	-		

4570. Cedar River near Austin, Minn.

Location.--Lat 43°38'10", long 92°58'20", in NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.15, T.102 N., R.18 W., on left bank 200 ft upstream from abandoned powerhouse, 500 ft downstream from highway bridge, 1.1 miles downstream from Turtle Creek, and 1.1 miles south of Austin.

Drainage area.--425 sq mi.

Records available.--May 1909 to September 1914, October 1944 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,162.10 ft above mean sea level, datum of 1929. May 1909 to April 1912, staff gage in tailwater of powerplant 200 ft downstream at datum 3.1 ft lower. May 1912 to September 1914, chain gage on highway bridge 500 ft downstream at datum 1.1 ft lower.

Average discharge.--21 years (1909-14, 1944-60), 167 cfs.

Extremes.--1909-14, 1944-60: Maximum discharge, 8,800 cfs Mar. 26, 1950 (gage height, 17.81 ft); no flow for several days in 1911.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	48.0	39.7	34.5	38.1	51.0	74.9	1,868	302	496	131	167	305	294
1952	232	216	174	79.5	110	640	972	185	420	140	161	72.0	283
1953	50.4	51.8	51.5	50.4	50.3	310	207	412	504	430	646	69.0	238
1954	54.6	62.9	68.5	51.7	69.8	85.4	131	309	672	117	80.7	82.8	149
1955	124	83.0	72.2	65.0	59.0	368	173	77.7	129	87.7	41.8	36.2	110
1956	37.6	36.0	28.6	37.7	39.1	73.1	262	120	103	108	71.4	45.0	80.0
1957	41.7	45.5	42.6	36.0	49.2	77.4	55.9	124	163	251	66.9	55.8	84.4
1958	45.0	68.3	59.6	47.2	65.7	64.9	113	68.4	68.6	54.9	48.3	42.1	62.0
1959	37.3	35.7	30.4	29.8	30.5	168	199	168	352	147	172	148	127
1960	110	102	125	79.5	56.9	210	283	496	260	195	77.2	68.4	172

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.13	0.10	0.09	0.10	0.12	0.20	4.90	0.82	1.30	0.36	0.45	0.80	9.37
1952	.63	.57	.47	.22	.28	1.74	2.55	.50	1.10	.38	.44	.19	9.07
1953	.14	.14	.14	.14	.12	.84	.54	1.12	1.32	1.17	1.75	.18	7.60
1954	.15	.17	.19	.14	.17	.23	.34	.84	1.76	.32	.22	.22	4.75
1955	.34	.22	.20	.18	.14	1.00	.45	.21	.34	.24	.11	.10	3.53
1956	.10	.09	.08	.10	.10	.20	.69	.33	.27	.29	.19	.12	2.56
1957	.11	.12	.12	.10	.12	.21	.15	.34	.43	.68	.18	.15	2.71
1958	.12	.18	.16	.13	.16	.18	.30	.19	.18	.15	.13	.11	1.99
1959	.10	.09	.08	.08	.07	.45	.52	.46	.92	.40	.47	.39	4.03
1960	.30	.27	.34	.22	.14	.57	.74	1.35	.68	.53	.21	.18	5.53

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	121	3.86
1951	1208	7,070	Apr. 7, 1951	33	294	0.692	9.37	333	10.72
1952	1238	7,520	Mar. 31, 1952	50	283	.666	9.07	244	7.82
1953	1278	6,890	Aug. 3, 1953	43	238	.560	7.60	241	7.69
1954	1338	5,370	June 20, 1954	47	149	.351	4.75	158	5.00
1955	1388	2,710	Mar. 11, 1955	34	110	.259	3.53	93.2	3.04
1956	1438	2,190	Apr. 2, 1956	25	80.0	.188	2.56	82.3	2.64
1957	1508	2,250	July 17, 1957	34	84.4	.199	2.71	83.0	2.82
1958	1558	534	June 5, 1958	30	62.0	.146	1.99	154.2	1.80
1959	1628	4,940	June 26, 1959	27	127	.299	4.03	146	4.67
1960	1708	4,260	May 22, 1960	50	172	.408	5.53	-	-

† Corrected.

IOWA RIVER BASIN

4580. Little Cedar River near Ionia, Iowa

Location.--Lat 43°02'00", long 92°30'10", in SW 1/4 NE 1/4 sec. 21, T.9S N., R.14 W., on left bank 12 ft downstream from highway bridge, 2.5 miles west of Ionia, and 7.0 miles upstream from mouth.

Drainage area.--306 sq mi.

Records available.--October 1954 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 973.23 ft above mean sea level, datum of 1929.

Average discharge.--6 years (1954-60), 72.3 cfs.

Extremes.--1954-60: Maximum discharge, 2,790 cfs June 25, 1960 (gage height, 9.19 ft); minimum daily, 3.0 cfs Feb. 4-9, 1959.

Flood of June 22, 1954, reached a stage of 11.37 ft (discharge, 4,600 cfs).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	-	-	-	-	-	-	-	-	-	-	-	-	-
1955	187	70.5	49.0	30.4	32.4	160	205	63.6	199	51.1	16.9	12.8	89.9
1956	18.3	14.6	7.51	5.91	7.02	107	171	92.8	33.9	26.4	65.0	46.4	49.6
1957	22.4	22.9	20.4	12.5	25.1	77.7	47.3	77.1	122	111	35.9	28.9	50.4
1958	27.7	40.1	32.7	22.7	36.8	51.7	77.1	30.5	24.0	40.4	29.0	14.8	35.6
1959	15.0	15.7	8.32	4.20	3.40	274	218	97.5	104	81.8	52.8	87.2	80.3
1960	68.6	101	95.3	62.3	35.5	167	218	277	230	78.1	96.0	105	128

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	-	-	-	-	-	-	-	-	-	-	-	-	-
1955	0.70	0.26	0.18	0.11	0.11	0.60	0.75	0.24	0.73	0.19	0.06	0.05	3.98
1956	.07	.05	.03	.02	.02	.40	.62	.35	.12	.10	.24	.17	2.19
1957	.08	.08	.08	.05	.09	.29	.17	.29	.44	.42	.14	.11	2.24
1958	.10	.15	.12	.09	.13	.19	.28	.12	.09	.15	.11	.05	1.58
1959	.05	.06	.03	.02	.01	1.03	.79	.37	.38	.31	.20	.32	3.57
1960	.26	.37	.36	.23	.13	.63	.79	1.04	.84	.29	.36	.38	5.68

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-
1954	-	-	-	-	-	-	-	-	-
1955	1388	1,500	June 3, 1955	9.6	89.9	0.294	3.98	67.5	2.99
1956	1438	1,160	Apr. 2, 1956	5.5	49.6	.162	2.19	51.8	2.28
1957	1508	890	July 23, 1957	10	50.4	.165	2.24	53.4	2.37
1958	1558	632	July 15, 1958	10	35.6	.118	1.58	30.3	1.35
1959	1628, 1708	1,850	May 29, 31, 1959	3.0	80.3	.252	3.57	99.5	4.42
1960	1708	2,790	June 25, 1960	23	128	.418	5.68	-	-

4585. Cedar River at Janesville, Iowa

Location.--Lat 42°39'00", long 92°27'50", in NE¼SW¼ sec.35, T.91 N., R.14 W., on left bank 300 ft downstream from highway bridge at Janesville and 3.3 miles upstream from West Fork Cedar River.

Drainage area.--1,661 sq mi.

Records available.--October 1904 to September 1906, October 1914 to September 1927, October 1932 to September 1942, October 1945 to September 1960. Monthly discharge only for some periods, published in WSP 1308. Published as Red Cedar River at Janesville, 1905-6.

Gage.--Water-stage recorder. Datum of gage is 868.46 ft above mean sea level, datum of 1929. Prior to July 26, 1919, chain gage 1,000 ft downstream at datum 4.0 ft lower. July 26, 1919, to Sept. 30, 1927, and Nov. 14, 1932, to Sept. 30, 1942, chain gage and Apr. 26, 1946, to Nov. 10, 1949, wire-weight gage, at highway bridge 300 ft upstream at same datum.

Average discharge.--40 years (1904-6, 1914-27, 1932-42, 1945-60), 692 cfs.

Extremes.--1905-6, 1914-27, 1932-42, 1945-60: Maximum discharge, 33,300 cfs Apr. 1, 1933 (gage height, 16.0 ft, from graph based on gage readings site then in use); minimum daily, 28 cfs Oct. 21, 1922.

Flood of Mar. 17, 1945, reached a stage of 16.2 ft, from floodmark at site 300 ft upstream (discharge, 34,300 cfs). Flood of Mar. 16, 1929, reached a stage of about that of Apr. 1, 1933 (from information by city of Waterloo).

Remarks.--Diurnal fluctuation during low water caused by powerplant at Waverly, 10 miles above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	185	164	154	134	521	1,684	7,598	1,630	1,864	1,235	1,003	775	1,405
1952	748	728	546	618	804	1,889	3,458	966	861	713	556	310	1,014
1953	212	218	214	188	461	923	730	995	1,310	1,067	2,300	340	750
1954	262	263	230	140	215	259	341	924	2,999	628	678	428	640
1955	712	438	320	254	432	1,042	792	422	518	354	161	137	465
1956	182	168	106	89.6	97.5	409	858	454	266	255	292	259	284
1957	160	181	142	115	231	397	247	418	626	485	232	232	289
1958	146	210	207	171	249	335	441	235	203	179	142	226	226
1959	130	138	94.2	85.9	61.2	1,310	1,226	454	1,112	881	598	548	553
1960	547	576	519	595	345	1,075	1,437	1,838	1,146	647	373	452	797

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.13	0.11	0.09	0.09	0.33	1.17	5.10	1.13	1.25	0.86	0.70	0.52	11.48
1952	.52	.49	.38	.43	.52	1.31	2.32	.67	.58	.50	.39	.21	8.32
1953	.15	.15	.15	.13	.29	.64	.49	.69	.88	.74	1.60	.23	6.14
1954	.18	.18	.16	.10	.13	.18	.23	.64	2.01	.44	.47	.29	5.01
1955	.49	.29	.22	.18	.27	.72	.53	.29	.35	.25	.11	.09	3.79
1956	.13	.11	.07	.06	.06	.28	.58	.30	.18	.18	.20	.17	2.32
1957	.11	.12	.10	.08	.14	.28	.17	.29	.42	.34	.16	.16	2.37
1958	.10	.14	.14	.12	.16	.23	.30	.16	.14	.14	.12	.10	1.85
1959	.09	.09	.07	.06	.04	.91	.82	.30	.75	.61	.41	.37	4.52
1960	.38	.39	.36	.41	.22	.75	.97	1.28	.77	.45	.26	.30	6.54

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	583	4.75
1951	1208	25,000	Apr. 9, 1951	97	1,405	0.846	11.48	1,534	12.54
1952	1238	14,700	Apr. 2, 1952	200	1,014	.610	8.32	899	7.38
1953	1278	15,000	Aug. 6, 1953	111	750	.452	6.14	759	6.21
1954	1338	18,400	June 22, 1954	105	640	.385	5.01	673	5.49
1955	1388	4,430	Mar. 14, 1955	114	465	.280	3.79	380	3.10
1956	1438	3,530	Apr. 5, 1956	74	284	.171	2.32	287	2.34
1957	1508	1,890	May 31, 1957	84	289	.174	2.37	296	2.42
1958	1558	1,100	Feb. 25, 1958	56	226	.136	1.85	209	1.72
1959	1628	6,620	Mar. 27, 1959	45	553	.333	4.52	661	5.40
1960	1708	13,200	Mar. 30, 1960	188	797	.480	6.54	-	-

4589. West Fork Cedar River at Finchford, Iowa

Location.--Lat 42°37'50", long 92°32'25", in SW¹/₄SE¹/₄ sec.6, T.90 N., R.14 W., on left bank 100 ft downstream from highway bridge in Finchford and 3.2 miles upstream from Shell Rock River.

Drainage area.--846 sq mi.

Records available.--October 1945 to September 1960. Prior to October 1955, published as West Fork Shell Rock River at Finchford.

Gage.--Water-stage recorder. Datum of gage is 867.06 ft above mean sea level, datum of 1929. Prior to June 10, 1955, wire-weight gage at same site and datum.

Average discharge.--15 years (1945-60), 349 cfs.

Extremes.--1945-60: Maximum discharge, 31,900 cfs June 27, 1951 (gage height, 17.28 ft, from floodmarks); minimum daily, 5.9 cfs Feb. 26, 27, 1959.
Flood in March 1929 reached a stage of about 14 ft, from information by local resident (discharge, 12,800 cfs, estimated).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	160	80.4	42.7	36.9	597	1,613	3,536	1,458	2,694	1,825	896	570	1,124
1952	419	369	251	215	605	985	1,326	509	556	517	153	79.4	497
1953	60.7	63.9	56.6	54.0	125	531	544	511	232	228	554	81.0	255
1954	58.5	66.3	55.1	50.3	60.8	86.2	138	411	2,449	482	316	225	363
1955	464	213	144	87.0	176	309	304	164	83.6	142	35.1	21.3	179
1956	57.3	40.4	23.3	9.37	11.1	184	178	137	58.6	31.7	29.3	22.9	65.5
1957	18.0	25.8	23.5	14.3	38.7	113	81.8	80.1	305	101	42.9	40.4	73.6
1958	37.6	51.7	85.6	64.0	87.3	144	217	90.5	192	216	93.3	35.0	109
1959	19.2	22.3	14.2	9.35	6.37	1,054	517	243	642	475	233	319	298
1960	198	399	330	257	162	763	1,489	1,243	339	161	138	224	475

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.22	0.11	0.06	0.05	0.73	2.20	4.66	1.99	3.55	2.49	1.22	0.75	18.03
1952	.57	.49	.34	.29	.77	1.34	1.75	.69	.73	.70	.21	.10	7.98
1953	.08	.08	.08	.07	.15	.72	.72	.70	.31	.31	.75	.11	4.08
1954	.08	.09	.08	.04	.07	.12	.18	.56	3.23	.66	.43	.30	5.84
1955	.63	.28	.20	.12	.22	.42	.40	.22	.11	.19	.05	.03	2.87
1956	.08	.05	.03	.01	.01	.25	.24	.19	.08	.04	.04	.03	1.05
1957	.02	.03	.03	.02	.05	.15	.11	.11	.40	.14	.06	.05	1.17
1958	.05	.07	.12	.09	.11	.20	.29	.12	.25	.29	.13	.05	1.77
1959	.03	.03	.02	.01	.008	1.44	.68	.33	.85	.64	.32	.42	4.78
1960	.27	.53	.45	.35	.21	1.04	1.96	1.69	.45	.22	.19	.29	7.65

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	338	5.44
1951	1208	31,900	June 27, 1951	21	1,124	1.33	18.03	1,187	19.04
1952	1238	5,800	Apr. 1, 1952	61	497	.587	7.98	425	6.82
1953	1278	2,250	Aug. 7, 1953	50	255	.301	4.08	255	4.09
1954	1338	14,200	June 23, 1954	17	363	.429	5.84	417	6.70
1955	1388	a850	Oct. 16, 1954	15	179	.212	2.87	120	1.92
1956	1438	642	Mar. 29, 1956	8.0	65.5	.077	1.05	61.0	.97
1957	1508	1,040	June 19, 1957	11	73.6	.087	1.17	82.6	1.33
1958	1558	712	July 17, 1958	15	109	.129	1.77	99.4	1.61
1959	1628	4,740	Mar. 28, 1959	5.9	298	.352	4.78	371	5.95
1960	1708	10,600	Mar. 30, 1960	88	475	.561	7.65	-	-

a Maximum observed.

4590. Shell Rock River near Northwood, Iowa

Location.--Lat 43°24'50", long 93°13'10", in NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.9, T.99 N., R.20 W., on right bank 50 ft downstream from highway bridge, 2 miles south of Northwood, and 4.1 miles upstream from Elk Creek.

Drainage area.--300 sq mi.

Records available.--October 1945 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 1,176.48 ft above mean sea level, datum of 1929. Prior to May 17, 1956, wire-weight gage at same site and datum.

Average discharge.--15 years (1945-60), 114 cfs.

Extremes.--1945-60: Maximum discharge, 2,430 cfs Apr. 10, 1951 (gage height, 9.55 ft, from graph based on gage readings); maximum gage height, 11.38 ft Apr. 7, 1951 (ice jam); minimum daily, 0.3 cfs Feb. 17-26, 1959.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	24.3	24.6	26.0	19.3	19.4	34.1	1,319	461	178	212	114	136	213
1952	116	94.5	80.9	51.4	78.2	322	685	162	84.7	121	37.5	155	155
1953	21.9	19.0	19.5	22.3	23.2	222	177	229	140	177	412	34.5	126
1954	21.1	23.8	32.1	16.1	35.7	41.0	61.9	183	510	132	46.9	47.1	95.8
1955	111	64.4	47.4	28.4	34.7	152	170	60.9	180	116	17.0	13.3	83.1
1956	15.5	18.0	13.5	15.3	17.7	109	224	121	45.6	29.1	58.3	20.1	57.2
1957	17.5	21.3	17.2	9.94	19.7	46.9	34.7	109	159	97.2	47.1	25.7	50.5
1958	21.7	33.7	32.8	23.2	23.2	52.2	171	52.8	24.5	15.0	9.68	7.94	38.9
1959	14.5	8.08	3.76	1.11	.42	27.1	184	166	184	150	82.9	84.6	75.7
1960	143	97.8	94.2	78.7	36.6	105	298	336	313	162	30.0	25.6	143

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.09	0.09	0.10	0.07	0.07	0.13	4.90	1.77	0.66	0.81	0.44	0.50	9.63
1952	.44	.35	.31	.20	.28	1.24	2.55	.62	.32	.47	.14	.13	7.05
1953	.08	.07	.09	.08	.08	.85	.66	.68	.52	.68	.58	.13	5.69
1954	.08	.09	.12	.06	.12	.16	.23	.70	1.90	.51	.18	.18	4.33
1955	.43	.24	.18	.11	.12	.58	.63	.23	.67	.44	.07	.05	3.75
1956	.06	.07	.05	.06	.06	.42	.83	.46	.17	.11	.22	.07	2.58
1957	.07	.08	.07	.04	.07	.18	.13	.42	.59	.37	.18	.10	2.30
1958	.08	.13	.13	.09	.08	.20	.64	.20	.09	.06	.04	.03	1.77
1959	.06	.03	.01	.004	.001	.10	.68	.64	.68	.58	.32	.31	3.42
1960	.55	.36	.36	.30	.13	.40	1.11	1.29	1.16	.62	.12	.10	6.50

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches		Mean	Runoff in inches
		Discharge	Date							
1950	-	-	-	-	-	-	-	-	91.4	4.14
1951	1208	2,430	Apr. 10, 1951	14	213	0.710	9.63	233	10.45	
1952	1238	1,470	Apr. 2, 1952	18	155	.517	7.05	136	6.17	
1953	1278	1,060	Aug. 4, 1953	8.0	126	.420	5.69	127	5.76	
1954	1338	1,360	June 22, 1954	10	95.8	.319	4.33	108	4.89	
1955	1388	502	June 4, 1955	11	83.1	.277	3.75	68.3	3.08	
1956	1438	800	Apr. 1, 1956	8.0	57.2	.191	2.58	58.0	2.62	
1957	1508	655	May 29, 1957	7.0	50.5	.168	2.30	53.2	2.42	
1958	1558	348	Apr. 6, 1958	5.3	38.9	.130	1.77	35.7	1.53	
1959	1628	655	May 31, 1959	.3	75.7	.252	3.42	102	4.58	
1960	1708	800	Mar. 30, 1960	14	143	.477	6.50	-	-	

4595. Winnebago River at Mason City, Iowa
(Formerly published as Lime Creek at Mason City)

Location--Lat 43°10'00", long 93°11'40", in NE¹/₄ sec.3, T.96 N., R.20 W., on right bank 650 ft upstream from Thirteenth Street Bridge in Mason City and 1.0 mile upstream from Willow Creek.

Drainage area--526 sq mi.

Records available--October 1932 to September 1960. Monthly discharge only for some periods, published in WSP 1308. Prior to October 1959, published as Lime Creek at Mason City.

Gage--Water-stage recorder. Concrete control since Nov. 6, 1934. Datum of gage is 1,069.59 ft above mean sea level, datum of 1929. Prior to Oct. 15, 1934, wire-weight gage at datum 6.47 ft lower. Oct. 15 to Nov. 6, 1934, staff gage at different datum, and Nov. 7, 1934, to Mar. 22, 1935, staff gage at present datum.

Average discharge--28 years (1932-60), 201 cfs.

Extremes--1932-60: Maximum discharge, 10,800 cfs Mar. 30, 1933 (gage height, 15.7 ft, present datum); minimum daily, 2.5 cfs Dec. 29-31, 1933, Aug. 8, 1934.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	29.0	20.4	16.5	17.8	203	325	2,588	693	637	531	307	250	466
1952	194	138	103	61.1	245	830	863	234	199	154	60.8	58.0	261
1953	32.1	29.1	26.7	27.2	29.5	294	277	294	169	122	355	38.5	141
1954	27.5	35.3	36.9	13.7	36.3	68.5	95.3	246	1,270	303	319	127	214
1955	271	133	86.0	53.0	50.2	295	253	94.5	581	380	39.1	25.3	189
1956	24.6	22.0	12.9	12.9	15.0	220	242	156	77.5	117	212	41.0	96.4
1957	27.7	27.8	27.9	16.4	28.4	92.7	61.0	258	234	102	48.1	32.2	80.0
1958	26.9	41.7	49.3	34.9	67.9	81.0	137	63.9	131	76.0	24.9	17.1	62.4
1959	16.8	19.3	13.3	9.73	7.50	175	164	583	394	182	321	247	176
1960	245	212	226	159	66.9	232	369	313	267	131	78.0	64.8	197

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.06	0.04	0.04	0.04	0.40	0.71	5.49	1.52	1.35	1.16	0.67	0.53	12.01
1952	.43	.29	.23	.13	.50	1.82	1.83	.51	.42	.34	.13	.12	6.75
1953	.07	.06	.06	.06	.06	.64	.59	.62	.36	.27	.78	.08	3.65
1954	.06	.07	.08	.03	.07	.15	.20	.54	2.69	.66	.70	.27	5.52
1955	.59	.28	.19	.12	.10	.65	.54	.21	1.23	.83	.09	.05	4.88
1956	.05	.05	.03	.03	.03	.48	.51	.34	.16	.26	.46	.09	2.49
1957	.06	.06	.06	.04	.06	.20	.13	.56	.50	.22	.11	.07	2.07
1958	.06	.09	.11	.08	.13	.18	.29	.14	.28	.17	.05	.04	1.62
1959	.04	.04	.03	.02	.01	.38	.35	1.28	.83	.33	.70	.52	4.53
1960	.54	.45	.49	.35	.14	.51	.78	.69	.57	.29	.17	.14	5.12

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	124	3.21
1951	1208	7,560	Apr. 7, 1951	9.6	466	0.886	12.01	497	12.82
1952	1238	4,360	Mar. 30, 1952	32	261	.496	6.75	232	5.99
1953	1278	1,750	Aug. 3, 1953	11	141	.268	3.65	142	3.67
1954	1338	7,060	June 21, 1954	7.6	214	.407	5.52	247	6.37
1955	1388	2,330	June 3, 1955	11	189	.359	4.88	153	3.95
1956	1438	1,360	Apr. 1, 1956	8.7	96.4	.183	2.49	98.5	2.54
1957	1508	1,090	May 30, 1957	13	80.0	.152	2.07	82.9	2.15
1958	1558	955	June 4, 1958	12	62.4	.119	1.62	56.7	1.47
1959	1628	3,040	May 21, 1959	6.5	176	.355	4.53	230	5.90
1960	1708	2,320	Mar. 26, 1960	32	197	.375	5.12	-	-

4605. Shell Rock River at Marble Rock, Iowa

Location.--Lat 42°58'00", long 92°52'15", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.8, T.94 N., R.17 W., on left wing-wall above dam at Marble Rock, 1.1 miles upstream from Ackley Creek and 9.5 miles downstream from Lime Creek.

Drainage area.--1,318 sq mi. Prior to October 1942, 1,357 sq mi at site at Greene.

Records available.--July 1933 to September 1953. Published as "at Greene" July 1933 to September 1942.

Gage.--Staff gage. Since Oct. 1, 1942, concrete control. Datum of gage is 961.17 ft above mean sea level, datum of 1929. Prior to Oct. 1, 1942, staff or wire-weight gage in tailrace of powerplant at Greene, 5.7 miles downstream at different datum. Oct. 1, 1942, to Mar. 12, 1945, and June 6, 1946, to June 19, 1950, water-stage recorder and Mar. 13, 1945, to June 5, 1946, staff gage, all at described site and datum.

Average discharge.--20 years (1933-53), 612 cfs.

Extremes.--1933-53: Maximum discharge, 22,700 cfs Apr. 7, 1951 (gage height, 9.35 ft); minimum daily, 6 cfs Jan. 20, 23, 30, 31, 1935.

Remarks.--Flow regulated by powerplant at station prior to 1943.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	147	84.1	71.1	78.7	649	863	6,465	1,963	1,884	1,375	859	657	1,252
1952	569	437	322	241	531	1,698	2,564	700	568	572	195	182	697
1953	116	105	94.9	94.1	108	768	759	825	465	453	1,180	140	429

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.13	0.07	0.06	0.07	0.51	0.75	5.47	1.72	1.59	1.20	0.75	0.56	12.88
1952	.50	.37	.28	.21	.45	1.49	2.00	.61	.48	.50	.17	.15	7.19
1953	.10	.09	.08	.08	.09	.67	.64	.72	.39	.40	1.05	.12	4.41

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	395	4.08
1951	1208	22,700	Apr. 7, 1951	45	1,252	0.950	12.88	1,338	13.77
1952	1258	8,190	Mar. 30, 1952	122	697	.529	7.19	612	6.31
1953	1278	4,630	Aug. 4, 1953	40	429	.325	4.41	-	-

4620. Shell Rock River at Shell Rock, Iowa

Location.--Lat 42°42'50", long 92°34'55", in NW¼NE¼ sec.11, T.91 N., R.15 W., on right bank 400 ft upstream from bridge on State Highway 3 in Shell Rock and 11 miles upstream from mouth.

Drainage area.--1,746 sq mi.

Records available.--June 1953 to September 1960.

Gage.--Water-stage recorder. Rockfill dam since Oct. 19, 1957. Datum of gage is 885.34 ft above mean sea level, datum of 1929.

Average discharge.--7 years (1953-60), 476 cfs.

Extremes.--1953-60: Maximum discharge, 21,300 cfs June 22, 1954 (gage height, 14.00 ft); minimum daily, 39 cfs Feb. 4-9, 1959.

Flood in 1856 reached a stage of 17.7 ft at bridge 400 ft downstream, from information furnished by Corps of Engineers (discharge not determined).

Remarks.--Diurnal fluctuation at low stages caused by powerplant at Greene. Records of water temperatures for the period June 1953 to September 1960 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	\$548	524	1,299	209	-
1954	186	192	197	124	190	215	307	779	5,612	1,018	998	536	695
1955	880	492	339	251	360	830	775	386	915	799	173	123	528
1956	138	123	89.4	91.7	105	406	721	467	217	241	439	154	266
1957	120	124	103	93.1	146	303	226	520	738	346	199	156	257
1958	147	195	213	168	211	302	557	243	351	203	128	98.3	234
1959	93.4	98.1	55.3	44.6	44.7	1,137	714	1,022	1,204	675	702	779	550
1960	735	698	682	546	513	1,077	1,486	1,595	1,108	606	368	418	804

* Not previously published; partly estimated on basis of records for nearby stations.

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	\$0.35	0.35	0.86	0.13	-
1954	0.12	0.12	0.13	0.08	0.11	0.14	0.20	0.51	2.31	.87	.66	.34	5.39
1955	.58	.31	.22	.17	.21	.55	.50	.25	.58	.53	.11	.08	4.09
1956	.09	.08	.06	.06	.06	.27	.46	.31	.14	.16	.28	.10	2.08
1957	.08	.08	.07	.06	.09	.20	.14	.34	.47	.23	.13	.10	1.99
1958	.10	.12	.14	.11	.13	.20	.36	.16	.22	.13	.08	.06	1.81
1959	.06	.06	.04	.03	.03	.75	.46	.67	.77	.45	.46	.50	4.28
1960	.49	.45	.04	.36	.19	.71	.95	1.05	.71	.40	.24	.27	6.27

* Not previously published; see footnote to preceding table.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-
1953	1278	84,720	Aug. 4, 1953	b110	95	695	0.398	5.39	791
1954	1358	21,300	June 22, 1954	95	85	528	.302	4.09	413
1955	1388	2,640	June 5, 1955	85	71	266	.152	2.08	266
1956	1438	2,800	Apr. 2, 1956	65	257	.147	1.99	274	2.12
1957	1508	2,200	May 30, 31, 1957	58	234	.134	1.81	208	1.61
1958	1558	1,650	June 4, 1958	39	550	.315	4.28	707	5.51
1959	1628	7,630	Mar. 27, 1959	110	804	.460	6.27	-	-
1960	1708	10,100	Mar. 30, 1960						

a Maximum during period June to September.

b Minimum day during period June to September.

4630. Beaver Creek at New Hartford, Iowa

Location.--Lat 42°34'20", long 92°36'55", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.28, T.90 N., R.15 W., on down-stream side of center bridge pier on highway bridge, a quarter of a mile north of New Hartford, and 8 miles upstream from mouth.

Drainage area.--347 sq mi.

Records available.--October 1945 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 881.30 ft above mean sea level, datum of 1929. Prior to July 14, 1959, wire-weight gage at same site and datum.

Average discharge.--15 years (1945-60), 158 cfs.

Extremes.--1945-60: Maximum discharge, 18,000 cfs (revised) June 13, 1947 (gage height, 13.5 ft, revised, from graph based on gage readings), from rating curve extended above 7,300 cfs by logarithmic plotting; minimum daily, 2.3 cfs Jan. 20-24, 1956.

Revisions.--The maximum discharge for the water year 1947 published in WSP 1308 has been revised to 18,000 cfs (gage height, 13.5 ft).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	47.7	25.9	16.7	12.1	524	921	956	404	684	477	606	243	408
1952	250	183	123	171	310	460	399	177	129	120	42.6	21.9	198
1953	20.6	24.6	18.1	19.4	118	274	191	169	178	159	157	21.3	113
1954	17.7	20.4	20.7	10.4	21.1	28.1	35.8	95.5	371	55.2	70.6	38.7	65.1
1955	112	49.2	29.7	19.7	99.6	106	107	67.1	32.6	89.3	13.6	8.27	61.0
1956	22.0	12.8	7.43	2.88	3.84	77.9	46.0	44.6	12.5	4.47	8.59	17.1	21.8
1957	4.98	8.80	9.64	6.57	17.6	44.8	34.0	105	117	37.6	23.6	15.4	35.5
1958	17.3	31.1	41.8	28.5	45.3	55.3	151	34.2	114	198	112	52.9	73.6
1959	23.4	24.8	11.3	7.07	5.32	1,053	203	128	156	233	160	93.5	177
1960	94.6	223	159	142	91.8	510	778	726	206	80.5	91.6	211	276

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.16	0.08	0.06	0.04	1.57	3.06	3.07	1.34	2.20	1.59	2.01	0.76	15.96
1952	.83	.59	.41	.57	.96	1.53	1.28	.59	.41	.40	.14	.07	7.78
1953	.07	.08	.06	.06	.36	.91	.61	.56	.57	.53	.52	.07	4.40
1954	.06	.07	.07	.03	.06	.09	.11	.32	1.19	.18	.23	.12	2.53
1955	.37	.16	.10	.07	.30	.35	.34	.22	.10	.30	.05	.03	2.39
1956	.07	.04	.02	.01	.01	.26	.15	.15	.04	.01	.03	.05	.84
1957	.02	.03	.03	†.02	.05	.15	.11	.35	.38	.13	.08	.05	1.40
1958	.06	.10	.14	.09	.14	.18	.49	.11	.37	.66	.37	.17	2.88
1959	.08	.08	.04	.02	.02	3.50	.65	.43	.50	.77	.53	.30	6.92
1960	.31	.72	.53	.47	.29	1.70	2.50	2.41	.66	.27	.30	.66	10.84

† Corrected.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean
		Discharge	Date					
1950	-	-	-	-	-	-	-	176
1951	1208	11,600	Mar. 29, 1951	5.9	408	1.18	15.96	447
1952	1238	1,510	Apr. 1, 1952	17	198	.571	7.78	157
1953	1278	1,720	Aug. 5, 1953	15	113	.326	4.40	112
1954	1338	1,990	June 17, 1954	5.8	65.1	.188	2.53	76.2
1955	1388	510	July 11, 1955	6.4	61.0	.176	2.39	48.4
1956	1438	200	Mar. 21, 1956	2.3	21.8	.063	.84	20.2
1957	1508	1,160	May 31, 1957	3.5	35.5	.102	1.40	41.1
1958	1558	1,560	July 16, 1958	9.8	73.6	.212	2.88	71.0
1959	1628	6,250	Mar. 21, 1959	5.0	177	.510	6.92	212
1960	1708	11,200	Mar. 30, 1960	35	276	.795	10.84	-

4635. Blackhawk Creek at Hudson, Iowa

Location.--Lat 42°24'30", long 92°27'45", in SW¼NE¼ sec.27, T.88 N., R.14 W., on left bank 35 ft downstream from bridge on State Highway 58 and 0.2 mile northwest of Chicago Great Western Railway tracks in the west edge of Hudson.

Drainage area.--303 sq mi.

Records available.--April 1952 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 865.03 ft above mean sea level, datum of 1929.

Average discharge.--8 years (1952-60), 106 cfs.

Extremes.--1952-60: Maximum discharge, 9,000 cfs Mar. 31, 1960 (gage height, 16.93 ft, backwater from ice); minimum daily, 1.9 cfs Jan. 21-23, July 30, 1958.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	302	188	173	53.2	25.1	13.8	-
1953	12.8	14.0	13.2	26.3	211	195	173	149	261	232	70.3	16.0	114
1954	13.5	14.2	17.5	9.54	16.2	15.9	47.7	162	389	46.5	129	60.4	76.7
1955	156	62.4	39.3	30.7	132	138	116	69.8	39.4	71.5	9.80	7.20	72.3
1956	9.25	7.45	5.05	2.34	3.07	38.8	20.5	34.9	10.2	9.38	26.9	52.7	18.4
1957	10.4	8.95	9.58	17.4	56.7	32.5	23.6	155	319	75.0	149	64.1	76.6
1958	37.4	59.0	92.2	55.5	55.2	67.0	154	46.4	250	349	158	62.2	116
1959	41.5	55.0	25.2	17.5	14.8	1,026	188	126	83.3	128	51.9	27.0	150
1960	29.4	78.8	79.2	163	70.5	357	892	599	263	104	43.7	57.4	228

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	1.11	0.71	0.64	0.20	0.10	0.05	-
1953	0.05	0.05	0.05	0.10	0.73	0.74	.64	.57	.96	.88	.27	.06	5.10
1954	.05	.05	.07	.04	.06	.06	.18	.62	1.43	.18	.49	.22	3.45
1955	.59	.23	.15	.12	.45	.52	.43	.27	.15	.27	.04	.03	3.25
1956	.04	.03	.02	.009	.01	.15	.08	.13	.04	.04	.10	.19	.84
1957	.04	.03	.04	.07	.19	.12	.09	.59	1.17	.29	.57	.24	3.44
1958	.14	.22	.35	.21	.19	.25	.57	.18	.92	1.33	.60	.23	5.19
1959	.16	.20	.10	.07	.05	3.90	.69	.48	.31	.49	.20	.10	6.75
1960	.11	.29	.30	.62	.25	1.36	3.29	2.28	.97	.40	.17	.21	10.25

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year			
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches		
		Discharge	Date								
1950	-	-	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-	-	-
1952	1238	a900	Apr. 1, 1952	b10	-	-	-	-	-	-	-
1953	1278	2,100	July 7, 1953	11	114	0.376	5.10	114	5.12	4.25	4.25
1954	1338	2,040	June 11, 1954	4.3	76.7	.253	3.45	94.6	4.25	4.25	4.25
1955	1388	830	Mar. 3, 1955	3.2	72.3	.239	3.25	52.4	2.37	2.37	2.37
1956	1438	421	Sept. 6, 1956	1.9	18.4	.061	.84	19.0	.86	.86	.86
1957	1508	2,490	May 30, 1957	3.3	76.6	.253	3.44	90.0	4.04	4.04	4.04
1958	1558	2,450	July 16, 1958	18	116	.383	5.19	110	4.94	4.94	4.94
1959	1628	8,750	Mar. 27, 1959	13	150	.495	6.75	156	6.99	6.99	6.99
1960	1708	9,000	Mar. 31, 1960	19	228	.752	10.75	-	-	-	-

a Maximum during period April to September.

b Minimum day during period April to September.

4640. Cedar River at Waterloo, Iowa

Location.--Lat 42°29'40", long 92°20'00", in NW¹/₄ NW¹/₄ sec. 25, T.89 N., R.13 W., on left bank at foot of East Seventh Street, 0.3 mile upstream from Eleventh Avenue Bridge in Waterloo, and 1 mile downstream from Blackhawk Creek.

Drainage area.--5,146 sq mi.

Records available.--October 1940 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 824.09 ft above mean sea level, datum of 1929.

Average discharge.--20 years (1940-60), 2,425 cfs.

Extremes.--1940-60: Maximum discharge, 56,400 cfs Apr. 9, 1951 (gage height, 18.83 ft); minimum daily, 152 cfs Jan. 28, 1959.

Flood of Mar. 16, 1929, reached a stage of about 20 ft, determined by Corps of Engineers, from information by city of Waterloo (discharge, 65,000 cfs). Flood of Apr. 2, 1933, reached a stage about 0.5 ft lower than Mar. 16, 1929, from information by city of Waterloo (discharge, 61,000 cfs).

Remarks.--Slight diurnal fluctuation at low flow caused by powerplant above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	733	527	401	393	2,206	6,686	20,720	7,386	8,039	6,556	4,402	3,052	5,081
1952	2,635	2,161	1,588	1,620	3,115	6,005	9,344	3,196	2,720	2,447	1,206	819	3,064
1953	648	613	559	545	1,507	3,187	2,989	3,151	2,754	2,500	4,575	957	2,005
1954	703	682	630	395	609	760	1,085	2,660	9,810	2,412	2,276	1,452	1,954
1955	2,434	1,429	970	758	1,198	2,615	2,224	1,269	1,626	1,534	491	357	1,413
1956	477	413	276	258	292	1,084	2,027	1,342	692	620	837	555	740
1957	366	414	373	313	593	1,047	741	1,198	2,368	1,119	695	557	812
1958	438	592	653	540	706	1,052	1,520	808	1,219	1,219	755	559	834
1959	404	417	296	252	188	5,353	3,127	2,098	3,293	2,587	1,880	1,955	1,826
1960	1,791	2,083	1,915	1,945	1,144	3,460	7,045	6,421	3,349	1,867	1,139	1,452	2,805

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.16	0.11	0.09	0.09	0.45	1.50	4.49	1.85	1.74	1.47	0.99	0.68	13.40
1952	.59	.47	.56	.36	.65	1.35	2.03	.72	.59	.55	.27	.18	8.12
1953	.15	.13	.13	.12	.30	.71	.65	.71	.60	.56	1.02	.21	5.29
1954	.16	.15	.14	.09	.12	.17	.24	.60	2.13	.54	.51	.32	5.17
1955	.55	.31	.22	.17	.24	.59	.48	.28	.35	.34	.11	.08	3.72
1956	.11	.09	.06	.06	.06	.24	.44	.30	.15	.14	.19	.12	1.96
1957	.08	.09	.08	.07	.12	.23	.16	.27	.51	.25	.16	.13	2.15
1958	.10	.13	.15	.12	.14	.24	.33	.18	.26	.27	.17	.11	2.20
1959	.09	.09	.07	.06	.04	1.20	.68	.47	.71	.58	.42	.41	4.82
1960	.40	.45	.43	.44	.24	.78	1.53	1.44	.73	.42	.26	.32	7.44

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	1,970	5.19
1951	1208	56,400	Apr. 9, 1951	298	5,081	0.987	13.40	5,477	14.46
1952	1238	28,000	Apr. 2, 1952	561	3,064	.595	8.12	2,661	7.11
1953	1278	19,800	Aug. 7, 1953	350	2,005	.390	5.29	2,021	5.33
1954	1338	49,400	June 23, 1954	300	1,954	.380	5.17	2,191	5.80
1955	1388	6,590	Mar. 14, 1955	342	1,413	.275	3.72	1,104	2.90
1956	1438	5,920	Apr. 4, 1956	205	740	.144	1.96	739	1.95
1957	1508	7,680	May 31, 1957	230	818	.159	2.15	862	2.28
1958	1558	4,320	July 17, 1958	310	834	.162	2.20	787	2.07
1959	1628	24,700	Mar. 28, 1959	152	1,826	.355	4.82	2,218	5.85
1960	1708	48,100	Mar. 31, 1960	704	2,805	.545	7.44	-	-

4645. Cedar River at Cedar Rapids, Iowa

Location.--Lat 41°58'20", long 91°40'05", in SE¼NW¼ sec.28, T.83 N., R.7 W., on right bank 500 ft upstream from Eighth Avenue Bridge in Cedar Rapids, 2.7 miles upstream from Prairie Creek, and at mile 109.0.

Drainage area.--6,510 sq mi.

Records available.--October 1902 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 700.33 ft above mean sea level, datum of 1929. Prior to Aug. 20, 1920, staff gage at same site and datum.

Average discharge.--58 years (1902-60), 3,021 cfs.

Extremes.--1902-60: Maximum discharge, 64,000 cfs Mar. 18, 1929 (gage height, 20.0 ft); minimum, 53 cfs Jan. 6, 1950, caused by construction operations upstream; minimum daily, 212 cfs Dec. 10, 1949.

Flood in June 1851 reached a stage of about 20 ft (discharge, 65,000 cfs, estimated).

Remarks.--Diurnal fluctuation at low stages caused by powerplant half a mile above station. Records of chemical analyses for the periods September 1906 to September 1907, January 1944 to September 1954; suspended sediment loads for the period October 1943 to September 1954; and water temperatures, are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	985	648	543	480	2,421	9,000	23,490	10,440	8,745	10,090	5,318	4,054	6,352
1952	3,647	3,079	2,210	3,031	4,197	7,973	11,020	4,362	3,451	2,880	1,472	1,016	4,020
1953	769	782	701	737	2,622	4,173	3,627	4,025	3,346	3,016	4,581	973	2,447
1954	714	753	714	492	747	848	1,292	3,308	9,700	3,242	2,693	2,037	2,210
1955	3,152	1,800	1,258	1,008	1,716	3,287	2,926	1,911	1,898	1,858	598	527	1,830
1956	805	520	351	323	366	1,039	2,341	1,862	895	758	1,208	915	951
1957	509	506	472	417	798	1,114	1,045	1,138	4,195	1,462	1,092	869	1,448
1958	603	801	877	696	778	1,619	1,943	1,059	1,986	1,834	1,243	885	1,195
1959	577	627	399	332	446	8,735	5,155	2,902	3,767	3,694	2,114	2,152	2,589
1960	2,309	3,038	2,498	4,484	2,184	2,719	13,270	10,280	4,799	2,953	1,426	1,815	4,311

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.17	0.11	0.10	0.09	0.39	1.59	4.03	1.85	1.50	1.79	0.94	0.69	13.25
1952	.65	.53	.39	.34	.70	1.41	1.89	.77	.59	.51	.26	.17	8.41
1953	.14	.13	.12	.13	.42	.74	.62	.71	.57	.53	.81	.17	5.09
1954	.13	.13	.13	.09	.12	.15	.22	.59	1.66	.57	.48	.35	4.62
1955	.56	.31	.22	.18	.27	.58	.50	.34	.33	.33	.11	.09	3.82
1956	.11	.09	.06	.06	.06	.18	.40	.33	.15	.13	.21	.16	1.94
1957	.09	.09	.08	.07	.13	.20	.18	.29	.72	.26	.19	.15	2.45
1958	.11	.14	.16	.12	.12	.29	.33	.19	.54	.32	.22	.15	2.49
1959	.10	.11	.07	.06	.07	1.55	.98	.51	.65	.65	.37	.37	5.39
1960	.41	.52	.44	.79	.36	.48	2.27	1.82	.82	.52	.25	.31	8.99

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	2,704	5.65
1951	1208	54,100	Apr. 11, 1951	300	6,352	0.976	13.25	6,920	14.44
1952	1238	27,000	Apr. 5, 1952	766	4,020	.618	8.41	3,461	7.23
1953	1278	15,200	Aug. 10, 1953	450	2,447	.376	5.09	2,441	5.09
1954	1338	41,400	June 26, 1954	320	2,210	.339	4.62	2,550	5.32
1955	1388	8,100	Mar. 5, 1955	374	1,830	.281	3.82	1,431	2.99
1956	1438	5,400	Apr. 8, 1956	280	931	.143	1.94	932	1.94
1957	1508	9,900	June 20, 1959	304	1,176	.181	2.45	1,243	2.60
1958	1558	5,240	June 13, 1958	341	1,195	.184	2.49	1,138	2.36
1959	1628	25,800	Mar. 30, 1959	250	2,589	.398	5.39	3,112	6.48
1960	1708	55,100	Apr. 2, 1960	1,020	4,311	.662	8.99	-	-

4650. Cedar River near Conesville, Iowa

Location.--Lat 41°24'30", long 91°17'15", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 2, T.76 N., R.4 W., on left bank 150 ft downstream from highway bridge, $\frac{3}{4}$ miles northeast of Conesville, 5.2 miles downstream from Wapsinonoc Creek, and at mile 10.5.

Drainage area.--7,785 sq mi.

Records available.--September 1939 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 581.95 ft above mean sea level, datum of 1929. Prior to Feb. 2, 1940, and Apr. 11, 1952, to July 1, 1954, wire-weight gage and Feb. 2, 1940, to Apr. 10, 1952, water-stage recorder, at same site and datum.

Average discharge.--21 years (1939-60), 3,837 cfs.

Extremes.--1939-60: Maximum discharge, 60,000 cfs June 18, 1947; maximum gage height, 15.60 ft Apr. 4, 1960; minimum daily discharge, 250 cfs Nov. 28, 1955, result of freezeup.

Maximum stage known since at least 1900, 15.8 ft in March 1929, from information by local residents to Corps of Engineers.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,256	837	593	632	3,377	9,662	24,440	12,340	8,649	12,080	5,046	4,761	6,973
1952	4,019	4,132	2,540	3,751	4,934	10,440	12,310	5,590	4,654	3,559	1,966	1,270	4,923
1953	920	1,250	1,056	1,196	4,999	5,249	4,672	5,171	4,083	3,830	4,927	1,272	3,209
1954	809	859	872	607	902	1,056	1,644	4,356	10,160	4,748	3,083	2,654	2,647
1955	4,284	2,321	1,570	1,419	3,040	4,353	4,264	2,936	2,365	2,193	832	620	2,514
1956	717	590	449	420	739	1,129	2,714	2,449	1,158	827	1,717	1,207	1,176
1957	599	592	549	530	929	1,204	1,244	1,699	5,076	1,784	1,453	1,176	1,400
1958	778	985	1,086	930	1,183	2,322	2,252	1,278	2,668	2,365	1,744	1,253	1,571
1959	768	871	536	468	1,823	10,850	8,700	4,443	4,612	5,040	2,378	2,382	3,581
1960	3,190	3,808	3,029	6,299	2,627	3,321	17,580	13,150	7,316	4,437	1,864	2,087	5,721

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.19	0.12	0.09	0.09	0.45	1.43	3.50	1.83	1.24	1.79	0.75	0.68	12.16
1952	.60	.59	.38	.56	.68	1.55	1.76	.83	.67	.53	.29	.18	8.62
1953	.14	.18	.16	.18	.67	.78	.67	.77	.59	.57	.73	.16	5.62
1954	.12	.12	.13	.09	.12	.16	.24	.65	1.46	.70	.46	.36	4.63
1955	.63	.33	.23	.21	.41	.64	.61	.43	.34	.32	.12	.08	4.36
1956	.11	.08	.07	.06	.10	.17	.39	.36	.17	.12	.25	.17	2.05
1957	.09	.08	.08	.08	.12	.18	.18	.25	.73	.26	.22	.17	2.44
1958	.12	.14	.16	.14	.16	.34	.32	.19	.38	.35	.26	.18	2.74
1959	.11	.12	.08	.07	.24	1.61	1.25	.66	.66	.75	.35	.34	6.24
1960	.47	.55	.45	.93	.36	.49	2.52	1.95	1.05	.66	.28	.30	10.01

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	3,430	5.99
1951	1208	54,100	Apr. 13, 1951	400	6,973	0.896	12.16	7,644	13.33
1952	1238	23,700	Apr. 7, 1952	920	4,923	.632	8.62	4,299	7.53
1953	1278	22,400	Feb. 21, 1953	650	3,209	.412	5.62	3,151	5.51
1954	1338	36,600	June 28, 1954	450	2,647	.340	4.63	3,122	5.45
1955	1368	10,700	Oct. 11, 1954	432	2,514	.323	4.36	1,973	3.43
1956	1438	1708	Apr. 3, 1956	250	1,176	.151	2.05	1,175	2.04
1957	1508	9,950	June 21, 1957	370	1,400	.180	2.44	1,493	2.61
1958	1558	7,800	June 14, 1958	430	1,571	.202	2.74	1,514	2.63
1959	1628	26,100	Apr. 1, 1959	400	3,581	.460	6.24	4,240	7.40
1960	1708	58,800	Apr. 4, 1960	1,360	5,721	.735	10.01	-	-

4655. Iowa River at Wapello, Iowa

Location.--Lat 41°10'40", long 91°10'55", in NW¹/₄SE¹/₄ sec.27, T.74 N., R.3 W., on right bank 30 ft downstream from bridge on State Highway 99 at east edge of Wapello, 13.0 miles downstream from Cedar River, and at mile 15.4.

Drainage area.--12,499 sq mi.

Records available.--October 1914 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 548.98 ft above mean sea level, adjustment of 1912. Prior to Apr. 16, 1934, chain gage at same site and datum.

Average discharge.--46 years (1914-60), 6,055 cfs.

Extremes.--1914-60: Maximum discharge, 94,000 cfs June 18, 1947 (gage height, 16.14 ft); maximum gage height, 17.02 ft Apr. 5, 1960, before levees broke downstream from gage; minimum daily discharge, 300 cfs Nov. 28, 1955, result of freezeup.

Remarks.--High flows regulated by Coralville Flood Control Reservoir (capacity, 492,000 acre-ft) since Sept. 17, 1958.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,594	1,016	769	842	6,607	14,280	37,200	20,660	16,450	19,370	7,847	7,408	11,160
1952	6,424	7,521	4,109	6,748	8,086	19,800	18,170	9,310	9,020	5,696	2,582	1,663	8,170
1953	1,301	1,915	1,636	2,004	9,679	9,166	8,236	8,916	7,072	5,874	5,515	1,498	5,204
1954	1,008	1,048	1,056	760	1,131	1,327	2,231	5,598	13,120	7,589	4,011	4,861	3,647
1955	7,119	3,539	2,346	2,168	4,746	6,651	7,778	4,899	3,150	2,935	1,094	826	3,932
1956	1,016	774	604	503	1,034	1,652	3,248	3,089	1,522	1,433	2,851	2,008	1,645
1957	718	872	773	853	2,006	1,916	1,967	2,550	8,050	3,352	2,358	1,773	2,259
1958	1,003	1,410	1,675	1,418	1,757	3,528	3,155	2,025	5,218	5,428	4,009	3,790	2,871
1959	1,672	1,759	1,008	830	3,816	19,060	17,760	9,905	8,168	7,708	2,879	2,807	6,456
1960	4,887	6,079	5,215	13,600	5,274	5,353	32,700	22,470	15,200	7,363	4,054	2,683	10,390

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.15	0.09	0.07	0.08	0.55	1.32	3.32	1.91	1.47	1.79	0.72	0.66	12.13
1952	.59	.67	.38	.62	.70	1.83	1.62	.86	.72	.53	.24	.15	8.91
1953	.12	.17	.15	.18	.81	.85	.74	.82	.63	.54	.51	.13	5.65
1954	.09	.09	.10	.07	.09	.12	.20	.52	1.17	.70	.37	.43	3.95
1955	.66	.32	.22	.20	.40	.61	.69	.45	.28	.27	.10	.07	4.27
1956	.09	.07	.06	.05	.09	.15	.29	.28	.14	.13	.26	.18	1.79
1957	.07	.08	.07	.08	.17	.18	.18	.24	.72	.31	.22	.16	2.48
1958	.09	.13	.15	.13	.15	.33	.28	.19	.47	.50	.37	.34	3.13
1959	.15	.16	.09	.08	.32	1.76	1.59	.91	.73	.71	.27	.25	7.02
1960	.45	.54	.48	1.25	.46	.49	2.92	2.07	1.36	.68	.37	.24	11.31

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	5,562	6.04
1951	1208	67,000	Apr. 14, 1951	580	11,160	0.893	12.13	12,390	13.46
1952	1238	41,500	Mar. 14, 1952	1,340	8,170	.654	8.91	7,068	7.71
1953	1278	32,800	Feb. 23, 1953	1,080	5,204	.416	5.65	5,059	5.49
1954	1338	40,800	June 29, 1954	580	3,647	.292	3.95	4,481	4.87
1955	1388	23,000	Apr. 25, 1955	700	3,932	.315	4.27	3,059	3.29
1956	1438,1708	9,340	Sept. 1, 1956	300	1,645	.132	1.79	1,642	1.79
1957	1508	14,200	June 22, 1957	540	2,259	.181	2.48	2,404	2.63
1958	1558	13,000	Feb. 27, 1958	700	2,871	.230	3.13	2,900	3.16
1959	1628	37,200	Mar. 22, 1959	660	6,456	.517	7.02	7,441	8.09
1960	1708	69,000	Apr. 5, 1960	1,920	10,590	.831	11.31	-	-

4660. Edwards River near Orion, Ill.

Location.--Lat 41°16'20", long 90°22'40", in NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.21, T.15 N., R.1 E., on left bank at downstream side of bridge on U.S. Highway 150, 1.5 miles north of Opheim and 5.5 miles south of Orion.

Drainage area.--163 sq mi.

Records available.--October 1940 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 653.96 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark). Prior to Apr. 4, 1941, wire-weight gage at same site and datum.

Average discharge.--20 years (1940-60), 97.7 cfs.

Extremes.--1940-60: Maximum discharge, 8,910 cfs Feb. 19, 1951 (gage height, 13.41 ft); minimum, 0.3 cfs Oct. 6, 1956.

Flood in August 1924 reached a stage of 20.2 ft, from floodmarks.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	12.9	7.74	4.8	40.6	871	117	240	431	125	259	146	73.2	189
1952	105	173	72.8	220	130	394	233	121	138	87.2	28.2	5.79	142
1953	4.23	8.78	16.8	12.1	104	75.5	70.2	65.7	70.2	215	13.5	3.71	54.8
1954	3.54	4.05	5.46	4.38	15.4	71.8	152	67.3	161	18.7	47.4	9.26	46.6
1955	266	69.9	66.5	185	284	137	285	112	241	42.2	15.1	4.75	141
1956	49.7	14.5	8.85	6.65	184	13.8	11.3	26.9	12.1	44.4	24.0	2.13	31.1
1957	.93	5.82	4.79	10.4	35.3	42.6	175	84.3	49.0	33.0	8.14	3.78	40.8
1958	5.54	8.26	54.4	28.5	159	108	67.5	55.5	493	73.3	53.6	21.8	92.9
1959	11.1	8.41	3.35	3.09	216	105	83.4	103	41.0	64.0	12.2	7.36	53.7
1960	127	83.7	124	218	100	300	450	214	231	57.5	54.6	15.9	165

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.09	0.05	0.03	0.29	5.57	0.83	1.64	3.05	0.86	1.83	1.04	0.50	15.78
1952	.74	1.18	.51	1.56	.86	2.79	1.59	.86	.95	.82	.20	.04	11.90
1953	.03	.06	.12	.09	.66	.53	1.48	.46	.48	1.52	.10	.03	4.56
1954	.03	.03	.04	.03	.10	.51	1.04	.48	1.10	.13	.34	.06	3.89
1955	1.88	.48	.47	1.31	1.81	.97	1.95	.79	1.65	.30	.11	.03	11.75
1956	.35	.10	.06	.05	1.09	.10	.08	.19	.08	.31	.17	.01	2.59
1957	.007	.04	.03	.07	.23	.30	1.20	.60	.61	.23	.06	.03	3.41
1958	.04	.06	.38	.20	1.02	.76	.46	.39	3.37	.52	.38	.15	7.73
1959	.08	.06	.02	.02	1.38	.74	.57	.73	.28	.45	.09	.05	4.47
1960	.90	.57	.88	1.55	.66	2.12	3.08	1.52	1.58	.41	.39	.11	13.77

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	106	8.80
1951	1208	8,910	Feb. 19, 1951	3.0	189	1.16	15.78	217	18.04
1952	1238	1,660	Mar. 11, 1952	3.4	142	1.871	11.90	116	9.68
1953	1278	5,000	July 6, 1953	2.0	54.8	.336	4.56	53.4	4.45
1954	1338	2,310	June 1, 1954	1.7	46.6	.286	3.89	79.4	6.62
1955	1388	4,040	Oct. 10, 1954	2.4	141	.865	11.75	113	9.43
1956	1438	3,100	Feb. 24, 1956	.5	31.1	.191	2.59	25.9	2.16
1957	1508	725	Apr. 4, 1957	.4	40.8	.250	3.41	45.6	3.81
1958	1558	4,200	June 10, 1958	1.6	92.9	.570	7.73	89.0	7.41
1959	1628	a2,000	Feb. 24, 1959	2.2	53.7	.329	4.47	80.0	6.66
1960	1708	3,550	Mar. 30, 1960	11	165	1.01	13.77	-	-

a About.

4665. Edwards River near New Boston, Ill.

Location.--Lat 41°11'15", long 90°58'05", at quarter corner between secs. 21 and 28, T.14 N., R.5 W., on left bank at downstream side of bridge on State Highway 17, 1½ miles northeast of New Boston and 5 miles upstream from mouth.

Drainage area.--434 sq mi.

Records available.--October 1934 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 529.92 ft above mean sea level, adjustment of 1912 (levels by Corps of Engineers). Prior to Mar. 1, 1941, wire-weight gage at same site and datum.

Average discharge.--26 years (1934-60), 249 cfs.

Extremes.--1934-60: Maximum discharge, 7,280 cfs Apr. 26, 1950, May 12, 1951; maximum gage height, 21.46 ft Oct. 13, 1954; minimum discharge, 5.2 cfs Sept. 30, 1956.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	45.4	35.1	22.9	89.7	1079	353	753	1,307	501	601	216	180	427
1952	193	333	159	555	325	1007	615	340	409	191	78.4	25.3	353
1953	17.4	27.5	45.0	30.5	304	178	207	171	145	324	37.9	13.5	124
1954	9.80	11.7	16.2	11.9	45.2	138	362	147	426	44.2	99.1	24.6	111
1955	778	166	162	529	601	397	802	317	450	105	36.9	19.4	362
1956	172	38.3	22.5	17.5	229	66.0	33.4	61.8	44.0	219	54.5	10.9	80.4
1957	7.12	12.0	11.5	16.8	51.6	79.3	369	171	176	82.7	23.6	11.5	83.9
1958	12.5	20.2	126	72.1	279	267	170	120	1,241	301	516	51.5	246
1959	35.2	32.0	14.8	15.7	643	293	237	258	172	171	79.7	39.9	163
1960	456	220	267	679	278	541	1,422	692	870	229	109	42.4	463

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.12	0.09	0.06	0.24	2.59	0.94	1.94	3.47	1.29	1.60	0.57	0.46	13.37
1952	.51	.86	.42	1.47	.81	2.68	1.58	.90	1.05	.51	.21	.07	11.07
1953	.05	.07	.12	.08	.73	.47	.53	.45	.37	.86	.10	.03	3.86
1954	.03	.03	.04	.03	.11	.37	.93	.39	1.09	.12	.26	.06	3.46
1955	2.07	.43	.43	1.41	1.44	1.05	2.06	.84	1.16	.28	.10	.05	11.32
1956	.46	.10	.06	.05	.57	.18	.09	.16	.11	.58	.14	.03	2.53
1957	.02	.03	.03	.04	.12	.21	.95	.45	.45	.22	.06	.03	2.61
1958	.03	.05	.33	.19	.67	.71	.44	.32	3.19	.80	.84	.13	7.70
1959	.09	.08	.04	.04	1.54	.78	.61	.69	.44	.45	.21	.10	5.07
1960	1.21	.57	.71	1.80	.69	1.44	3.66	1.84	2.24	.61	.29	.11	15.17

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	296	9.27
1951	1208	7,280	May 12, 1951	15	427	0.984	13.37	476	14.89
1952	1238	2,460	Mar. 14, 1952	17	353	.813	11.07	305	9.52
1953	1278	1,880	Feb. 20, 1953	10	124	.286	5.86	120	3.72
1954	1358	2,050	June 3, 1954	6.5	111	.286	5.48	201	6.29
1955	1388	7,020	Oct. 13, 1954	15	362	.834	11.32	288	9.01
1956	1438	2,540	July 8, 1956	5.8	80.4	.185	2.53	63.4	1.99
1957	1508	1,000	Apr. 6, 1957	6.5	83.9	.193	2.61	94.7	2.94
1958	1558	4,840	June 13, 1958	5.5	246	.567	7.70	240	7.50
1959	1628	3,500	Feb. 24, 1959	11	163	.376	5.07	235	7.35
1960	1708	6,250	Apr. 1, 1960	32	483	1.11	15.17	-	-

4670. Pope Creek near Keithsburg, Ill.

Location.--Lat 41°07'45", long 90°55'10", in SE $\frac{1}{4}$ sec.11, T.13 N., R.5 W., near center of span on downstream side of highway bridge, 2 miles northeast of Keithsburg and 3.3 miles upstream from mouth.

Drainage area.--171 sq mi.

Records available.--October 1934 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Wire-weight and crest-stage gages. Datum of gage is 524.07 ft above mean sea level, adjustment of 1912 (levels by Corps of Engineers).

Average discharge.--26 years (1934-60), 97.9 cfs.

Extremes.--1934-60: Maximum discharge, 4,230 cfs Mar. 12, 1939 (gage height, 26.24 ft); maximum gage height observed, 28.0 ft Feb. 21, 1937 (backwater from ice); minimum discharge, 0.6 cfs Oct. 1, 2, 1949.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	14.0	9.49	7.13	33.5	405	125	329	390	148	358	78.2	44.2	158
1952	63.6	96.8	51.4	200	108	401	252	129	196	89.2	34.5	9.63	136
1953	5.63	10.9	24.2	16.3	139	46.9	75.8	63.6	64.4	77.9	8.87	3.99	44.1
1954	4.08	3.82	5.67	4.06	13.6	92.6	171	51.7	157	17.2	31.8	6.47	46.4
1955	156	34.9	46.6	169	310	135	201	112	139	34.6	12.5	7.40	112
1956	78.6	11.8	7.46	6.22	82.8	19.1	11.4	53.6	43.6	78.6	24.1	3.88	35.0
1957	2.54	2.96	3.47	9.85	14.6	33.1	176	69.8	82.8	44.6	7.06	3.60	37.5
1958	8.37	37.6	55.5	24.2	85.2	82.5	65.0	80.5	447	228	138	28.8	106
1959	15.6	12.8	5.79	6.61	279	111	90.3	136	58.6	72.7	32.8	31.3	69.5
1960	232	86.3	125	261	119	320	482	243	253	81.4	59.2	19.9	190

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.09	0.06	0.05	0.23	2.47	0.85	2.15	2.63	0.97	2.28	0.53	0.29	12.60
1952	.43	.63	.35	1.35	.68	2.70	1.64	.87	1.28	.60	.23	.06	10.82
1953	.04	.07	.16	.11	.84	.32	.49	.43	.42	.53	.06	.03	3.50
1954	.03	.02	.04	.03	.08	.62	1.12	.35	1.02	.12	.21	.04	3.68
1955	1.05	.23	.31	1.14	1.88	.91	1.31	.75	.91	.23	.08	.05	8.85
1956	.53	.08	.05	.04	.52	.13	.07	.36	.28	.53	.16	.03	2.78
1957	.02	.02	.02	.07	.09	.22	1.15	.47	.54	.30	.05	.02	2.97
1958	.06	.25	.37	.16	.52	.56	.42	.54	2.92	1.53	.93	.19	8.45
1959	.11	.08	.04	.04	1.70	.75	.59	.91	.38	.49	.22	.20	5.51
1960	1.57	.56	.84	1.76	.75	2.16	3.14	1.64	1.65	.55	.40	.13	15.15

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches	
		Discharge	Date							
1950	-	-	-	-	-	-	-	122	9.70	
1951	1208	3,860	May 11, 1951	3.7	158	0.924	12.60	174	13.81	
1952	1238	1,600	Mar. 22, 1952	4.2	136	.795	10.82	122	9.68	
1953	1278	2,040	July 6, 1953	2.6	44.1	.258	3.50	41.8	3.32	
1954	1358	1,600	Mar. 25, 1954	3.4	46.4	.271	3.68	65.4	5.18	
1955	1388	2,090	Oct. 11, 1954	4.2	112	.655	8.85	99.9	7.92	
1956	1438	1,840	Oct. 6, 1955	3.1	35.0	.205	2.78	27.5	2.18	
1957	1508	671	July 4, 1957	1.9	37.5	.219	2.97	45.2	3.59	
1958	1558	3,040	July 31, 1958	3.0	106	.620	8.45	101	8.00	
1959	1628	1,320	May 30, 1959	4.0	69.5	.406	5.51	104	8.25	
1960	1708	3,500	Mar. 30, 1960	12	190	1.11	15.15	-	-	

HENDERSON CREEK BASIN

4675. Henderson Creek near Little York, Ill.

Location.--Lat 41°02'35", long 90°44'45", between secs. 8 and 9, T.12 N., R.3 W., near center of span at upstream side of bridge on State Highways 94 and 135, 1.3 miles upstream from Duck Creek, 2.2 miles north of Little York, and 3.8 miles upstream from North Henderson Creek.

Drainage area.--151 sq mi.

Records available.--October 1940 to September 1958, water year 1960 (annual maximum).

Gage.--Crest-stage gage. Datum of gage is 566.24 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Oct. 1, 1958, wire-weight and crest-stage gages at same site and datum.

Average discharge.--18 years (1940-58), 88.8 cfs.

Extremes.--1940-58, 1959-60: Maximum discharge, 8,250 cfs Apr. 25, 1950 (gage height, 17.65 ft).

1940-58: No flow at times in 1949, 1953-55.

Flood of June 28, 1924, reached a stage of 23.2 ft, from floodmark.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	6.05	4.84	3.05	41.4	358	111	272	252	107	410	56.0	23.3	136
1952	67.9	82.3	37.1	169	75.0	304	198	150	217	51.2	79.4	8.37	120
1953	2.00	9.62	16.1	15.1	122	63.4	86.3	74.8	52.9	68.2	3.15	.560	42.3
1954	3.13	1.10	2.51	1.95	11.6	64.3	154	59.0	267	11.9	24.0	2.79	50.0
1955	27.9	15.5	18.5	139	238	117	171	84.7	263	28.5	16.4	2.68	92.0
1956	43.5	5.24	4.45	3.25	77.6	13.6	12.0	75.0	46.4	142	50.0	1.53	39.6
1957	.97	2.09	3.17	14.5	25.1	40.2	191	72.0	91.9	17.3	2.26	4.02	38.5
1958	9.06	10.9	65.0	22.7	107	68.2	48.7	57.1	351	76.2	74.6	6.90	74.1
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.05	0.04	0.02	0.32	2.47	0.84	2.01	1.93	0.79	3.13	0.43	0.21	12.24
1952	.52	.61	.28	1.29	.54	2.32	1.46	1.14	1.60	.39	.61	.08	10.82
1953	.02	.07	.12	.12	.84	.48	.64	.57	.39	.52	.02	.004	3.79
1954	.02	.008	.02	.01	.08	.49	1.14	.45	1.97	.09	.18	.02	4.48
1955	.21	.11	.14	†1.06	1.64	.69	1.26	.65	1.94	.22	.13	.02	8.27
1956	.33	.04	.03	.02	.55	.10	.09	.57	.34	1.08	.38	.01	3.54
1957	.007	.02	.02	.11	.17	.31	1.41	.55	.68	.13	.02	.03	3.46
1958	.07	.08	.48	.17	.74	.52	.36	.44	2.59	.58	.57	.05	6.65
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

† Corrected.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	133	11.95
1951	1208	3,090	Feb. 19, 1951	1.3	136	0.901	12.24	150	13.54
1952	1238	1,160	June 21, 1952	3	120	.795	10.82	107	9.62
1953	1278	1,360	July 6, 1953	.2	42.3	.280	3.79	40.5	3.63
1954	1338	1,790	June 2, 1954	0	50.0	.331	4.48	54.6	4.89
1955	1388	1,970	Feb. 20, 1955	0	92.0	.609	8.27	91.3	8.21
1956	1438	1,870	July 9, 1956	.7	39.6	.262	3.54	35.6	3.19
1957	1508	1,220	June 13, 1957	.1	38.5	.255	3.46	45.0	4.04
1958	1558	1,870	June 12, 1958	.9	74.1	.491	6.65	-	-
1959	-	-	-	-	-	-	-	-	-
1960	1708	3,250	Mar. 29, 1960	-	-	-	-	-	-

4680. North Henderson Creek near Seaton, Ill.

Location.--Lat 41°05'25", long 90°46'25", near center of sec.30, T.13 N., R.3 W., near center of span on downstream side of bridge on county road, 1.1 miles upstream from Snake Creek, 1.6 miles southeast of Seaton, and 6 miles upstream from mouth.

Drainage area.--66.4 sq mi.

Records available.--October 1940 to September 1951.

Gage.--Wire-weight and crest-stage gages. Datum of gage is 581.43 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Average discharge.--11 years (1940-51), 42.2 cfs.

Extremes.--1940-51: Maximum discharge, 1,740 cfs Apr. 24, 1950 (gage height, 14.27 ft); no flow for several days in October 1940, August and September 1941.
Flood in May 1935 reached a stage of 15.7 ft, from floodmarks.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	5.06	3.02	3.45	10.5	158	48.4	131	126	46.0	169	35.7	18.7	62.2

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.09	0.05	0.06	0.18	2.47	0.84	2.20	2.18	0.77	2.94	0.62	0.31	12.71

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	48.4	9.89
1951	1208	1,440	Feb.19, July 22	1.5	62.2	0.937	12.71	-	-

4685. Cedar Creek at Little York, Ill.

Location.--Lat 41°00'50", long 90°44'45", between secs. 20 and 21, T.12 N., R.3 W., near center of span on downstream side of bridge on State Highway 135 at north edge of Little York, 1.5 miles upstream from Davids Creek and 6.7 miles upstream from mouth.

Drainage area.--128 sq mi.

Records available.--October 1940 to September 1960.

Gage.--Wire-weight and crest-stage gages. Datum of gage is 574.27 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Average discharge.--20 years (1940-60), 86.3 cfs.

Extremes.--1940-60: Maximum discharge, 8,260 cfs July 9, 1956 (gage height, 17.04 ft); minimum observed, 1.0 cfs Aug. 28, 1941.

Flood in June 1924 reached a stage of 18.1 ft, from floodmark.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	12.7	11.1	4.03	38.3	311	119	245	190	126	247	57.9	27.8	114
1952	55.1	96.3	43.0	111	77.1	271	186	151	175	52.4	62.8	24.0	109
1953	12.5	23.4	27.0	22.0	142	92.8	120	124	127	49.2	13.1	9.66	62.9
1954	11.9	12.2	11.5	6.77	34.4	75.6	200	65.7	230	21.0	55.2	6.49	60.6
1955	39.9	23.7	27.5	140	166	116	143	111	191	40.4	25.1	23.3	86.5
1956	36.5	14.3	11.8	9.04	50.3	16.4	14.3	34.9	26.8	212	61.0	11.0	41.7
1957	5.96	13.1	10.2	25.4	35.9	52.3	183	84.7	85.2	24.1	15.4	9.25	45.0
1958	15.5	15.2	54.7	16.9	86.3	44.1	51.8	37.8	140	74.6	36.0	14.7	47.1
1959	16.2	15.0	6.55	8.31	225	65.8	90.1	86.3	45.0	35.5	18.1	24.5	51.7
1960	102	45.1	67.5	129	72.5	209	274	202	218	101	45.6	21.4	124

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.11	0.10	0.04	0.34	2.53	1.07	2.14	1.71	1.10	2.23	0.52	0.24	12.13
1952	.50	.84	.39	1.00	.65	2.44	1.62	1.36	1.52	.47	.57	.21	11.57
1953	.11	.20	.24	.20	1.16	.84	1.05	1.12	1.10	.44	.12	.08	6.66
1954	.11	.11	.10	.06	.28	.68	1.74	.59	2.01	.19	.50	.06	6.43
1955	.36	.21	.25	1.26	1.35	1.05	1.25	1.00	1.67	.36	.23	.20	9.19
1956	.33	.12	.11	.08	.42	.15	.12	.31	.23	1.91	.55	.10	4.43
1957	.05	.11	.09	.23	.29	.47	1.60	.76	.75	.22	.14	.08	4.77
1958	.14	.13	.49	.15	.54	.40	.45	.34	1.22	.67	.32	.13	4.98
1959	.15	.13	.06	.07	1.83	.59	.79	.78	.39	.52	.16	.21	5.48
1960	.91	.39	.61	1.16	.61	1.88	2.39	1.82	1.90	.91	.41	.19	13.18

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	127	13.49
1951	1208	2,740	Feb. 19, 1951	1.5	114	0.891	12.13	128	13.61
1952	1238	965	June 21, 1952	12	109	.852	11.57	97.9	10.39
1953	1278	2,600	June 10, 1953	5.8	62.9	.491	6.66	60.6	6.43
1954	1338	3,000	June 1, 1954	2.0	60.6	.473	6.43	65.2	6.93
1955	1388	1,070	Feb. 21, 1955	6.7	86.5	.676	9.19	84.1	8.93
1956	1438	8,260	July 9, 1956	4.9	41.7	.326	4.43	38.9	4.12
1957	1508	(b)	(b)	3.2	45.0	.352	4.77	49.8	5.28
1958	1558	790	June 10, 1958	6.2	47.1	.368	4.98	43.1	4.56
1959	1628	al, 300	Feb. 24, 1959	3.5	51.7	.404	5.48	66.6	7.05
1960	1708	2,800	Mar. 29, 1960	14	124	.969	13.18	-	-

a About.

b Not determined.

4690. Henderson Creek near Oquawka, Ill.

Location.--Lat 41°00'05", long 90°51'15", in NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.28, T.12 N., R.4 W., on left bank at downstream side of bridge on State Highway 94, 1 mile south of Bald Bluff, $\frac{1}{2}$ miles northeast of Oquawka, and 22 miles upstream from mouth.

Drainage area.--428 sq mi.

Records available.--October 1934 to September 1960. Prior to October 1938, published as Henderson River near Oquawka. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 541.67 ft above mean sea level, adjustment of 1912 (levels by Corps of Engineers). Prior to Mar. 4, 1941, wire-weight gage at same site and datum.

Average discharge.--26 years (1934-60), 259 cfs.

Extremes.--1934-60: Maximum discharge, 16,500 cfs Apr. 25, 1950 (gage height, 28.17 ft); minimum observed, 1.7 cfs Sept. 22, 23, 1940.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	31.2	28.6	11.2	89.7	1221	357	783	699	311	886	185	99.9	386
1952	178	281	136	423	256	857	847	471	651	196	195	32.7	360
1953	19.5	52.6	65.8	51.7	344	215	291	248	200	139	23.6	13.0	137
1954	23.1	16.2	17.6	417	55	54.9	155	422	175	696	60.7	101	22.5
1955	207	62.1	56.5	417	655	319	433	309	588	82.0	73.7	30.4	266
1956	124	29.7	18.3	16.8	238	47.4	33.4	153	128	582	148	13.4	128
1957	10.1	18.7	27.2	43.7	65.0	106	532	249	244	64.5	22.2	16.4	116
1958	27.2	30.6	158	65.0	289	168	138	183	803	268	162	38.7	193
1959	29.8	29.6	14.9	18.2	875	218	220	261	135	125	50.5	42.4	163
1960	473	206	256	509	248	737	940	625	696	333	137	36.8	434

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.08	0.07	0.03	0.24	2.97	0.96	2.04	1.88	0.81	2.39	0.50	0.26	12.23
1952	.48	.73	.37	1.14	.65	2.31	1.69	1.27	1.70	.53	.52	.09	11.48
1953	.05	.14	.18	.14	.84	.58	.76	.67	.52	.37	.06	.03	4.34
1954	.06	.05	.05	.03	.13	.42	1.10	.47	1.81	.16	.27	.06	4.61
1955	.56	.16	.15	1.12	1.59	.86	1.13	.83	1.53	.22	.20	.08	8.43
1956	.33	.08	.05	.05	.60	.13	.09	.41	.33	1.57	.40	.03	4.07
1957	.03	.05	.07	.12	.16	.28	1.39	.67	.64	.17	.06	.04	3.68
1958	.07	.08	.43	.18	.70	.45	.36	.49	2.09	.72	.44	.10	6.11
1959	.08	.08	.04	.05	2.13	.59	.57	.70	.35	.34	.14	.11	5.18
1960	1.27	.54	.69	1.37	.62	1.99	2.45	1.68	1.81	.90	.37	.10	13.79

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches	
		Discharge	Date							
1950	-	-	-	-	-	-	-	399	12.66	
1951	1208	9,000	Feb. 19, 1951	3.5	386	0.902	12.23	430	13.63	
1952	1238	3,540	June 21, 1952	8.8	360	.841	11.48	322	10.27	
1953	1278	2,020	Feb. 24, 1953	7.6	137	.320	4.34	130	4.13	
1954	1338	4,620	June 2, 1954	2.9	145	.339	4.61	168	5.32	
1955	1388	4,600	Feb. 21, 1955	9.0	266	.621	8.43	253	8.02	
1956	1438	6,000	July 9, 1956	8.2	128	.299	4.07	118	3.76	
1957	1508	1,760	June 13, 1957	7.5	116	.271	3.68	130	4.11	
1958	1558	3,310	June 12, 1958	8.1	193	.451	6.11	181	5.73	
1959	1628	3,500	Feb. 24, 1959	6.5	163	.351	6.18	236	7.48	
1960	1708	7,750	Mar. 30, 1960	25	434	1.01	13.79	-	-	

4695. South Henderson Creek at Biggsville, Ill.

Location.--Lat 40°51'25", long 90°51'50", between secs. 16 and 17, T.10 N., R.4 W., near center of span on downstream side of bridge on State Highway 94 at north edge of Biggsville, 1.5 miles downstream from Old Tom Creek and 6.4 miles upstream from mouth.

Drainage area.--81.4 sq mi.

Records available.--October 1939 to September 1960.

Gage.--Wire-weight and crest-stage gages. Datum of gage is 618.02 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark).

Average discharge.--21 years (1939-60), 47.7 cfs.

Extremes.--1939-60: Maximum discharge observed, 6,700 cfs June 12, 1946 (gage height, 18.50 ft); no flow for several days in 1940, 1946-47, 1949, 1953-59.

Flood in 1924 reached a stage of about 19 ft, from information furnished by local residents.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	4.39	3.32	2.30	10.7	197	59.7	141	65.0	51.4	84.6	24.7	14.8	53.8
1952	24.5	47.0	24.4	52.3	32.7	146	100	83.1	137	43.6	63.4	13.9	64.0
1953	3.35	7.06	8.65	8.00	56.3	48.9	73.7	57.7	49.9	13.0	74	0	27.0
1954	0	0	0.08	34	2.92	21.5	117	41.7	102	10.2	62.9	6.33	30.4
1955	32.1	11.9	9.13	91.0	77.2	51.1	68.7	117	114	36.1	11.3	15.3	54.4
1956	6.61	1.42	.36	.26	41.7	2.76	1.77	9.16	.23	78.3	4.58	.14	12.2
1957	0	.06	.62	2.62	3.80	17.1	55.1	41.5	46.0	12.7	.51	5.53	15.4
1958	3.58	6.52	7.54	5.81	29.1	16.1	18.3	12.1	208	49.5	26.4	6.26	32.2
1959	5.97	4.21	.52	.10	177	28.0	27.6	46.8	18.5	9.37	3.39	4.47	26.0
1960	63.5	21.7	25.9	67.3	43.4	118	158	121	138	61.4	22.4	2.23	70.3

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.06	0.05	0.03	0.15	2.52	0.85	1.93	0.92	0.70	1.20	0.35	0.20	8.96
1952	.35	.64	.35	.74	.43	2.07	1.37	1.18	1.87	.62	.97	.19	10.71
1953	.05	.10	.12	.11	.72	.69	1.01	.82	.68	.18	.01	0	4.49
1954	0	0	.001	.005	.04	.31	1.60	.59	1.40	.15	.87	.09	5.08
1955	.45	1.16	.13	1.29	.99	.72	1.22	1.68	1.56	.51	.16	.21	9.06
1956	.09	.02	.005	.004	.55	.04	.02	.13	.003	1.11	.03	.002	2.03
1957	0	.0008	.009	.04	.05	.24	.76	.59	.63	.18	.077	.08	2.59
1958	.05	.09	.11	.08	.37	.23	.25	.17	2.85	.70	.37	.09	5.36
1959	.08	.06	.007	.001	2.27	.37	.38	.66	.27	.13	.03	.06	4.34
1960	.90	.30	.37	.95	.58	1.68	2.17	1.72	1.89	.87	.32	.03	11.78

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	67.1	11.20
1951	1208	2,800	Feb. 19, 1951	1.2	53.8	0.661	8.96	60.9	10.16
1952	1258	1,110	June 20, 1952	2.4	64.0	.786	10.71	57.6	9.64
1953	1278	1,190	June 11, 1953	0	27.0	.332	4.49	25.4	4.22
1954	1358	1,460	Aug. 17, 1954	0	30.4	.373	5.08	34.8	5.82
1955	1388	1,730	Feb. 19, 1955	0	54.4	.668	9.06	50.6	8.44
1956	1438	2,600	July 8, 1956	0	12.2	.150	2.03	11.6	1.93
1957	1508	158	June 28, 1957	0	15.4	.189	2.59	16.9	2.83
1958	1558	1,000	June 10, 1958	0	32.2	.396	5.35	31.6	5.26
1959	1628	1,240	Feb. 23, 1959	0	26.0	.319	4.34	34.5	5.76
1960	1708	1,490	Mar. 28, 1960	1.2	70.3	.864	11.78	-	-

4700. Skunk River near Ames, Iowa

Location.--Lat 42°04'05", long 93°37'05", in NW¹SW¹ sec.23, T.84 N., R.24 W., on left bank 2½ miles north of Ames, 3½ miles downstream from Keigley Branch, and 5.2 miles upstream from Squaw Creek.

Drainage area.--315 sq mi.

Records available.--July 1920 to September 1927, October 1932 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Concrete control since July 21, 1934. Datum of gage is 893.6 ft above mean sea level, datum of 1929 (Iowa Highway Commission bench mark). Prior to Aug. 25, 1921, staff gage at same site and datum.

Average discharge.--35 years (1920-27, 1932-60), 127 cfs.

Extremes.--1920-27, 1932-60: Maximum discharge, 8,630 cfs June 10, 1954; maximum gage height, 13.90 ft May 20, 1944; no flow at times in 1934, 1937, 1953-57.

Remarks.--Several diversions for irrigation above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	33.6	9.34	2.99	1.56	151	551	639	403	808	377	103	110	265
1952	123	75.4	48.9	106	122	428	330	123	66.0	282	19.2	4.85	144
1953	1.71	3.46	3.38	4.09	87.2	136	194	233	154	52.0	18.7	.61	73.7
1954	.12	.83	.84	.19	1.33	7.69	20.6	158	1,189	43.1	300	79.0	149
1955	305	93.2	48.2	27.9	102	98.6	137	113	501	102	2.40	.37	90.1
1956	.22	.14	.05	.05	.31	9.12	6.67	20.1	1.57	.08	1.70	27.1	5.58
1957	1.02	8.02	8.94	9.72	33.4	36.1	21.0	203	350	203	17.6	17.3	75.8
1958	11.9	69.4	101	48.9	75.1	89.9	156	55.5	208	629	79.4	30.7	130
1959	9.60	9.31	3.71	2.18	2.33	397	146	268	234	144	24.9	86.3	111
1960	50.0	132	102	102	60.4	411	777	628	238	222	59.4	69.1	238

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.12	0.03	0.01	0.006	0.50	2.02	2.26	1.48	2.86	1.38	0.38	0.39	11.44
1952	.45	.27	.18	.39	.42	1.56	1.17	.45	.23	1.03	.07	.02	6.24
1953	.006	.01	.01	.01	.29	.50	.69	.85	.55	.19	.07	.002	3.18
1954	.0004	.002	.003	.0007	.004	.03	.07	.58	4.21	.16	1.10	.28	6.44
1955	1.12	.33	.18	.10	.34	.36	.48	.41	.18	.37	.009	.001	3.88
1956	.0008	.0005	.0002	.0002	.001	.03	.02	.07	.006	.0003	.006	.10	.24
1957	.004	.03	.03	.04	.11	.13	.07	.74	1.24	.74	.06	.06	3.25
1958	.04	.25	.37	.18	.25	.33	.55	.20	.73	2.30	.29	.11	5.60
1959	.04	.03	.01	.008	.008	1.45	.52	.98	.83	.53	.09	.31	4.81
1960	.18	.47	.37	.37	.21	1.50	2.75	2.30	.84	.81	.22	.24	10.26

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	113	4.87
1951	1208	5,320	Mar. 29, 1951	0.7	265	0.841	11.44	282	12.18
1952	1238	1,630	July 9, 1952	3.0	144	.457	6.24	124	5.37
1953	1278	980	May 1, 1953	0	73.7	.234	3.18	75.1	3.16
1954	1338	8,630	June 10, 1954	0	149	.473	6.44	187	8.06
1955	1388	1,340	Oct. 15, 1954	0	90.1	.286	3.88	52.5	2.25
1956	1438	376	Sept. 4, 1956	0	5.58	.018	.24	7.05	.30
1957	1508	3,540	June 16, 1957	0	75.8	.241	3.25	89.6	3.85
1958	1558	3,150	July 4, 1958	6.0	130	.413	5.60	117	5.02
1959	1628	1,720	May 31, 1959	1.5	111	.352	4.81	133	5.75
1960	1708	6,210	Mar. 30, 1960	12	238	.758	10.26	-	-

4710. Skunk River below Squaw Creek, near Ames, Iowa

Location.--Lat 42°00'30", long 93°35'40", in NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.13, T.83 N., R.24 W., on right bank 15 ft downstream from highway bridge, a quarter of a mile downstream from Squaw Creek, 1 mile downstream from bridge on U.S. Highway 30, and 2 miles southeast of Ames.

Drainage area.--556 sq mi.

Records available.--October 1952 to September 1960.

Gage.--Water-stage recorder and concrete control. Datum of gage is 867.10 ft above mean sea level, datum of 1929.

Average discharge.--8 years (1952-60), 198 cfs.

Extremes.--1952-60: Maximum discharge, 9,260 cfs Mar. 30, 1960 (gage height, 13.20 ft); no flow for many days during 1953-57.

Flood of May 19, 1944, reached a stage of 13 ft, from floodmarks (discharge, about 10,000 cfs).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	1.98	4.08	3.73	3.32	149	225	353	396	308	108	35.4	1.72	132
1954	.67	.45	.14	.07	1.76	13.0	25.3	243	1,795	81.5	856	186	265
1955	594	177	86.1	49.7	142	172	270	246	109	217	5.06	1.18	173
1956	.49	.37	.10	0	0	8.71	3.62	31.0	2.49	0	.03	24.5	5.95
1957	0	2.57	5.34	10.6	63.9	62.2	26.6	246	674	406	43.3	34.3	131
1958	25.4	115	172	87.2	132	153	231	81.0	412	1,338	139	56.9	247
1959	15.7	14.1	3.62	1.24	4.28	868	255	580	461	229	38.5	98.3	216
1960	58.6	166	148	148	98.8	726	1,365	1,246	393	376	100	110	412

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	0.004	0.008	0.008	0.007	0.28	0.47	0.71	0.82	0.62	0.22	0.07	0.003	3.22
1954	.001	.0009	.0003	.0001	.003	.03	.05	.50	3.60	.17	1.73	.37	6.46
1955	1.23	.35	.18	.10	.27	.36	.54	.51	.22	.45	.01	.002	4.20
1956	.001	.0007	.0002	0	0	.02	.007	.06	.005	0	.00007	.05	.14
1957	0	.005	.01	.02	.12	.15	.05	.51	1.35	.84	.09	.07	3.20
1958	.05	.23	.36	.18	.25	.32	.46	.17	.83	2.77	.29	.11	6.02
1959	.03	.03	.008	.003	.008	1.80	.51	1.20	.93	.48	.08	.20	5.28
1960	.12	.33	.31	.31	.19	1.51	2.74	2.58	.79	.78	.21	.22	10.09

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-
1953	1278	1,620	May 1, 1953	0.6	132	0.237	3.22	131	3.20
1954	1358	8,700	Aug. 28, 1954	0	265	.477	6.46	337	8.21
1955	1398	2,680	Oct. 14, 1954	.7	173	.311	4.20	101	2.46
1956	1438	638	May 13, 1956	0	5.95	.011	.14	6.54	.16
1957	1508	6,360	June 16, 1957	0	131	.236	3.20	157	3.82
1958	1558	8,550	July 4, 1958	6.9	247	.444	6.02	223	5.45
1959	1628	5,520	May 31, 1959	.2	216	.388	5.28	244	5.97
1960	1708	9,260	Mar. 30, 1960	24	412	.741	10.09	-	-

4712. Indian Creek near Mingo, Iowa

Location.--Lat 41°48'20", long 93°18'25", in NW¼ sec.28, T.81 N., R.21 W., or right bank 30 ft downstream from bridge on State Highway 117, 0.7 mile downstream from Wolf Creek, 2.2 miles upstream from Byers Branch, and $\frac{3}{4}$ miles northwest of Mingo.

Drainage area.--276 sq mi.

Records available.--May 1958 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 810.47 ft above mean sea level, datum of 1929.

Extremes.--1958-60: Maximum discharge, 5,860 cfs May 7, 1960 (gage height, 15.07 ft); minimum daily, 2.2 cfs Sept. 13-15, 1959.

Flood of May 20, 1944, reached a stage of 21.4 ft, from information by local residents (discharge not determined).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1958	-	-	-	-	-	-	-	-	220	460	67.0	99.8	-
1959	20.2	26.2	11.2	6.49	15.2	527	197	356	226	84.9	10.9	10.4	125
1960	13.5	50.6	34.5	124	57.8	464	622	883	196	309	61.1	47.2	240

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1958	-	-	-	-	-	-	-	-	0.89	1.92	0.28	0.40	-
1959	0.08	0.11	0.05	0.03	0.06	2.20	0.80	1.49	.91	.35	.05	.04	6.17
1960	.06	.20	.14	.52	.23	1.94	2.51	3.69	.79	1.29	.26	.19	11.82

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1958	1558	*2,800	July 5, 1958	513	-	-	-	-	-
1959	1628	*3,400	Mar. 20, 1959	2.2	125	0.453	6.17	129	6.33
1960	1708	5,860	May 7, 1960	8.7	240	.870	11.82	-	-

* Revised.

a Maximum during period May to September.

b Minimum during period May to September.

SKUNK RIVER BASIN

4715. Skunk River near Oskaloosa, Iowa

Location.--Lat 41°21'15", long 92°39'30", in NW¼SW¼ sec.25, T.76 N., R.16 W., on right bank 300 ft upstream from bridge on U.S. Highway 63 and 4 miles north of Oskaloosa.

Drainage area.--1,635 sq mi.

Records available.--October 1945 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 685.50 ft above mean sea level, datum of 1929. Prior to Nov. 21, 1947, wire-weight gage at site 300 ft downstream at same datum.

Average discharge.--15 years (1945-60), 755 cfs.

Extremes.--1945-60; Maximum discharge, 20,000 cfs June 15, 1947 (gage height, 21.26 ft, from floodmarks); minimum daily, 1.8 cfs Oct. 11-13, 1956.

Flood in May 1944 reached a stage of 25.8 ft, from floodmarks (discharge, 37,000 cfs, from rating curve extended above 18,000 cfs on basis of velocity-area study).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	60.0	39.6	15.0	10.6	1,019	1,083	2,090	1,922	3,154	1,979	505	448	1,023
1952	647	592	356	991	1,029	2,722	1,668	1,183	885	972	295	108	955
1953	59.1	171	127	226	2,296	880	1,005	1,102	743	426	114	35.6	586
1954	27.0	34.8	31.6	14.9	42.9	45.9	130	442	2,928	371	1,182	709	495
1955	1,379	558	292	230	900	781	734	691	282	334	48.0	56.4	522
1956	27.6	21.0	7.55	5.3	64.9	63.5	42.1	74.2	48.6	31.4	68.5	27.8	40.1
1957	8.47	14.5	10.2	32.4	118	89.0	107	510	1,129	1,011	175	103	276
1958	73.5	162	284	167	334	383	359	197	684	2,012	418	287	448
1959	129	182	58.9	33.5	886	2,691	1,642	1,911	1,544	1,089	220	219	884
1960	211	504	394	1,418	624	1,195	4,610	3,936	1,580	1,688	478	372	1,418

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.04	0.03	0.01	0.007	0.65	0.76	1.43	1.36	2.15	1.40	0.36	0.31	8.51
1952	.46	.40	.25	.70	.68	1.92	1.14	.83	.60	.69	.21	.07	7.95
1953	.04	.12	.09	.16	1.46	.62	.69	.78	.51	.30	.08	.02	4.87
1954	.02	.02	.02	.01	.03	.03	.09	.31	2.00	.26	.83	.48	4.10
1955	.97	.38	.21	.16	.57	.55	.50	.49	.19	.24	.03	.04	4.33
1956	.02	.01	.005	.004	.04	.04	.03	.05	.03	.02	.05	.02	.32
1957	.006	.01	.007	.02	.07	.06	.07	.56	.77	.71	.12	.07	2.27
1958	.05	.11	.20	.12	.21	.27	.25	.14	.47	1.42	.29	.20	3.73
1959	.09	.12	.04	.02	.56	1.90	1.12	1.35	1.05	.77	.16	.15	7.33
1960	.15	.34	.28	1.00	.41	.84	3.15	2.78	1.08	1.19	.34	.25	11.81

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches		
		Discharge	Date								
1950	-	-	-	-	-	-	-	-	598	-	4.97
1951	1208	7,810	June 7, 1951	7.5	1,023	0.626	8.51	1,147	9.54		
1952	1238	6,700	Mar. 12, 1952	65	955	.584	7.95	852	7.09		
1953	1278	9,980	Feb. 22, 1953	24	586	.358	4.87	564	4.68		
1954	1338	5,420	June 24, 1954	14	495	.303	4.10	675	5.60		
1955	1388	3,700	Feb. 20, 1955	9.6	522	.319	4.33	339	2.81		
1956	1438	782	Aug. 13, 1956	3.0	40.1	.025	.32	38.2	.31		
1957	1508	4,860	June 18, 1957	1.8	276	.169	2.27	317	2.61		
1958	1558	5,680	July 7, 1958	51	448	.274	3.73	436	3.62		
1959	1628	8,500	Mar. 21, 1959	26	884	.541	7.33	945	7.85		
1960	1708	14,800	Apr. 3, 1960	146	1,418	.867	11.81	-	-		

4725. North Skunk River near Sigourney, Iowa

Location.--Lat 41°18'05", long 92°12'10", in NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.14, T.75 N., R.12 W., on right bank 20 ft downstream from bridge on State Highway 149, 2 $\frac{1}{2}$ miles south of Sigourney, and 16.2 miles upstream from mouth.

Drainage area.--730 sq mi.

Records available.--October 1945 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 651.53 ft above mean sea level, datum of 1929. Prior to June 10, 1953, wire-weight gage at same site and datum.

Average discharge.--15 years (1945-60), 379 cfs.

Extremes.--1945-60: Maximum discharge, 27,500 cfs Mar. 31, 1960 (gage height, 25.33 ft); minimum daily, 0.1 cfs Oct. 7 to Nov. 15, 1956.
Flood in May 1944 reached a stage of 22.8 ft, from floodmark (discharge, 14,500 cfs).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	6.07	5.78	4.63	9.33	589	453	1,027	1,136	1,363	1,341	240	136	524
1952	396	542	194	645	465	1,550	674	651	559	182	120	97.6	507
1953	14.3	236	115	157	975	655	570	464	309	88.3	18.6	6.77	295
1954	2.25	4.62	5.44	2.26	12.8	17.0	91.2	121	458	37.6	232	51.6	86.2
1955	380	93.3	111	81.9	330	303	537	252	55.1	107	7.90	49.7	191
1956	14.2	6.12	2.58	2.42	64.8	43.8	11.2	14.4	47.2	29.2	83.3	4.35	27.7
1957	1.13	3.58	3.85	14.5	74.0	25.4	46.8	163	230	568	102	30.6	106
1958	21.7	52.3	46.0	27.1	205	137	90.1	68.5	186	298	268	187	132
1959	64.4	137	36.0	21.0	677	1,713	952	1,368	506	547	128	134	523
1960	194	485	430	1,524	387	1,236	2,126	1,780	960	901	189	87.1	860

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.010	0.009	0.007	0.01	0.84	0.72	1.57	1.79	2.08	2.12	0.38	0.21	9.75
1952	.62	.85	.51	1.02	.69	2.45	1.03	1.03	.85	.29	.19	.15	9.46
1953	.02	.36	.18	.25	1.39	1.03	.87	.73	.47	.14	.03	.01	5.48
1954	.004	.007	.009	.004	.02	.03	.14	.19	.70	.06	.37	.08	1.61
1955	.60	.14	.17	.13	.47	.48	.82	.40	.08	.17	.01	.08	3.55
1956	.02	.009	.004	.004	.10	.07	.02	.02	.07	.05	.15	.007	.52
1957	.0002	.005	.006	.02	.11	.04	.07	.26	.35	.90	.16	.05	1.97
1958	.05	.08	.07	.04	.29	.22	.14	.11	.29	.47	.42	.29	2.44
1959	.10	.21	.06	.03	.97	2.71	1.46	2.16	.77	.86	.20	.20	9.75
1960	.31	.74	.68	2.41	.57	1.95	3.25	2.81	1.47	1.42	.50	.13	16.04

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	261	4.85
1951	1208	7,460	July 3, 1951	3.3	524	0.718	9.75	817	11.48
1952	1238	7,660	Mar. 15, 1952	20	507	.695	9.46	443	8.26
1953	1278	3,820	Feb. 24, 1953	4.1	295	.404	5.48	266	4.94
1954	1338	1,830	Apr. 30, 1954	1.2	86.2	.118	1.61	135	2.50
1955	1368	5,180	Apr. 24, 1955	.6	191	.262	3.55	144	2.67
1956	1438	880	June 20, 1956	.4	27.7	.038	.52	26.4	.50
1957	1508	3,490	July 8, 1957	.1	106	.145	1.97	115	2.14
1958	1558	2,040	Feb. 27, 1958	7.2	132	.181	2.44	141	2.63
1959	1628	7,270	Mar. 22, 1959	18	523	.716	9.73	596	11.09
1960	1708	27,500	Mar. 31, 1960	54	860	1.18	16.04	-	-

4735. Big Creek near Mount Pleasant, Iowa

Location.--Lat 41°00'50", long 91°34'45", in NW1/4 sec.29, T.72 N., R.6 W., on left bank 12 ft downstream from highway bridge, 100 ft downstream from Lynn Creek, 0.7 mile downstream from Brandywine Creek, and 3.4 miles northwest of Mount Pleasant.

Drainage area.--106 sq mi.

Records available.--October 1955 to September 1960.

Gage.--Water-stage recorder and concrete control. Datum of gage is 630.53 ft above mean sea level, datum of 1929.

Average discharge.--5 years (1955-60), 48.6 cfs.

Extremes.--1955-60: Maximum discharge, 4,420 cfs Mar. 29, 1960 (gage height, 15.30 ft); no flow for many days most years.

Flood of Aug. 3, 1948, reached a stage of about 27 ft, from floodmarks, by local residents (discharge not determined).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	1.15	0	0	0	34.5	0.54	0.33	0.38	5.91	11.1	15.3	0	5.66
1957	0	0	0	.35	2.45	1.65	26.1	7.02	5.59	.23	3.34	.31	3.89
1958	1.59	6.97	20.3	5.79	86.9	29.2	15.7	19.8	145	105	40.6	9.39	40.1
1959	3.21	20.9	3.26	4.09	229	167	126	107	34.4	71.1	2.69	26.9	65.1
1960	182	22.5	75.8	141	54.8	271	262	162	312	35.8	17.3	.67	128

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	0.01	0	0	0	0.35	0.006	0.004	0.004	0.06	0.12	0.17	0	0.72
1957	0	0	0	.004	.02	.02	.27	.08	.06	.002	.04	.003	.50
1958	.02	.07	.22	.06	.85	.32	.17	.21	1.52	1.14	.44	.10	5.12
1959	.05	.22	.04	.04	2.25	1.82	1.33	1.17	.36	.77	.03	.28	8.54
1960	1.97	.24	.82	1.54	.56	2.34	2.75	1.76	3.28	.39	.19	.007	16.45

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1956	1438	500	Feb. 24, 1956	0	5.66	0.053	0.72	5.56	0.71
1957	1508	264	Apr. 3, 1957	0	3.89	.037	.50	8.32	.81
1958	1558, 1628	1,600	Feb. 24, 1958	0	40.1	.378	5.12	39.9	5.10
1959	1628	1,150	Feb. 23, 1959	0	65.1	.614	8.34	86.5	11.08
1960	1708	4,460	Mar. 29, 1960	.3	128	1.21	16.45	-	-

4740. Skunk River at Augusta, Iowa

Location.--Lat 40°45'10", long 91°16'30", in NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.26, T.69 N., R.4 W., on left bank 300 ft upstream from bridge on State Highway 394 (revised) at Augusta, 2 miles upstream from Long Creek, and at mile 12.5.

Drainage area.--4,303 sq mi.

Records available.--September to November 1913, October 1914 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 521.69 ft above mean sea level, adjustment of 1912. Sept. 30 to Nov. 15, 1913, staff gage at site 400 ft upstream at datum about 0.7 ft higher. May 27, 1915, to Jan. 14, 1935, chain gage at site 400 ft upstream at present datum.

Average discharge.--46 years (1914-60), 2,177 cfs.

Extremes.--1913, 1914-60: Maximum discharge, 51,000 cfs Apr. 3, 1960 (gage height, 25.00 ft); minimum daily, 7 cfs Aug. 27 to Sept. 1, 1934.
Flood of June 1, 1903, reached a stage of about 21 ft (discharge, about 45,000 cfs).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	97.2	95.8	57.5	90.4	4,158	2,662	7,099	7,062	7,710	6,350	3,433	1,012	3,305
1952	1,358	2,551	1,000	2,866	2,588	8,823	4,676	2,916	3,252	1,768	1,262	356	2,795
1953	126	579	459	496	4,161	3,763	3,719	2,477	1,789	930	210	71.4	1,544
1954	40.2	48.3	57.2	25.5	85.6	227	918	1,101	3,956	808	1,826	1,510	882
1955	2,845	841	495	1,308	3,516	2,051	3,669	1,780	690	747	149	121	1,503
1956	348	49.4	36.6	27.8	228	284	104	106	333	214	515	107	195
1957	15.5	20.5	21.2	86.6	268	191	833	987	1,688	1,968	661	233	582
1958	146	402	913	329	917	1,254	664	603	2,233	4,146	2,591	781	1,254
1959	333	890	187	126	3,647	8,098	5,020	5,379	3,699	2,794	1,082	1,045	2,684
1960	2,830	1,382	2,378	7,455	2,578	3,681	15,460	9,819	6,746	5,344	1,595	544	4,986

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.03	0.02	0.02	0.02	1.01	0.71	1.84	1.89	2.00	1.70	0.92	0.26	10.42
1952	.36	.66	.27	.79	.65	2.36	1.21	.78	.84	.47	.34	.09	8.82
1953	.03	.15	.12	.13	1.01	1.01	.96	.66	.46	.25	.06	.02	4.86
1954	.01	.01	.02	.007	.02	.06	.24	.30	1.03	.22	.49	.39	2.80
1955	.76	.22	.13	.35	.85	.55	.95	.48	.18	.20	.04	.03	4.74
1956	.09	.01	.01	.007	.06	.07	.03	.03	.09	.06	.14	.03	.63
1957	.004	.005	.006	.02	.06	.05	.22	.26	.44	.53	.16	.06	1.84
1958	.04	.10	.24	.09	.22	.34	.17	.16	.58	1.11	.69	.20	3.94
1959	.09	.23	.05	.03	.88	2.17	1.30	1.44	.96	.75	.29	.27	8.46
1960	.76	.36	.64	2.00	.65	.99	4.01	2.63	1.75	1.43	.43	.14	15.79

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	1,809	5.70
1951	1208	23,700	May 11, 1951	18	3,305	0.768	10.42	3,694	11.64
1952	1238	18,900	Mar. 13, 1952	137	2,795	.650	8.82	2,483	7.83
1953	1278	16,100	Apr. 1, 1953	44	1,544	.359	4.86	1,459	4.60
1954	1338	9,780	Aug. 27, 1954	16	882	.205	2.80	1,223	3.87
1955	1388	18,500	Apr. 25, 1955	35	1,503	.349	4.74	1,187	3.74
1956	1438	4,050	June 20, 1956	18	195	.045	.63	163	.53
1957	1509	5,850	July 31, 1957	12	582	.135	1.84	701	2.20
1958	1558	12,800	Aug. 1, 1958	65	1,254	.291	3.94	1,248	3.93
1959	1628	15,000	Feb. 26, 1959	100	2,684	.624	8.46	3,123	9.85
1960	1708	51,000	Apr. 3, 1960	349	4,986	1.16	15.79	-	-

4745. Mississippi River at Keokuk, Iowa

Location.--Lat 40°23'35", long 91°22'25", in SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.30, T.65 N., R.4 W., near right bank in tailwater at downstream end of new lock below dam and powerplant of Union Electric Co. at Keokuk, 2.8 miles upstream from Des Moines River and at mile 364.2 upstream from Ohio River.

Drainage area.--119,000 sq mi, approximately.

Records available.--January 1878 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 477.41 ft above mean sea level, datum of 1929 (levels by Corps of Engineers); 477.83 ft above mean sea level, adjustment of 1912; 477.34 ft above mean gull level; and 484.65 ft above Memphis datum. Jan. 1, 1878, to May 1913, staff gage at Galland (formerly Nashville), 8 miles upstream; zero of gage was set to low-water mark of 1864, or 496.94 ft above mean sea level, adjustment of 1912.

Average discharge.--82 years (1878-1960), 60,980 cfs.

Extremes.--1878-1960: Maximum daily discharge, 314,000 cfs May 18, 1888 (gage height, 12.0 ft, site and datum then in use; 19.6 ft, present site and datum); minimum daily, 5,000 cfs Dec. 27, 1933.

Flood of June 6, 1851, reached a stage of 21.0 ft, present site and datum; estimated as 13.5 ft at Galland (discharge, 360,000 cfs).

Remarks.--Flow regulated by powerplant above station since 1913, and reservoirs and navigation dams above station since about 1935. Records for May 1913 to September 1937 adjusted for change in contents in Keokuk Reservoir, those after September 1937 unadjusted.

Cooperation.--Records furnished by Union Electric Co., formerly Mississippi River Power Co.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	25,620	21,370	26,480	25,730	47,520	84,040	193,100	184,900	102,100	138,200	70,150	70,810	83,120
1952	76,480	83,340	55,820	63,430	63,800	110,800	189,000	148,500	73,480	82,150	87,300	42,200	89,750
1953	26,770	30,230	34,480	33,280	58,620	76,910	117,400	87,700	86,000	90,840	91,780	39,060	64,430
1954	25,860	28,030	33,780	26,430	31,540	41,080	66,840	127,200	95,860	92,910	39,960	42,890	54,510
1955	81,970	46,600	38,370	42,390	45,280	71,040	104,000	55,310	63,470	42,890	38,580	24,230	54,540
1956	27,100	28,750	27,220	24,430	25,750	38,480	103,500	67,850	45,950	44,580	43,090	27,760	41,860
1957	18,140	27,230	25,110	24,630	25,820	39,180	58,780	49,980	55,430	86,030	44,550	40,240	42,160
1958	28,840	36,450	34,370	27,090	27,270	47,680	55,770	33,760	50,440	50,200	26,550	28,770	37,280
1959	21,280	28,290	20,390	18,620	30,970	86,920	111,400	69,450	55,660	52,220	34,010	46,700	47,990
1960	73,840	61,660	47,140	84,710	48,890	46,680	181,100	176,000	117,400	60,650	36,410	47,500	81,790

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.25	0.20	0.26	0.25	0.42	0.81	1.87	1.79	0.96	1.34	0.68	0.66	9.49
1952	.74	.78	.54	.61	.58	1.07	1.77	1.44	.69	.80	.85	.40	10.27
1953	.28	.28	.33	.32	.51	.75	1.10	.85	.81	.88	.89	.37	7.35
1954	.25	.26	.33	.26	.28	.40	.63	1.23	.90	.90	.39	.40	6.23
1955	.79	.44	.37	.41	.40	.69	.98	.54	.60	.42	.37	.23	6.24
1956	.26	.25	.26	.24	.23	.37	.97	.66	.43	.43	.42	.26	4.78
1957	.18	.26	.24	.24	.23	.38	.55	.48	.61	.83	.43	.58	4.61
1958	.28	.34	.33	.26	.24	.46	.52	.33	.47	.49	.26	.27	4.28
1959	.21	.27	.20	.18	.27	.84	1.04	.67	.52	.51	.33	.44	5.48
1960	.72	.58	.46	.62	.44	.45	1.70	1.71	1.10	.59	.35	.45	9.37

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year			
		Maximum day		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches		
		Discharge	Date								
1950	-	-	-	-	-	-	-	-	-	62,160	7.11
1951	1208	265,100	Apr. 29, 1951	15,700	83,120	0.698	9.49	85,030	10.84		
1952	1238	253,800	Apr. 27, 1952	25,400	89,750	.754	10.27	79,380	9.08		
1953	1278	137,200	Apr. 1, 2, 1953	22,800	64,430	.541	7.35	64,110	7.32		
1954	1338	181,400	May 17, 1954	21,800	54,510	.458	6.23	61,190	6.99		
1955	1388	156,600	Apr. 25, 1955	19,700	54,540	.458	6.24	47,300	5.41		
1956	1438	131,500	Apr. 22, 1956	18,300	41,860	.352	4.78	47,960	4.69		
1957	1508	106,000	July 15, 1957	13,800	42,160	.354	4.61	44,620	5.08		
1958	1558	99,000	June 13, 1958	15,800	37,280	.313	4.25	34,790	3.98		
1959	1628	182,000	Apr. 5, 1959	14,400	47,990	.403	5.48	57,470	6.56		
1960	1708	289,500	Apr. 4, 1960	28,200	81,790	.687	9.37	-	-		

4760. West Fork Des Moines River at Jackson, Minn.

Location.--Lat 43°37'10", long 94°59'10", in SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.24, T.102 N., R.35 W., or right bank in Jackson, 200 ft downstream from dam at powerplant.

Drainage area.--1,220 sq mi, approximately.

Records available.--May 1909 to December 1913, August 1930 to September 1960 (winter records incomplete prior to 1936). Published as Des Moines River at Jackson, 1909-13, as Des Moines River near Jackson, 1930-35, and as West Fork Des Moines River near Jackson, 1936-44.

Gage.--Water-stage recorder. Datum of gage is 1,287.75 ft above mean sea level, datum of 1929. May 31, 1909, to Dec. 20, 1913, staff gage at site 0.6 mile downstream at datum 0.99 ft lower. Aug. 22, 1930, to Sept. 30, 1944, chain gage at site 7 miles upstream at datum 17.10 ft higher. Oct. 1, 1944, to Oct. 26, 1949 (revised), wire-weight gage at site 600 ft upstream at datum 10.64 ft higher.

Average discharge.--25 years (1935-60), 256 cfs.

Extremes.--1909-13, 1930-60: Maximum discharge, 8,360 cfs June 8, 1953 (gage height, 17.43 ft, from floodmark), from rating curve extended above 3,500 cfs on basis of contracted-opening measurement of peak flow; no flow at times.

Remarks.--Regulation at times by Yankton, Long, Shetek, and Heron Lakes.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	3.46	11.1	6.90	6.03	16.7	71.0	2,620	1,049	687	829	260	130	474
1952	90.8	78.9	78.4	38.7	85.6	353	2,732	595	493	280	72.2	38.1	408
1953	7.08	5.00	6.16	7.45	7.60	374	379	1,057	1,884	511	324	77.2	388
1954	10.3	15.8	18.6	6.58	70.3	448	467	228	282	12	59.7	29.8	147
1955	59.6	55.3	57.8	26.4	12.9	199	223	109	56.5	3.27	.13	.02	65.5
1956	0	0	0	0	.03	27.4	27.8	41.9	26.8	24.9	29.6	.96	15.1
1957	.88	10.9	4.95	1.04	.62	137	95.8	100	335	331	147	131	108
1958	67.5	110	76.9	29.5	23.5	51.7	234	103	46.7	8.80	2.70	.29	62.8
1959	0	2.29	1.22	.10	0	11.8	9.37	83.1	100	5.00	3.12	19.4	19.7
1960	11.3	49.9	72.1	70.8	20.1	211	2,150	822	529	202	86.3	309	376

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.003	0.01	0.007	0.006	0.01	0.07	2.40	0.99	0.63	0.78	0.25	0.12	5.28
1952	.09	.07	.07	.04	.08	.33	2.50	.56	.45	.26	.07	.035	4.55
1953	.007	.005	.006	.007	.006	.35	.35	1.00	1.72	.48	.31	.07	4.31
1954	.01	.01	.02	.006	.06	.42	.43	.22	.26	.12	.06	.03	1.65
1955	.06	.05	.05	.02	.01	.19	.20	.10	.03	.003	.0001	.00002	.71
1956	0	0	0	0	.00002	.03	.03	.04	.02	.02	.03	.0009	.17
1957	.0008	.01	.005	.001	.0005	.13	.09	.09	.31	.31	.14	.12	1.21
1958	.06	.10	.07	.03	.02	.05	.21	.10	.04	.008	.003	.0003	.69
1959	0	.002	.001	.00008	0	.01	.009	.08	.09	.005	.003	.02	.22
1960	.01	.05	.07	.07	.02	.20	2.00	.78	.48	.19	.08	.28	4.23

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches	
		Discharge	Date							
1950	-	-	-	-	-	-	-	-	79.7	0.88
1951	1208	4,380	Apr. 10, 1951	0.3	474	0.389	5.28	493	5.49	
1952	1238	4,290	Apr. 5, 1952	5.6	408	.334	4.55	389	4.35	
1953	1276	8,360	June 8, 1953	1.4	388	.318	4.31	390	4.33	
1954	1338	1,160	Mar. 25, 1954	4.5	147	.120	1.65	158	1.77	
1955	1388	630	Mar. 11, 1955	0	65.5	.054	.71	50.9	.55	
1956	1438	483	May 30, 1956	0	15.1	.012	.17	16.4	.19	
1957	1508	1,230	June 23, 1957	.1	108	.089	1.21	128	1.42	
1958	1558	395	Apr. 6, 1958	0	62.8	.051	.69	†41.8	†4.46	
1959	1628	3,370	Mar. 30, 1959	0	19.7	.016	.22	30.6	.35	
1960	1708	3,800	Apr. 4, 1960	2.4	376	.308	4.23	-	-	

† Corrected.

4765. West Fork Des Moines River at Estherville, Iowa

Location--Lat 43°24'00", long 94°50'40", in SW¹/₄SE¹/₄ sec.10, T.99 N., R.34 W., on right bank in city park, 1,200 ft downstream from bridge on State Highway 9 at Estherville and 2.5 miles upstream from Brown Creek.

Drainage area--1,372 sq mi.

Records available--October 1951 to September 1960.

Gage--Water-stage recorder and concrete control. Datum of gage is 1,247.55 ft above mean sea level, datum of 1929.

Average discharge--9 years (1951-60), 206 cfs.

Extremes--1951-60: Maximum discharge, 10,800 cfs June 8, 1953 (gage height, 15.53 ft); minimum daily, 0.2 cfs Sept. 21, 22, 28, Oct. 19, 1958.

Remarks--Diurnal fluctuation at low flow caused by powerplant 0.3 miles above station which discharges an average daily flow of about 0.5 cfs into river from subterranean wells.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	#124	#106	105	51.8	154	536	2,976	551	588	359	99.2	47.3	#472
1953	15.1	11.3	12.3	11.7	12.0	427	443	1,059	2,252	527	361	81.1	435
1954	13.5	28.6	25.2	7.53	82.5	473	505	276	426	185	97.9	55.4	181
1955	94.4	90.6	62.9	32.1	14.5	266	275	129	50.8	8.12	3.72	1.35	86.1
1956	2.56	2.73	1.32	1.08	1.18	55.3	68.0	52.7	41.3	28.3	57.3	4.37	26.5
1957	2.23	16.5	10.0	3.69	3.42	154	143	145	386	324	160	146	125
1958	81.4	114	85.8	35.9	30.1	69.5	259	122	56.3	18.6	5.33	74	73.2
1959	.92	1.66	1.39	.81	.77	16.0	13.4	95.7	205	12.2	4.03	25.2	31.4
1960	16.6	56.0	71.3	81.3	30.9	287	2,341	1,001	607	234	89.7	536	427

* Not previously published; estimated on basis of records for station at Jackson.

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	#0.10	#0.09	0.09	0.04	0.12	0.45	2.42	0.46	0.48	0.30	0.08	.04	#4.67
1953	.01	.009	.01	.01	.009	.36	.36	.89	1.83	.44	.30	.07	4.30
1954	.01	.02	.02	.006	.06	.40	.41	.23	.35	.16	.08	.05	1.80
1955	.08	.07	.05	.03	.01	.22	.22	.11	.04	.007	.003	.001	.84
1956	.002	.002	.001	.0009	.0009	.05	.06	.04	.03	.02	.05	.004	.26
1957	.002	.01	.008	.003	.003	.13	.12	.12	.31	.27	.13	.12	1.23
1958	.07	.09	.07	.03	.02	.06	.21	.10	.05	.02	.004	.0006	.72
1959	.0008	.001	.001	.0007	.0006	.01	.01	.08	.17	.01	.003	.02	.31
1960	.01	.05	.06	.07	.02	.24	1.90	.84	.49	.20	.08	.27	4.23

* Not previously published; see footnote to preceding table.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-
1952	1238	4,880	Apr. 6, 1952	#18	#472	#0.344	#4.67	447	4.42
1953	1278	10,800	June 8, 1953	1.5	435	.517	4.30	437	4.32
1954	1338	1,380	Mar. 19, 1954	3.2	181	.132	1.80	196	1.95
1955	1398	752	Mar. 12, 1955	.6	86.1	.063	.84	65.8	.65
1956	1438	370	Apr. 4, 1956	.6	26.5	.019	.26	28.3	.28
1957	1508	1,200	June 24, 1957	.7	125	.091	1.23	146	1.44
1958	1558	404	Apr. 7, 1958	.2	73.2	.053	.72	49.9	.50
1959	1628	3,040	June 1, 1959	.2	31.4	.023	.31	43.1	.42
1960	1708	4,040	Apr. 5, 1960	8.9	427	.511	4.23	-	-

* Not previously published.

4780. East Fork Des Moines River near Burt, Iowa

Location.--Lat 43°12'35", long 94°10'40", in NW¼NE¼ sec.20, T.97 N., R.28 W., on right bank 30 ft downstream from highway bridge, 0.8 mile upstream from Buffalo Creek, 2.5 miles northeast of Burt, and 5.3 miles downstream from Mud Creek.

Drainage area.--462 sq mi.

Records available.--October 1951 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,109.92 ft above mean sea level, datum of 1929.

Average discharge.--9 years (1951-60), 92.2 cfs.

Extremes.--1951-60: Maximum discharge, 3,870 cfs June 21, 1954 (gage height, 12.67 ft); no flow Jan. 24 to Mar. 3, 1959.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	181	114	71.9	31.6	94.6	479	795	189	222	294	75.4	65.2	217
1953	5.58	4.37	4.60	5.21	4.29	526	238	278	537	120	90.5	3.35	135
1954	2.26	5.83	5.55	1.40	6.68	50.1	40.2	133	846	357	78.8	66.4	133
1955	121	57.3	31.0	15.0	6.25	124	204	99.4	148	36.2	1.39	.50	70.5
1956	.85	.85	.80	.77	.80	52.3	24.3	36.9	25.7	26.2	42.1	3.38	18.1
1957	1.76	3.66	2.44	1.08	.73	34.0	37.2	44.2	185	62.3	12.6	3.00	32.3
1958	2.80	9.18	9.16	2.71	6.56	8.93	81.7	41.9	65.8	53.3	1.71	.87	23.7
1959	1.75	.90	.67	.121	0	50.9	16.5	125	170	20.6	17.8	12.8	33.1
1960	21.7	32.5	62.5	64.4	17.9	96.6	413	684	497	92.9	11.3	13.4	167

† Corrected.

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	0.45	0.27	0.18	0.08	0.22	1.20	1.90	0.47	0.54	0.75	0.18	0.16	6.38
1953	.01	.01	.01	.01	.01	.81	.57	.69	1.30	.50	.23	.008	3.96
1954	.006	.01	.01	.004	.02	.13	.10	.33	2.04	.89	.20	.16	3.90
1955	.50	.14	.08	.04	.01	.31	.49	.25	.36	.09	.003	.001	2.07
1956	.002	.002	.002	.002	.002	.13	.06	.09	.06	.07	.11	.008	.54
1957	.004	.009	.006	.003	.002	.08	.09	.11	.45	.16	.03	.007	.95
1958	.007	.02	.02	.007	.01	.02	.20	.10	.16	.13	.004	.008	.68
1959	.002	.002	.002	.0005	0	.08	.04	.51	.41	.05	.04	.03	.97
1960	.05	.08	.16	.16	.04	.24	1.00	1.71	1.20	.23	.03	.03	4.93

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean
		Discharge	Date					
1950	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-
1952	1238	1,680	Mar. 31, 1952	14	217	0.470	6.38	187
1953	1278	1,060	June 13, 1953	1.2	135	.292	3.96	135
1954	1338	3,870	June 21, 1954	.4	133	.288	3.90	149
1955	1388,1708	670	(a)	.1	70.5	.153	2.07	53.1
1956	1438	244	Aug. 3, 1956	.2	18.1	.039	.54	18.5
1957	1508	392	June 1, 1957	.2	32.3	.070	.95	33.5
1958	1558	355	June 4, 1958	.3	25.7	.051	.68	22.1
1959	1628	675	May 23, 1959	0	33.1	.072	.97	42.7
1960	1708	2,120	May 22, 1960	1.8	167	.361	4.93	-

a Apr. 26, June 3, 1955.

4790. East Fork Des Moines River at Dakota City, Iowa
(Formerly published as East Fork Des Moines River near Hardy)

Location.--Lat 42°43'25", long 94°11'30", in NW¹SE¹ sec.6, T.91 N., R.28 W., on right bank 50 ft upstream from old mill dam, in city park at east edge of Dakota City, 500 ft upstream from highway bridge, 0.6 mile downstream from bridge on State Highway 3, and 3.6 miles upstream from confluence with West Fork Des Moines River.

Drainage area.--1,308 sq mi. At site used prior to Oct. 1, 1954, 1,268 sq mi.

Records available.--March 1940 to September 1960. Prior to October 1954, published as "near Hardy."

Gage.--Water-stage recorder. Datum of gage is 1,038.71 ft above mean sea level, datum of 1929. Prior to Oct. 1, 1954, wire-weight gage at site 8 miles upstream at different datum.

Average discharge.--20 years (1940-60), 447 cfs.

Extremes.--1940-60: Maximum discharge, 18,800 cfs June 21, 1954 (gage height, 16.95 ft, from floodmark, site and datum then in use); minimum daily, 5.0 cfs Sept. 23, 1948.

Flood of June 21, 1954, reached a stage of 24.02 ft (discharge, 17,400 cfs) at present site.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	78.8	29.2	21.6	21.9	207	1,018	4,729	1,781	1,365	2,458	721	734	1,098
1952	524	272	183	86.4	329	1,060	1,999	507	702	1,000	196	144	583
1953	33.0	33.5	25.6	22.6	26.0	698	581	603	852	284	471	29.4	306
1954	20.1	25.5	29.4	17.9	58.1	181	125	451	3,326	987	291	187	473
1955	511	262	133	76.6	43.9	354	599	391	641	244	28.4	15.5	276
1956	15.2	16.3	15.3	15.5	15.8	177	129	100	71.9	91.5	115	16.0	65.3
1957	12.7	24.2	19.6	15.7	21.0	98.6	91.1	202	381	114	35.8	20.1	86.4
1958	17.1	30.7	35.7	21.8	42.1	74.5	186	118	272	275	26.7	11.1	92.8
1959	12.0	14.2	11.7	8.94	10.4	166	110	1,212	793	160	157	107	232
1960	152	183	236	260	105	426	1,068	1,221	1,316	229	51.1	40.8	440

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.07	0.03	0.02	0.02	0.17	0.93	4.16	1.62	1.20	2.24	0.66	0.65	11.77
1952	.48	.24	.17	.06	.28	.96	1.76	.46	.62	.91	.18	.13	6.27
1953	.03	.03	.02	.02	.02	.63	.51	.55	.75	.26	.43	.03	3.28
1954	.02	.02	.03	.02	.05	.16	.11	.41	2.93	.90	.26	.16	5.07
1955	.45	.22	.12	.07	.03	.31	.51	.34	.55	.22	.03	.01	2.86
1956	.01	.01	.01	.01	.01	.16	.11	.09	.06	.08	.10	.01	.66
1957	.01	.02	.02	.01	.02	.09	.08	.18	.33	.10	.03	.02	.91
1958	.02	.03	.03	.02	.05	.07	.16	.10	.23	.24	.03	.01	.97
1959	.01	.01	.01	.008	.008	.15	.09	1.07	.68	.14	.14	.09	2.41
1960	.13	.16	.21	.23	.09	.38	.91	1.08	1.12	.20	.05	.03	4.59

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	224	2.40
1951	1208	10,800	Apr. 9, 1951	16	1,098	0.866	11.77	1,169	12.54
1952	1238	5,600	Apr. 2, 1952	37	583	.460	6.27	508	5.46
1953	1278	2,000	Aug. 5, 1953	15	306	.241	3.28	305	3.27
1954	1338	18,800	June 21, 1954	14	473	.373	5.07	543	5.79
1955	1398	1,640	June 9, 1955	13	276	.211	2.86	203	2.10
1956	1438	640	Mar. 27, 1956	6.0	65.3	.050	.66	66.1	.68
1957	1508	1,060	May 30, 1957	7.0	86.4	.066	.91	88.7	.94
1958	1558	1,360	July 14, 1958	7.9	92.8	.071	.97	89.0	.92
1959	1628	6,860	May 22, 1959	7.9	232	.177	2.41	276	2.88
1960	1708	4,500	Mar. 29, 1960	14	440	.336	4.59	-	-

4800. Lizard Creek near Clare, Iowa

Location.--Lat 42°32'40", long 94°20'45", in NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.11, T.89 N., R.30 W., on right bank 20 ft downstream from highway bridge, 3 miles south of Clare, 8 miles northwest of Fort Dodge, and 8.9 miles upstream from South Lizard Creek.

Drainage area.--257 sq mi.

Records available.--March 1940 to September 1960. Monthly discharge only for some periods, published in WSP 1308. Prior to October 1954, published as North Lizard Creek near Clare.

Gage.--Water-stage recorder. Concrete control since Oct. 11, 1956. Datum of gage is 1,079.30 ft above mean sea level, datum of 1929. Prior to May 6, 1953, wire-weight gage at same site and datum.

Average discharge.--20 years (1940-60), 90.3 cfs.

Extremes.--1940-60: Maximum discharge, 10,000 cfs June 23, 1947 (gage height, 16.0 ft, from floodmark), from rating curve extended above 4,500 cfs by logarithmic plotting; no flow Sept. 30, 1943, Aug. 27-29, 1956.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	40.3	9.01	5.32	3.49	46.8	416	577	453	666	265	250	187	244
1952	95.6	56.4	48.4	50.8	157	334	279	119	120	294	37.1	14.6	134
1953	4.44	6.06	4.91	5.66	8.72	167	140	127	288	98.8	125	4.12	81.9
1954	3.72	5.01	3.74	1.29	9.10	49.8	72.5	137	1158	104	184	75.0	149
1955	208	80.1	37.6	18.3	23.9	108	156	78.7	38.3	6.45	1.29	.32	63.3
1956	3.35	1.62	.71	.30	.30	20.5	3.79	9.02	5.69	1.09	.21	.39	3.95
1957	.47	1.74	1.01	.51	3.62	18.6	12.8	25.8	18.5	14.8	3.34	8.25	9.15
1958	6.28	20.6	26.3	10.4	26.0	25.0	75.8	31.7	186	96.6	11.5	3.32	42.9
1959	2.96	2.87	1.02	.37	.13	59.1	33.2	184	174	58.4	27.7	13.7	45.0
1960	13.7	26.3	47.9	37.9	19.4	262	199	155	145	62.2	12.3	9.23	82.6

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.18	0.04	0.02	0.02	0.19	1.86	2.50	2.03	2.89	1.19	1.12	0.81	12.85
1952	.43	.24	.22	.23	.66	1.90	1.21	.53	.52	1.32	.17	.06	7.09
1953	.02	.03	.02	.03	.04	.75	.61	.57	1.25	.44	.56	.02	4.34
1954	.02	.02	.02	.006	.04	.22	.31	.62	5.03	.47	.82	.33	7.91
1955	.93	.35	.17	.08	.10	.48	.68	.35	.17	.03	.006	.001	3.35
1956	.02	.007	.003	.001	.001	.09	.02	.04	.02	.005	.0009	.002	.21
1957	.002	.008	.005	.002	.01	.08	.06	.12	.08	.07	.01	.04	.49
1958	.03	.09	.12	.05	.11	.11	.32	.14	.81	.43	.05	.01	2.27
1959	.01	.01	.005	.002	.0005	.27	.14	.75	.75	.26	.12	.06	2.56
1960	.06	.11	.21	.17	.08	1.18	.86	.69	.63	.28	.06	.04	4.37

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	1208	3,620	Mar. 28, 1951	1.3	244	0.949	12.85	59.0	3.12
1952	1236	1,470	Mar. 30, 1952	5.2	134	.521	7.09	256	13.50
1953	1278	1,190	June 28, 1953	2.4	81.9	.319	4.34	118	6.26
1954	1338	6,210	June 20, 1954	1.0	149	.580	7.91	176	9.30
1955	1388	660	Apr. 25, 1955	.1	63.3	.246	3.35	36.4	1.93
1956	1438	147	May 31, 1956	0	3.95	.015	.21	3.74	.19
1957	1508	399	May 21, 1957	.1	9.15	.036	.49	13.5	.71
1958	1558	1,740	June 3, 1958	2.3	42.9	.167	2.27	39.1	2.06
1959	1628	1,740	June 1, 1959	.1	45.0	.175	2.56	51.8	2.71
1960	1708	3,650	Mar. 29, 1960	5.4	82.6	.321	4.37	-	-

4805. Des Moines River at Fort Dodge, Iowa

Location.--Lat 42°30'25", long 94°12'00", in NW1/4 sec.19, T.89 N., R.28 W., on right bank 400 ft upstream from Soldier Creek, 1,800 ft downstream from Illinois Central Railroad bridge in Fort Dodge, and 2,000 ft downstream from Lizard Creek.

Drainage area.--4,190 sq mi (revised).

Records available.--April 1905 to July 1906 (no winter records), October 1913 to September 1927 (published as "at Kalo"), October 1946 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 969.38 ft above mean sea level, datum of 1929. Apr. 22, 1905, to July 19, 1906, chain gage at bridge, 3,000 ft downstream, at different datum. Oct. 18, 1913, to Oct. 20, 1921, June 20 to Sept. 30, 1927, chain gage and Oct. 21, 1921, to June 19, 1927, water-stage recorder, at site 7 miles downstream at Kalo, at different datum. Oct. 1, 1946, to Dec. 7, 1949, wire-weight gage at bridge 1,800 ft upstream from present site, at present datum.

Average discharge.--28 years (1913-27, 1946-60), 1,272 cfs.

Extremes.--1905-6, 1913-27, 1946-60: Maximum discharge, 35,400 cfs June 21, 1954; maximum gage height, 19.62 ft (revised), from floodmap, June 23, 1947; minimum daily discharge, 14 cfs Nov. 3, 1955.

Maximum stage known, that of June 23, 1947 (discharge, 34,000 cfs).

Remarks.--Diurnal fluctuation at low flow caused by powerplant above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	509	225	118	87.8	563	2,968	12,950	6,061	5,398	6,024	2,593	1,405	3,327
1952	1,471	770	721	577	2,280	5,571	7,476	1,869	1,923	3,061	535	387	2,046
1953	152	130	116	108	192	2,035	2,028	2,441	4,716	1,447	1,740	291	1,286
1954	160	172	137	80.1	218	941	1,184	1,691	8,812	2,083	1,518	739	1,475
1955	1,516	781	451	261	206	1,229	1,988	1,133	1,106	410	93.4	54.2	771
1956	66.6	67.2	44.2	43.5	43.8	338	378	300	220	152	211	64.1	161
1957	32.8	79.1	51.7	42.7	53.3	354	372	506	859	578	277	238	294
1958	151	271	242	167	177	296	722	431	1,096	1,250	157	58.2	419
1959	42.7	54.5	41.0	33.5	35.5	509	336	2,201	2,048	529	284	228	531
1960	269	346	487	617	253	1,573	5,073	3,535	3,015	909	257	407	1,392

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.14	0.06	0.03	0.02	0.14	0.82	3.45	1.67	1.44	1.66	0.71	0.64	10.78
1952	.40	.20	.20	.16	.59	.98	1.99	.51	.51	.84	.15	.10	6.63
1953	.04	.03	.03	.03	.05	.56	.54	.87	1.26	.40	.48	.08	4.17
1954	.04	.05	.04	.02	.05	.26	.32	.47	2.35	.57	.42	.20	4.79
1955	.42	.21	.12	.07	.05	.34	.53	.31	.29	.11	.03	.01	2.49
1956	.02	.02	.01	.01	.01	.09	.10	.08	.06	.04	.06	.02	.52
1957	.009	.02	.01	.01	.01	.09	.10	.14	.26	.16	.08	.06	.95
1958	.04	.07	.07	.05	.04	.08	.19	.12	.29	.34	.04	.02	1.35
1959	.01	.01	.01	.009	.009	.14	.02	.61	.55	.15	.08	.06	1.51
1960	.07	.09	.13	.17	.07	.43	1.35	.97	.80	.25	.07	.11	4.51

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year			
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches		
		Discharge	Date								
1950	-	-	-	-	-	-	-	-	-	-	-
1951	1208	22,300	Apr. 8, 1951	67	3,327	0.794	10.78	3,535	1.09	5.93	4.20
1952	1238	13,100	Apr. 2, 1952	158	2,046	.488	6.63	1,830	1.29	5.41	1.79
1953	1278	8,850	June 13, 1953	42	1,286	.307	4.17	1,292	1.20	1.90	-
1954	1338	35,400	June 21, 1954	28	1,475	.352	4.79	1,666	1.29	1.90	-
1955	1388	6,840	Apr. 26, 1955	33	771	.184	2.49	555	1.20	1.90	-
1956	1438	3,400	Mar. 28, 1956	14	161	.038	.52	160	1.20	1.90	-
1957	1508	4,400	May 30, 1957	20	294	.070	.95	336	1.20	1.90	-
1958	1558	*7,450	July 14, 1958	40	419	.100	1.35	375	1.20	1.90	-
1959	1628	9,680	May 22, 1959	28	531	.127	1.73	612	1.20	1.90	-
1960	1708	16,200	Mar. 29, 1960	120	1,392	.332	4.51	-	1.20	1.90	-

* Revised.

4810. Boone River near Webster City, Iowa

Location.--Lat 42°26'00", long 93°48'15", in NW¹SE¹ sec.18, T.88 N., R.25 W., on right bank 10 ft upstream from bridge on State Highway 60, 2 miles south of Webster City, and 4.5 miles downstream from White Fox Creek.

Drainage area.--844 sq mi.

Records available.--March 1940 to September 1960.

Gage.--Water-stage recorder. Concrete control since Sept. 24, 1956. Datum of gage is 989.57 ft above mean sea level, datum of 1929. Prior to June 26, 1940, wire-weight gage at same site and datum.

Average discharge.--20 years (1940-60), 329 cfs.

Extremes.--1940-60: Maximum discharge, 20,300 cfs June 22, 1954 (gage height, 18.55 ft); minimum daily, 1.6 cfs Sept. 30, Oct. 1, 1956.

Maximum stage known since 1896, 19.1 ft about June 10, 1918, from floodmarks, from information by local resident (discharge, 21,500 cfs). Flood of June 18, 1932, reached a stage of 16.0 ft (discharge, 15,000 cfs).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	143	35.5	15.1	12.9	454	1,418	2,922	1,212	2,045	1,343	441	431	871
1952	236	144	142	122	528	924	1,115	419	560	1,188	774	364	457
1953	17.3	25.5	16.5	16.1	32.5	396	595	634	418	203	303	15.1	224
1954	10.3	18.8	16.8	9.51	31.4	78.2	178	446	3,485	299	433	166	428
1955	554	215	101	51.0	51.4	197	306	190	258	358	19.0	11.9	194
1956	39.8	15.9	8.33	6.98	7.45	90.7	54.1	95.3	48.6	40.5	14.1	8.85	36.1
1957	7.04	13.9	13.0	11.5	19.2	84.0	33.7	106	391	59.3	16.6	17.6	64.2
1958	13.8	36.0	52.1	23.2	45.1	65.1	144	87.9	354	736	58.0	16.7	135
1959	20.0	15.6	9.49	6.61	7.07	606	195	54	598	223	51.9	68.2	196
1960	63.7	113	151	155	67.0	727	733	677	273	89.8	33.0	24.5	260

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.20	0.05	0.02	0.02	0.56	1.94	3.86	1.65	2.70	1.83	0.60	0.57	14.00
1952	.32	.19	.19	.17	.67	1.26	1.47	.57	.74	1.62	.11	.05	7.36
1953	.02	.03	.02	.02	.04	.54	.79	.87	.55	.28	.41	.02	3.59
1954	.01	.02	.02	.01	.04	.11	.24	.61	4.81	.41	.59	.22	6.89
1955	.76	.28	.14	.07	.06	.27	.40	.26	.34	.49	.03	.02	3.12
1956	.05	.02	.01	.01	.01	.12	.07	.13	.06	.06	.02	.01	.57
1957	.01	.02	.02	.02	.02	.11	.04	.14	.52	.08	.02	.02	1.02
1958	.02	.05	.07	.03	.06	.09	.19	.09	.47	1.01	.08	.02	2.18
1959	.03	.02	.01	.009	.009	.83	.26	.74	.79	.30	.07	.09	3.16
1960	.09	.15	.21	.21	.09	.99	.97	.92	.36	.12	.05	.03	4.19

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	231	3.71
1951	1208	10,400	June 28, 1951	8.0	871	1.03	14.00	898	14.43
1952	1238	3,830	July 9, 1952	17	457	.541	7.36	418	6.73
1953	1278	1,760	May 1, 1953	8.2	224	.265	3.59	223	3.57
1954	1338	20,300	June 22, 1954	5.2	428	.507	6.89	498	8.02
1955	1388	7,190	July 6, 1955	9.0	194	.230	3.12	126	2.02
1956	1438	890	May 30, 1956	1.6	36.1	.043	.57	33.5	.54
1957	1508	3,230	June 16, 1957	1.6	64.2	.076	1.02	69.9	1.11
1958	1558	5,300	July 15, 1958	8.8	135	.160	2.18	130	2.10
1959	1628	3,500	May 24, 1959	5.0	196	.032	3.16	220	3.55
1960	1708	8,960	Mar. 29, 1960	11	260	.308	4.19	-	-

4815. Des Moines River near Boone, Iowa

Location.--Lat 42°04'40", long 93°55'55", in NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.24, T.84 N., R.27 W., on left bank 30 ft upstream from Boone Water Department dam, 2 miles northwest of Boone, and 2.2 miles upstream from Bluff Creek.

Drainage area.--5,511 sq mi.

Records available.--April 1920 to September 1960 in reports of the Geological Survey. Monthly discharge only for some periods, published in WSP 1308. December 1904 to April 1920 (fragmentary gage heights during high-water periods only) in reports of U.S. Weather Bureau.

Gage.--Water-stage recorder. Concrete control since Oct. 20, 1932. Datum of gage is 871.52 ft above mean sea level, adjustment of 1912. Prior to May 1, 1920, chain gage at site 2.5 miles downstream at datum 7.87 ft lower. Apr. 9, 1920, to Sept. 13, 1924, chain gage 1.3 miles upstream at datum 1.65 ft lower. Oct. 9, 1924, to Jan. 10, 1933, chain gage 0.3 mile upstream at datum 6.69 ft lower. Jan. 11, 1933, to Sept. 30, 1934, staff gage at present site at datum 0.41 ft lower. Oct. 1, 1934, to Feb. 6, 1935, staff gage at present site and datum.

Average discharge.--40 years (1920-60), 1,557 cfs.

Extremes.--1904-60: Maximum discharge, 57,400 cfs June 22, 1954 (gage height, 25.35 ft, from graph based on hourly gage readings).

1920-60: No flow for a short time on Jan. 9, 25, 1938, caused by manipulation of gates in control dam; minimum daily discharge, 17 cfs Jan. 28, 1940 (unaffected by gate operation).

Flood of May 30, 1903, reached a stage of 25.4 ft, from high-water mark, site and datum then in use (discharge, 43,600 cfs).

Remarks.--Slight diurnal fluctuation at low flow caused by powerplants above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	755	260	130	100	870	4,523	16,410	8,046	7,799	8,208	3,238	2,943	4,443
1952	1,735	1,000	957	681	2,787	4,589	9,566	2,566	2,566	4,774	706	428	2,688
1953	112	152	145	147	237	2,516	2,819	3,356	5,379	2,029	2,214	339	1,831
1954	152	170	161	87.6	263	975	1,395	2,258	13,150	2,725	2,417	1,264	2,078
1955	2,492	1,221	658	366	266	1,573	2,292	1,597	1,498	1,049	114	67.2	1,104
1956	113	86.4	58.1	55.2	57.6	427	469	362	325	241	261	94.3	213
1957	47.2	98.4	70.2	50.2	83.3	387	509	613	1,929	850	351	305	441
1958	205	355	358	266	226	484	1,058	614	1,769	2,017	294	105	645
1959	73.8	82.5	54.7	41.1	42.3	1,476	799	2,742	3,278	1,045	376	332	866
1960	366	481	643	832	413	2,060	6,921	4,899	3,678	1,310	365	480	1,868

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.16	0.05	0.03	0.02	0.16	0.95	3.32	1.69	1.58	1.72	0.68	0.60	10.95
1952	.36	.20	.20	.14	.55	.96	1.94	.54	.52	1.00	.15	.09	6.85
1953	.04	.03	.03	.03	.04	.53	.57	.70	1.09	.42	.46	.07	4.01
1954	.03	.03	.03	.02	.05	.20	.28	.47	2.66	.57	.51	.26	5.11
1955	.52	.25	.14	.08	.05	.33	.46	.33	.30	.22	.02	.01	2.71
1956	.02	.02	.01	.01	.01	.09	.10	.08	.07	.05	.05	.02	.53
1957	.01	.02	.01	.01	.02	.08	.10	.13	.39	.18	.07	.06	1.08
1958	.04	.07	.07	.06	.04	.10	.21	.13	.36	.42	.06	.02	1.58
1959	.02	.02	.01	.009	.008	.31	.18	.57	.66	.22	.08	.07	2.14
1960	.08	.10	.13	.17	.08	.43	1.40	1.02	.74	.27	.08	.10	4.60

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	1,141	2.82
1951	1208	28,200	Mar. 30, 1951	57	4,443	0.806	10.95	4,568	11.47
1952	1238	16,600	Apr. 2, 1952	198	2,688	0.488	6.85	2,417	5.99
1953	1278	9,060	June 15, 1953	87	1,631	.296	4.01	1,632	4.00
1954	1338	57,400	June 22, 1954	66	2,078	.379	5.11	2,405	5.93
1955	1708	6,290	July 10, 1955	45	1,104	.200	2.71	758	1.85
1956	1438	1,550	May 31, 1956	42	213	.039	.53	209	.52
1957	1508	8,300	June 16, 1957	25	441	1.08	1.08	500	1.22
1958	1558	9,500	July 16, 1958	60	645	.117	1.58	586	1.45
1959	1628	13,200	June 1, 1959	33	866	.157	2.14	975	2.40
1960	1708	29,800	Mar. 31, 1960	164	1,868	.339	4.60	-	-

4820. Des Moines River at Des Moines, Iowa

Location.--Lat 41°36'45", long 93°37'15", in NE¼ sec.34, T.79 N., R.24 W., on right bank 5 ft upstream from Second Avenue Bridge in Des Moines, 1.8 miles upstream from Center Street Dam, 2.8 miles upstream from Raccoon River, and 4.5 miles downstream from Beaver Creek.

Drainage area.--6,245 sq mi.

Records available.--October 1902 to August 1903, October 1914 to February 1915 (gage heights and discharge measurements only), May 1905 to July 1906 and March 1915 to September 1960 in reports of Geological Survey. Monthly discharge only for some periods, published in WSP 1308. Gage-height records collected at Locust or Walnut Street Bridges, 1893-94, 1897-1941, are contained in reports of U.S. Weather Bureau.

Gage.--Water-stage recorder and concrete multiple-arch control dam. Datum of gage is 773.68 ft (revised) above mean sea level, datum of 1929, and at city datum. Prior to Aug. 21, 1941, staff, chain, or recording gages at several sites within 3 miles of present site at various datums.

Average discharge.--45 years (1915-60), 1,979 cfs.

Extremes.--1902-3, 1905-6, 1914-60: Maximum discharge, 60,200 cfs June 24, 1954 (gage height, 30.16 ft).
1915-60: Minimum unregulated discharge, 24 cfs Jan. 29, 30, 1940; operation of sluice gates in control dam at times has caused brief periods of no flow.

Remarks.--Records of chemical analyses for the period November 1954 to June 1955, water temperatures and suspended sediment loads for the period November 1954 to September 1960 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	744	255	144	111	554	4,495	19,190	9,590	8,402	9,527	3,645	5,417	5,012
1952	2,189	1,292	1,160	822	5,058	4,789	11,020	3,320	3,226	5,760	900	558	3,164
1953	198	189	188	169	779	2,603	5,282	3,946	6,113	2,404	2,227	355	1,873
1954	184	216	179	97.6	273	974	1,525	2,454	14,200	3,015	3,851	1,840	2,396
1955	3,518	1,600	827	522	678	1,749	2,629	2,112	1,633	1,436	141	83.9	1,416
1956	116	78.7	57.6	60.7	66.2	404	509	430	338	220	232	115	219
1957	67.3	118	86.2	65.0	119	341	604	666	2,796	1,083	378	308	552
1958	214	402	435	321	313	794	1,076	738	2,036	3,724	650	294	919
1959	168	158	92.3	55.6	110	2,834	1,686	3,605	4,757	1,610	438	413	1,333
1960	490	599	672	1,282	674	1,458	10,530	6,971	4,598	2,241	813	667	2,577

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.14	0.05	0.03	0.02	0.09	0.83	3.43	1.77	1.50	1.76	0.67	0.61	10.90
1952	.40	.23	.21	.15	.52	.88	1.97	.61	.58	1.06	.17	.10	6.88
1953	.04	.03	.03	.03	.13	.48	.59	.73	1.09	.44	.41	.06	4.06
1954	.03	.04	.03	.02	.05	.18	.27	.45	2.54	.56	.71	.33	5.21
1955	.65	.29	.15	.10	.11	.32	.47	.39	.29	.27	.03	.01	3.08
1956	.02	.01	.01	.01	.01	.07	.09	.08	.06	.04	.04	.02	.46
1957	.01	.02	.02	.01	.02	.06	.11	.12	.50	.20	.07	.06	1.20
1958	.04	.07	.08	.06	.05	.15	.19	.14	.36	.69	.12	.05	2.00
1959	.03	.03	.02	.01	.02	.52	.30	.67	.85	.30	.08	.07	2.90
1960	.09	.11	.12	.24	.12	.27	1.88	1.29	.82	.41	.15	.12	5.62

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year			
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches		
		Discharge	Date								
1950	-	-	-	-	-	-	-	1,385	3.00		
1951	1208	32,400	Mar. 31, 1951	48	5,012	0.803	10.90	5,306	11.52		
1952	1238	17,800	Apr. 3, 1952	253	3,164	.507	6.88	2,823	6.14		
1953	1278	11,400	June 12, 1953	48	1,873	.300	4.06	1,874	4.06		
1954	1338	60,200	June 24, 1954	72	2,396	.384	5.21	2,848	6.20		
1955	1368	6,840	Oct. 15, 1954	57	1,416	.227	3.08	937	2.03		
1956	1438	1,420	May 30, 1956	50	219	.035	.46	221	.47		
1957	1508	9,680	June 17, 1957	53	552	.088	1.20	617	1.34		
1958	1558	8,480	July 17, 1958	90	919	.147	2.00	866	1.89		
1959	1628	16,100	June 3, 1959	45	1,333	.213	2.90	1,445	3.14		
1960	1708	36,200	Apr. 1, 1960	305	2,577	.413	5.62	-	-		

4821.7. Big Cedar Creek near Varina, Iowa

Location.--Lat 42°41'21", long 94°47'55", in NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.24, T.91 N., R.34 W., on left bank 5 ft downstream from highway bridge, 3.1 miles above Drainage Ditch 74, and 5.5 miles northeast of Varina.

Drainage area.--80.0 sq mi.

Records available.--October 1959 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,225.12 ft above mean sea level, datum of 1929.

Extremes.--1959-60: Maximum discharge, 1,020 cfs Mar. 27, 1960 (gage height, 11.42 ft), from rating curve extended above 450 cfs by logarithmic plotting; maximum gage height, 13.13 ft Mar. 27, 1960 (backwater from ice); minimum daily discharge, 2.0 cfs Aug. 23, 1960.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1960	2.95	4.10	13.4	8.13	4.76	73.0	62.2	59.5	63.0	17.2	8.07	3.73	26.7

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1960	0.04	0.06	0.19	0.12	0.06	1.05	0.87	0.86	0.88	0.25	0.12	0.04	4.55

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1960	1708	1,020	Mar. 27, 1960	2.0	26.7	0.354	4.55	-	-

4823. North Raccoon River near Sac City, Iowa

Location.--Lat 42°20'20", long 94°59'10", in NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.24, T.87 N., R.36 W., on right bank 15 ft downstream from highway bridge, 0.2 mile upstream from Indian Creek, and 4.5 miles south of Sac City.

Drainage area.--713 sq mi.

Records available.--June 1958 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,157.65 ft above mean sea level (levels by Sac County Engineer).

Extremes.--1958-60: Maximum discharge, 9,020 cfs Mar. 30, 1960 (gage height, 16.73 ft); minimum daily, 1.0 cfs Jan. 25 to Feb. 5, 1959. Flood of June 21, 1954, reached a stage of 15.61 ft from floodmark (discharge, 7,000 cfs).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1958	-	-	-	-	-	-	-	-	636	145	24.1	8.94	-
1959	6.39	9.44	4.39	1.43	1.16	80.6	62.0	557	592	110	56.0	30.1	126
1960	35.4	51.9	123	130	56.9	748	865	652	607	204	60.2	47.5	299

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1958	-	-	-	-	-	-	-	-	1.00	0.23	0.04	0.01	-
1959	0.01	0.01	0.007	0.002	0.002	0.13	0.10	0.90	.93	.18	.09	.05	2.41
1960	.06	.08	.20	.21	.09	1.21	1.35	1.05	.95	.33	.19	.07	5.70

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1958	1558	84,560	June 4, 1958	b5.4	-	-	-	-	-
1959	1628	5,200	May 31, 1959	1.0	126	0.177	2.41	142	2.72
1960	1708	9,020	Mar. 30, 1960	20	299	.419	5.70	-	-

a Maximum during period June to September.

b Minimum day during period June to September.

4825. North Raccoon River near Jefferson, Iowa

Location.--Lat 41°59'20", long 94°22'30", in SW¼NW¼ sec.20, T.83 N., R.30 W., on right bank 50 ft downstream from bridge on State Highway 17, 2 miles south of Jefferson, and 4.2 miles upstream from Hardin Creek.

Drainage area.--1,619 sq mi.

Records available.--March 1940 to September 1960. Prior to October 1955, published as Raccoon River near Jefferson.

Gage.--Water-stage recorder. Datum of gage is 967.09 ft above mean sea level, datum of 1929. Prior to Apr. 22, 1946, wire-weight gage at site 4 miles upstream at different datum. Apr. 22 to June 25, 1946, wire-weight gage, June 26, 1946, to Sept. 30, 1955, water-stage recorder, and Oct. 1, 1955, to Apr. 30, 1958, wire-weight gage, at present site and datum.

Average discharge.--20 years (1940-60), 625 cfs.

Extremes.--1940-60: Maximum discharge, 29,100 cfs June 23, 1947 (gage height, 22.3 ft); minimum daily, 0.6 cfs Oct. 5, 1956.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	121	54.7	26.2	25.7	105	2,041	3,468	3,189	3,637	1,604	2,916	1,902	1,596
1952	1,009	521	421	462	1,398	1,780	2,192	922	780	2,036	248	102	985
1953	61.2	65.1	74.3	69.7	232	790	938	956	1,145	573	333	45.8	441
1954	27.0	37.4	37.7	21.5	74.3	135	332	565	4,584	565	1,550	670	714
1955	1,424	538	279	175	178	820	1,080	533	253	354	31.1	16.6	476
1956	19.5	19.8	15.7	15.2	17.5	68.5	46.3	76.1	68.0	18.1	12.1	17.0	32.8
1957	5.04	33.1	25.4	19.3	31.9	74.3	65.0	136	1,032	302	48.5	59.3	152
1958	64.7	228	283	123	195	304	345	185	1,277	655	160	56.5	322
1959	38.9	38.6	22.2	14.9	13.4	479	368	952	1,943	413	91.3	63.6	362
1960	66.8	127	169	237	118	1,079	2,564	1,689	1,039	456	155	139	653

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.09	0.04	0.02	0.02	0.07	1.45	2.39	2.27	2.51	1.14	2.08	1.31	13.39
1952	.72	.36	.30	.33	.95	1.25	1.51	.66	.52	1.45	.18	.07	8.28
1953	.04	.04	.05	.05	.15	.58	.65	.68	.79	.41	.24	.03	3.69
1954	.02	.03	.03	.02	.05	.10	.23	.40	3.16	.40	1.10	.46	6.00
1955	1.01	.37	.20	.12	.11	.58	.74	.38	.17	.25	.02	.01	3.96
1956	.01	.01	.01	.01	.01	.05	.03	.05	.05	.01	.009	.01	.26
1957	.004	.02	.02	.01	.02	.05	.04	.10	.71	.21	.03	.04	1.25
1958	.05	.16	.20	.09	.13	.22	.24	.13	.88	.47	.11	.04	2.72
1959	.03	.03	.02	.01	.009	.34	.25	.68	1.27	.29	.07	.04	3.04
1960	.05	.09	.12	.17	.08	.77	1.77	1.20	.72	.32	.11	.10	5.50

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	357	2.96
1951	1508	16,000	Mar. 29, 1951	18	1,596	0.986	13.39	1,743	14.62
1952	1238	6,580	Apr. 1, 1952	68	985	.608	8.28	838	7.03
1953	1278	3,490	July 1, 1953	25	441	.272	3.69	432	3.64
1954	1338	21,300	June 22, 1954	16	714	.441	6.00	895	7.50
1955	1388	3,580	Apr. 26, 1955	12	476	.294	3.96	292	2.41
1956	1438	650	May 13, 1956	1.0	32.8	.020	.26	33.5	.27
1957	1508	7,800	June 16, 1957	.6	152	.094	1.25	195	1.62
1958	1558	4,720	June 7, 1958	28	322	.199	2.72	282	2.39
1959	1628	9,800	June 3, 1959	12	362	.224	3.04	384	3.22
1960	1708	18,600	Mar. 31, 1960	60	653	.403	5.50	-	-

DES MOINES RIVER BASIN

4830. East Fork Hardin Creek near Churdan, Iowa

Location.--Lat 42°06'25", long 94°22'10", in SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.5, T.84 N., R.30 W., on left bank 35 ft upstream from highway bridge, 4.4 miles upstream from mouth, and 6.5 miles south-east of Churdan.

Drainage area.--24.0 sq mi.

Records available.--July 1952 to September 1960.

Gage.--Water-stage recorder and concrete control. Datum of gage is 1,050.90 ft above mean sea level, datum of 1929.

Average discharge.--8 years (1952-60), 6.89 cfs.

Extremes.--1952-60: Maximum discharge, 413 cfs May 5, 1960 (gage height, 8.92 ft), from rating curve extended above 180 cfs by logarithmic plotting; no flow at times each year.

Remarks.--Small diversion for irrigation above station. Records of suspended sediment loads for the period July 1952 to September 1957 are published in reports of the Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	16.6	1.45	0.253	-
1952	-	-	-	-	-	-	-	-	-	2.35	.354	0	-
1953	0.125	0.168	0.213	0.205	13.0	6.37	15.3	14.6	16.4	1.21	41.6	9.20	5.68
1954	0	0	0	.02	.02	.13	.56	3.32	22.5	1.21	41.6	9.20	6.58
1955	47.3	12.7	5.13	2.43	3.70	8.50	21.1	8.49	4.41	19.0	.33	0	11.2
1956	0	0	0	0	0	.196	.0577	2.79	3.60	.0739	0	.0487	.563
1957	0	.022	.075	.003	1.14	.492	.216	2.57	40.0	4.82	3.13	.254	4.11
1958	.44	2.82	4.87	2.46	4.89	7.24	5.30	2.29	17.6	59.6	3.57	.50	7.67
1959	.29	.10	0	0	.01	16.9	10.5	28.8	21.9	5.24	.25	.07	7.05
1960	.08	.08	.13	.05	.39	27.1	37.0	60.7	11.4	7.41	2.25	.70	12.3

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	0.80	0.07	0.01	-
1953	0.006	0.008	0.01	0.01	0.57	0.31	0.71	0.70	0.76	.11	.02	0	3.21
1954	0	0	0	0	.0008	.006	.03	.16	1.04	.06	2.00	.43	3.73
1955	2.27	.59	.25	.12	.16	.41	.98	.41	.21	.92	.02	0	6.34
1956	0	0	0	0	0	.009	.003	.13	.17	.004	0	.002	.32
1957	0	.001	.004	.0002	.05	.02	.01	.12	1.86	.23	.02	.01	2.33
1958	.02	.13	.23	.12	.21	.35	.25	.11	.82	1.90	.17	.02	4.33
1959	.01	.005	0	0	.0005	.81	.49	1.39	1.02	.25	.01	.003	3.99
1960	.004	.004	.006	.002	.02	1.30	1.72	2.92	.53	.56	.11	.03	7.01

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-
1952	1238	a79	July 14, 1952	0	-	-	-	-	-
1953	1278	105	June 10, 1953	0	5.68	0.237	3.21	5.64	3.19
1954	1338, 1708	329	Aug. 26, 1954	0	6.58	.274	3.73	12.1	6.84
1955	1388	252	July 10, 1955	0	11.2	.467	6.34	5.67	3.23
1956	1438	112	May 13, 1956	0	.563	.023	.32	.571	.32
1957	1508	371	June 16, 1957	0	4.11	.171	2.33	4.79	2.70
1958	1558	186	July 19, 1958	0	7.67	.320	4.33	7.02	3.96
1959	1628	288	May 31, 1959	0	7.05	.294	3.99	7.04	3.99
1960	1708	413	May 5, 1960	0	12.3	.513	7.01	-	-

a Maximum during period July to September.

4836. Middle Raccoon River at Panora, Iowa

Location.--Lat 41°41'15", long 94°22'15", in NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.5, T.79 N., R.30 W., on left bank 15 ft downstream from highway bridge, 0.2 mile southeast of Panora, and 1.5 miles upstream from Andy's Branch.

Drainage area.--440 sq mi.

Records available.--June 1958 to September 1960.

Gage.--Water-stage recorder and concrete control. Datum of gage is 991.20 ft above mean sea level, datum of 1929.

Extremes.--1958-60: Maximum discharge, 9,150 cfs July 2, 1958 (gage height, 11.87 ft), from rating curve extended above 4,500 cfs by logarithmic plotting; minimum daily, 12 cfs Nov. 14, 1959.
Flood of June 10, 1953, reached a stage of 14.3 ft, from floodmark (discharge not determined).

Remarks.--City of Panora diverts approximately 100 acre-ft per year above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1958	-	-	-	-	-	-	-	-	-	592	148	71.6	-
1959	34.7	31.1	21.9	17.0	44.9	376	224	432	340	132	33.5	34.4	144
1960	24.6	31.7	34.4	41.2	39.7	332	717	542	206	160	97.8	54.1	190

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1958	-	-	-	-	-	-	-	-	-	1.55	0.39	0.18	-
1959	0.09	0.08	0.06	0.04	0.11	0.99	0.57	1.13	0.86	.35	.09	.09	4.46
1960	.06	.08	.09	.11	.10	.87	1.82	1.42	.52	.42	.26	.14	5.89

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1958	1558	a9,150	July 2, 1958	b34	-	-	-	-	-
1959	1628	2,480	June 1, 1959	15	144	0.327	4.46	144	4.46
1960	1708	5,320	Mar. 31, 1960	12	190	.432	5.89	-	-

a Maximum during period June to September.

b Minimum day during period June to September.

DES MOINES RIVER BASIN

4840. South Raccoon River at Redfield, Iowa

Location.--Lat 41°34'45", long 94°11'00", in SW¹/₄SW¹/₄ sec.3, T.78 N., R.29 W., on left bank 10 ft upstream from highway bridge at Redfield, 0.8 mile downstream from bridge on State Highway 90 (revised), 1 mile downstream from Middle Raccoon River, and 15.6 miles upstream from mouth.

Drainage area.--988 sq mi.

Records available.--March 1940 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 896.43 ft above mean sea level, datum of 1929. Prior to June 12, 1946, wire-weight gage at same site and datum.

Average discharge.--20 years (1940-60), 414 cfs.

Extremes.--1940-60: Maximum discharge, 35,000 cfs July 2, 1958 (gage height, 29.04 ft, from floodmark); minimum daily, 19 cfs July 27, 1940, Nov. 30, 1955.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	68.6	53.5	46.8	45.9	224	1,330	1,319	1,696	2,056	966	1,003	500	778
1952	425	241	220	280	612	1,460	1,137	697	1,188	1,052	488	225	669
1953	115	123	110	92.5	658	472	537	563	1,441	255	94.5	50.8	372
1954	48.4	64.1	54.9	34.5	96.4	77.0	113	207	390	57.4	639	161	162
1955	429	173	110	86.9	234	435	602	320	226	368	37.8	36.0	255
1956	30.1	36.2	32.4	34.0	35.5	96.5	50.0	115	169	115	310	287	109
1957	56.0	125	67.7	51.9	118	140	210	352	1,451	180	81.8	88.1	242
1958	127	242	257	154	347	443	246	144	184	2,371	317	738	466
1959	111	93.4	58.7	48.6	169	948	596	1,194	710	303	100	97.9	371
1960	74.8	106	99.5	154	117	918	1,552	1,449	442	439	364	149	490

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.08	0.06	0.05	0.05	0.24	1.55	1.49	1.98	2.32	1.13	1.17	0.56	10.68
1952	.50	.27	.26	.33	.67	1.70	1.28	.61	1.34	1.23	.57	.25	9.21
1953	.13	.14	.13	.11	.69	.55	.61	.66	1.63	.30	.11	.06	5.12
1954	.06	.07	.06	.04	.10	.09	.13	.24	.44	.07	.75	.18	2.23
1955	.50	.20	.13	.10	.25	.51	.68	.37	.26	.43	.04	.04	3.51
1956	.04	.04	.04	.04	.11	.06	.13	.19	.13	.36	.32	.150	1.50
1957	.07	.14	.08	.06	.12	.16	.24	.41	1.64	.21	.10	.10	3.33
1958	.15	.27	.30	.18	.37	.52	.28	.17	.21	2.77	.37	.83	6.42
1959	.13	.11	.07	.06	.18	1.11	.67	1.39	.80	.35	.12	.11	5.10
1960	.09	.12	.12	.18	.13	1.07	1.75	1.69	.50	.51	.43	.17	6.76

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	382	5.23
1951	1208	15,400	Mar. 29, 1951	35	778	0.787	10.68	838	11.52
1952	1238	9,740	June 27, 1952	117	669	.677	9.21	624	8.58
1953	1278	21,300	June 10, 1953	45	372	.377	5.12	357	4.91
1954	1338	7,200	Aug. 22, 1954	20	162	.164	2.23	208	2.87
1955	1388	6,310	Apr. 24, 1955	21	255	.258	3.51	203	2.80
1956	1438	3,840	Sept. 4, 1956	19	109	.110	1.50	122	1.67
1957	1508	12,700	June 17, 1957	36	242	.245	3.33	274	3.76
1958	1558	35,000	July 2, 1958	43	466	.472	6.42	436	6.01
1959	1628	*5,420	May 30, 1959	45	371	.376	5.10	372	5.12
1960	1708	9,340	(a)	55	490	.496	6.76	-	-

* Revised.

a Mar. 30, May 7, 1960.

4845. Raccoon River at Van Meter, Iowa

Location.--Lat 41°32'00", long 93°57'10", in SW¹/₄SW¹/₄ sec.22, T.78 N., R.27 W., or right bank 100 ft downstream from highway bridge, 0.3 mile northeast of Van Meter, 1.2 miles downstream from confluence of the North and South Raccoon Rivers, and 30 miles upstream from mouth.

Drainage area.--3,441 sq mi.

Records available.--April 1915 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 841.16 ft above mean sea level, datum of 1929. Prior to Oct. 1, 1915, chain gage at same site at datum 2.00 ft higher. Oct. 1, 1915, to May 30, 1923, chain gage; May 31, 1923, to Sept. 30, 1927, water-stage recorder; and Oct. 1, 1927, to Aug. 8, 1934, chain gage, all at same site and datum.

Average discharge.--45 years (1915-60), 1,174 cfs.

Extremes.--1915-60: Maximum discharge, 41,200 cfs June 13, 1947; maximum gage height, 21.77 ft July 3, 1958; minimum daily discharge, 10 cfs Jan. 22-31, 1940.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	236	132	85.8	73.5	342	3,452	7,051	6,706	7,461	3,681	4,309	3,278	3,074
1952	1,850	975	762	1,036	2,139	4,042	4,870	2,245	2,876	4,163	930	402	2,190
1953	202	216	198	185	1,112	1,568	1,941	2,045	3,559	1,282	498	126	1,073
1954	90.9	130	112	88.7	186	243	424	989	5,523	893	2,733	1,680	1,078
1955	2,690	1,099	560	357	778	1,709	2,100	1,189	729	1,216	129	77.2	1,056
1956	62.3	66.0	55.0	51.1	57.3	187	125	227	293	146	377	347	166
1957	78.0	178	109	83.9	187	262	393	735	3,602	762	174	180	559
1958	204	497	571	369	572	1,074	738	436	1,818	5,178	731	1,162	1,117
1959	211	189	114	96.8	221	2,505	1,561	3,097	3,877	1,130	261	190	1,125
1960	168	286	306	489	567	1,280	6,891	4,687	2,155	1,348	720	420	1,590

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.08	0.04	0.03	0.02	0.10	1.16	2.29	2.25	2.42	1.23	1.44	1.06	12.12
1952	.62	.32	.26	.35	.67	1.35	1.58	.75	.93	1.39	.31	.13	8.66
1953	.07	.07	.07	.06	.34	.53	.63	.69	1.15	.43	.17	.04	4.25
1954	.03	.04	.04	.02	.06	.08	.14	.30	1.79	.30	.92	.54	4.26
1955	.90	.36	.19	.12	.24	.57	.68	.40	.24	.41	.04	.03	4.10
1956	.02	.02	.02	.02	.02	.06	.04	.08	.09	.05	.13	.11	.66
1957	.03	.06	.04	.03	.06	.09	.13	.25	1.17	.26	.06	.06	2.24
1958	.07	.16	.19	.12	.17	.36	.24	.15	.59	1.73	.25	.38	4.41
1959	.07	.06	.04	.03	.07	.84	.51	1.04	1.26	.38	.09	.06	4.45
1960	.06	.09	.10	.16	.12	.43	2.23	1.57	.70	.45	.24	.14	6.29

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	1,093	4.32
1951	1208	27,700	Mar. 31, 1951	52	3,074	0.893	12.12	3,333	13.17
1952	1238	15,100	Apr. 1, 1952	231	2,190	.636	8.66	1,947	7.67
1953	1278	26,000	June 11, 1953	85	1,073	.312	4.25	1,049	4.15
1954	1338	20,800	June 25, 1954	45	1,078	.313	4.26	1,417	5.60
1955	1388	8,620	Apr. 24, 1955	45	1,056	.307	4.18	705	2.79
1956	1438	4,150	Sept. 4, 1956	37	166	.048	.66	181	.73
1957	1508	20,000	June 18, 1957	35	559	.162	2.24	635	2.53
1958	1558	35,200	July 3, 1958	95	1,117	.325	4.41	1,054	4.16
1959	1628	13,500	June 4, 1959	70	1,125	.327	4.45	1,146	4.53
1960	1708	32,300	Apr. 2, 1960	138	1,590	.462	6.29	-	-

4855. Des Moines River below Raccoon River, at Des Moines, Iowa

Location.--Lat 41°34'30", long 93°35'40", in NE¹/₄SE¹/₄ sec.10, T.78 N., R.24 W., near right bank on upstream side of East 14th Street Bridge, 0.8 mile downstream from Raccoon River and Scott Street Dam and at mile 200.7 (revised).

Drainage area.--9,879 sq mi.

Records available.--April 1940 to September 1960.

Gage.--Wire-weight gage. Datum of gage is 762.52 ft (revised) above mean sea level, datum of 1929. Prior to Oct. 1, 1951, and Oct. 1, 1953, to Sept. 30, 1959, water-stage recorder above Scott Street Dam, 0.8 mile upstream at datum 11.16 ft (revised) higher.

Average discharge.--20 years (1940-60), 3,755 cfs.

Extremes.--1940-60: Maximum discharge, 77,000 cfs June 26, 1947 (gage height, 20.8 ft in gage well, 21.6 ft from outside floodmark, site and datum then in use); minimum daily, 55 cfs Oct. 12, 1956.

Maximum stage known since at least 1893, that of June 26, 1947, site and datum then in use. Flood of May 31, 1903, reached a stage of 20.9 ft (from flood profile) at Scott Street site and datum, by office of Des Moines City Engineer.

Remarks.--Water for municipal supply of Des Moines is taken from infiltration galleries on Raccoon River, about 3.5 miles above station. These galleries are 150 to 300 ft from the river and generally about 30 ft below grade. At times, water is pumped directly from Raccoon River into recharge basins above galleries. Effluent from city sewage treatment plant, which includes storm-water runoff from portion of city, enters Des Moines River 2.3 miles below station, and corresponds roughly to pumpage except following heavy local rains. Net effect of pumpage, storm water, and other diversions is not known. Low flow can be regulated by pumpage into or release from reservoir of Des Moines Water Works (capacity, 4,800 acre-ft) on Raccoon River.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,039	392	225	183	784	6,751	27,350	16,310	16,360	13,690	8,049	6,780	8,170
1952	4,011	2,333	1,996	1,892	5,215	8,872	15,740	5,614	6,126	9,948	2,129	1,093	5,405
1953	395	420	396	373	2,042	4,413	5,364	5,915	9,379	3,795	2,720	508	2,974
1954	257	322	288	151	423	1,247	1,942	3,334	18,890	3,929	6,457	3,818	3,415
1955	6,086	2,791	1,470	947	1,446	3,704	4,943	3,530	2,369	2,930	253	159	2,561
1956	167	127	90.5	104	115	571	592	575	567	308	604	432	355
1957	100	220	146	120	238	585	962	1,629	6,358	1,762	511	493	1,089
1958	394	862	1,102	786	856	2,009	1,843	970	3,711	9,799	1,503	1,539	2,126
1959	398	356	211	135	316	6,005	3,294	6,995	8,676	2,996	743	599	2,572
1960	616	906	1,048	1,977	1,068	2,873	18,540	11,670	6,658	3,498	1,559	1,013	4,276

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.12	0.04	0.03	0.02	0.08	0.80	3.09	1.90	1.85	1.60	0.94	0.77	11.24
1952	.47	.26	.23	.22	.57	1.04	1.78	.66	.69	1.16	.25	.12	7.45
1953	.05	.05	.05	.04	.22	.52	.61	.69	1.06	.44	.32	.06	4.11
1954	.03	.04	.03	.02	.04	.15	.22	.39	2.13	.46	.75	.43	4.69
1955	.71	.32	.17	.11	.15	.43	.56	.41	.27	.34	.05	.02	3.52
1956	.02	.01	.01	.01	.01	.07	.07	.07	.06	.04	.07	.05	.49
1957	.01	.02	.02	.01	.03	.07	.11	.19	.72	.21	.06	.06	1.51
1958	.05	.10	.13	.09	.09	.23	.21	.11	.42	1.14	.16	.17	2.92
1959	.05	.04	.02	.02	.03	.70	.57	.82	.98	.35	.06	.07	3.54
1960	.07	.10	.12	.23	.12	.34	2.09	1.36	.75	.41	.16	.11	5.98

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	2,573	5.53
1951	1208	54,800	Mar. 31, 1951	120	8,170	0.827	11.24	8,732	11.01
1952	1238	8,732	Apr. 1, 1952	477	5,405	.547	7.45	4,806	6.64
1953	1278	34,200	June 12, 1953	187	2,974	.301	4.11	2,945	4.06
1954	1358	67,300	June 24, 1954	110	3,415	.346	4.69	4,213	5.79
1955	1388	11,600	(a)	109	2,561	.259	3.52	1,722	2.36
1956	1438	3,850	Sept. 5, 1955	72	355	.036	.49	362	.50
1957	1508	25,700	June 19, 1957	55	1,099	.110	1.51	1,248	1.74
1958	1558	39,000	July 4, 1958	210	2,126	.215	2.92	2,009	2.75
1959	1628	27,700	June 3, 1959	108	2,572	.260	3.54	2,706	3.72
1960	1708	68,900	Apr. 2, 1960	385	4,276	.433	5.88	-	-

a Apr. 27, July 11, 1955.

4860. North River near Norwalk, Iowa

Location.--Lat 41°26'55", long 93°40'55", near center of sec.25, T.77 N., R.25 W., near center of span on downstream side of bridge on State Highway 28, 1½ miles south of Norwalk, 8 miles northwest of Indianola, 9 miles south of Des Moines, and 10.8 miles upstream from Middle Creek.

Drainage area.--340 sq mi. Prior to Jan. 7, 1960, 349 sq mi.

Records available.--February 1940 to September 1960.

Gage.--Wire-weight gage. Prior to June 12, 1946, wire-weight gage and June 12, 1946, to Jan. 6, 1960, water-stage recorder, at site 2.1 miles downstream at datum 788.45 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Average discharge.--20 years (1940-60), 170 cfs.

Extremes.--1940-60: Maximum discharge, 32,000 cfs June 13, 1947 (gage height, 25.3 ft from floodmark, site and datum then in use), from rating curve extended above 9,100 cfs on basis of area-velocity studies; no flow for several days during each year 1954-58.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1.87	1.82	1.31	1.31	50.8	220	401	845	500	247	66.1	95.4	203
1952	44.4	48.3	34.4	108	126	665	365	323	559	163	200	22.9	222
1953	4.29	31.6	30.7	33.7	284	172	223	159	313	43.4	5.78	.74	107
1954	.23	.75	.82	.58	3.26	3.90	39.9	89.4	250	1.18	207	16.4	51.3
1955	61.9	23.0	12.5	11.1	148	157	70.9	34.9	13.5	127	3.87	27.5	57.1
1956	5.43	.37	.36	.40	3.21	6.56	1.22	7.15	8.24	14.3	63.2	17.3	10.7
1957	17.5	12.4	3.69	3.25	9.80	11.9	129	241	56.9	4.88	57.40	.26	41.1
1958	.68	4.48	12.6	7.16	68.4	58.5	22.4	7.06	18.6	642	57.6	177	90.3
1959	25.1	26.6	9.39	7.83	118.5	349	228	620	299	608	42.7	26.6	198
1960	22.5	104	77.5	503	141	570	700	647	125	34.1	120	88.8	262

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.006	0.006	0.004	0.004	0.15	0.73	1.28	2.79	1.60	0.81	0.22	0.30	7.90
1952	.15	.15	.11	.36	.39	2.20	1.17	1.07	1.79	.54	.66	.07	8.66
1953	.01	.10	.10	.11	.85	.57	.71	.52	1.00	.14	.02	.002	4.13
1954	.0008	.002	.003	.001	.01	.01	.13	.30	.80	.004	.69	.05	2.00
1955	.20	.07	.04	.04	.44	.52	.23	.12	.04	.42	.01	.09	2.22
1956	.02	.001	.001	.001	.01	.02	.004	.02	.03	.05	.21	.06	.43
1957	.06	.04	.01	.01	.03	.04	.41	.80	.18	.02	.001	.0006	1.60
1958	.002	.01	.04	.02	.20	.19	.07	.02	.06	2.12	.19	.57	3.49
1959	.08	.08	.03	.03	.35	1.15	.73	2.05	.95	2.01	.14	.08	7.68
1960	.07	.33	.26	1.70	.45	1.93	2.30	2.19	.41	.12	.41	.29	10.46

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	86.9	3.38
1951	1208	3,970	May 2, 1951	0.4	203	0.582	7.90	214	8.29
1952	1238	5,670	June 23, 1952	6.6	222	0.636	8.66	217	8.46
1953	1278	1,940	June 11, 1953	.2	107	.307	4.13	101	3.93
1954	1338	1,600	May 31, 1954	0	51.3	.147	2.00	59.3	2.30
1955	1388	1,400	July 11, 1955	0	57.1	.164	2.22	49.4	1.93
1956	1438	1,140	Aug. 8, 1956	0	10.7	.031	.43	13.0	.52
1957	1508	1,410	May 11, 1957	0	41.1	.118	1.60	39.7	1.54
1958	1558	3,180	July 6, 1958	0	90.3	.259	3.49	93.9	3.63
1959	1628	9,460	July 1, 1959	3.4	198	.567	7.68	210	8.15
1960	1708	6,800	Mar. 30, 1960	4.8	262	.771	10.46	-	-

4865. Middle River near Indianola, Iowa

Location.--Lat 41°26'00", long 93°33'20", in SW 1/4 sec.31, T.77 N., R.23 W., on right bank 5 ft downstream from bridge on U.S. Highways 65 and 69, 5 miles north of Indianola, 11.0 miles south of Des Moines, and 12.5 miles upstream from mouth.

Drainage area.--506 sq mi.

Records available.--March 1940 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 773.34 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to June 11, 1946, June 9, 1947, to Nov. 23, 1948, and Sept. 8, 1951, to Oct. 30, 1952, wire-weight gage at same site and datum. June 11, 1946, to June 8, 1947 (destroyed by flood), and Nov. 24, 1948, to Sept. 7, 1951, water-stage recorder at same site and datum.

Average discharge.--20 years (1940-60), 248 cfs.

Extremes.--1940-60: Maximum discharge, 34,000 cfs June 13, 1947 (gage height, 26.40 ft, from floodmarks); minimum daily, 1.0 cfs Nov. 30, 1955, July 14, Oct. 5, 8-12, 1956.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	11.7	7.27	4.80	5.77	123	469	741	1,257	802	237	99.4	78.0	320
1952	66.8	81.2	45.4	210	223	898	400	438	1,165	219	299	44.1	340
1953	19.7	65.5	52.9	66.5	487	290	378	266	528	132	16.9	7.08	191
1954	5.04	5.92	5.20	2.31	8.21	735	65.0	163	719	17.6	224	28.5	104
1955	82.9	39.2	20.4	14.0	117	185	83.9	58.5	50.1	163	6.50	25.9	70.4
1956	11.2	2.80	1.62	1.96	5.72	17.3	4.81	10.1	17.9	13.0	196	124	34.0
1957	8.44	12.2	5.97	6.38	14.0	17.7	256	354	147	26.6	8.55	8.94	72.3
1958	8.54	14.3	22.9	25.6	117	128	61.7	30.7	25.8	851	171	529	164
1959	61.2	49.5	19.7	15.7	258	564	405	1,180	474	473	150	53.7	306
1960	47.0	75.5	97.9	596	190	1,000	738	780	189	87.2	150	142	342

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.03	0.02	0.01	0.009	0.25	1.07	1.63	2.86	1.77	0.54	0.23	0.17	8.59
1952	.15	.18	.10	.48	.48	2.05	.88	1.00	2.57	.50	.66	.10	9.15
1953	.04	.14	.12	.15	1.02	.67	.83	.61	1.17	.30	.04	.02	5.11
1954	.01	.01	.01	.005	.02	.02	.14	.37	1.58	.04	.51	.06	2.78
1955	.19	.09	.05	.03	.24	.42	.19	.13	.11	.37	.01	.06	1.89
1956	.03	.006	.004	.004	.01	.04	.01	.02	.04	.03	.45	.27	.91
1957	.02	.03	.01	.01	.03	.04	.57	.81	.32	.06	.02	.02	1.94
1958	.02	.03	.05	.06	.24	.29	.14	.07	.06	1.89	.39	1.17	4.41
1959	.14	.11	.04	.03	.53	1.29	.89	2.64	1.05	1.08	.30	8.22	8.22
1960	.11	.17	.22	1.36	.40	2.28	1.63	1.78	.42	.20	.34	.51	9.22

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	129	3.46
1951	1208	8,520	May 1, 1951	3.4	320	0.632	8.59	334	8.96
1952	1238	14,400	June 22, 1952	13	340	.672	9.15	335	9.02
1953	1278	8,450	June 10, 1953	5.0	191	.377	5.11	181	4.84
1954	1338	6,540	June 1, 1954	1.6	104	.206	2.78	115	3.08
1955	1388	2,850	July 10, 1955	1.8	70.4	.139	1.89	59.7	1.60
1956	1438	2,650	Aug. 18, 1956	1.0	34.0	.067	.91	34.9	.93
1957	1508	3,350	May 11, 1957	1.0	72.3	.143	1.94	73.9	1.98
1958	1558	8,280	Sept. 8, 1958	1.3	164	.324	4.41	171	4.60
1959	1628	8,650	July 1, 1959	12	306	.605	8.22	314	8.43
1960	1708	9,900	Mar. 30, 1960	23	342	.676	9.22	-	-

4875. South River near Ackworth, Iowa

Location.--Lat 41°22'20", long 93°25'45", in SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.19, T.76 N., R.22 W., rear center of span on downstream side of bridge on State Highway 92, 2 miles east of Ackworth, 4.5 miles downstream from Otter Creek, and 7 miles east of Indianola.

Drainage area.--474 sq mi.

Records available.--February 1940 to September 1960.

Gage.--Wire-weight gage. Datum of gage is 761.91 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to June 12, 1946, wire-weight gage and June 13, 1946, to Apr. 13, 1960, water-stage recorder and wire-weight gage, at same site and datum.

Average discharge.--20 years (1940-60), 229 cfs.

Extremes.--1940-60: Maximum discharge, 34,000 cfs June 5, 1947 (gage height, 24.60 ft); no flow Sept. 19 to Oct. 13, 1956.

Flood in June 1930 reached a stage of 24.5 ft, from information by local residents (discharge, about 30,000 cfs).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2.31	2.59	2.54	1.79	1.79	496	867	1,209	945	312	35.5	10.4	339
1952	46.1	193	44.6	196	143	1,036	294	401	1,017	50.9	256	9.48	307
1953	5.51	215	74.3	140	655	512	572	229	897	159	7.22	4.28	285
1954	3.74	4.02	3.42	1.67	5.04	4.49	157	147	544	3.70	47.9	3.55	76.6
1955	20.0	3.18	3.06	3.06	103	120	53.6	15.4	3.38	186	6.71	13.7	44.1
1956	2.48	1.99	.88	1.05	5.44	5.60	1.70	11.4	30.9	4.12	142	8.52	18.2
1957	1.35	1.05	1.16	1.09	8.04	3.61	194	169	146	1.80	2.02	1.05	44.0
1958	1.69	1.90	2.20	2.12	44.8	39.7	13.9	25.5	9.76	473	71.0	5.70	58.3
1959	1.34	25.6	4.52	4.59	261	596	597	1,962	382	208	335	285	390
1960	118	97.2	174	871	190	1,568	548	933	290	66.9	212	485	465

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.006	0.006	0.006	0.004	0.39	1.21	2.04	2.94	2.22	0.76	0.09	0.02	9.69
1952	.11	.45	.11	.48	.32	2.52	.69	.98	2.39	.12	.62	.02	8.81
1953	.01	.51	.18	.34	1.44	1.25	1.35	.56	2.11	.39	.02	.01	8.17
1954	.009	.009	.008	.004	.01	.01	.37	.36	1.28	.009	.12	.009	2.20
1955	.05	.007	.007	.007	.23	.29	.13	.04	.008	.45	.02	.03	1.27
1956	.006	.005	.002	.003	.01	.01	.004	.03	.07	.01	.35	.02	.52
1957	.0009	.002	.003	.003	.02	.009	.46	.41	.34	.004	.005	.002	1.26
1958	.004	.004	.005	.005	.10	.10	.03	.06	.02	1.15	.17	.01	1.66
1959	.003	.06	.01	.01	.57	1.45	1.41	4.77	.90	.51	.82	.67	11.18
1960	.29	.23	.42	2.12	.43	3.81	1.29	2.27	.68	.16	.52	1.14	13.36

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	178	5.10
1951	1208	13,100	May 26, 1951	1.6	339	0.715	9.69	362	10.34
1952	1238	16,600	June 22, 1952	4.8	307	.648	8.81	308	8.84
1953	1278	16,200	June 10, 1953	3.2	285	.601	8.17	261	7.50
1954	1358	7,100	Apr. 25, 1954	1.3	76.6	.162	2.20	77.9	2.24
1955	1388	5,500	July 10, 1955	.7	44.1	.093	1.27	42.3	1.22
1956	1438	2,350	Aug. 18, 1956	0	18.2	.038	.52	17.9	.51
1957	1508	3,130	Apr. 3, 1957	0	44.0	.093	1.26	44.3	1.27
1958	1558	6,040	July 2, 1958	.6	58.3	.123	1.66	60.4	1.72
1959	1628	13,700	May 22, 1959	.6	390	.823	11.18	420	12.05
1960	1708	18,100	Mar. 30, 1960	12	465	.981	13.36	-	-

4880. Whitebreast Creek near Knoxville, Iowa

Location.--Lat 41°19'25", long 93°08'55", in NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.3, T.75 N., R.20 W., on right bank 10 ft downstream from bridge on State Highway 92, 2.2 miles west of Knoxville, 1.1 miles upstream from Butcher Creek, and 11.1 miles upstream from mouth.

Drainage area.--380 sq mi.

Records available.--July 1945 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 734.73 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark). Prior to Feb. 18, 1949, wire-weight gage at same site and datum.

Average discharge.--15 years (1945-60), 182 cfs.

Extremes.--1945-60: Maximum discharge, 14,000 cfs June 6, 1947 (gage height, 19.6 ft, from floodmark); minimum daily, 0.2 cfs June 27, 1956.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2.43	2.49	2.18	1.61	212	330	569	681	599	246	17.5	9.09	222
1952	49.6	115	31.2	224	152	737	198	286	687	22.9	91.2	4.99	216
1953	3.35	304	72.9	61.5	402	485	467	184	542	68.2	3.10	1.92	213
1954	1.96	2.62	2.08	1.06	2.74	3.92	118	52.4	87.4	1.60	53.2	1.83	27.3
1955	71.7	2.05	1.92	12.3	165	75.5	74.4	38.8	3.45	218	4.72	5.40	55.6
1956	1.28	1.06	.67	1.09	4.11	5.85	1.67	13.8	9.72	8.19	141	1.59	16.0
1957	.82	.70	.91	.92	7.93	6.38	212	172	173	8.58	6.88	2.86	49.3
1958	5.04	3.45	3.09	3.91	81.0	72.1	31.0	49.7	5.77	783	127	20.4	99.9
1959	4.00	113	11.2	5.91	340	807	657	1,723	218	108	328	234	383
1960	168	106	213	588	153	1,115	697	982	283	90.8	120	137	390

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.007	0.007	0.007	0.005	0.58	1.00	1.67	2.07	1.76	0.75	0.05	0.03	7.94
1952	.15	.34	.09	.68	.43	2.24	.58	.87	2.02	.07	.28	.01	7.76
1953	.01	.89	.22	.19	1.10	1.47	1.37	.56	1.59	.21	.009	.006	7.62
1954	.006	.008	.006	.003	.008	.01	.35	.16	.26	.005	.16	.005	.98
1955	.22	.006	.006	.04	.45	.23	.22	.12	.01	.66	.01	.02	1.99
1956	.004	.003	.002	.003	.01	.02	.005	.04	.03	.02	.43	.005	.57
1957	.002	.002	.003	.003	.02	.02	.62	.52	.51	.03	.02	.008	1.76
1958	.02	.01	.009	.01	.22	.22	.09	.15	.02	2.37	.39	.06	3.57
1959	.01	.33	.03	.02	.93	2.45	1.93	5.23	.64	.33	.99	.77	13.66
1960	.51	.31	.65	1.78	.43	3.38	2.05	2.98	.83	.28	.36	.40	13.96

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	155	5.53
1951	1208	5,200	July 3, 1951	1.3	222	0.584	7.94	238	8.50
1952	1238	9,500	June 21, 1952	2.9	216	.568	7.76	232	8.30
1953	1278	6,540	June 10, 1953	1.7	213	.561	7.62	183	6.52
1954	1338	3,850	Apr. 25, 1954	.6	27.3	.072	.98	33.2	1.19
1955	1588	2,590	July 10, 1955	.5	55.6	.146	1.99	49.4	1.77
1956	1438	3,000	Aug. 8, 1956	.2	16.0	.042	.57	16.0	.57
1957	1508	2,760	May 13, 1957	.4	49.3	.130	1.76	50.1	1.79
1958	1558	7,300	July 2, 1958	.6	99.9	.263	3.57	109	3.90
1959	1628	7,800	May 22, 1959	.6	383	1.01	13.66	413	14.76
1960	1708	11,000	Mar. 30, 1960	6.6	390	1.03	13.96	-	-

4885. Des Moines River near Tracy, Iowa

Location.--Lat 41°16'55", long 92°51'30", in NW¼SE¼ sec.19, T.75 N., R.17 W., near right bank on downstream side of Bellefontaine highway bridge, 0.8 mile east of Tracy, 3.0 miles upstream from Cedar Creek, and 6.5 miles downstream from English Creek.

Drainage area.--12,479 sq mi.

Records available.--March 1920 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Wire-weight gage. Datum of gage is 670.91 ft (revised) above mean sea level, datum of 1929. Prior to Feb. 13, 1933, chain gage, Feb. 13, 1933, to June 26, 1940, wire-weight gage, and June 27, 1940, to June 29, 1952, water-stage recorder, all at same site and datum.

Average discharge.--40 years (1920-60), 4,137 cfs.

Extremes.--1920-60: Maximum discharge, 155,000 cfs June 14, 1947 (gage height, 26.5 ft); minimum daily, 40 cfs Jan. 29 to Feb. 1, 1940.

Maximum stage known since 1851, that of June 14, 1947. Flood of May 31, 1903, reached a stage of about 25 ft (discharge, about 130,000 cfs). Minimum daily discharge known since at least 1910, 40 cfs Jan. 29 to Feb. 1, 1940.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,043	477	310	217	1,793	6,491	31,520	22,380	18,950	15,770	7,783	7,179	9,501
1952	4,429	3,123	2,227	2,743	6,152	13,350	17,380	8,113	10,250	10,800	3,075	1,445	6,915
1953	615	1,399	957	993	4,615	6,228	8,265	7,870	10,900	4,921	2,956	720	4,188
1954	379	381	367	192	440	1,095	2,271	3,745	20,710	5,598	6,811	5,687	3,966
1955	6,800	3,373	1,796	1,113	2,543	4,698	5,368	4,392	2,825	3,747	463	350	3,129
1956	334	177	133	148	202	557	699	619	808	427	1,248	594	496
1957	176	329	205	136	402	494	1,918	2,708	6,760	2,279	704	584	1,386
1958	432	826	1,123	862	1,200	2,586	2,053	1,391	3,828	13,040	2,521	2,275	2,695
1959	614	771	337	219	2,559	8,786	6,678	12,690	11,360	6,346	1,672	1,371	4,459
1960	1,204	1,448	1,643	5,895	2,612	5,660	26,180	17,430	9,740	5,196	2,711	2,445	6,836

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.10	0.04	0.03	0.02	0.15	0.80	2.82	2.07	1.69	1.46	0.72	0.64	10.34
1952	.41	.28	.21	.25	.53	1.23	1.55	.75	.92	1.00	.28	.13	7.54
1953	.06	.13	.09	.09	.39	.58	.74	.73	.97	.45	.27	.66	4.56
1954	.04	.03	.03	.02	.04	.10	.20	.35	1.85	.52	.63	.11	4.32
1955	.63	.30	.17	.10	.21	.43	.48	.41	.25	.35	.04	.03	3.40
1956	.03	.02	.01	.01	.02	.05	.06	.06	.07	.04	.12	.05	.54
1957	.02	.03	.02	.01	.03	.05	.17	.25	.60	.21	.07	.05	1.51
1958	.04	.07	.10	.08	.10	.24	.18	.13	.34	1.20	.23	.20	2.91
1959	.06	.07	.03	.02	.21	.81	.60	1.17	1.02	.59	.15	.12	4.85
1960	.11	.13	.15	.54	.23	.52	2.34	1.61	.87	.48	.25	.22	7.45

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	3,331	3.83
1951	1208	56,300	Apr. 2, 1951	170	9,501	0.761	10.34	10,170	11.07
1952	1238	38,400	June 22, 1952	760	6,915	.554	7.54	6,343	6.92
1953	1278	27,700	June 14, 1953	360	4,188	.336	4.56	4,634	4.38
1954	1358	69,900	June 27, 1954	130	3,966	.318	4.32	4,678	5.32
1955	1388	14,300	July 12, 1955	195	3,129	.251	3.40	2,176	2.36
1956	1458	4,480	Aug. 20, 1956	92	496	.040	.54	502	.55
1957	1508	24,100	June 20, 1957	89	1,386	.111	1.51	1,629	1.65
1958	1558	33,100	July 7, 1958	280	2,695	.216	2.91	2,639	2.86
1959	1628	38,900	May 31, 1959	200	4,459	.357	4.85	4,676	5.08
1960	1708	75,500	Apr. 4, 1960	680	6,836	.548	7.45	-	-

DES MOINES RIVER BASIN

4890. Cedar Creek near Bussey, Iowa

Location.--Lat 41°13'10", long 92°54'25", at corner common to secs. 10, 11, 14, 15, T.74 N., R.18 W., on left bank at downstream side of bridge on State Highway 156, 1.6 miles northwest of Bussey, and 8.9 miles upstream from mouth.

Drainage area.--374 sq mi.

Records available.--October 1947 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 682.15 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Feb. 21, 1949, wire-weight gage at same site and datum.

Average discharge.--13 years (1947-60), 183 cfs.

Extremes.--1947-60: Maximum discharge, 29,300 cfs May 9, 1950; maximum gage height, 28.06 ft July 2, 1958; no flow Sept. 6-20, 1955, Oct. 11, 12, 1956.

Flood in June 1946 reached a stage of 28.45 ft on upstream side and 28.05 ft on downstream side of bridge from levels to floodmarks by Corps of Engineers (discharge, 31,500 cfs).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.81	3.15	2.55	3.30	373	359	664	816	777	246	29.5	8.68	272
1952	90.3	102	38.5	211	161	802	243	350	991	44.0	15.5	13.1	267
1953	2.73	258	55.6	65.6	405	713	371	146	170	30.7	2.51	.60	183
1954	149	.93	1.00	.89	2.29	3.78	1.11	44.3	82.1	2.30	107	1.79	29.9
1955	60.5	2.16	1.79	9.25	300	90.9	130	137	13.8	43.5	7.68	6.38	65.4
1956	.58	.33	.39	.20	3.79	4.81	.79	7.19	12.2	16.5	361	1.97	34.6
1957	.18	.52	.84	.38	2.61	6.84	315	206	91.5	140	9.53	11.8	65.5
1958	2.59	10.2	14.8	14.0	168	92.0	38.4	109	29.0	1284	268	176	185
1959	34.9	109	22.7	15.5	614	960	722	1096	118	73.4	47.8	108	325
1960	130	40.9	121	489	151	1371	751	1350	302	64.5	34.1	8.81	404

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.002	0.009	0.008	0.01	1.04	1.11	1.98	2.51	2.32	0.76	0.09	0.03	9.87
1952	.28	.30	.12	.65	.46	2.47	.73	1.08	2.96	.14	.48	.04	9.71
1953	.008	.77	.17	.20	1.13	2.20	1.11	.45	.51	.09	.008	.002	6.65
1954	.002	.003	.003	.003	.006	.01	.35	.14	.25	.007	.33	.005	1.08
1955	.19	.006	.006	.03	.84	.28	.39	.42	.04	.13	.02	.02	2.37
1956	.002	.001	.001	.0006	.01	.01	.002	.02	.04	.05	1.11	.006	1.25
1957	.0056	.002	.003	.001	.007	.02	.94	.63	.27	.43	.03	.04	2.37
1958	.008	.03	.05	.04	.47	.28	.11	.34	.09	3.96	.83	.53	6.74
1959	.11	.52	.07	.05	1.71	2.96	2.15	3.38	.35	.23	.15	.32	11.80
1960	.40	.12	.37	1.51	.43	4.23	2.24	4.16	.90	.20	.11	.03	14.70

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	184	6.69
1951	1208	7,680	May 26, 1951	0.5	272	0.727	9.87	291	10.55
1952	1258	20,100	June 21, 1952	3.0	267	.714	9.71	273	9.96
1953	1278	5,920	Mar. 31, 1953	.2	183	.489	6.65	157	5.71
1954	1358	3,460	Aug. 26, 1954	.3	29.9	.080	1.08	35.1	1.27
1955	1388	3,500	Feb. 20, 1955	0	65.4	.175	2.37	60.0	2.17
1956	1438	3,980	Aug. 9, 1956	.1	34.6	.093	1.25	34.6	1.25
1957	1508	4,060	Apr. 3, 1957	0	65.5	.175	2.37	67.7	2.46
1958	1558	29,000	July 2, 1958	.6	185	.495	6.74	197	7.15
1959	1628	11,000	May 21, 1959	2.2	325	.869	11.80	336	12.19
1960	1708	18,800	Mar. 30, 1960	3.4	404	1.08	14.70	-	-

4895. Des Moines River at Ottumwa, Iowa

Location (revised).--Lat 41°00'30", long 92°24'40", in NW¼SW¼ sec.30, T.72 N., R.13 W., on right bank 10 ft downstream from Vine Street Bridge at Ottumwa, 6.3 miles upstream from Village Creek, 9.7 miles downstream from South Avery Creek, and at mile 92.6.

Drainage area.--13,374 sq mi.

Records available.--March 1917 to September 1960 (published as "at Eldon" October 1930 to March 1935). Monthly discharge only for some periods, published in WSP 1378.

Gage.--Water-stage recorder. Datum of gage is 622.77 ft above mean sea level, datum of 1929. Prior to Aug. 2, 1917, staff gage and Aug. 2, 1917, to Sept. 30, 1930, chain gage, at Market Street Bridge half a mile upstream at datum 0.06 ft higher. Oct. 1, 1930, to Mar. 31, 1935, chain gage at Eldon 15 miles downstream at different datum.

Average discharge.--43 years (1917-60), 4,595 cfs.

Extremes.--1917-60: Maximum discharge, 135,000 cfs June 7, 1947 (gage height, 27.2 ft); minimum daily, 30 cfs Jan. 27-29, 31, Feb. 2, 3, 5-7, 1940.

Maximum stage known since at least 1850, that of June 7, 1947. Flood of May 31, 1903, reached a stage of 19.4 ft, present site and datum or about 22 ft at Market Street Bridge, from information by Corps of Engineers and U.S. Weather Bureau (discharge estimated as 140,000 cfs).

Remarks.--Diurnal fluctuation at low flow caused by powerplant above station prior to Dec. 12, 1958.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,164	531	316	267	2,453	6,763	32,340	24,100	20,890	16,960	7,866	7,377	10,090
1952	4,791	3,458	2,395	2,983	6,467	15,150	18,280	9,104	11,540	11,420	3,585	1,560	7,554
1953	625	1,978	1,113	938	5,599	7,400	8,828	7,873	11,490	5,221	2,921	713	4,537
1954	387	391	366	195	435	1,041	2,418	3,638	18,460	6,348	6,591	5,870	3,841
1955	6,589	3,182	1,872	1,153	2,735	4,868	5,526	4,577	2,590	3,645	525	348	3,140
1956	371	223	142	145	216	567	716	693	830	462	1,847	629	572
1957	209	278	195	150	330	537	2,286	2,777	6,207	2,538	767	697	1,413
1958	506	951	1,296	900	1,260	2,875	2,210	1,797	3,758	14,090	3,334	2,636	2,988
1959	737	910	382	245	3,512	9,349	7,654	12,950	12,070	6,793	1,975	1,618	4,853
1960	1,771	1,632	2,068	7,208	2,860	6,104	28,440	20,730	10,900	5,346	2,605	2,447	7,667

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.10	0.04	0.03	0.02	0.19	0.58	2.70	2.08	1.74	1.46	0.68	0.62	10.24
1952	.41	.29	.21	.26	.52	1.31	1.53	.78	.96	.98	.31	.13	7.69
1953	.05	.17	.10	.08	.44	.64	.74	.68	.96	.45	.25	.06	4.62
1954	.03	.03	.03	.02	.03	.09	.20	.31	1.54	.55	.57	.49	3.89
1955	.07	.27	.16	.10	.21	.42	.46	.39	.22	.31	.05	.03	3.19
1956	.03	.02	.01	.01	.02	.05	.06	.06	.07	.04	.16	.05	.58
1957	.02	.02	.02	.01	.03	.05	.19	.24	.51	.22	.07	.08	1.44
1958	.04	.06	.11	.08	.10	.25	.18	.15	.31	1.21	.29	.22	3.02
1959	.06	.08	.03	.02	.27	.81	.64	1.12	1.01	.59	.17	.13	4.93
1960	.15	.14	.18	.62	.23	.53	2.37	1.79	.91	.46	.22	.20	7.80

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	3,619	3.65
1951	1208	55,200	Apr. 4, 1951	140	10,090	0.754	10.24	10,820	10.98
1952	1238	42,500	June 23, 1952	545	7,554	.565	7.69	6,972	7.10
1953	1278	29,400	June 14, 1953	345	4,537	.339	4.62	4,323	4.39
1954	1338	61,400	June 28, 1954	88	3,841	.287	3.89	4,725	4.80
1955	1388	13,800	July 12, 1955	150	3,140	.235	3.19	2,222	2.25
1956	1438	9,720	Aug. 9, 1956	44	572	.043	.58	567	.58
1957	1508	22,000	June 18, 1957	64	1,413	.106	1.44	1,587	1.61
1958	1558	33,500	July 4, 1958	156	2,988	.223	3.02	2,927	2.96
1959	1628	38,600	June 1, 1959	163	4,853	.363	4.93	5,143	5.23
1960	1708	70,500	Apr. 1, 1960	850	7,667	.573	7.80	-	-

4905. Des Moines River at Keosauqua, Iowa

Location.--Lat 40°43'45", long 91°57'45", in SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.36, T.69 N., R.10 W., on right bank 10 ft upstream from bridge on State Highway 1 at Keosauqua, 4.0 miles upstream from Chequest Creek, and at mile 50.6.

Drainage area.--14,038 sq mi.

Records available.--May 1903 to July 1906, April 1910 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 558.10 ft above mean sea level, datum of 1912 (levels by Corps of Engineers). Prior to Dec. 24, 1933, chain gage at same site and datum.

Average discharge.--51 years (1903-5, 1911-60), 5,134 cfs.

Extremes.--1903-6, 1910-60: Maximum discharge, 146,000 cfs June 1, 1903 (gage height, 27.85 ft, from floodmark); minimum daily, 40 cfs Jan. 30, 1940.
Flood of June 1, 1851, reached a stage of 24 ft (discharge not determined).

Remarks.--Some diurnal fluctuation at medium and low stages caused by powerplant at Ottumwa.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,154	533	347	271	2,945	7,132	54,440	26,670	23,480	18,160	8,563	7,721	10,960
1952	5,032	4,034	2,586	3,105	6,666	16,740	19,870	9,685	11,990	12,000	4,289	1,650	8,132
1953	687	2,034	1,199	1,024	6,052	8,421	9,215	8,758	12,580	5,861	3,072	799	4,394
1954	466	426	443	232	458	1,162	2,727	4,120	15,770	7,085	6,294	6,430	4,047
1955	7,561	3,496	1,926	1,525	3,316	5,592	6,346	5,264	2,909	3,963	629	340	3,578
1956	507	242	160	168	263	591	710	635	899	448	2,222	606	623
1957	248	277	177	132	307	538	2,543	3,069	6,706	2,813	803	694	1,524
1958	510	920	1,420	916	1,616	3,149	2,094	1,976	4,381	15,080	4,101	2,788	3,267
1959	778	1,217	409	231	3,548	11,290	8,691	13,990	12,690	7,076	2,787	2,221	5,417
1960	2,912	1,682	2,397	7,654	3,050	7,661	29,900	21,740	11,870	6,046	2,750	2,651	8,354

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.09	0.04	0.03	0.02	0.22	0.59	2.74	2.19	1.87	1.49	0.77	0.61	10.59
1952	.41	.52	.21	.25	.51	1.37	1.58	.80	.95	.99	.53	.13	7.87
1953	.06	.16	.10	.08	.45	.69	.79	.72	.98	.46	.23	.06	4.82
1954	.04	.03	.04	.02	.03	.10	.22	.34	1.49	.58	.52	.51	3.92
1955	.62	.28	.16	.13	.25	.46	.50	.43	.23	.33	.03	.03	3.47
1956	.04	.02	.01	.01	.02	.05	.06	.05	.07	.04	.18	.05	.60
1957	.02	.02	.01	.01	.02	.04	.20	.25	.53	.23	.07	.06	1.46
1958	.04	.07	.12	.08	.12	.26	.17	.16	.35	1.24	.34	.22	3.17
1959	.06	.10	.03	.02	.26	.93	.69	1.15	1.01	.56	.23	.18	5.24
1960	.24	.13	.20	.63	.23	.63	2.38	1.79	.94	.50	.23	.21	8.11

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	4,025	5.89
1951	1208	63,500	May 10, 1951	160	10,960	0.781	10.59	11,760	11.37
1952	1238	42,900	June 24, 1952	688	8,132	0.579	7.87	7,484	7.25
1953	1278	31,600	Apr. 1, 1953	380	4,994	.356	4.82	4,779	4.61
1954	1338	60,800	June 29, 1954	130	4,047	.288	3.92	5,028	4.87
1955	1388	22,100	Oct. 10, 1954	160	3,578	.255	3.47	2,561	2.48
1956	1438	11,600	Aug. 10, 1956	74	623	.044	.60	605	.58
1957	1508	21,300	June 21, 1957	64	1,524	.109	1.46	1,705	1.64
1958	1558	35,800	July 5, 1958	288	3,287	.233	3.17	3,229	3.13
1959	1628	41,400	June 1, 1959	200	5,417	.386	5.24	5,805	5.62
1960	1708	73,800	Apr. 2, 1960	880	8,354	.595	8.11	-	-

4910. Sugar Creek near Keokuk, Iowa

Location.--Lat 40°26'45", long 91°28'55", in SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.7, T.65 N., R.5 W., on left bank 10 ft downstream from highway bridge, 4.1 miles upstream from mouth, and 6 miles northwest of Keokuk.

Drainage area.--105 sq mi.

Records available.--April 1922 to September 1931; August 1958 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 510.20 ft above mean sea level, datum of 1929. Prior to June 25, 1923, chain gage and June 25, 1923, to Oct. 8, 1928, water-stage recorder, at site 100 ft upstream at same datum. Nov. 28, 1928, to Sept. 30, 1931, chain gage, at same site and datum. June 30, 1923, to June 27, 1927, heavy timber and riprap control.

Average discharge.--11 years (1922-31, 1958-60), 73.9 cfs.

Extremes.--1922-31, 1958-60: Maximum discharge not determined, occurred Nov. 17, 1928; maximum discharge recorded, 6,620 cfs Oct. 1, 1927 (gage height, 13.85 ft); no flow at times.

Maximum stage known, 20.6 ft June 9, 1905, from floodmarks (discharge, 33,000 cfs, estimated on basis of area-velocity study).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1958	-	-	-	-	-	-	-	-	-	-	-	13.0	-
1959	2.72	15.0	1.06	0.97	134	143	162	88.2	14.8	11.1	105	168	69.8
1960	253	9.47	33.9	92.3	63.6	228	172	175	230	272	11.0	.31	129

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1958	-	-	-	-	-	-	-	-	-	-	-	0.14	-
1959	0.03	0.16	0.01	0.01	1.33	1.57	1.72	0.57	0.16	0.12	1.16	1.78	9.02
1960	2.78	.10	.37	1.01	.65	2.50	1.83	1.92	2.44	2.99	.12	.003	16.71

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1958	-	-	-	-	-	-	-	-	-
1959	1628	4,300	Sept. 28, 1959	0.2	69.8	0.665	9.02	93.4	12.07
1960	1708	6,120	July 12, 1960	0	129	1.23	16.71	-	-

4943. Fox River at Bloomfield, Iowa

Location.--Lat 40°46'10", long 92°25'10", in SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.13, T.69 N., R.14 W., on left bank 15 ft downstream from highway bridge, $\frac{1}{2}$ miles north of Bloomfield, and 8.6 miles downstream from North Fox Creek.

Drainage area.--87.7 sq mi.

Records available.--Water years 1953-57 (annual maximum), October 1957 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 755.57 ft above mean sea level, datum of 1929. Sept. 3, 1952, to Sept. 5, 1957, crest-stage gage on bridge 15 ft upstream at datum 1.00 ft lower.

Extremes.--1952-60: Maximum discharge, 8,600 cfs May 6, 1960 (gage height, 24.02 ft).

1957-60: No flow Oct. 1-14, 18-21, 1957; June 30, 1958.

Floods of June 9, 1905, and June 18, 1946, were the highest known, from information in local records (stage and discharge unknown).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1958	0.84	1.57	12.8	1.95	47.8	19.3	9.06	29.5	39.5	158	92.4	23.3	36.5
1959	2.90	40.3	2.43	1.69	158	170	104	56.4	15.3	40.9	225	113	78.9
1960	178	7.25	56.1	91.5	38.3	291	148	311	72.8	24.1	2.85	.89	103

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1958	0.01	0.02	0.17	0.03	0.57	0.25	0.12	0.39	0.50	2.08	1.21	0.30	5.65
1959	.04	.51	.03	.02	1.88	2.23	1.32	.74	.19	.54	2.95	1.44	11.89
1960	2.34	.09	.74	1.20	.47	3.83	1.88	4.09	.93	.32	.04	.01	15.94

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-
1953	-	1,640	Mar. 30, 1953	-	-	-	-	-	-
1954	-	1,060	May 28, 1954	-	-	-	-	-	-
1955	-	2,560	Apr. 25, 1955	-	-	-	-	-	-
1956	-	827	July 31, 1956	-	-	-	-	-	-
1957	-	913	Apr. 26, 1957	-	-	-	-	-	-
1958	1558	3,970	July 31, 1958	0	36.5	0.416	5.65	38.9	6.03
1959	1628	5,660	Aug. 5, 1959	.9	76.9	.877	11.89	93.6	14.48
1960	1708	8,600	May 6, 1960	.5	103	1.17	15.94	-	-

4945. Fox River at Cantril, Iowa

Location.--Lat 40°39'35", long 92°03'40", in NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.30, T.68 N., R.10 W., on left bank 5 ft downstream from bridge on State Highway 2, a quarter of a mile upstream from Bone Run, and 1 mile northeast of Cantril.

Drainage area.--161 sq mi.

Records available.--August 1940 to September 1951.

Gage.--Water-stage recorder. Datum of gage is 657.98 ft above mean sea level, datum of 1929. Prior to Nov. 8, 1940, wire-weight gage at same site and datum.

Average discharge.--11 years (1940-51), 97.7 cfs.

Extremes.--1940-51: Maximum discharge, 16,500 cfs June 18, 1946 (gage height, 18.94 ft); no flow Aug. 9-16, Aug. 31 to Sept. 3, 1941.

Flood in 1920 reached a stage of 17.9 ft, from information by Iowa Highway Commission (discharge, about 10,000 cfs).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1.45	1.92	1.02	1.08	200	75.1	212	153	281	265	152	14.9	112

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.01	0.01	0.007	0.008	1.29	0.54	1.47	1.09	1.94	1.90	1.09	0.10	9.46

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	1208	6,500	July 20, 1951	0.7	112	0.696	9.46	77.7	6.56

4950. Fox River at Wayland, Mo.

Location.--Lat 40°23'45", long 91°35'50", in NW¹ sec.31, T.65 N., R.6 W., on left bank 90 ft downstream from bridge on U.S. Highway 136, three-quarters of a mile west of Wayland, and 5 miles downstream from Brush Creek.

Drainage area.--400 sq mi, approximately. At site used prior to Oct. 1, 1929, 372 sq mi.

Records available.--February 1922 to September 1960. Published as "near Wayland" prior to October 1929.

Gage.--Water-stage recorder. Datum of gage is 501.52 ft above mean sea level, datum of 1929. Prior to Oct. 1, 1929, chain gage at bridge 2.8 miles upstream at different datum. Oct. 1, 1929, to Nov. 18, 1934, chain gage and Nov. 19, 1934, to June 11, 1936, wire-weight gage, at bridge 90 ft upstream at present datum.

Average discharge.--38 years (1922-60), 229 cfs (165,800 acre-ft per year).

Extremes.--1922-60: Maximum discharge, 25,000 cfs June 29, 1933 (gage height, 21.53 ft, from floodmarks); no flow at times in 1930, 1934, 1936, 1939-40, 1953, 1956-57.

Corrections.--Corrected records for the water year 1935, superseding those published in WSP 1308, are given herewith:

Month	Mean	Per square mile	Runoff in inches	Acre-feet
October 1934.....	10.2	-	-	630
Calendar year 1934...	63.1	-	2.14	45,700
Water year 1934-35...	364	0.910	12.32	263,200

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1.83	3.76	1.94	5.26	465	396	625	342	504	311	255	24.9	242
1952	58.3	102	28.5	132	95	911	423	128	511	24.6	293	56.6	231
1953	5.82	10.9	54.5	21.0	464	838	511	196	83.3	16.2	.95	.20	182
1954	10	.11	.20	.44	5.40	33.6	151	165	4.12	24.6	2.83	82.4	
1955	326	10.3	11.7	466	43.8	150	275	215	45.0	26.9	1.65	2.74	161
1956	13.4	1.22	.40	.56	43.9	8.56	2.35	1.39	.06	16.0	122	1.68	17.6
1957	0	.01	.02	.19	.42	11.7	237	147	278	146	14.3	5.70	69.9
1958	83.5	94.7	306	41.7	331	156	82.2	225	451	335	851	172	261
1959	56.0	172	22.3	15.9	1,006	770	451	352	144	95.6	681	504	351
1960	887	37.4	243	452	287	1,065	701	1,014	1,055	681	19.5	5.07	538

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	112	224	119	324	25,840	24,360	37,170	21,040	30,000	19,140	15,670	1,480	175,500
1952	3,580	6,100	1,750	8,140	5,460	56,030	25,190	7,840	30,430	1,510	18,010	3,370	167,400
1953	358	646	3,350	1,290	25,780	51,530	30,420	12,060	4,960	996	59	12	131,500
1954	6.1	6.7	12	27	300	2,070	21,670	9,310	9,820	255	1,520	166	45,160
1955	20,020	612	718	28,650	23,260	9,230	16,360	13,190	2,680	1,650	101	163	116,600
1956	824	72	24	35	2,520	526	140	85	3.6	986	7,470	100	12,790
1957	0	.4	1.2	12	23	719	14,100	9,050	16,540	8,970	879	336	50,630
1958	5,140	5,630	18,820	2,570	18,390	9,600	4,890	13,820	26,830	20,580	52,340	10,230	188,800
1959	3,440	10,250	1,370	978	55,850	47,360	26,820	21,660	8,590	5,880	41,860	30,020	254,100
1960	54,520	2,230	14,960	27,800	16,510	65,500	41,730	62,340	61,570	41,870	1,200	302	390,500

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year			
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	223	7.54	161,200
1951	1208	5,250	May 12, 1951	0.3	242	0.605	8.23	175,500	258	8.75	186,500
1952	1238	6,400	June 23, 1952	4.7	231	.578	7.86	167,400	221	7.53	160,300
1953	1278	7,960	Apr. 1, 1953	0.1	182	.455	6.18	131,500	176	5.97	127,100
1954	1338	4,050	Apr. 21, 1954	0	82.4	.156	2.12	45,160	91.8	3.12	66,490
1955	1388	6,000	Jan. 6, 1955	.1	161	.402	5.47	116,600	133	4.52	96,200
1956	1438	1,030	Aug. 9, 1956	0	17.6	.044	.60	12,790	16.3	.56	11,870
1957	1508	6,130	June 11, 1957	0	69.9	.175	2.37	50,630	111	3.75	80,220
1958	1558	4,750	July 31, 1958	1.4	261	.652	8.84	189,800	241	8.16	174,300
1959	1628	9,840	Aug. 8, 1959	6.5	351	.878	11.92	254,100	429	14.56	310,400
1960	1708	13,400	Mar. 30, 1960	2.7	538	1.34	18.30	390,500	-	-	-

BEAR CREEK BASIN

4955. Bear Creek near Marcelline, Ill.

Location--Lat 40°08'34", long 91°20'14", between secs. 20 and 21, T.2 N., R.8 W., on right bank at downstream side of highway bridge, 0.9 mile downstream from Grindstone Creek, 2½ miles northeast of Marcelline, and 12 miles upstream from mouth.

Drainage area--348 sq mi.

Records available--March 1944 to September 1960.

Gage--Water-stage recorder. Datum of gage is 504.52 ft above mean sea level, datum of 1929. Prior to June 24, 1949, wire-weight gage at same site and datum.

Average discharge--16 years (1944-60), 172 cfs.

Extremes--1944-60: Maximum discharge, 21,200 cfs July 22, 1951 (gage height, 26.07 ft); no flow for many days in 1953-56.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1.43	1.81	1.21	75.3	598	570	326	39.9	194	840	128	18.3	231
1952	21.2	75.0	21.8	113	95.3	608	485	226	48.8	139	24.6	102	164
1953	.68	9.79	17.6	9.46	61.2	222	181	160	139	3.77	1.37	0	67.0
1954	.09	.08	.72	.76	5.80	89.9	215	45.1	146	39.8	36.5	4.41	48.6
1955	128	1.59	2.26	263	537	78.1	431	603	68.6	17.8	2.19	.80	175
1956	163	1.77	2.19	.82	19.4	3.83	36.2	6.47	.72	44.0	55.9	.10	28.1
1957	0	0	.07	41.5	24.4	23.8	269	327	544	47.2	4.41	4.11	107
1958	63.6	2.96	46.7	12.2	140	42.3	63.8	20.6	33.5	563	189	8.79	123
1959	6.36	12.0	3.57	5.25	71.3	113	119	119	90.8	7.58	127	55.2	110
1960	183	5.20	17.1	71.5	118	565	419	245	1,130	1,002	66.7	12.2	320

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.005	0.006	0.004	0.25	1.79	1.89	1.05	0.13	0.62	2.78	0.42	7.06	9.00
1952	.07	.24	.07	.37	.30	2.01	1.56	.75	.16	.46	.08	.33	6.40
1953	.002	.03	.06	.03	.18	.74	.58	.53	.44	.01	.005	.0	2.61
1954	.0003	.0003	.002	.003	.02	.30	.69	.15	.47	.13	.12	.01	1.90
1955	.43	.005	.008	.87	1.61	.26	1.38	2.00	.22	.06	.007	.003	6.85
1956	.54	.006	.007	.003	.06	.01	.12	.02	.002	.15	.19	.0003	1.11
1957	0	0	.0002	.14	.07	.08	.86	1.08	1.74	.16	.01	.01	4.15
1958	.21	.009	.15	.04	.42	.14	.20	.07	1.01	1.87	.63	.03	4.78
1959	.02	.04	.01	.02	2.13	.38	.38	.39	.29	.03	.42	.18	4.29
1960	.61	.02	.06	.24	.37	1.87	1.34	.81	3.62	3.32	.22	.04	12.52

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	170	6.64
1951	1208	21,200	July 22, 1951	0.6	231	0.664	9.00	240	9.37
1952	1238	4,680	Mar. 18, 1952	.6	164	.471	6.40	156	6.11
1953	1278	2,230	May 17, 1953	0	67.0	.193	2.61	64.8	2.52
1954	1338	3,030	June 1, 1954	0	48.6	.140	1.90	59.8	2.34
1955	1388	10,300	May 28, 1955	0	175	.503	6.85	178	6.96
1956	1438	4,920	Oct. 5, 1955	0	28.1	.081	1.11	14.0	.56
1957	1508	8,470	June 11, 1957	0	107	.307	4.15	116	4.52
1958	1558	5,210	July 31, 1958	.4	123	.353	4.78	115	4.48
1959	1628	7,120	Feb. 10, 1959	1.1	110	.316	4.29	126	4.91
1960	1708	15,700	July 1, 1960	1.7	320	.920	12.52	-	-

4960. Wyaconda River above Canton, Mo.

Location.--Lat 40°08'30", long 91°33'55", in SE $\frac{1}{4}$ sec.28, T.62 N., R.6 W., on left bank on downstream side of bridge on State Highway 16, 1 mile upstream from Sugar Creek and 2 miles west of Canton.

Drainage area.--393 sq mi.

Records available.--October 1932 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 515.41 ft above mean sea level, datum of 1929. Prior to Nov. 16, 1934, chain gage and Nov. 16, 1934, to Apr. 30, 1939, wire-weight gage, at same site and datum.

Average discharge.--28 years (1932-60), 219 cfs (158,500 acre-ft per year).

Extremes.--1932-60: Maximum discharge, 17,700 cfs June 30, 1933 (gage height, 30.00 ft, from floodmarks); no flow at times in 1934, 1936, 1940-41, 1953-56.

Correction.--In WSP 1308, the monthly mean for June 1949 is listed in error; it should be 324 cfs.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	3.98	3.81	2.33	5.00	702	521	539	165	286	411	167	18.2	232
1952	46.3	101	18.9	102	72.6	947	462	196	322	15.1	115	16.5	202
1953	3.16	2.88	17.4	9.59	314	664	486	152	38.1	10.3	.66	.02	140
1954	0	0	.47	.10	3.46	71.1	298	158	148	2.76	30.9	2.26	59.5
1955	250	6.11	4.43	469	480	136	275	264	47.3	28.7	2.18	.55	162
1956	107	2.73	.86	1.15	34.0	8.29	3.58	2.57	.66	35.5	98.6	6.24	25.3
1957	0	0	.87	2.59	4.46	7.53	194	301	313	72.0	23.4	7.41	77.3
1958	266	130	419	52.5	418	162	27.2	140	447	235	898	254	293
1959	98.0	190	29.6	18.7	1,029	686	477	221	171	65.7	480	386	315
1960	773	27.4	187	406	337	826	713	721	825	1,217	19.9	6.57	507

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	245	227	143	308	38,960	32,010	32,080	10,130	17,030	25,300	10,260	1,080	167,800
1952	2,850	6,000	1,160	6,180	4,180	58,220	27,520	12,060	19,170	930	7,080	979	146,300
1953	194	171	1,070	590	17,440	40,830	28,900	9,350	2,270	636	40	1.0	101,500
1954	0	0	29	6.3	192	4,370	17,750	9,720	8,810	170	1,900	134	43,080
1955	15,390	364	273	28,830	26,680	8,390	16,360	16,220	2,810	1,760	134	33	117,200
1956	6,580	162	53	71	1,960	510	201	158	39	2,180	6,060	371	18,340
1957	0	0	54	159	248	463	11,540	18,510	18,640	4,430	1,440	441	55,920
1958	16,390	7,750	25,760	3,090	23,240	10,360	4,000	8,580	26,580	14,490	55,210	15,120	210,600
1959	6,020	11,350	1,760	1,150	57,160	42,160	28,050	13,600	10,150	4,040	29,530	22,840	227,900
1960	47,550	1,650	11,470	24,940	19,360	50,780	42,420	44,330	49,100	74,810	1,220	381	368,000

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	207	7.16	150,000
1951	1208	5,900	Feb. 20, 1951	1.4	232	0.590	8.00	167,800	245	8.46	177,200
1952	1238	3,280	Mar. 19, Apr. 24	3.2	202	.514	7.00	146,300	190	6.56	137,700
1953	1278	5,380	Apr. 1, 1953	0	140	.356	4.85	101,500	138	4.76	100,100
1954	1338	2,600	Apr. 22, 1954	0	59.5	.151	2.05	43,080	81.6	2.81	59,080
1955	1398	5,460	Jan. 7, 1955	0	162	.412	5.58	117,200	149	5.14	108,000
1956	1438	2,280	Oct. 5, 1955	0	25.3	.064	.86	18,340	16	.55	11,580
1957	1508	2,540	June 11, 1956	0	77.3	.197	2.66	55,920	146	5.04	105,800
1958	1558	3,800	Aug. 2, 1958	.1	291	.740	10.04	210,600	248	8.57	179,800
1959	1628	4,580	Aug. 9, 1959	6.1	315	.802	10.86	227,900	372	12.85	269,400
1960	1708	10,600	July 2, 1960	4.1	507	1.29	17.56	368,000	-	-	-

4970. North Fabius River at Monticello, Mo.

Location.--Lat 40°06'30", long 91°42'55", in SW 1/4 sec. 6, T. 61 N., R. 7 W., near center of span on downstream side of bridge on State Highway 16, 1 mile south of Monticello and 19 miles upstream from Middle Fabius River.

Drainage area.--452 sq mi.

Records available.--February 1922 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Wire-weight gage. Datum of gage is 540.73 ft above mean sea level, datum of 1929. Prior to Nov. 22, 1930, chain gage at site 400 ft downstream at datum 0.03 ft lower. Nov. 22, 1930, to Nov. 17, 1934, chain gage at present site and datum.

Average discharge.--38 years (1922-60), 257 cfs (186,100 acre-ft per year).

Extremes.--1922-60: Maximum discharge, 17,400 cfs June 30, 1933 (gage height, 30.8 ft, from floodmarks); no flow at times in 1934, 1936-37, 1940-41, 1953, 1955-56. Maximum stage known since at least 1874, that of June 30, 1933.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	6.20	7.04	5.26	4.95	725	460	631	200	325	642	122	17.3	258
1952	69.0	121	34.5	189	114	849	463	209	578	64.7	37.0	13.1	228
1953	2.80	4.78	13.6	10.0	273	744	437	241	37.0	10.9	1.01	.51	147
1954	.34	2.00	1.51	.57	3.71	41.6	329	142	209	5.73	62.5	3.72	66.4
1955	314	13.1	10.2	502	570	150	237	353	38.9	22.8	3.56	2.44	183
1956	86.7	3.68	1.73	.19	42.1	7.91	7.15	2.35	.31	56.4	152	4.11	30.6
1957	.01	1.06	.77	5.65	4.93	9.28	224	304	196	61.1	11.5	10.9	69.3
1958	265	103	411	68.3	440	171	88.6	252	403	333	520	222	272
1959	92.3	294	48.9	24.0	998	737	581	283	114	108	572	497	357
1960	931	44.2	258	456	304	1,066	647	1,040	820	812	25.8	7.43	535

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	381	419	323	304	40,240	28,280	37,530	12,270	19,560	59,470	7,520	1,030	187,100
1952	4,240	7,170	2,120	11,630	6,550	52,220	27,540	12,860	34,420	3,980	2,280	782	165,800
1953	172	284	837	613	15,180	45,730	26,010	14,820	2,200	672	62	30	106,600
1954	21	119	93	35	206	2,560	19,570	8,700	12,450	229	3,840	221	48,040
1955	19,320	781	627	50,840	31,670	9,250	14,110	21,700	2,320	1,400	206	145	132,400
1956	5,330	219	106	12	2,420	486	425	144	19	3,470	9,330	244	22,200
1957	.8	63	45	347	274	570	13,350	18,720	11,670	3,760	706	650	50,160
1958	16,280	6,160	25,270	4,200	24,410	10,540	5,270	15,510	23,990	20,500	31,960	13,190	197,300
1959	5,670	17,510	3,010	1,470	55,450	45,310	34,590	17,380	6,760	6,660	35,170	29,580	258,600
1960	57,240	2,630	14,660	28,020	17,490	64,920	38,530	63,980	48,770	48,950	1,590	442	388,200

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year			
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff		
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet	
1950	-	-	-	-	-	-	-	-	201	6.03	145,300	-
1951	1208	9,410	July 22, 1951	3.0	258	0.571	7.76	187,100	276	8.28	199,500	-
1952	1238	5,580	Mar. 11, 1952	1.1	228	.504	6.87	165,800	212	6.35	153,600	-
1953	1278	7,550	Mar. 31, 1953	0	147	.325	4.42	106,600	145	4.38	105,600	-
1954	1338	5,270	Apr. 21, 1954	0	66.4	.147	2.00	48,040	94.7	2.85	68,540	-
1955	1398	8,190	Jan. 6, 1955	0	183	.405	5.50	132,400	162	4.87	117,300	-
1956	1438	2,500	Aug. 9, 1956	0	30.6	.068	.92	22,200	22.9	.69	16,660	-
1957	1508	3,320	June 11, 1957	0	69.3	.153	2.08	50,160	135	4.06	97,760	-
1958	1558	6,100	Aug. 1, 1958	2.0	272	.602	8.20	197,300	243	7.30	175,800	-
1959	1628	8,700	Aug. 7, 1959	5.5	357	.790	10.74	258,600	424	12.74	306,900	-
1960	1708	11,200	July 2, 1960	4.1	535	1.18	16.10	388,200	-	-	-	-

4975. Middle Fabius River near Baring, Mo.

Location.--Lat 40°19'55", long 92°12'50", in NW¹ NW¹ sec. 26, T. 64 N., R. 12 W., on right bank at downstream side of bridge on State Highway 15, 1 mile downstream from confluence of North and South Forks and 6 miles north of Baring.

Drainage area.--185 sq mi.

Records available.--April 1930 to September 1960 (fragmentary prior to October 1934). Monthly discharge only for June and July 1935, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 679.69 ft above mean sea level, datum of 1929. Prior to Sept. 17, 1934, chain gage at same site and datum.

Average discharge.--26 years (1934-60), 108 cfs (78,190 acre-ft per year).

Extremes.--1930-60: Maximum discharge, 9,540 cfs June 16, 1945 (gage height, 25.1 ft); no flow at times in many years.

Flood in July 1875 reached a stage of about 27 ft.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.74	0.89	0.79	1.75	307	147	318	69.6	127	162	30.8	3.93	95.5
1952	34.8	49.7	11.1	72.0	61.1	450	226	83.3	195	7.85	2.83	.24	99.4
1953	.42	1.19	2.15	1.55	98.4	456	217	111	5.48	.46	.03	.007	74.5
1954	0	.04	.03	0	.25	2.49	159	98.8	72.7	.23	40.1	.65	31.1
1955	171	5.03	5.49	377	260	71.5	115	158	14.1	25.1	.22	1.15	99.7
1956	56.1	.65	.66	.75	25.6	6.11	2.18	1.94	.06	35.7	17.8	1.97	12.5
1957	0	.03	.13	.25	.31	.90	138	141	24.5	73.6	2.26	2.07	32.1
1958	113	82.9	248	47.6	226	70.7	44.8	118	112	356	119	112	137
1959	65.3	46.6	9.20	9.37	427	366	193	57.5	16.2	28.4	400	282	156
1960	449	13.0	134	209	155	426	225	465	191	366	6.84	.62	222

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	46	53	48	107	17,040	9,010	18,930	4,280	7,560	9,940	1,900	234	69,150
1952	2,140	2,960	685	4,430	3,510	27,660	13,420	5,120	11,570	483	174	14	72,170
1953	26	71	132	95	5,470	28,040	12,910	6,850	326	29	1.6	.4	53,950
1954	0	2.2	1.8	0	14	153	9,450	6,080	4,330	14	2,460	39	22,540
1955	10,520	300	338	23,180	14,420	4,400	6,820	9,720	838	1,540	13	68	72,160
1956	3,450	38	40	46	1,470	375	130	119	4.0	2,200	1,100	117	9,090
1957	0	1.6	8.1	16	17	55	8,200	8,690	1,480	4,530	139	123	23,240
1958	6,950	4,940	15,250	2,930	12,540	4,350	2,660	7,280	6,850	21,860	7,330	6,640	99,380
1959	3,890	2,770	565	576	23,700	22,510	11,500	3,530	965	1,760	2,570	16,790	113,100
1960	27,620	771	8,220	12,830	8,910	26,210	13,390	28,590	11,390	22,530	420	37	160,900

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year			
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff		
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet	
1950	-	-	-	-	-	-	-	-	103	7.58	74,690	-
1951	1208	4,180	Feb. 20, 1951	0.6	95.5	0.516	7.00	69,150	103	7.58	74,790	-
1952	1238	2,710	Apr. 23, June 3	0	99.4	.537	7.32	72,170	91.8	6.75	66,610	-
1953	1278	6,160	Mar. 31, 1953	0	74.5	.403	5.45	53,950	74.2	5.43	53,730	-
1954	1338	2,660	Apr. 21, 1954	0	31.1	.168	2.30	22,540	46.5	3.43	33,700	-
1955	1388	6,490	Jan. 6, 1955	0	99.7	.539	7.31	72,160	89.1	6.54	64,530	-
1956	1438	1,470	Oct. 6, 1955	0	12.5	.068	.91	9,090	7.67	.56	5,570	-
1957	1508	1,710	May 14, 1957	0	32.1	.174	2.35	23,240	69.6	5.10	50,370	-
1958	1558	3,440	Aug. 1, 1958	.2	137	.741	10.07	99,380	110	8.05	79,460	-
1959	1628	5,800	Aug. 6, 1959	.6	156	.843	11.47	113,100	197	14.45	142,500	-
1960	1708	7,100	July 1, 1960	.4	222	1.20	16.30	160,900	-	-	-	-

4980. Middle Fabius River near Monticello, Mo.

Location.--Lat 40°05'40", long 91°44'10", in SE $\frac{1}{4}$ sec.12, T.61 N., R.8 W., near center of span on upstream side of bridge on State Highway 16, 2 $\frac{1}{2}$ miles southwest of Monticello, 8 miles downstream from Radish Branch, and 17 miles upstream from mouth.

Drainage area.--393 sq mi.

Records available.--July 1945 to September 1960.

Gage.--Wire-weight and crest-stage gages. Datum of gage is 540.46 ft above mean sea level, datum of 1929.

Average discharge.--15 years (1945-60), 222 cfs (160,700 acre-ft per year).

Extremes.--1945-60: Maximum discharge, 16,200 cfs June 7, 1947 (gage height, 26.28 ft); no flow at times in 1953-56.
Maximum stage known, 26.6 ft, from floodmark, date unknown (discharge, 16,800 cfs).
Flood of June 17, 1945, reached a stage of 23.3 ft, from floodmark.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2.64	4.28	3.26	4.32	569	353	589	129	313	698	79.4	12.6	227
1952	56.9	98.1	28.9	144	108	330	463	225	550	21.8	6.95	7.59	222
1953	1.08	4.60	7.93	3.96	171	538	637	234	20.4	6.80	1.71	.09	135
1954	0	0	1.10	.85	3.00	50.4	185	151	160	1.44	121	16.9	57.6
1955	291	8.91	5.83	592	397	156	272	293	39.1	43.6	2.12	1.45	174
1956	141	3.71	2.35	1.97	25.8	11.2	3.83	5.05	1.04	74.1	85.1	3.21	30.2
1957	0	0	.11	.51	1.23	6.32	272	404	147	139	21.0	8.50	85.7
1958	417	141	553	85.1	36.1	216	78.0	184	284	385	323	174	266
1959	83.1	92.9	18.7	13.6	951	730	490	139	63.2	34.1	484	452	291
1960	848	33.4	218	448	365	700	480	843	620	939	21.1	3.44	462

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	162	255	201	265	31,590	21,700	35,050	7,910	18,650	42,890	4,880	747	164,300
1952	3,500	5,840	1,780	8,840	6,180	57,180	28,760	13,820	52,750	1,340	427	452	180,900
1953	67	274	488	243	9,480	33,080	37,890	14,400	1,210	418	105	5.2	97,660
1954	0	0	68	52	166	3,100	10,990	9,280	9,510	89	7,480	1,010	41,720
1955	17,920	530	358	36,390	22,030	9,610	16,170	18,030	2,320	2,680	130	86	126,300
1956	8,670	221	145	121	1,480	691	228	310	62	4,560	5,230	191	21,910
1957	0	0	6.5	19	68	389	16,200	24,810	8,720	8,560	1,290	506	60,570
1958	25,670	8,410	33,960	5,230	19,190	13,280	4,700	11,290	16,900	23,670	19,870	10,350	192,500
1959	5,110	5,530	1,150	835	52,810	44,890	29,160	8,550	3,760	2,100	25,770	26,880	210,500
1960	52,130	1,990	13,400	27,520	20,890	43,060	28,580	51,820	56,900	57,770	1,300	204	335,700

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year				
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	209	7.21	151,600
1951	1208	6,610	July 23, 1951	2.1	227	0.578	7.85	164,300	241	8.35	176,500
1952	1238	4,230	June 3, 1952	1.6	222	.565	7.67	180,900	207	7.17	150,800
1953	1278	5,880	Apr. 2, 1953	0	135	.344	4.66	97,660	134	4.63	96,900
1954	1358	2,580	Mar. 25, 1954	0	57.6	.147	1.99	41,720	83.5	2.68	60,460
1955	1388	5,670	Jan. 8, 1955	0	174	.443	6.03	126,300	161	5.56	116,500
1956	1438	1,860	Oct. 5, 1955	0	30.2	.077	1.04	21,910	17.8	.61	12,880
1957	1508	3,230	May 10, 1957	0	83.7	.213	2.88	60,570	178	4.53	128,600
1958	1558	5,600	Oct. 24, 1957	.1	265	.677	9.18	192,500	188	6.49	136,300
1959	1628	3,930	Aug. 9, 1959	3.8	291	.740	10.03	210,500	368	12.70	266,300
1960	1708	7,310	July 31, 1960	2.2	462	1.18	16.00	335,700	-	-	-

5000. South Fabius River near Taylor, Mo.

Location.--Lat 39°53'50", long 91°34'50" (revised), in SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.21, T.59 N., R.6 W., on right bank at downstream side of highway bridge, 4 $\frac{1}{2}$ miles southwest of Taylor, 5 miles downstream from Grassy Creek, and 5.3 miles upstream from confluence with North Fabius River.

Drainage area.--620 sq mi; 630 sq mi at site used prior to May 14, 1936.

Records available.--October 1934 to September 1960. Monthly discharge only prior to December 1934, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 482.91 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to May 14, 1936, wire-weight gage at bridge 4 miles downstream at datum 21.94 ft lower. May 14, 1936, to Dec. 2, 1940, wire-weight gage at present site and datum.

Average discharge.--26 years (1934-60), 362 cfs (262,100 acre-ft per year).

Extremes.--1934-60: Maximum discharge, 19,700 cfs June 8, 1947 (gage height, 19.5 ft), from rating curve extended above 11,000 cfs; no flow at times in 1936, 1940-41, 1956. Flood in 1928 reached a stage of 18.49 ft, from floodmark, present site and datum.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	3.16	5.10	5.67	10.3	862	651	657	107	409	765	104	58.1	297
1952	84.3	237	57.5	231	144	1,455	870	421	660	26.7	72.0	59.3	360
1953	1.12	8.45	21.3	10.8	254	675	785	292	79.3	85.5	4.06	.59	184
1954	1.12	.40	2.01	2.12	6.86	101	283	151	352	4.62	398	38.7	112
1955	519	15.9	11.4	712	903	279	586	868	198	178	15.7	5.27	353
1956	373	6.14	6.05	4.64	21.6	15.0	81.9	28.8	50.3	123	285	6.29	84.1
1957	0	0	1.52	28.9	16.7	85.6	813	850	361	484	138	32.1	235
1958	871	314	650	123	593	301	141	205	274	1,375	582	51.9	425
1959	35.5	69.2	11.6	16.0	856	792	514	205	217	38.2	159	215	256
1960	613	25.8	194	418	414	902	726	1,070	845	1,136	24.0	4.53	553

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	195	303	349	632	47,870	40,050	39,100	6,570	24,300	46,940	6,370	2,270	214,900
1952	5,180	14,080	3,530	14,190	8,260	89,480	51,770	25,890	39,260	1,640	4,430	3,530	261,200
1953	69	503	1,310	663	14,090	41,510	46,710	17,930	4,720	5,260	250	23	133,000
1954	7.5	24	124	131	381	6,190	16,830	9,310	20,920	284	24,450	2,310	80,960
1955	31,910	829	704	43,750	50,150	17,140	33,780	53,340	11,750	10,940	962	313	255,600
1956	22,910	365	372	285	1,240	924	4,870	1,770	2,990	7,560	17,400	374	61,060
1957	0	0	93	1,780	925	5,260	48,380	52,270	21,470	29,740	8,470	1,917	170,300
1958	53,560	18,670	39,990	7,590	21,830	18,500	8,380	12,630	16,310	84,540	23,510	1,907	307,400
1959	2,180	4,120	714	982	47,570	48,690	30,580	12,600	12,920	2,350	9,760	12,780	185,200
1960	37,700	1,540	11,950	25,720	23,840	55,480	43,210	65,810	50,300	69,830	1,470	277	387,100

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year				
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	226	4.92	163,500
1951	1208	6,030	Mar. 29, 1951	1.6	297	0.479	6.50	214,900	327	7.18	236,900
1952	1238	5,430	Apr. 25, 1952	1.9	360	.581	7.92	261,200	331	7.23	240,300
1953	1278	5,670	Apr. 2, 1953	.1	184	.297	4.03	133,000	181	3.97	131,500
1954	1358	3,490	Aug. 17, 1954	.1	112	.181	2.45	80,960	158	3.45	114,200
1955	1388	12,300	May 28, 1955	.3	353	.569	7.73	255,600	339	7.43	245,800
1956	1458	5,070	Oct. 6, 1955	0	84.1	.136	1.85	61,060	51.7	1.14	37,510
1957	1508	6,290	May 17, 1957	0	235	.379	5.15	170,300	390	8.54	282,400
1958	1558	9,820	Oct. 26, 1957	-	425	.685	9.29	307,400	279	6.11	202,200
1959	1628	3,990	Feb. 10, 1959	1.4	256	.413	5.60	185,200	317	6.94	229,400
1960	1708	7,850	Mar. 30, 1960	2.1	533	.860	11.71	387,100	-	-	-

5005. North River at Bethel, Mo.

Location.--Lat 39°52', long 92°01', in NE¼NW¼ sec.33, T.59 N., R.10 W., at left abutment on downstream side of bridge on State Highway 15 at Bethel, 2½ miles upstream from Messner Branch.

Drainage area.--58 sq mi, approximately.

Records available.--April 1930 to September 1960 (fragmentary prior to August 1936).

Gage.--Water-stage recorder. Datum of gage is 683.37 ft above mean sea level, datum of 1929. Prior to July 19, 1939, chain gage and July 19, 1939, to Apr. 16, 1956, wire-weight gage, on upstream side of bridge at same datum.

Average discharge.--24 years (1936-60), 36.4 cfs (26,350 acre-ft per year).

Extremes.--1930-60: Maximum discharge, 6,930 cfs Apr. 5, 1947; maximum gage height, 20.9 ft Apr. 5, 1947, and Oct. 24, 1957, from floodmarks; no flow at times in many years.

Maximum stage known since at least 1875, that of Apr. 5, 1947, and Oct. 24, 1957, from information by local residents.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.12	0.42	0.35	0.57	77.3	35.5	43.9	2.78	87.9	32.4	7.01	1.78	23.6
1952	10.3	22.5	2.93	25.2	13.2	153	127	40.4	15.5	.49	2.10	2.39	34.6
1953	23	.56	.72	.38	19.1	68.4	50.3	23.1	5.18	1.43	.21	.04	14.1
1954	0	.01	.09	.19	.24	18.2	76.7	19.9	33.7	4.07	92.5	4.70	20.9
1955	49.5	1.16	.60	56.0	79.7	14.5	42.3	82.1	39.6	55.7	2.36	.30	35.1
1956	39.0	.27	.41	.26	.34	.35	5.64	1.57	5.53	2.91	41.4	.41	8.28
1957	0	.06	.35	.83	5.85	69.8	66.4	41.0	90.1	7.40	11.6	24.6	
1958	179	39.7	82.2	7.41	61.6	21.7	8.21	8.09	20.9	156	40.2	.53	52.4
1959	73	2.32	.29	1.08	163	86.1	35.0	19.5	8.52	11.2	14.4	10.7	28.3
1960	38.0	.93	16.8	35.4	42.5	102	74.2	86.4	47.7	145	.95	.08	49.4

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	7.1	25	22	35	4,290	2,180	2,610	171	5,230	1,990	431	106	17,100
1952	636	1,340	180	1,550	761	9,380	7,570	2,480	924	30	129	142	25,120
1953	14	34	44	23	1,060	4,200	3,000	1,420	308	88	13	2.2	10,210
1954	0	6	5.8	12	13	1,120	4,570	2,220	2,010	250	5,670	279	15,150
1955	3,040	69	37	3,450	4,420	693	2,520	5,050	2,360	3,420	145	18	25,420
1956	2,400	16	25	16	20	22	335	97	329	179	2,540	25	6,000
1957	0	0	3.6	22	46	359	4,160	4,080	2,440	5,540	455	689	17,790
1958	11,000	2,360	5,060	455	3,420	1,330	489	498	1,250	9,570	2,470	31	37,930
1959	45	138	18	65	9,040	5,290	1,960	1,200	507	692	884	636	20,480
1960	2,340	55	1,040	2,180	2,440	6,280	4,410	5,310	2,840	8,940	58	4.6	35,900

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	25.8	6.04	18,760
1951	1208	1,020	June 27, 1951	0.1	23.6	0.407	5.53	17,100	26.5	6.21	19,200
1952	1238	2,280	Apr. 23, 1952	0	34.6	.597	8.13	25,120	31.8	7.45	23,060
1953	1278	1,020	Apr. 1, 1953	0	14.1	.243	3.30	10,210	14.0	3.27	10,120
1954	1338	1,800	Apr. 6, 1954	0	20.9	.360	4.90	15,150	25.3	5.91	18,290
1955	1368	1,950	May 28, 1955	0	35.1	.605	8.21	25,420	34.1	7.99	24,720
1956	1438	795	Aug. 3, 1956	0	8.28	.143	1.95	6,000	4.92	1.16	3,570
1957	1508	930	July 29, 1957	0	24.6	.424	5.75	17,790	50.0	11.69	36,210
1958	1558	5,670	Oct. 24, 1957	.3	52.4	.903	12.25	37,930	27.2	6.37	19,710
1959	1628	1,300	Feb. 10, 1959	.1	28.3	.486	6.61	20,480	32.7	7.66	23,710
1960	1708	2,170	Mar. 28, 1960	0	49.4	.852	11.61	35,900	-	-	-

5010. North River at Palmyra, Mo.

Location (corrected).--Lat 39°49'05", long 91°31'15", in SE1/4 sec.13, T.58 N., R.6 W., on right bank 100 ft upstream from city waterworks dam, 1,000 ft upstream from bridge on U.S. Highways 24 and 61, half a mile north of Palmyra, and 7 miles upstream from mouth.

Drainage area.--373 sq mi.

Records available.--December 1934 to September 1960.

Gage.--Water-stage recorder and concrete control. Datum of gage is 464.81 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Oct. 1, 1945, wire-weight gage at bridge 1,000 ft downstream at same datum. Oct. 1, 1945, to June 22, 1951, staff gage at same site and datum.

Average discharge.--25 years (1935-60), 215 cfs (155,700 acre-ft per year).

Extremes.--1934-60: Maximum discharge, 27,400 cfs Apr. 11, 1944 (gage height, 22.96 ft, site then in use); from rating curve extended above 15,000 cfs; maximum gage height, 24.42 ft May 28, 1955; no flow for many days in 1936, 1941, 1956.

Maximum stage known, about 28.0 ft, from floodmarks, date unknown, at site 1,000 ft downstream, present datum.

Remarks.--Water diverted from river above and below dam by city of Palmyra.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	4.27	2.47	1.91	12.9	313	861	257	42.5	458	99.0	47.1	55.7	178
1952	47.3	226	46.1	153	125	850	573	272	48.6	6.51	43.6	60.3	204
1953	1.12	2.95	14.4	10.5	104	390	301	154	119	29.6	4.95	.25	94.2
1954	1.10	.18	.57	.66	.92	36.2	229	106	162	3.20	140	2.97	56.8
1955	126	5.48	6.08	265	582	146	459	937	286	187	25.4	9.60	251
1956	176	3.74	3.66	3.43	6.36	6.54	118	28.3	139	35.1	83.8	5.68	50.9
1957	0	0	.23	16.7	32.2	90.6	608	470	450	254	34.8	14.7	164
1958	282	92.6	220	55.5	207	132	32.2	33.8	44.4	1232	240	15.9	227
1959	8.01	24.3	8.66	12.6	588	304	206	343	188	21.0	72.3	9.94	146
1960	75.7	7.76	21.8	81.5	105	403	357	306	176	540	21.3	2.92	176

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	263	147	118	792	17,380	52,960	15,300	2,610	27,270	6,090	2,900	3,320	129,200
1952	2,910	13,420	2,850	9,390	7,210	52,240	34,100	16,750	2,890	400	2,680	3,590	148,400
1953	69	175	885	646	5,790	23,990	17,810	9,480	7,070	1,820	304	15	68,150
1954	6.1	11	55	41	51	2,230	15,630	6,490	9,620	197	8,610	177	41,100
1955	7,740	326	374	16,300	32,320	8,980	27,290	57,630	17,010	11,530	1,560	571	181,600
1956	10,820	223	225	211	366	402	7,010	1,740	8,280	2,160	5,150	338	36,920
1957	0	0	14	1,030	1,790	5,570	36,180	28,920	26,770	15,600	2,140	873	118,900
1958	17,510	4,930	13,540	5,410	11,510	8,100	5,490	5,770	2,640	75,780	14,730	948	164,200
1959	492	1,450	532	774	32,680	18,670	12,240	21,110	11,210	1,290	4,450	592	105,500
1960	4,650	462	1,340	5,010	6,050	24,790	21,230	18,810	10,460	33,210	1,310	174	127,500

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year			
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	151	5.48	109,000
1951	1208	17,900	Mar. 29, 1951	1.2	178	0.477	6.49	129,200	204	7.43	147,600
1952	1238	7,460	Mar. 18, 1952	1.0	204	.547	7.45	148,400	180	6.54	130,400
1953	1278	5,200	Mar. 31, 1953	.1	94.2	.253	3.43	68,150	92.7	3.38	67,080
1954	1338	2,900	June 1, 1954	.1	56.8	.152	2.07	41,100	68.4	2.49	49,490
1955	1388	23,000	May 28, 1955	.3	251	.673	9.14	181,600	254	9.27	184,500
1956	1438	6,600	June 21, 1956	0	50.9	.136	1.86	36,920	35.4	1.30	25,670
1957	1508	8,900	May 17, 1957	0	164	.440	5.97	118,900	214	7.77	154,700
1958	1558	11,100	July 16, 1958	.7	227	.609	8.26	164,200	181	6.58	130,800
1959	1628	10,600	Feb. 10, 1959	.3	146	.391	5.29	105,500	151	5.49	109,500
1960	1708	5,590	Mar. 28, 1960	1.5	176	.472	6.42	127,500	-	-	-

5020. Bear Creek at Hannibal, Mo.

Location.--Lat 39°40'43", long 91°24'41", in SE 1/4 NW 1/4 sec. 1, T.56 N., R.5 W., on left bank on downstream side of bridge on U.S. Highway 61, at Hannibal, 4 1/4 miles upstream from mouth.

Drainage area.--31.0 sq mi.

Records available.--October 1938 to September 1942 and October 1947 to September 1960 in reports of Geological Survey. Monthly discharge only for some periods, published in WSP 1308. October 1936 to November 1938 (gage heights and discharge measurements only) in reports of Missouri Geological Survey.

Gage.--Water-stage recorder. Datum of gage is 508.91 ft above mean sea level, datum of 1929. Prior to Oct. 1, 1939, chain gage, Oct. 1, 1939, to Mar. 25, 1948, wire-weight gage, and Mar. 26, 1948, to Sept. 30, 1953, water-stage recorder, at same site at datum 2.00 ft higher.

Average discharge.--17 years (1938-42, 1947-60), 15.7 cfs (11,370 acre-ft per year).

Extremes.--1938-42, 1947-60: Maximum discharge, 6,500 cfs Aug. 3, 1957 (gage height, 14.05 ft); no flow at times in 1940-41, 1952-56, 1959-60.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.29	1.05	0.89	3.51	47.8	44.0	20.4	7.92	30.2	11.6	4.17	4.41	14.4
1952	3.05	12.7	5.37	14.7	20.0	40.6	34.0	21.3	9.18	8.72	2.04	1.81	14.4
1953	.71	2.22	2.11	1.56	2.06	17.6	11.5	7.05	.73	.02	.003	.007	3.81
1954	.05	.18	.71	.98	1.43	1.80	15.7	3.94	1.82	0	3.19	.02	2.47
1955	1.85	.54	1.05	7.48	24.0	3.92	20.2	40.7	21.2	16.3	17.8	.56	12.9
1956	14.2	.79	.71	.61	2.23	.88	1.16	1.51	10.1	.52	1.49	.09	2.86
1957	0	.18	3.03	5.59	6.94	60.2	35.7	74.7	56.6	32.7	3.41	23.3	
1958	10.6	3.22	17.3	4.85	35.8	9.85	17.4	14.8	1.25	138	43.9	3.33	25.1
1959	2.06	19.1	2.46	2.69	72.3	13.5	20.4	18.8	2.56	.28	.18	.01	12.4
1960	.68	.40	.88	2.02	1.71	28.8	15.1	7.01	19.1	18.3	.84	.10	7.93

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	18	62	55	204	2,680	2,710	1,210	487	1,800	713	257	262	10,440
1952	187	758	330	906	1,150	2,500	2,020	1,310	548	536	126	108	10,450
1953	44	132	130	96	114	1,080	685	433	43	1.0			2,760
1954	2.8	11	44	60	80	111	934	242	108	0	196	1.4	1,790
1955	113	32	64	460	1,330	241	1,200	2,500	1,260	1,000	1,090	33	9,320
1956	876	47	43	37	132	54	69	93	599	32	91	5.6	2,080
1957	0	0	11	186	311	427	3,580	2,200	4,450	3,480	2,010	203	18,860
1958	651	191	1,060	298	1,990	606	1,030	907	748	460	2,700	198	18,160
1959	127	1,130	152	165	4,020	832	1,210	1,180	152	17	11	.6	8,980
1960	42	24	54	124	99	1,770	897	431	1,140	1,130	52	6.1	5,770

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	10.6	4.65	7,680
1951	1208	2,580	July 28, 1951	0.1	14.4	0.465	6.31	10,440	16.0	7.00	11,580
1952	1238	988	Mar. 18, 1952	0	14.4	.465	6.34	10,480	13.1	5.76	9,510
1953	1278	208	Mar. 21, 1953	0	3.81	.123	1.67	2,760	3.47	1.52	2,510
1954	1338	415	Apr. 30, 1954	0	2.47	.080	1.10	1,790	2.68	1.19	1,940
1955	1388	2,920	Aug. 29, 1955	0	12.9	.416	5.66	9,320	13.9	6.12	10,080
1956	1438	1,850	Oct. 5, 1955	0	2.86	.092	1.26	2,080	1.55	.68	1,120
1957	1508	6,500	Aug. 3, 1957	0	23.3	.752	10.21	16,860	25.9	1.35	18,750
1958	1558	3,750	Aug. 21, 1958	.2	25.1	.810	10.98	18,160	24.4	7.69	17,670
1959	1628	1,850	Feb. 10, 1959	0	12.4	.400	5.43	8,980	10.6	4.64	7,690
1960	1708	1,400	July 12, 1960	0	7.93	.256	3.47	5,770	-	-	-

5025. Salt River near Shelbina, Mo.

Location.--Lat 39°44', long 92°01', in SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.17, T.57 N., R.10 W., on right bank 75 ft downstream from bridge on State Highway 15, 3 miles north of Shelbina, and 15 miles upstream from Black Creek.

Drainage area.--481 sq mi.

Records available.--April 1930 to September 1960 (fragmentary prior to October 1933).

Monthly discharge only for period October 1933 to February 1934 published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 664.58 ft above mean sea level, datum of 1929. Prior to Mar. 1, 1934, chain gage at bridge 75 ft upstream at same datum.

Average discharge.--27 years (1933-60), 265 cfs (191,900 acre-ft per year).

Extremes.--1930-60: Maximum discharge, 23,000 cfs June 7, 1947 (gage height, 27.4 ft); no flow at times in 1934, 1936-38, 1940-41, 1947, 1952-57.

Flood in June 1928 reached a stage of 23.54 ft, from floodmarks (discharge, 18,000 cfs).

Remarks.--Water diverted from river above gage by city of Shelbina.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	4.72	4.87	2.94	6.65	740	412	537	115	777	580	55.8	49.2	269
1952	85.5	230	40.9	192	142	1,444	640	325	213	23.3	7.55	31.7	257
1953	0	5.43	10.1	4.13	189	588	741	254	35.0	2.07	1.38	0	149
1954	0	0	0	.01	3.41	71.2	266	142	268	.61	196	22.0	82.4
1955	325	5.10	5.25	527	632	235	262	721	176	235	20.2	2.46	261
1956	171	2.65	1.69	2.09	17.7	6.41	53.2	19.2	112	263	263	28.8	80.9
1957	0	.26	1.76	9.54	9.71	51.7	456	565	435	357	106	49.6	171
1958	609	295	568	86.2	345	298	114	301	170	1,075	504	26.1	385
1959	39.6	45.5	5.68	8.59	664	791	438	297	93.6	12.5	115	234	242
1960	438	14.2	195	589	311	782	430	1,226	466	855	11.8	2.28	430

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	290	290	181	490	41,080	25,350	31,970	7,040	46,210	35,640	3,430	2,930	194,800
1952	5,240	13,680	2,510	11,780	8,170	70,360	38,080	19,960	12,650	1,430	465	1,870	186,200
1953	0	323	622	254	10,460	34,510	44,070	15,650	2,080	127	23	0	107,900
1954	0	0	0	.8	190	4,380	17,020	8,750	15,970	58	12,030	1,310	59,670
1955	20,010	303	323	32,430	35,120	14,460	15,620	44,360	10,470	14,430	1,240	146	188,900
1956	10,530	158	104	129	1,020	394	3,160	1,190	6,670	16,190	17,430	1,710	58,680
1957	0	16	108	587	540	3,180	27,120	34,770	25,760	21,980	6,540	2,950	123,600
1958	49,730	17,430	34,740	5,900	19,140	18,350	6,810	18,530	10,120	66,000	30,960	1,550	278,700
1959	2,440	2,710	349	528	49,080	48,630	26,040	18,250	5,570	770	7,050	15,970	175,400
1960	26,960	844	11,970	23,940	17,900	48,080	25,590	74,370	27,750	52,590	723	135	311,800

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year					
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet		
1950	-	-	-	-	-	-	-	-	219	6.14	158,300	-	-
1951	1208	6,180	June 28, 1951	1.4	269	0.559	7.59	194,800	298	8.39	215,500	-	-
1952	1238	5,230	Mar. 11, 1952	.1	257	.534	7.25	186,200	228	6.45	165,800	-	-
1953	1278	7,010	Apr. 1, 1953	0	149	.310	4.21	107,900	148	4.18	107,000	-	-
1954	1338	2,020	Apr. 7, 1954	0	82.4	.171	2.32	59,670	111	3.14	80,300	-	-
1955	1388	5,740	Feb. 20, 1955	0	261	.543	7.38	188,900	247	6.98	179,100	-	-
1956	1438	2,580	July 4, 1956	0	80.9	.168	2.30	58,680	66.2	1.88	48,020	-	-
1957	1508	3,800	May 18, 1957	0	171	.356	4.80	123,600	311	8.77	225,300	-	-
1958	1558	10,600	Oct. 25, 1957	.6	385	.800	10.87	278,700	252	7.12	182,300	-	-
1959	1628	3,700	Feb. 12, 1959	1.8	242	.503	6.83	175,400	291	8.16	209,600	-	-
1960	1708	7,850	Mar. 30, 1960	.7	430	.894	12.16	311,800	-	-	-	-	-

5050. South Fork Salt River at Santa Fe, Mo.

Location.--Lat 39°21'45", long 91°49'05", in NW¼NE¼ sec.20, T.53 N., R.8 W., on right bank on downstream side of highway bridge, a quarter of a mile south of Santa Fe and 1 mile upstream from Elm Creek.

Drainage area.--298 sq mi.

Records available.--October 1939 to September 1960.

Gage.--Water-stage recorder; wire-weight gage used below 2.4 ft. Datum of gage is 613.05 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Feb. 5, 1940, wire-weight gage only at same site and datum.

Average discharge.--21 years (1939-60), 180 cfs (130,300 acre-ft per year).

Extremes.--1939-60: Maximum discharge, 13,100 cfs Apr. 23, 1944 (gage height, 21.10 ft); no flow at times in 1947, 1952-57, 1959-60.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1.33	3.92	2.47	8.03	479	758	289	41.4	391	207	126	154	203
1952	157	243	88.9	278	196	575	371	21.8	60.0	10.8	74.1	1.58	173
1953	.14	4.36	8.65	6.76	10.9	181	144	175	94.6	34.4	2.02	1.46	55.6
1954	.01	.36	1.15	1.63	1.91	2.74	16.6	22.2	47.9	3.58	21.4	9.31	10.7
1955	125	7.26	5.78	157	256	51.3	52.3	20.1	127	66.8	72.6	78.5	83.8
1956	450	2.68	2.19	1.76	7.50	4.27	325	138	77.1	258	4.81	4.80	107
1957	.09	.85	3.00	2.05	46.4	95.0	823	269	243	144	3.35	.83	135
1958	1.25	1.80	14.0	4.41	53.1	175	107	290	99.8	1,431	277	121	217
1959	37.7	88.4	6.38	89.0	723	165	63.4	128	7.90	3.94	12.4	7.39	107
1960	152	3.44	23.3	13.7	97.7	528	369	236	72.9	93.7	9.46	.22	134

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	82	233	152	494	26,590	46,600	17,210	2,540	23,280	12,730	7,770	9,180	146,900
1952	9,630	14,480	5,460	17,110	11,280	35,340	22,090	1,340	3,570	666	4,550	94	125,600
1953	8.7	259	532	416	605	11,150	8,580	10,780	5,630	2,120	124	87	40,290
1954	.4	21	70	100	106	168	989	1,360	2,850	208	1,320	554	7,750
1955	7,690	432	355	9,660	10,240	3,150	3,110	1,240	7,570	4,110	4,460	4,670	60,690
1956	27,650	160	135	108	431	262	19,350	8,470	4,590	15,840	296	285	77,580
1957	5.8	51	184	126	2,580	5,840	48,950	16,510	14,490	8,830	206	49	97,820
1958	77	107	860	271	2,950	10,770	6,360	17,850	5,940	88,010	17,010	7,190	157,400
1959	2,320	5,260	393	5,470	40,130	10,160	3,770	7,880	470	242	765	440	77,300
1960	9,330	205	1,440	840	5,620	32,480	21,970	14,490	4,340	5,760	582	13	97,070

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year			
		Momentary maximum		Minimum day	Mean	Runoff		Mean		Runoff	
		Discharge	Date			Per square mile	Inches	Inches	Acre-feet	Inches	Acre-feet
1950	-	-	-	-	-	-	-	109	4.96	-	78,900
1951	1208	7,210	Mar. 17, 1951	0.3	203	0.681	9.22	243	11.06	146,900	176,000
1952	1238	5,410	Mar. 18, 1952	.4	173	.581	7.90	133	6.09	125,600	96,840
1953	1278	3,030	June 14, 1953	0	55.6	.187	2.53	54.7	2.49	40,290	39,580
1954	1338	865	June 2, 1954	0	10.7	.036	.48	22.3	1.00	7,750	16,130
1955	1388	4,100	Feb. 19, 1955	0	83.8	.281	3.83	111	5.06	60,690	80,160
1956	1438	9,280	Apr. 29, 1956	0	107	.359	4.90	68.7	3.15	77,580	49,870
1957	1508	3,740	Apr. 18, 1957	0	135	.453	6.15	136	6.20	97,820	98,620
1958	1558	12,300	July 31, 1958	0	217	.728	9.90	227	10.34	157,400	164,300
1959	1628	8,000	Feb. 10, 1959	0	107	.359	4.87	111	5.06	77,300	80,500
1960	1708	7,120	Mar. 28, 1960	0	134	.450	6.09	-	-	97,070	-

5060. Youngs Creek near Mexico, Mo.

Location.--Lat 39°18'40", long 91°56'40", in NW¼SW¼ sec.5, T.52 N., R.9 W., on downstream side of bridge on State Highway 15, 6 miles upstream from Long Branch and 11 miles north of Mexico.

Drainage area.--67.4 sq mi.

Records available.--April 1930 to September 1960 (fragmentary prior to August 1936).

Gage.--Water-stage recorder. Datum of gage is 704.31 ft above mean sea level, datum of 1929 (levels by Missouri Highway Department). Prior to June 1, 1956, wire-weight gage on upstream side of bridge at same datum.

Average discharge.--24 years (1936-60), 42.6 cfs (30,840 acre-ft per year).

Extremes.--1930-60: Maximum discharge, 6,530 cfs July 31, 1958 (gage height, 12.52 ft); no flow at times in most years.

Maximum stage known, about 15.1 ft, from floodmarks, date unknown.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0	0	0	0.11	94.1	160	59.2	3.55	127	42.4	63.3	31.2	48.0
1952	34.2	56.1	26.3	55.5	38.1	193	70.5	5.08	10.0	.22	74.3	1.97	47.3
1953	0	1.14	3.68	3.42	13.2	76.0	35.3	29.1	9.14	6.39	0	0	14.8
1954	0	0	0	0	0	.03	3.37	8.66	13.6	.11	5.60	4.18	2.96
1955	58.2	.08	1.09	53.6	50.7	8.06	26.6	13.5	82.0	5.31	76.4	15.0	32.4
1956	115	.03	.10	.06	1.17	.81	70.2	35.2	13.7	74.1	.15	.33	26.1
1957	0	0	0	1.11	17.5	19.2	103	75.0	59.0	22.8	.18	0	24.7
1958	4.73	.19	7.45	1.06	35.5	22.8	43.4	27.7	458	24.1	0	3.49	20.5
1959	4.19	17.7	1.09	8.41	126	50.1	55.9	11.0	1.18	.003	0	0	20.5
1960	6.34	.01	.87	1.36	7.90	118	55.3	38.2	20.1	22.0	0	0	22.6

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0	0	0	6.7	5,230	9,520	3,520	218	7,550	2,610	3,690	1,860	34,710
1952	2,100	3,340	1,620	3,410	2,190	11,870	4,190	312	596	13	4,570	117	34,330
1953	0	68	226	210	734	4,670	2,100	1,790	544	393	0	0	10,740
1954	0	0	0	0	0	1.6	201	533	810	6.5	344	249	2,150
1955	3,580	5.0	67	3,290	2,810	496	1,580	831	4,880	326	4,690	895	23,450
1956	7,050	1.6	6.0	3.6	67	50	4,180	2,170	813	4,560	8.9	20	18,930
1957	0	0	0	68	974	1,180	6,140	4,610	3,510	1,400	11	0	17,890
1958	45	11	458	65	1,860	2,230	1,360	2,670	1,650	28,190	1,480	208	40,230
1959	258	1,050	67	517	7,000	5,080	2,130	677	70	.2	0	1.6	14,850
1960	390	.6	54	84	454	7,230	3,290	2,350	1,200	1,350	0	0	16,400

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	-	-	-
1951	1208	2,310	Mar. 17, 1951	0	48.0	0.712	9.65	34,710	22.3	4.49	16,120
1952	1238	2,370	Aug. 21, 1952	0	47.3	.702	9.55	34,330	57.7	7.67	27,560
1953	1278	655	Mar. 31, 1953	0	14.8	.220	2.98	10,740	14.4	2.90	10,440
1954	1338	330	June 3, 1954	0	2.96	.044	.61	2,150	8.0	1.63	5,800
1955	1388	2,570	Aug. 29, 1955	0	32.4	.481	6.54	23,450	37.1	7.48	26,860
1956	1438	2,610	Apr. 29, 1956	0	26.1	.387	5.26	18,930	16.3	3.30	11,870
1957	1508	1,650	May 17, 1957	0	24.7	.366	4.98	17,890	25.4	5.13	18,410
1958	1558	6,530	July 31, 1958	0	55.6	.825	11.19	40,230	56.8	11.43	41,090
1959	1628	2,030	Feb. 10, 1959	0	20.5	.304	4.13	14,850	19.2	3.87	13,920
1960	1708	2,670	Mar. 28, 1960	0	22.6	.335	4.56	16,400	-	-	-

5065. Middle Fork Salt River at Paris, Mo.

Location.--Lat 39°29'00", long 91°59'50", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.2, T.54 N., R.10 W., on right bank on downstream side of Wabash Railroad bridge in Paris, 12 $\frac{1}{2}$ miles upstream from Elk Fork Salt River.

Drainage area.--356 sq mi.

Records available.--October 1939 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 621.71 ft above mean sea level, datum of 1929. Prior to Jan. 22, 1940, wire-weight gage at same site and datum.

Average discharge.--21 years (1939-60), 210 cfs (152,000 acre-ft per year).

Extremes.--1939-60: Maximum discharge, 23,100 cfs Aug. 1, 1958 (gage height, 29.94 ft); no flow at times in 1940-41, 1950, 1953-54, 1956.

Remarks.--Water diverted from river above gage by city of Paris.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.40	1.41	1.67	3.96	352	519	354	41.4	536	137	38.3	84.3	170
1952	67.0	274	45.7	709	151	807	464	199	58.3	8.68	90.7	193	212
1953	1.22	6.41	28.9	13.1	305	468	495	236	29.2	7.66	1.13	.18	133
1954	.01	0	.37	1.08	3.96	53.8	345	203	110	7.37	138	7.67	72.1
1955	330	2.48	2.80	340	466	120	142	923	152	182	44.3	5.92	227
1956	110	2.76	1.99	1.67	4.09	3.26	112	47.2	48.1	207	69.4	25.4	53.1
1957	0	.07	1.54	6.29	13.9	78.5	338	391	559	54.9	66.7	21.9	127
1958	253	109	309	43.7	179	247	87.6	136	56.9	2011	1195	16.0	392
1959	19.5	47.7	7.20	29.9	743	565	255	128	94.6	14.9	37.4	51.3	162
1960	135	4.58	43.8	162	137	527	282	577	147	514	5.83	.55	213

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	24	84	103	244	19,530	31,940	21,050	2,550	31,870	8,430	2,360	5,010	123,200
1952	4,120	16,290	2,810	12,840	7,540	49,650	27,630	12,240	3,470	534	5,580	11,490	154,200
1953	75	361	1,780	804	16,950	30,010	29,460	14,490	1,740	472	70	11	96,240
1954	0	0	23	66	220	3,310	20,540	12,460	6,560	23	8,510	468	52,180
1955	20,320	147	172	20,930	26,980	7,400	8,450	56,740	9,030	11,210	2,720	352	164,500
1956	6,770	164	123	103	235	201	6,670	2,900	2,860	12,730	4,270	1,510	38,540
1957	0	4.2	95	387	770	4,830	20,090	24,040	33,280	3,380	4,100	1,300	92,280
1958	15,570	6,480	19,030	2,690	9,970	15,170	5,210	8,380	3,360	123,600	73,470	950	283,900
1959	1,200	2,640	443	1,840	41,240	34,630	15,060	7,900	5,630	916	2,300	3,050	117,000
1960	8,190	272	2,690	9,970	7,870	32,390	16,770	35,460	8,730	31,600	358	33	154,300

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	138	5.25	99,660
1951	1208	5,060	June 30, 1951	0	170	0.478	6.47	123,200	202	7.69	146,200
1952	1238	2,930	Apr. 24, 1952	2.3	212	.596	8.13	154,200	183	7.31	133,200
1953	1278	4,800	Apr. 2, 1953	.1	133	.374	5.05	96,240	130	4.94	94,030
1954	1358	2,160	Apr. 22, 1954	0	72.1	.203	2.75	52,180	101	3.83	72,600
1955	1388	7,920	May 29, 1955	0	227	.638	8.67	164,500	208	7.96	150,900
1956	1438	2,300	July 31, 1956	0	53.1	.149	2.02	38,540	43.5	1.65	31,580
1957	1508	2,930	June 15, 1957	0	127	.357	4.87	92,280	184	7.02	133,300
1958	1558	23,100	Aug. 1, 1958	.4	392	1.10	14.94	263,900	342	13.01	247,500
1959	1628	3,840	Feb. 12, 1959	.7	162	.455	6.16	117,000	171	6.51	123,700
1960	1708	6,770	July 2, 1960	.1	213	.598	8.11	154,300	-	-	-

5070. Elk Fork Salt River near Paris, Mo.

Location--Lat 39°26'25", long 92°00'05", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.22, T.54 N., R.10 W., on left bank on upstream side of bridge on State Highway 15, 2 $\frac{1}{2}$ miles south of Paris and 11 miles upstream from mouth.

Drainage area--262 sq mi.

Records available--April 1930 to September 1954 (fragmentary prior to February 1935). Monthly discharge only for October 1934 to January 1935, published in WSP 1308.

Gage--Water-stage recorder. Datum of gage is 630.86 ft above mean sea level, datum of 1929. Prior to Nov. 23, 1934, chain gage and Nov. 23, 1934, to Jan. 21, 1935, wire-weight gage, at same site and datum.

Average discharge--20 years (1934-54), 181 cfs (131,000 acre-ft per year).

Extremes--1930-54: Maximum discharge, 20,600 cfs June 27, 1942 (gage height, 20.22 ft); no flow at times in 1930-31, 1933-38, 1940-41, 1953-54.

Flood in June 1928 reached a stage of 19.1 ft, from information by local residents (discharge, 18,400 cfs).

Maximum stage known since at least 1875, 21.03 ft July 31, 1958, from floodmarks.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.74	2.22	2.30	3.54	293	770	228	17.9	287	94.1	125	72.4	157
1952	26.1	200	38.8	165	157	641	222	62.2	97.7	8.65	430	25.2	173
1953	.61	4.68	15.7	11.2	187	407	258	144	18.1	9.09	3.60	1.80	87.8
1954	1.48	.42	.82	.76	2.32	4.22	131	92.9	32.8	.003	35.8	1.14	25.3

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	46	132	142	218	16,290	47,360	13,570	1,100	17,060	5,790	7,670	4,310	113,700
1952	1,800	11,890	2,390	10,020	9,020	59,430	13,220	3,830	5,810	532	26,450	1,500	125,700
1953	37	278	966	691	10,390	25,020	15,360	8,820	1,080	559	222	107	63,530
1954	91	25	51	47	129	260	7,780	5,710	1,950	.2	2,200	68	18,310

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	93.7	4.87	67,860
1951	1208	6,800	Mar. 29, 1951	0.4	157	0.599	8.14	113,700	179	9.25	129,200
1952	1238	9,560	Aug. 22, 1952	.4	173	.660	9.00	125,700	153	7.96	111,100
1953	1278	4,080	Apr. 1, 1953	0	87.8	.335	4.55	63,530	86.2	4.47	62,420
1954	1338	1,480	Apr. 11, 1954	0	25.3	.097	1.32	18,310	-	-	-

5075. Salt River near Monroe City, Mo.

Location.--Lat 39°32'25", long 91°40'20", in NE 1/4 sec. 22, T. 55 N., R. 7 W., on left bank on downstream side of old bridge pier, 135 ft upstream from highway bridge at Joanna, 2,500 ft downstream from Indian Creek, 2 miles upstream from Lick Creek, and 8 miles southeast of Monroe City.

Drainage area.--2,230 sq mi, approximately.

Records available.--October 1939 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 520.04 ft above mean sea level, datum of 1929. Prior to Feb. 2, 1940, wire-weight gage at same site and datum.

Average discharge.--21 years (1939-60), 1,323 cfs (957,800 acre-ft per year).

Extremes.--1939-60: Maximum discharge, 71,100 cfs Aug. 1, 1958 (gage height, 34.81 ft); no flow July 28-31, 1954.

Flood in June 1928 reached a stage of about 36 ft, from information by local residents.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	16.2	19.9	21.2	47.0	3168	4,118	2,283	290	2,633	1,403	542	499	1,236
1952	442	1,430	261	1,576	978	5,124	2,585	998	579	133	779	467	1,264
1953	4.68	31.4	92.4	56.5	940	2,618	2,546	1,296	411	89.8	16.1	7.08	673
1954	2.25	1.84	5.64	8.85	16.1	149	1,287	666	602	11.5	518	40.2	275
1955	1,338	27.8	36.0	1,880	2,933	681	1,047	3,006	1,083	1,761	479	197	1,192
1956	1,407	16.8	17.4	13.4	46.6	30.2	1,071	596	674	1,568	539	138	513
1957	1.56	2.23	8.59	85.3	189	508	3,428	2,478	3,145	900	384	86.5	933
1958	1,520	507	1,341	236	1,026	1,408	614	1,184	665	9,312	5,505	241	1,970
1959	197	484	49.7	154	41.72	2,427	1,392	1,971	419	49.1	415	216	889
1960	999	35.9	251	718	844	3,080	2,539	3,606	1,105	2,644	44.6	6.56	1,330

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	998	1,190	1,300	2,890	175,900	253,200	135,800	17,850	156,700	86,270	33,300	29,620	895,100
1952	27,160	85,120	16,040	84,600	56,270	315,100	153,800	61,350	34,440	8,180	47,870	27,780	917,700
1953	288	1,870	5,680	3,470	52,180	161,000	151,500	79,680	24,470	5,520	987	421	487,100
1954	139	110	224	544	896	9,130	76,610	40,980	35,820	704	31,820	2,390	199,400
1955	82,250	1,650	2,210	116,200	157,400	41,870	62,300	184,800	64,460	108,300	29,450	11,747	862,600
1956	86,520	998	1,070	823	2,680	1,860	63,710	36,620	40,110	98,440	33,120	8,237	372,200
1957	96	133	528	5,240	10,480	31,260	204,000	152,400	187,100	55,320	23,610	5,157	675,300
1958	81,180	30,150	82,470	14,490	57,010	86,580	36,530	72,830	39,550	572,600	338,500	14,310	1,426,000
1959	12,140	28,770	3,050	9,490	231,700	149,200	82,830	59,680	24,940	3,020	25,520	12,877	643,200
1960	61,420	2,130	15,460	44,180	48,530	189,400	151,100	221,700	65,780	162,500	2,740	397	965,300

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year			
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff	Mean	Runoff		
		Discharge	Date						Inches	Acre-feet	
1950	-	-	-	-	-	-	-	881	5.3	637,800	
1951	1208	23,000	Mar. 18, 1951	10	1,236	0.554	7.53	895,100	1,409	8.53	1,020,000
1952	1258	21,900	Mar. 19, 1952	8.0	1,264	.567	7.71	917,700	1,101	6.70	797,200
1953	1278	17,800	Apr. 1, 1953	1.8	673	.302	4.10	487,100	663	4.07	479,700
1954	1338	6,400	Apr. 22, 1954	0	275	.123	1.67	199,400	394	2.33	285,000
1955	1388	25,500	Feb. 20, 1955	9.2	1,192	.535	7.24	862,600	1,195	7.27	865,100
1956	1438	20,600	Apr. 29, 1956	3.1	513	.230	3.14	372,200	392	2.40	284,400
1957	1508	23,600	June 14, 1957	.5	933	.418	5.68	675,300	1,200	7.29	868,400
1958	1558	71,100	Aug. 1, 1958	6.4	1,970	.883	11.98	1,426,000	1,763	10.73	1,276,000
1959	1628	24,800	Feb. 10, 1959	9.0	889	.399	5.41	643,200	937	5.77	678,300
1960	1708	27,000	Mar. 30, 1960	3.4	1,330	.596	8.11	965,300	-	-	-

5080. Salt River near New London, Mo.

Location.--Lat 39°36'44", long 91°24'30", in NE 1/4 sec. 36, T.56 N., R.5 W., on left bank 180 ft (corrected) upstream from bridge on U.S. Highway 61, 2 miles north of New London, and 8 miles upstream from Spencer Creek.

Drainage area.--2,480 sq mi, approximately.

Records available.--February 1922 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 477.03 ft above mean sea level, datum of 1929. Prior to Apr. 7, 1931, chain gage at present site at datum 0.03 ft higher. Apr. 7, 1931, to Nov. 14, 1934, chain gage and Nov. 15, 1934, to Jan. 17, 1935, wire-weight gage, at site 180 ft (corrected) downstream at datum 0.04 ft lower.

Average discharge.--38 years (1922-60), 1,534 cfs (1,111,000 acre-ft per year).

Extremes.--1922-60: Maximum discharge, 64,700 cfs Aug. 2, 1958 (gage height, 29.92 ft); no flow Aug. 3-14, 1934, Aug. 21 to Sept. 1, 1936.
Flood of July 14, 1858, reached a stage of about 27.6 ft, present site and datum, based on comparison of June 1928 flood crest at stone marker 1 mile below gage.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	25.1	31.3	27.0	61.1	3,465	4,565	2,671	303	2,533	1,603	579	537	1,549
1952	467	1,515	254	1,697	1,108	5,570	2,982	1,114	638	316	792	480	1,413
1953	11.2	37.2	105	64.7	961	2,557	2,846	1,401	422	101	37.7	14.5	710
1954	3.51	2.82	3.85	12.5	23.0	156	1,537	758	611	16.9	524	57.1	308
1955	1,348	64.0	49.0	1,937	2,856	724	1,125	3,038	1,206	1,811	464	245	1,232
1956	1,441	33.7	23.4	18.9	51.2	33.7	974	752	743	1,663	589	152	543
1957	1,394	3.96	12.4	128	244	574	3,911	2,961	3,931	1,077	576	92.9	1,124
1958	1,335	541	1,415	267	956	1,550	780	1,323	746	9,888	6,689	308	2,177
1959	254	640	70.4	130	4,882	2,742	1,745	1,384	546	59.5	466	188	1,064
1960	1,138	41.5	252	797	967	3,224	3,018	3,915	1,250	3,209	85.7	12.0	1,500

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,550	1,860	1,660	3,750	192,500	280,700	158,900	18,660	150,700	98,580	35,590	31,960	976,400
1952	28,740	90,170	15,630	104,300	63,750	542,500	177,400	68,480	37,990	19,460	48,700	28,580	1,026,000
1953	691	2,220	6,440	3,980	53,380	157,200	169,400	86,150	25,130	6,200	2,320	862	514,000
1954	216	168	237	766	1,280	9,590	91,460	46,600	36,340	1,040	32,240	3,400	223,300
1955	82,880	3,810	3,010	119,100	158,600	44,510	66,960	186,800	71,770	111,400	28,510	14,600	892,000
1956	88,630	2,010	1,440	1,160	2,950	2,070	57,970	46,230	44,230	102,200	36,240	3,060	394,200
1957	119	236	762	7,880	15,560	35,290	232,700	162,100	233,900	66,230	35,410	5,530	813,700
1958	82,100	32,180	87,000	16,400	53,080	95,350	46,400	81,350	44,410	606,000	411,300	18,300	1,576,000
1959	15,590	38,070	4,330	8,000	271,100	168,600	103,800	85,130	32,510	3,660	28,640	11,160	770,600
1960	69,990	2,470	15,470	49,000	55,600	198,200	179,600	240,700	74,350	197,300	5,270	712	1,089,000

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year			
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff	Mean	Runoff		
		Discharge	Dat#						Inches	Acre-feet	
1950	-	-	-	-	-	-	-	969	5.32	701,400	-
1951	1208	23,500	Mar. 18, 1951	14	1,349	0.544	7.38	976,400	1,528	1,106,000	-
1952	1238	21,800	Mar. 19, 1952	18	1,413	.570	7.77	1,026,000	1,241	900,500	-
1953	1278	17,800	Apr. 1, 1953	2.9	710	.286	3.89	514,000	698	505,200	-
1954	1358	7,700	Apr. 22, 1954	.7	308	.124	1.68	223,300	452	312,400	-
1955	1388	23,500	Feb. 20, 1955	17	1,232	.497	6.75	892,000	1,235	894,300	-
1956	1438	19,900	Apr. 30, 1956	4.5	543	.219	2.98	394,200	418	303,200	-
1957	1508	24,600	June 15, 1957	4	1,124	.453	6.16	813,700	1,400	1,014,000	-
1958	1558	64,700	Aug. 2, 1958	12	2,177	.878	11.92	1,576,000	1,979	1,433,000	-
1959	1628	25,600	Feb. 11, 1959	12	1,064	.429	5.83	770,600	1,106	800,500	-
1960	1708	29,000	Mar. 30, 1960	6.9	1,500	.605	8.24	1,089,000	-	-	-

5100. Hadley Creek near Barry, Ill.

Location.--Lat 39°42'48", long 91°03'56", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.14, T.4 S., R.6 W., on left bank 300 ft downstream from bridge on U.S. Highway 36, 1.8 miles northwest of Barry, and 2 miles upstream from Beebe Creek.

Drainage area.--40.6 sq mi.

Records available.--October 1955 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 533.59 ft above mean sea level, datum of 1929.

Average discharge.--5 years (1955-60), 20.1 cfs.

Extremes.--1955-60: Maximum discharge, 8,000 cfs Apr. 29, 1956 (gage height, 11.31 ft), from rating curve extended above 1,500 cfs by logarithmic plotting; no flow for many days in 1956-59.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	3.57	0.44	0.67	0.35	2.67	0.78	57.3	17.5	38.5	0.99	3.58	0.01	10.4
1957	0	2.36	1.53	12.7	6.04	28.4	168	93.2	60.4	1.33	11.4	.03	32.0
1958	.82	.59	3.66	1.98	10.3	3.80	18.8	24.0	15.3	95.6	42.5	5.36	18.7
1959	1.11	17.9	1.72	13.7	77.8	20.2	21.9	16.2	3.37	.15	2.46	1.07	14.3
1960	17.4	.53	3.67	3.35	7.35	56.4	47.0	70.2	57.6	26.0	8.27	.33	24.9

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	0.10	0.01	0.02	0.01	0.07	0.02	1.58	0.50	1.06	0.03	0.10	0.0003	3.50
1957	0	.06	.04	.36	.15	.81	4.61	2.65	1.66	.04	.32	.0006	10.70
1958	.02	.02	.10	.06	.26	.11	.52	.68	.42	2.71	1.21	.15	6.26
1959	.03	.49	.05	.39	2.00	.57	.60	.46	.09	.004	.07	.03	4.78
1960	.49	.01	.10	.10	.20	1.60	1.29	1.99	1.58	.74	.23	.009	8.34

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1956	1708	8,000	Apr. 29, 1956	0	10.4	0.256	3.50	10.3	3.47
1957	1708	5,000	May 17, 1957	0	32.0	.788	10.70	32.1	10.74
1958	1708	2,900	July 15, 1958	0	18.7	.461	6.26	20.0	6.69
1959	1708	2,700	Feb. 10, 1959	0	14.3	.352	4.78	14.5	4.81
1960	1708	1,740	Mar. 27, 1960	.2	24.9	.613	8.34	-	-

5105. Hadley Creek at Kinderhook, Ill.

Location.--Lat 39°41'35", long 91°08'55", in SE¹/₄ sec.25, T.4 S., R.7 W., on right bank at upstream side of bridge on State Highway 96, 0.8 mile southeast of Kinderhook, 2.0 miles upstream from Chicago, Burlington & Quincy Railroad bridge, and 5.5 miles upstream from mouth.

Drainage area.--72.7 sq mi.

Records available.--October 1939 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 469.55 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark). Prior to Dec. 15, 1939, wire-weight gage at same site and datum.

Average discharge.--21 years (1939-60), 46.9 cfs.

Extremes.--1939-60: Maximum discharge, 15,000 cfs Apr. 23, 1944 (gage height, 13.91 ft), from rating curve extended above 4,900 cfs on basis of contracted-opening measurement of peak flow; no flow for many days in many years.
Flood of Aug. 17, 1939, reached a stage of 15.93 ft, from floodmarks.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.58	1.41											
1952	6.55	16.7	18.4	25.9	26.1	107	57.2	57.1	14.8	33.7	17.0	13.1	5.86
1953	.52	13.6	6.80	5.74	5.22	43.2	105	103	33.4	27.7	9.77	6.80	7.21
1954	0	0	0	.21	1.29	4.32	36.8	35.7	13.5	12.9	23.5	.26	8.02
1955	14.2	4.72	6.89	34.5	93.1	20.1	125	136	25.7	27.9	108	3.29	49.7
1956	13.4	1.72	1.59	.82	4.43	1.62	107	18.2	95.5	2.62	4.27	.15	20.7
1957	0	.83	3.04	34.1	10.3	37.3	316	248	184	5.52	50.4	.28	74.1
1958	2.78	1.40	5.55	2.66	12.1	9.13	26.1	52.4	17.4	219	102	5.64	38.5
1959	3.26	49.0	5.52	22.1	196	36.8	42.0	46.8	6.85	.57	5.43	2.91	33.5
1960	24.9	2.18	4.45	5.72	8.74	103	93.6	127	125	52.9	12.9	.59	46.9

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.009	0.02	0.02	0.10	1.54	0.91	0.88	0.23	0.52	0.27	0.21	0.09	4.80
1952	.10	.26	.29	.41	.39	1.66	1.58	.53	.43	.15	.11	.11	6.02
1953	.008	.21	.11	.09	.07	.68	.51	.34	.03	.03	.002	.0005	2.08
1954	0	0	0	.003	.02	.07	.57	.06	.20	.20	.37	.004	1.50
1955	.23	.07	.11	.55	1.33	.32	1.92	2.16	.39	.44	1.71	.05	9.28
1956	.21	.03	.03	.01	.07	.03	1.65	.29	1.47	.04	.07	.002	3.90
1957	0	.01	.05	.54	.15	.59	4.85	3.93	2.83	.09	1.80	.004	13.84
1958	.04	.02	.09	.04	.17	.14	.40	.83	.27	3.48	1.61	.09	7.18
1959	.05	.75	.09	.35	2.60	.58	.65	.74	.11	.009	.09	.04	6.26
1960	.40	.03	.07	.09	.13	1.64	1.44	2.01	1.92	.84	.21	.009	8.79

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	26.4	4.92
1951	1208	3,250	Feb. 18, 1951	0.5	25.6	0.352	4.80	28.9	5.40
1952	1258	3,070	Mar. 18, 1952	.4	32.2	.443	6.02	30.4	5.70
1953	1278	854	Nov. 18, 1952	0	11.2	.154	2.08	9.46	1.75
1954	1358	1,620	Apr. 22, 1954	0	8.02	.110	1.50	10.2	1.91
1955	1398	11,800	Aug. 29, 1955	.1	49.7	.684	9.28	49.0	9.14
1956	1458	12,600	Apr. 29, 1956	0	20.7	.285	3.90	19.6	3.69
1957	1508	13,200	May 17, 1957	0	74.1	1.02	13.84	74.6	13.93
1958	1558	6,120	July 15, 1958	0	38.5	.530	7.18	42.4	7.92
1959	1628	as 600	Feb. 10, 1959	0	33.5	.461	6.26	31.4	5.87
1960	1708	5,000	June 29, 1960	0	46.9	.645	8.79	-	-

a About.

5135. Bay Creek at Pittsfield, Ill.

Location.--Lat 39°37'30", long 90°47'40", in NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.18, T.5 S., R.3 W., on right bank at downstream side of bridge on abandoned highway, 50 ft downstream from Panther Creek, 0.1 mile downstream from bridge on State Highway 107, 0.4 mile downstream from Wabash Railroad bridge, and 1.4 miles northeast of Pittsfield.

Drainage area.--39.6 sq mi.

Records available.--October 1939 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 638.48 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Dec. 7, 1939, wire-weight gage at same site and datum.

Average discharge.--21 years (1939-60), 22.2 cfs.

Extremes.--1939-60: Maximum discharge, 8,300 cfs June 9, 1945 (gage height, 13.25 ft), from rating curve extended above 4,400 cfs; no flow during many periods.
Flood of Sept. 8, 1926, reached a stage of 18.4 ft, from floodmark.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.198	0.186	0.080	4.32	93.4	26.3	28.6	4.20	27.0	8.39	6.50	8.78	16.7
1952	8.32	20.0	19.1	22.9	25.1	62.3	66.9	20.4	38.3	6.75	1.97	4.58	24.6
1953	.29	8.49	2.51	2.35	2.08	20.3	11.6	10.8	1.14	.70	.23	.43	5.10
1954	.26	.22	.24	.18	.27	2.18	13.8	1.23	2.67	62.1	28.5	5.90	9.92
1955	8.45	.70	.59	17.4	44.6	5.54	34.6	61.8	15.8	2.63	8.85	.50	16.6
1956	7.57	.53	.34	.15	3.67	.45	22.7	1.95	8.07	2.57	3.46	.32	4.28
1957	.23	.21	1.76	3.73	4.89	10.7	84.1	130	102	1.65	2.24	.88	28.5
1958	12.7	.85	4.58	.92	10.4	5.78	14.9	11.6	9.57	54.4	22.7	4.45	12.8
1959	9.27	35.2	2.28	20.8	122	25.9	21.2	8.66	2.21	.77	3.83	1.77	20.4
1960	22.9	.93	3.66	3.77	10.2	98.1	41.2	39.9	53.5	19.4	1.35	1.08	24.8

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.006	0.005	0.002	0.13	2.46	0.76	0.81	0.12	0.76	0.24	0.19	0.25	5.73
1952	.24	.56	.56	.66	.68	1.81	1.88	.59	1.08	.20	.06	.12	8.44
1953	.009	.24	.07	.07	.05	.59	.33	.32	.03	.02	.007	.01	1.75
1954	.008	.006	.007	.005	.007	.08	.39	.04	.08	1.81	.83	.17	3.41
1955	.25	.02	.02	.51	1.17	.16	.97	1.80	.45	.08	.28	.01	5.70
1956	.22	.01	.01	.004	.10	.01	.64	.06	.23	.07	.10	.009	1.46
1957	.007	.006	.05	.11	.13	.31	2.37	3.79	2.88	.05	.07	.02	9.79
1958	.37	.02	.13	.03	.27	.17	.42	.34	.27	1.59	.66	.13	4.40
1959	.27	.99	.07	.61	3.19	.76	.60	.25	.06	.02	.11	.05	6.98
1960	.67	.03	.11	.11	.28	2.86	1.16	1.16	1.51	.57	.04	.03	8.53

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	16.2	5.56
1951	1208	1,560	Feb. 18, 1951	0.06	16.7	0.422	5.73	20.6	7.08
1952	1238	2,370	June 22, 1952	.2	24.6	.621	8.44	21.8	7.40
1953	1278	530	Nov. 25, 1953	.1	5.10	.129	1.75	4.23	1.45
1954	1338	6,840	July 22, 1954	0	9.92	.251	3.41	10.7	3.68
1955	1388	5,920	May 28, 1955	0	16.8	.419	5.70	16.5	5.65
1956	1438	4,160	Apr. 29, 1956	0	4.28	.108	1.46	3.75	1.29
1957	1508	8,050	May 17, 1957	.1	28.5	.720	9.79	29.9	10.25
1958	1558	2,130	Oct. 23, 1957	.1	12.8	.323	4.40	15.2	5.21
1959	1628	8,150	Feb. 10, 1959	.1	20.4	.515	6.98	18.8	6.46
1960	1708	3,740	Mar. 30, 1960	.1	24.8	.826	8.53	-	-

a About.

5130. Bay Creek at Nebo, Ill.

Location.--Lat 39°26'35" long 90°47'45", in NW¼ sec.19, T.7 S., R.3 W., on left bank 40 ft downstream from highway bridge, 500 ft upstream from Spring Creek, a quarter of a mile west of Nebo, and 1.6 miles upstream from Chicago & Alton Railroad bridge. Records include flow of Spring Creek.

Drainage area.--162 sq mi, including that of Spring Creek.

Records available.--October 1939 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 462.56 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Dec. 9, 1939, wire-weight gage at bridge at same datum.

Average discharge.--21 years (1939-60), 87.1 cfs.

Extremes.--1939-60: Maximum discharge, 23,500 cfs Aug. 16, 1946 (gage height, 19.31 ft), from rating curve extended above 9,000 cfs; no flow for many days.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1.45	4.53	2.85	23.2	292	126	102	47.3	66.6	61.9	34.7	30.3	64.4
1952	48.3	72.1	45.8	112	101	169	218	85.1	104	16.0	5.95	2.91	81.4
1953	.39	16.4	6.58	6.28	5.82	55.5	54.1	48.3	2.75	7.93	1.95	.05	17.2
1954	.08	.14	.31	.32	.81	12.3	37.0	3.92	2.80	66.4	60.4	15.7	16.8
1955	32.0	6.81	7.21	49.9	115	27.5	82.0	89.2	26.9	15.0	71.4	1.73	43.3
1956	79.5	2.18	1.00	.67	4.51	1.77	42.6	20.0	58.0	11.1	15.6	.54	19.8
1957	0	.08	8.74	9.91	22.6	59.5	284	374	301	15.4	9.29	.21	90.3
1958	33.8	4.84	31.8	9.73	29.7	25.9	75.4	76.5	130	484	112	28.1	87.5
1959	15.8	85.2	13.2	54.4	266	100	96.5	48.6	8.37	1.92	3.60	10.4	57.1
1960	64.5	5.29	8.62	11.6	27.7	241	276	194	118	70.2	6.05	2.00	85.5

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.01	0.05	0.02	0.16	1.88	0.90	0.70	0.34	0.46	0.44	0.25	0.21	5.40
1952	.34	.50	.33	.79	.87	1.20	1.50	.61	.72	.11	.04	.02	6.83
1953	.003	.11	.05	.04	.04	.39	.37	.34	.02	.06	.01	.0003	1.43
1954	.0006	.001	.002	.002	.005	.09	.26	.03	.02	.47	.45	.11	1.42
1955	.23	.05	.05	.36	.74	.20	.56	.63	.19	.11	.51	.01	3.64
1956	.57	.02	.007	.005	.03	.01	.29	.14	.40	.08	.11	.004	1.67
1957	0	.0005	.06	.07	.15	.42	1.96	2.66	2.07	.11	.07	.001	7.57
1958	.24	.05	.23	.07	.18	.18	.52	.54	.90	3.44	.79	.19	7.51
1959	.11	.59	.09	.58	1.71	.71	.66	.35	.06	.01	.03	.07	4.78
1960	.46	.04	.06	.08	.18	1.71	1.90	1.38	.81	.50	.04	.01	7.17

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	60.7	5.08
1951	1208	3,090	May 22, 1951	0.8	64.4	0.398	5.40	77.6	6.51
1952	1238	2,440	Apr. 23, 1952	.2	81.4	.502	6.83	69.4	5.82
1953	1278	736	Mar. 31, 1953	0	17.2	.106	1.43	15.4	1.27
1954	1338	2,500	July 22, 1954	0	16.8	.104	1.42	20.7	1.75
1955	1388	5,300	Aug. 29, 1955	0	43.3	.267	3.64	46.4	3.91
1956	1438	5,980	June 19, 1956	0	19.8	.122	1.67	13.6	1.13
1957	1508	11,800	June 14, 1957	0	90.3	.557	7.57	95.6	8.01
1958	1558	14,200	July 31, 1958	0	87.5	.540	7.31	91.0	7.60
1959	1628	5,160	Feb. 10, 1959	0	57.1	.352	4.78	54.2	4.55
1960	1708	7,910	Apr. 16, 1960	.2	85.5	.528	7.17	-	-

5135. Lost Creek at Elsberry, Mo.

Location.--Lat 39°09'20", long 90°46'20", in NW¼SE¼ sec.29, T.51 N., R.2 E., three-quarters of a mile southwest of Elsberry.

Drainage area.--12.2 sq mi.

Records available.--June 1954 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 450 ft (from topographic map).

Average discharge.--6 years (1954-60), 5.46 cfs (3,950 acre-ft per year).

Extremes.--1954-60: Maximum discharge, 3,880 cfs June 30, 1960 (gage height, 11.48 ft), from rating curve extended above 170 cfs on basis of slope-area measurements at gage heights, 5.06 and 10.88 ft; no flow for many days in 1954-56.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	-	-	-	-	-	-	-	-	-	-	-	-	-
1955	5.24	0.71	0.26	3.46	5.29	3.04	4.81	2.70	0.88	0.37	0.41	0.12	2.67
										2.79	2.53	.48	
1956	4.33	.11	.10	.01	1.29	.74	6.83	3.57	1.37	8.11	.05	.07	2.22
1957	0	.26	.87	.34	6.29	9.91	36.1	36.6	22.0	2.91	.15	.18	9.61
1958	.28	.80	1.10	.65	1.32	3.58	4.54	6.38	6.69	28.3	4.61	1.35	5.01
1959	.67	1.67	.48	2.90	11.0	5.09	3.74	1.57	.52	1.17	8.89	3.12	3.35
1960	14.2	2.86	2.24	2.22	4.15	19.4	15.5	26.7	24.8	5.52	.52	.21	9.88

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	-	-	-	-	-	-	-	-	-	-	-	-	-
1955	322	42	16	213	294	187	286	166	52	23	25	7.1	-
									172	156	29		1,940
1956	266	6.7	6.3	.8	74	45	406	220	81	498	3.0	4.0	1,610
1957	0	16	54	21	349	609	2,150	2,250	1,310	179	9.3	11	6,960
1958	17	47	68	40	74	220	270	392	398	1,740	284	80	3,630
1959	41	99	30	179	611	313	223	97	31	72	547	186	2,430
1960	874	170	138	136	239	1,190	920	1,640	1,470	339	32	12	7,160

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff	
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-
1954	-	-	-	-	-	-	-	-	-	-	-
1955	1388	2,190	Aug. 7, 1955	0	2.67	0.219	2.97	1,940	2.53	2.82	1,830
1956	1438	2,130	July 29, 1956	0	2.22	.182	2.47	1,610	1.93	2.14	1,400
1957	1508	3,340	June 14, 1957	0	9.61	.788	10.68	6,960	9.70	10.78	7,020
1958	1558	1,590	July 19, 1958	.1	5.01	.411	5.57	3,630	5.06	5.63	3,670
1959	1628	970	Aug. 17, 1959	.1	3.35	.275	3.73	2,430	4.75	5.28	3,440
1960	1708	3,880	June 30, 1960	.1	9.88	.810	11.01	7,160	-	-	-

5145. Cuivre River near Troy, Mo.

Location.--Lat 39°00'59", long 90°59'00", in SE $\frac{1}{4}$ sec.14, T.49 N., R.1 W., on downstream side of center pier of bridge on U.S. Highway 61, $1\frac{1}{2}$ miles downstream from confluence of North and West Forks and 2 miles north of Troy.

Drainage area.--903 sq mi.

Records available.--February 1922 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 450.27 ft above mean sea level, datum of 1929. Prior to Oct. 1, 1930, chain gage at site 3 miles downstream at datum 4.31 ft lower. Oct. 1, 1930, to Nov. 12, 1934, chain gage and Nov. 13, 1934, to July 10, 1939, wire-weight gage, at present site and datum.

Average discharge.--38 years (1922-60), 643 cfs (465,500 acre-ft per year).

Extremes.--1922-60: Maximum discharge, 120,000 cfs Oct. 5, 1941 (gage height, 33.4 ft, from floodmarks); no flow Aug. 29, 1936, Aug. 6, 1954.

Flood in October 1941 exceeded the previously known maximum flood in December 1895 by 5 or 6 ft at Frenchmans Bluff, 3 miles downstream, and is highest flood since 1888.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	4.89	30.2	10.6	71.2	2,332	2,005	909	99.9	599	411	58.3	294	557
1952	421	514	200	771	578	1,057	1,433	176	165	28.8	66.8	3.48	450
1953	1.18	17.9	14.0	17.7	17.0	402	591	594	92.3	27.7	61.0	2.16	154
1954	1.33	1.50	1.41	1.63	1.80	251	25.8	36.8	170	45.4	16.5	27.2	27.3
1955	185	6.16	8.24	265	478	220	636	183	239	524	44.8	15.7	232
1956	520	26.8	10.5	5.47	24.5	21.7	304	490	259	1,007	42.5	3.00	228
1957	.86	2.74	8.45	5.40	433	638	3,272	1,883	1,631	406	40.4	4.72	690
1958	3.00	6.40	13.4	20.0	104	593	786	446	370	2,155	1,888	205	555
1959	193	255	31.9	515	1,707	504	209	577	91.3	41.7	228	177	369
1960	1,220	48.4	133	141	357	2,016	1,198	1,570	681	799	25.8	4.60	687

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	300	1,790	653	4,380	129,500	123,300	54,110	6,140	35,640	25,250	3,580	17,480	402,100
1952	25,860	30,570	12,320	47,420	33,250	64,980	85,260	10,800	9,820	1,770	4,110	207	326,400
1953	73	1,060	860	1,090	946	24,720	35,190	36,520	5,490	1,700	3,750	129	111,500
1954	82	77	87	100	100	154	1,540	2,260	10,090	2,670	1,010	1,620	19,790
1955	11,230	367	507	16,290	25,560	13,510	37,870	11,260	14,250	32,220	2,760	937	167,800
1956	31,960	1,590	648	336	1,410	1,340	18,100	30,150	15,430	61,890	2,610	179	165,600
1957	53	163	519	332	24,040	39,250	194,700	115,800	97,030	24,950	2,480	281	499,600
1958	184	381	823	1,250	5,760	36,450	46,760	27,420	22,050	132,500	16,100	12,180	401,800
1959	11,900	15,160	1,960	31,660	94,800	30,970	12,410	35,480	5,430	2,570	13,990	10,530	266,900
1960	74,990	2,880	8,160	8,680	20,510	124,000	71,320	96,520	40,550	49,150	1,580	274	498,600

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year				
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff			
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet		
1950	-	-	-	-	-	-	-	-	54 $\frac{1}{2}$	8.20	395,600	-	-
1951	1208	28,600	Feb. 21, 1951	3.5	557	0.617	8.34	402,100	647	9.71	468,100	-	-
1952	1238	10,300	Apr. 12, 1952	1.5	450	.498	6.77	326,400	358	5.39	259,600	-	-
1953	1278	8,050	May 5, 1953	.7	154	.171	2.32	111,500	152	2.28	109,800	-	-
1954	1338	1,960	July 2, 1954	.1	27.3	.030	.41	19,790	45.7	.66	31,650	-	-
1955	1388	13,100	July 15, 1955	.7	232	.257	3.49	167,800	262	3.94	189,900	-	-
1956	1438	9,290	Apr. 29, 1956	1.1	228	.252	3.44	165,600	182	2.76	132,200	-	-
1957	1508	21,000	June 8, 1957	.5	690	.764	10.36	499,600	691	10.38	500,300	-	-
1958	1558	23,100	Aug. 1, 1958	1.2	555	.615	8.35	401,800	593	8.92	429,500	-	-
1959	1628	19,200	Feb. 10, 1959	3.7	369	.409	5.54	266,900	447	6.73	323,900	-	-
1960	1708	24,700	Mar. 28, 1960	2.4	687	.761	10.35	498,600	-	-	-	-	-

5150. Kankakee River near North Liberty, Ind.

Location.--Lat 41°33'50", long 86°29'50", on line between secs. 14 and 23, T.36 N., R.1 W., on left bank at downstream side of bridge on St. Joseph County highway named "New Road," 4 miles northwest of North Liberty.

Drainage area.--152 sq mi.

Records available.--January 1951 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 680.04 ft above mean sea level, datum of 1929 (levels by Indiana Flood Control and Water Resources Commission). Prior to June 26, 1956, wire-weight gage at same site and datum.

Average discharge.--9 years (1951-60), 147 cfs.

Extremes.--1951-60: Maximum discharge, 686 cfs Oct. 10, 1954; maximum gage height, 8.64 ft Oct. 12, 1954 (backwater from return of overbank flow); minimum discharge, 52 cfs Sept. 9-11, 1959; minimum gage height, 1.60 ft Aug. 19, 1957.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	204	189	230	241	156	162	134	125	-
1952	216	*291	221	*339	257	229	250	186	186	112	101	77.6	*205
1953	75.3	94.5	118	134	130	155	134	135	104	75.2	74.8	64.4	108
1954	70.1	73.9	87.5	82.7	132	160	240	167	126	133	94.9	80.3	120
1955	294	211	207	272	193	233	183	143	149	108	86.8	85.9	181
1956	185	165	127	110	152	185	*158	*304	139	101	89.5	71.6	*149
1957	75.0	79.4	91.7	106	127	112	*201	165	116	88.8	74.4	81.6	110
1958	117	158	*203	155	136	218	128	98.4	122	95.2	120	87.2	137
1959	76.9	94.7	85.0	89.9	226	*314	234	164	101	91.2	77.9	64.7	*134
1960	150	201	171	223	258	205	270	159	179	116	101	86.0	176

* Revised.

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	1.40	1.43	1.69	1.83	1.15	1.23	1.02	0.92	-
1952	1.64	*2.13	1.68	*2.57	1.82	1.74	1.84	1.41	1.37	.85	.76	.57	*18.38
1953	.57	.69	.90	1.02	.89	1.17	.99	1.03	.76	.57	.57	.47	9.63
1954	.53	.54	.66	.63	.90	1.21	1.76	1.27	.92	1.01	.72	.59	10.74
1955	2.22	1.55	1.57	2.06	1.32	1.76	1.34	1.08	1.09	.82	.66	.63	16.10
1956	1.41	1.22	.96	.83	1.08	1.41	*1.16	*2.31	1.02	.77	.68	.53	*13.38
1957	.57	.58	.70	.80	.87	.85	*1.47	1.26	.85	.67	.56	.60	*9.78
1958	.89	1.16	*1.54	1.18	.93	1.65	.94	.74	.90	.72	.91	.64	*12.20
1959	.58	.70	.63	.68	1.55	*2.39	1.72	1.24	.74	.69	.59	.48	*11.99
1960	1.14	1.47	1.29	1.70	1.83	1.56	1.99	1.21	1.32	.88	.77	.63	15.79

* Revised.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches	
		Discharge	Date							
1950	-	-	-	-	-	-	-	-	-	-
1951	1208	520	May 11, 1951	-	-	-	-	-	-	-
1952	1238	*570	Nov. 14, 1951	68	*205	*1.35	*18.38	*189	*15.08	
1953	1278	260	Mar. 16, 1953	56	108	.711	9.63	103	9.20	
1954	1336	360	Apr. 28, 1954	65	120	.789	10.74	161	14.35	
1955	1388	686	Oct. 10, 1954	70	181	1.19	16.10	161	14.35	
1956	1438	*619	May 12, 1956	68	*149	*.980	*13.38	137	*11.64	
1957	1508	*530	Apr. 27, 1957	56	110	.724	*9.78	*129	*11.52	
1958	1558	*480	Dec. 20, 1957	71	137	.901	*12.20	118	10.52	
1959	1628	*480	Mar. 27, 1959	52	*134	*.882	*11.99	157	*13.98	
1960	1708	566	Mar. 31, 1960	68	176	1.16	15.79	-	-	

* Revised.

5155. Kankakee River at Davis, Ind.

Location.--Lat 41°24', long 86°42', in NE $\frac{1}{4}$ sec.13, T.34 N., R.3 W., on left bank at downstream side of bridge on U.S. Highway 30 at Davis, half a mile downstream from Mill Creek and 4 miles east of Hanna.

Drainage area.--508 sq mi.

Records available.--July to December 1905, April to July 1906, October 1924 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 664.68 ft above mean sea level, datum of 1929. July 13, 1905, to July 21, 1906, staff gage at site, 50 ft downstream at different datum. July 28, 1925, to May 18, 1929, chain gage on bridge half a mile downstream at different datum. Apr. 19, 1931, to Mar. 11, 1942, chain gage at present site and datum. Mar. 12, 1942, to Nov. 3, 1953, wire-weight gage at present site and datum.

Average discharge.--36 years (1924-60), 482 cfs.

Extremes.--1905-6, 1924-60: Maximum discharge observed, about 1,700 cfs Dec. 15, 1927 (gage height, 9.50 ft, site and datum then in use), from rating curve extended above 520 cfs; maximum gage height at present site and datum, 11.76 ft Oct. 16-18, 1954; minimum discharge observed, 154 cfs Aug. 30 to Sept. 3, 1941; minimum gage height observed, 2.97 ft Aug. 14, 1934.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	396	421	588	725	672	671	744	731	513	588	434	418	575
1952	592	873	740	1,085	910	791	913	680	651	415	348	294	690
1953	290	308	365	399	406	539	473	465	371	301	298	232	370
1954	217	244	282	276	449	563	794	619	519	518	383	314	431
1955	1,162	915	668	896	697	826	689	531	545	393	326	306	663
1956	511	477	389	338	490	597	490	938	474	360	300	237	467
1957	242	266	287	330	398	380	677	668	479	338	294	273	385
1958	366	511	660	589	481	713	467	356	508	349	473	511	482
1959	275	319	289	374	754	957	835	621	459	398	306	241	482
1960	525	709	591	715	904	646	1,035	617	629	438	394	324	625

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.90	0.93	1.34	1.65	1.38	1.52	1.63	1.66	1.13	1.33	0.98	0.92	15.37
1952	1.34	1.92	1.68	2.46	1.93	1.80	2.01	1.54	1.43	.94	.79	.64	18.48
1953	.66	.68	.83	.90	.83	1.22	1.04	1.05	.81	.68	.68	.51	9.89
1954	.49	.54	.64	.63	.92	1.28	1.74	1.41	1.14	1.18	.87	.69	11.53
1955	2.64	2.01	1.51	2.03	1.43	1.88	1.52	1.21	1.19	.89	.74	.67	17.72
1956	1.16	1.05	.88	.77	1.04	1.36	1.08	2.13	1.04	.82	.68	.52	12.53
1957	.55	.58	.65	.75	.82	.86	1.48	1.51	1.05	.77	.67	.60	10.29
1958	.83	1.13	1.50	1.34	.99	1.61	1.03	.81	1.12	.79	1.07	.68	12.90
1959	.62	.70	.66	.85	1.54	2.17	1.83	1.41	.96	.90	.69	.53	12.86
1960	1.19	1.56	1.34	1.63	1.92	1.46	2.28	1.40	1.38	.99	.90	.71	16.76

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	750	20.03
1951	1208	1,100	July 10, 1951	355	575	1.13	15.37	641	17.14
1952	1238	1,300	Jan. 21, 1952	280	690	1.36	18.48	586	15.71
1953	1278, 1338	850	Mar. 15, 1953	197	370	.728	9.89	932	16.32
1954	1338	1,160	Apr. 28, 1954	195	431	.848	11.53	599	16.02
1955	1388	1,620	Oct. 16-18, 1954	265	663	1.31	17.72	548	14.65
1956	1438	1,260	May 13, 1956	218	467	.919	12.53	418	11.22
1957	1508	1,240	Apr. 29, 1957	235	385	.758	10.29	448	11.97
1958	1558	1,100	Dec. 21, 1957	250	482	.949	12.90	427	11.42
1959	1628	1,150	Mar. 28, 1959	195	482	.949	12.86	561	14.97
1960	1708	1,350	Apr. 3, 1960	280	625	1.23	16.76	-	-

5160. Yellow River near Bremen, Ind.

Location (revised).--Lat 41°25', long 86°10', on line between SW $\frac{1}{4}$ sec.3 and NW $\frac{1}{4}$ sec.10, T.34 N., R.3 E., on left bank at downstream side of bridge, 0.5 mile downstream from Bunch ditch, 2 miles southwest of Bremen, and 4 miles upstream from Dausman ditch.

Drainage area.--132 sq mi.

Records available.--August 1955 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 784.63 ft above mean sea level, datum of 1929 (levels by Indiana Flood Control and Water Resources Commission).

Average discharge.--5 years (1955-60), 96.7 cfs.

Extremes.--1955-60: Maximum discharge, 1,380 cfs May 13, 1956; maximum gage height, 13.07 ft Mar. 30, 1960; minimum discharge, 6.2 cfs Aug. 23 and Oct. 11, 12, 13, 1957; minimum gage height, 0.81 ft Sept. 10, 1955.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	-	-	-	-	-	-	-	-	-	-	-	-	-
1955	-	-	-	-	-	-	-	-	-	-	-	9.03	-
1956	23.8	45.5	28.9	15.1	205	157	155	374	39.0	17.0	13.6	9.27	89.9
1957	8.13	8.30	6.10	19.8	35.0	32.8	268	68.6	67.8	27.5	8.25	7.95	46.3
1958	16.6	61.6	220	68.9	128	148	58.7	23.9	119	75.2	238	30.4	97.4
1959	21.2	68.3	32.2	64.4	470	300	288	103	78.8	44.2	13.9	14.4	122
1960	40.3	131	93.6	220	284	175	289	75.2	160	33.8	22.2	31.7	128

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	-	-	-	-	-	-	-	-	-	-	-	-	-
1955	-	-	-	-	-	-	-	-	-	-	-	0.08	-
1956	0.21	0.38	0.25	0.13	1.67	1.37	1.30	3.26	0.33	0.15	0.12	.08	9.25
1957	.07	.07	.07	.17	.28	.29	2.26	.60	.57	.24	.07	.07	4.76
1958	.15	.52	1.92	.60	1.01	1.29	.33	.21	1.01	.66	2.08	.26	10.04
1959	.19	.58	.28	.56	3.71	2.62	2.43	.90	.67	.39	.12	.12	12.57
1960	.35	1.11	.82	1.92	2.32	1.53	2.44	.66	1.35	.30	.19	.27	13.26

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-
1954	-	-	-	-	-	-	-	-	-
1955	1438	-	-	-	-	-	-	-	-
1956	1438	1,380	May 13, 1956	7.5	89.9	0.681	9.25	83.8	8.62
1957	1508	890	Apr. 27, 1957	6.6	46.3	.351	4.76	69.4	7.14
1958	1558	1,070	Dec. 20, 1957	6.4	97.4	.738	10.04	82.4	8.50
1959	1628	1,120	Feb. 10, Mar. 28	6.8	122	.924	12.57	134	13.80
1960	1708	1,220	Mar. 30, 1960	14	128	.970	13.26	-	-

5165. Yellow River at Plymouth, Ind.

Location (revised).--Lat 41°20'25", long 86°18'16", in NW¼ sec.13, T.33 N., R.2 E., on left bank 50 ft upstream from LaPorte Street footbridge in Plymouth, 1.1 miles downstream from Elmer Seldenright (formerly Baker) ditch, and 8.1 miles upstream from Wolf Creek.

Drainage area.--284 sq mi.

Records available.--July 1948 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 764.78 ft above mean sea level, datum of 1929 (levels by Indiana Flood Control and Water Resources Commission). Prior to Aug. 27, 1959, wire-weight gage at same site and datum.

Average discharge.--12 years (1948-60), 254 cfs.

Extremes.--1948-60: Maximum discharge, 5,390 cfs Oct. 12, 13, 1954 (gage height, 17.13 ft); minimum, 18 cfs Oct. 24, 1953; minimum gage height observed, 3.49 ft Jan. 11, 14, 1954.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	40.4	68.1	293	469	514	333	510	359	153	664	148	62.4	300
1952	320	550	388	883	419	417	473	278	341	181	60.8	46.3	363
1953	26.4	42.5	67.1	138	159	351	217	172	105	52.1	71.4	31.1	119
1954	26.1	27.9	30.4	38.2	140	368	756	257	222	192	169	56.9	190
1955	1,583	262	262	485	327	459	273	113	113	61.7	42.1	30.1	336
1956	59.7	96.0	84.2	38.1	382	330	249	811	112	70.6	86.2	35.5	194
1957	27.1	31.2	33.9	50.1	97.5	79.5	581	210	156	103	33.5	32.3	119
1958	66.6	156	474	169	217	307	106	65.4	231	180	494	155	219
1959	74.4	217	89.6	145	1,007	692	614	294	242	135	50.1	46.6	295
1960	100	322	235	452	605	328	749	197	327	102	69.4	88.0	295

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.16	0.27	1.15	1.90	1.88	1.35	2.00	1.46	0.60	2.69	0.60	0.25	14.31
1952	1.30	2.16	1.57	3.59	1.59	1.69	1.86	1.13	1.34	.73	.25	.18	17.39
1953	.11	.17	.27	.56	.58	1.43	.85	.70	.41	.21	.29	.12	5.70
1954	.11	.11	.12	.16	.51	1.50	2.97	1.04	.87	.78	.69	.22	9.08
1955	6.42	1.03	1.06	1.97	1.20	1.87	1.07	.46	.44	.25	.17	.12	16.06
1956	.24	.58	.26	.15	1.44	1.34	.98	3.30	.44	.29	.35	.14	9.31
1957	.11	.12	.14	.20	.56	.52	2.29	.85	.61	.42	.14	.13	5.89
1958	.27	.61	1.92	.69	.80	1.24	.42	.28	.91	.73	2.01	.61	10.47
1959	.30	.85	.36	.59	3.70	2.81	2.41	1.20	.95	.55	.20	.18	14.10
1960	.41	1.26	.95	1.83	2.30	1.33	2.94	.80	1.28	.41	.28	.35	14.14

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches		Mean	Runoff in inches	
		Discharge	Date								
1950	-	-	-	-	-	-	-	-	428	20.46	
1951	1208	2,900	July 12, 1951	36	300	1.08	14.31	372	17.76		
1952	1238	2,030	Jan. 3, 1952	28	363	1.28	17.39	269	12.91		
1953	1278	1,160	Mar. 16, 1953	20	119	.419	5.70	115	5.49		
1954	1338	2,290	Apr. 28, 1954	18	190	.669	9.08	361	17.25		
1955	1368	5,390	Oct. 12-13, 1954	22	336	1.18	16.06	176	8.43		
1956	1438	2,200	May 1, 1956	23	194	.683	9.31	184	8.80		
1957	1508	1,140	Apr. 29, 1957	22	119	.419	5.69	170	8.12		
1958	1558	1,600	Dec. 21, 1957	24	219	.771	10.47	192	9.18		
1959	1628	2,240	Feb. 15, 1959	20	295	1.04	14.10	338	15.21		
1960	1708	2,340	Mar. 31, 1960	41	295	1.04	14.14	-	-		

5170. Yellow River at Knox, Ind.

Location.--Lat 41°18', long 86°37', in SE $\frac{1}{4}$ sec.14, T.33 N., R.2 W., on right bank 40 ft upstream from bridge on U.S. Highway 35 in Knox, $\frac{1}{2}$ miles downstream from Eagle Creek, and 9 miles upstream from mouth.

Drainage area.--425 sq mi.

Records available.--August to December 1905, March to July 1906, August 1943 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 679.93 ft above mean sea level, datum of 1929, Lafayette supplementary adjustment of 1951 (levels by Indiana Flood Control and Water Resources Commission). August 1905 to July 1906, chain gage at same site at different datum. August 1943 to July 17, 1952, wire-weight gage at same site and datum.

Average discharge.--17 years (1943-60), 392 cfs.

Extremes.--1905-6, 1943-60: Maximum discharge, 5,660 cfs Oct. 15, 16, 1954 (gage height, 13.75 ft); minimum, 39 cfs Jan. 11, 1957, result of freezeup; minimum gage height, 4.26 ft Jan. 12, 1954.

Remarks.--Low flow is affected by pumpage at times.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	124	172	447	648	684	576	762	611	326	737	255	162	458
1952	403	725	565	1,117	676	669	736	512	518	281	148	118	538
1953	110	116	177	261	286	515	396	350	241	154	160	90.1	238
1954	87.0	94.7	98.8	117	242	509	870	462	388	336	283	142	302
1955	1,939	470	450	750	492	745	507	285	274	165	116	102	527
1956	154	214	160	122	452	511	323	1,085	269	155	145	97.6	307
1957	83.2	94.8	106	130	173	194	194	428	260	130	106		225
1958	168	306	581	356	300	493	243	169	389	327	652	257	354
1959	168	315	205	246	1,193	861	785	544	354	262	132	115	426
1960	226	467	386	597	812	430	1,115	392	467	238	191	167	454

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.34	0.45	1.21	1.76	1.68	1.86	2.00	1.66	0.86	2.00	0.69	0.43	14.64
1952	1.10	1.92	1.54	3.05	1.73	1.83	1.94	1.40	1.37	.77	.43	.31	17.36
1953	.30	.30	.48	.71	.70	1.40	1.04	.95	.63	.42	.43	.24	7.60
1954	.24	.25	.27	.32	.59	1.38	2.29	1.26	1.02	.91	.77	.37	9.67
1955	5.26	1.24	1.22	2.03	1.21	2.02	1.33	.77	.72	.45	.31	.27	16.83
1956	.42	.56	.43	.33	1.14	1.38	.85	2.94	.71	.42	.39	.26	9.83
1957	.23	.25	.29	.35	.47	.53	1.86	1.16	.68	.73	.35	.28	7.18
1958	.46	.80	1.58	.97	.74	1.34	.64	.46	1.02	.89	1.76	.68	11.34
1959	.46	.83	.56	.67	2.93	2.34	2.06	1.48	.93	.71	.36	.30	13.63
1960	.61	1.23	1.05	1.61	2.06	1.16	2.92	1.06	1.23	.65	.52	.44	14.54

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	856	20.95
1951	1208	2,440	July 14, 1951	110	458	1.08	14.64	537	17.28
1952	1238, 1278	1,990	Jan. 4, 1952	106	538	1.27	17.36	431	13.89
1953	1278	1,100	Mar. 18, 1953	77	238	.560	7.60	228	7.28
1954	1338	2,060	Apr. 29, 1954	59	302	.711	9.67	520	16.63
1955	1388	5,660	Oct. 15-16, 1954	88	527	1.24	16.83	330	10.52
1956	1438	2,200	May 15, 1956	81	307	.722	9.83	287	9.19
1957	1508	1,220	Apr. 30, 1957	68	225	.529	7.18	285	9.25
1958	1558	1,430	Dec. 23, 1957	91	354	.853	11.34	323	10.35
1959	1628	2,550	Feb. 14, 15, 1959	90	426	1.00	13.63	458	14.67
1960	1708	2,700	Apr. 2, 1960	120	454	1.07	14.54	-	-

5175. Kankakee River at Dunns Bridge, Ind.

Location.--Lat 41°13'17", long 86°57'52", in sec.15, T.32 N., R.5 W., on left bank at downstream side of county highway bridge at Dunns Bridge, 1.8 miles north of Tefft. and 3.5 miles upstream from Davis ditch.

Drainage area.--1,308 sq mi.

Records available.--July 1948 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 649.65 ft above mean sea level, datum of 1929, Lafayette supplementary adjustment of 1951 (levels by Indiana Flood Control and Water Resources Commission). Prior to July 17, 1956, wire-weight gage at same site and datum.

Average discharge.--12 years (1948-60), 1,293 cfs.

Extremes.--1948-60: Maximum discharge, 5,300 cfs Oct. 22, 1954 (gage height, 13.20 ft); minimum observed, 290 cfs Jan. 14, 1954 (revised), result of freezeup; minimum gage height, 2.00 ft Sept. 17, 1959.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	701	746	1,288	1,744	1,753	1,825	2,249	1,979	1,282	1,862	1,333	794	1,437
1952	1,254	2,262	1,950	2,870	2,223	1,921	2,264	1,747	1,741	928	621	474	1,685
1953	499	536	696	818	902	1,421	1,230	1,198	943	724	590	392	829
1954	370	417	532	532	867	1,324	2,173	1,646	1,207	1,120	817	574	964
1955	3,378	2,484	1,479	2,308	1,551	2,247	1,751	1,219	1,265	797	543	472	1,625
1956	819	879	711	622	1,118	1,620	1,123	2,886	1,185	764	562	407	1,059
1957	377	418	470	647	766	719	1,664	1,769	1,162	1,044	622	480	845
1958	776	1,278	1,702	1,485	1,076	1,744	1,082	767	1,529	1,154	1,600	828	1,247
1959	616	818	764	1,067	2,450	2,693	2,513	1,908	1,107	909	606	432	1,315
1960	1,105	1,675	1,396	1,757	2,428	1,502	2,995	1,561	1,588	1,033	862	640	1,538

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.62	0.64	1.14	1.54	1.40	1.61	1.92	1.74	1.09	1.64	0.91	0.68	14.93
1952	1.10	1.93	1.72	2.53	1.83	1.69	1.93	1.54	1.49	.82	.55	.40	17.53
1953	.44	.46	.61	.72	.72	1.26	1.05	1.06	.80	.64	.52	.34	8.62
1954	.33	.36	.47	.47	.69	1.15	1.85	1.45	1.03	.99	.72	.49	10.01
1955	2.97	2.12	1.30	2.03	1.24	1.98	1.47	1.07	1.08	.70	.48	.40	16.84
1956	.72	.75	.63	.55	.92	1.43	.96	2.55	1.01	.67	.50	.35	11.04
1957	.33	.36	.41	.57	.61	.63	1.42	1.56	.99	.92	.55	.41	8.76
1958	.68	1.09	1.50	1.31	.86	1.53	.92	.68	1.30	1.01	1.33	.71	12.93
1959	.54	.70	.67	.94	1.95	2.38	2.14	1.68	.94	.80	.53	.37	13.64
1960	.97	1.43	1.23	1.54	2.01	1.33	2.56	1.37	1.35	.91	.76	.55	16.01

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches	
		Discharge	Date							
1950	-	-	-	-	-	-	-	1,997	-	20.73
1951	1208	3,230	July 16, 1951	670	1,437	1.10	14.93	1,665	17.28	
1952	1236	3,380	Jan. 23, 1952	432	1,685	1.29	17.53	1,373	14.29	
1953	1278	2,190	Mar. 19, 1953	362	829	.634	8.62	794	8.27	
1954	1338	3,100	May 2, 1954	*290	964	.737	10.01	1,470	15.24	
1955	1388	5,300	Oct. 22, 1954	400	1,625	1.24	16.84	1,210	12.55	
1956	1438	3,800	May 17-18, 1956	365	1,059	.810	11.04	964	10.04	
1957	1508	3,100	Apr. 29, 1957	362	845	.646	8.76	1,054	10.93	
1958	1558	2,730	Dec. 24, 25, 1957	425	1,247	.953	12.93	1,114	11.56	
1959	1628	3,850	Feb. 17, 1959	349	1,315	1.01	13.64	1,481	15.36	
1960	1708	3,660	Apr. 4, 5, 1960	545	1,538	1.18	16.01	-	-	

* Revised.

5180. Kankakee River at Shelby, Ind.

Location (revised).--Lat 41°11', long 87°21', in NE $\frac{1}{4}$ sec.33, T.32 N., R.8 W., on left bank 25 ft downstream from Monon Railroad bridge, 1 mile south of Shelby and 9 miles upstream from Beaver Lake Creek.

Drainage area.--1,753 sq mi.

Records available.--October 1922 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 628.13 ft above mean sea level, datum of 1929. Prior to Dec. 19, 1934, chain gage at highway bridge about 400 ft upstream at same datum.

Average discharge.--38 years (1922-60), 1,529 cfs.

Extremes.--1922-60: Maximum discharge, 7,200 cfs Dec. 21, 1927 (gage height, 11.40 ft, present datum, site then in use), from rating curve extended above 3,000 cfs by gage-height relation study with that of present site; minimum daily, 260 cfs Jan. 13-15, 1954, result of freezeup; minimum gage height, 0.80 ft (present datum, site then in use) Aug. 4, 5, 1934.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	886	913	1,540	2,177	2,241	2,421	2,996	2,593	1,679	2,409	1,414	1,060	1,860
1952	1,502	2,963	2,558	3,569	2,942	2,503	2,899	2,257	2,524	1,282	838	598	2,198
1953	573	663	858	1,031	1,173	1,862	1,600	1,501	1,251	1,052	708	460	1,061
1954	455	519	687	672	1,059	1,682	2,865	2,167	1,472	1,327	935	706	1,212
1955	3,400	3,205	1,888	2,825	1,976	2,703	2,217	1,621	1,719	1,010	676	655	1,992
1956	1,136	1,184	990	927	1,434	2,057	1,391	3,773	1,522	965	707	502	1,384
1957	468	525	612	818	1,027	1,974	2,288	2,631	1,535	1,709	944	706	1,187
1958	964	1,646	2,173	1,981	1,401	2,166	1,374	996	2,022	1,480	1,998	950	1,573
1959	706	927	963	1,438	3,392	3,502	3,148	2,489	1,363	1,182	820	518	1,692
1960	1,426	2,161	1,829	2,252	3,056	1,998	3,679	1,956	2,024	1,336	1,024	771	1,951

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.58	0.58	1.01	1.43	1.33	1.59	1.91	1.70	1.07	1.58	0.93	0.67	14.38
1952	.99	1.88	1.68	2.35	1.81	1.65	1.84	1.48	1.61	.84	.55	.38	17.06
1953	.38	.42	.56	.68	.70	1.22	1.02	.99	.80	.69	.46	.29	8.21
1954	.30	.33	.45	.44	.63	1.11	1.82	1.43	.94	.87	.61	.45	9.38
1955	2.24	2.04	1.24	1.86	1.18	1.78	1.41	1.07	1.09	.66	.45	.42	15.44
1956	.75	.75	.65	.61	.88	1.35	.88	2.48	.97	.63	.46	.32	10.73
1957	.31	.33	.40	.54	.61	.64	1.46	1.73	.98	1.12	.62	.45	9.19
1958	.63	1.05	1.43	1.30	.83	1.43	.87	.65	1.28	.97	1.12	.60	12.16
1959	.46	.59	.63	.95	2.01	2.31	2.01	1.64	.87	.78	.54	.33	13.12
1960	.94	1.37	1.20	1.48	1.88	1.31	2.34	1.29	1.28	.88	.67	.49	15.13

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	2,509	19.43
1951	1208	3,890	Apr. 15, 1951	782	1,860	1.06	14.38	2,166	16.76
1952	1238	4,200	June 16, 1952	540	2,198	1.25	17.06	1,787	13.87
1953	1278	2,650	Mar. 19, 1953	435	1,061	.605	8.21	1,025	7.93
1954	1338	3,620	May 3, 4, 1954	260	1,212	.691	9.38	1,184	13.82
1955	1388	5,040	Oct. 27, 1954	510	1,992	1.14	15.44	1,557	12.07
1956	1438	4,540	May 12, 1956	450	1,384	.790	10.73	1,242	9.62
1957	1508	4,240	Apr. 29 to May 1	435	1,187	.677	9.19	1,454	11.26
1958	1558	3,480	Dec. 26, June 14	555	1,573	.897	12.16	1,389	10.73
1959	1628	5,100	Feb. 16, 17, 1959	405	1,692	.965	13.12	1,929	14.95
1960	1708	4,160	Apr. 6, 7, 1960	654	1,951	1.11	15.13	-	-

ILLINOIS RIVER BASIN

5185. Singleton ditch near Hebron, Ind.

Location.--Lat 41°17', long 87°15', on line between secs. 20 and 29, T.33 N., R.7 W., at State Highway 2 bridge, 3.2 miles southwest of Hebron.

Drainage area.--34.0 sq mi.

Records available.--December 1948 to December 1951.

Gage.--Wire-weight gage. Altitude of gage is 645 ft (from topographic map).

Extremes.--1948-51: Maximum discharge, 652 cfs Dec. 22, 1949 (gage height, 9.6 ft); minimum, 3.9 cfs Oct. 1, 1950; minimum gage height, 0.52 ft Sept. 9, 1949.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	6.08	5.86	11.1	34.7	58.3	37.0	74.5	44.0	18.5	49.7	12.4	7.56	29.8
1952	23.3	65.5	34.0	-	-	-	-	-	-	-	-	-	-

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.21	0.19	0.38	1.18	1.78	1.26	2.44	1.49	0.61	1.68	0.42	0.25	11.89
1952	.79	2.15	1.15	-	-	-	-	-	-	-	-	-	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	37.9	15.14
1951	1208	544	July 9, 1951	-	29.8	0.876	11.89	38.1	15.20
1952	1238	a580	Nov. 14, 1951	3.9	-	-	-	-	-

a Maximum during period October to December.

5190. Singleton ditch at Schneider, Ind.

Location--Lat 41°12'44", long 87°26'44", on line between NE $\frac{1}{4}$ sec.21 and NW $\frac{1}{4}$ sec.22, T.32 N., R.9 W., on left bank 15 ft upstream from bridge on Ackerman Avenue (revised), half a mile upstream from Bruce ditch, $1\frac{1}{2}$ miles downstream from Cedar Creek, and $1\frac{2}{3}$ miles north of Schneider.

Drainage area--122 sq mi.

Records available--July 1948 to September 1960.

Gage--Water-stage recorder. Datum of gage is 623.67 ft above mean sea level, datum of 1929. Prior to Oct. 1, 1949, wire-weight gage at same site at datum 2.00 ft higher. Oct. 1, 1949, to Aug. 13, 1951, wire-weight gage at same site and datum.

Average discharge--12 years (1948-60), 97.0 cfs (revised).

Extremes (revised)--1948-60: Maximum discharge, 1,120 cfs Feb. 14, 1959 (gage height, 10.45 ft); minimum, 7.6 cfs Aug. 29, 1955; minimum gage height, 1.14 ft Sept. 13, 1957, result of unusual regulation.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	22.7	20.1	41.5	131	231	141	232	146	60.8	138	43.6	28.8	102
1952	53.6	180	111	242	100	176	203	94.5	287	52.6	28.7	18.1	177
1953	16.1	20.0	23.5	24.0	51.8	181	87.6	61.6	64.7	57.0	19.2	11.1	51.6
1954	10.1	11.8	16.6	26.3	44.0	139	213	77.8	62.2	62.0	26.4	13.2	58.5
1955	237	56.3	78.6	185	117	123	97.7	58.9	56.9	29.4	19.9	12.1	89.5
1956	29.2	31.0	25.5	19.6	*164	92.8	*68.7	184	49.0	28.4	16.3	8.88	*59.5
1957	9.11	11.8	13.5	22.8	34.3	34.3	*264	177	76.4	*208	45.7	16.1	*76.3
1958	32.5	69.1	124	83.1	85.3	108	56.2	30.6	*198	99.0	39.3	26.7	*66.0
1959	21.3	35.3	51.6	*16	261	202	189	55.7	*172	56.0	31.1	*129	
1960	161	192	134	213	262	159	210	83.5	228	68.0	27.3	15.1	145

* Revised.

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.21	0.18	0.39	1.24	1.97	1.34	2.12	1.38	0.56	1.30	0.41	0.26	11.36
1952	.51	1.64	1.05	2.29	.88	1.66	1.85	.89	2.44	.50	.27	.17	14.15
1953	.15	.16	.22	.23	.44	1.71	.80	.58	.59	.54	.18	.10	5.72
1954	.10	.11	.16	.25	.38	1.31	1.95	.74	.57	.59	.25	.12	6.53
1955	2.24	.51	.74	1.75	1.00	1.16	.89	.56	.52	.28	.19	.11	9.95
1956	.28	.28	.24	.19	*1.44	.68	*.63	1.74	.45	.27	.15	.08	*6.63
1957	.09	.11	.13	.22	.29	.32	*2.41	1.67	.70	*1.96	.43	.15	*8.48
1958	.31	.81	1.18	.79	.73	1.02	.51	.29	*1.81	.94	.94	.24	*9.57
1959	.20	.32	.27	.49	*4.14	2.47	1.85	1.60	.51	*1.63	.53	.28	*14.29
1960	1.52	1.75	1.27	2.02	2.32	1.50	1.92	.79	2.09	.64	.26	.14	16.22

* Revised.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	147	16.32
1951	1208	841	Feb. 19, 1951	14	102	0.836	11.36	124	13.78
1952	1235	1,015	June 15, 1952	15	127	1.04	14.15	103	11.50
1953	1275	812	Mar. 15, 1953*	9.4	51.6	.423	5.72	49.8	5.54
1954	1338	810	Mar. 25, 1954	8.8	58.5	.480	6.53	86.7	9.65
1955	1388	953	Oct. 11-12, 1954	8.4	89.5	.734	9.95	65.3	7.26
1956	1438	*1,000	Feb. 25, 1956	8.4	*59.5	*.488	*6.63	*55.2	*16.16
1957	1508	*1,110	Apr. 28, 1957	8.4	*76.3	*.625	*8.48	*94.0	*10.45
1958	1558	*798	June 13, 1958	12	*86.0	*.705	*9.57	*12.4	*8.06
1959	1625	*1,120	Feb. 14, 1959	17	*129	*1.06	*14.29	*162	*18.04
1960	1708	1,100	Feb. 11, 1960	10	145	1.19	16.22	-	-

* Revised.

* Not previously published.

5195. West Creek near Schneider, Ind.

Location.--Lat 41°12'52", long 87°29'36", in NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.19, T.32 N. R.9 W., on left bank at downstream side of county highway bridge, 1.2 miles upstream from Singleton ditch and 2 $\frac{1}{2}$ miles northwest of Schneider.

Drainage area.--54.5 sq mi.

Records available.--July 1948 to December 1951, January 1954 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 627.86 ft above mean sea level, datum of 1929 (levels by Soil Conservation Service). Prior to Mar. 17, 1950, staff gage 75 ft below bridge at same datum. Mar. 17, 1950, to Dec. 31, 1951, Jan. 1, 1954, to June 10, 1956, wire-weight gage at same site and datum.

Average discharge.--9 years (1948-51, 1954-60), 41.9 cfs.

Extremes.--1948-51, 1954-60: Maximum discharge, 1,840 cfs Oct. 10, 11, 1954 (gage height, 8.06 ft, from graph based on gage readings); minimum, 1.3 cfs Feb. 17, 1957 (gage height, 0.32 ft), result of freezeup.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	9.25	8.65	14.0	53.0	152	53.3	83.7	56.5	15.8	27.4	10.0	9.47	40.3
1952	14.0	70.9	25.3	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	-	-	-	12.9	21.4	101	101	20.0	17.2	40.6	12.9	7.69	-
1955	169	16.5	25.5	71.5	62.0	63.7	26.7	18.2	18.6	16.4	14.4	8.20	42.7
1956	11.0	11.5	10.3	8.60	75.6	34.5	34.5	68.2	14.2	9.78	8.00	6.27	24.2
1957	6.28	7.63	7.05	11.3	10.9	12.6	106	46.0	26.9	96.4	11.0	7.48	29.2
1958	9.93	51.0	37.5	19.4	44.1	41.2	19.9	10.6	87.6	23.9	54.3	13.2	32.5
1959	9.85	15.3	12.5	21.0	11.4	68.4	60.7	81.1	16.5	56.5	15.6	12.5	48.3
1960	51.5	69.3	51.3	83.1	98.0	73.8	76.1	30.3	77.7	20.4	11.1	10.3	54.2

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.20	0.18	0.30	1.12	2.91	1.13	1.71	1.20	0.32	0.58	0.21	0.19	10.05
1952	.50	1.45	.49	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	-	-	-	.27	.41	2.13	2.06	.42	.35	.86	.27	.16	-
1955	3.57	.34	.54	1.51	1.19	1.35	.55	.38	.38	.35	.30	.17	10.63
1956	.23	.24	.22	.18	1.50	.73	.71	1.44	.29	.21	.17	.13	6.05
1957	.13	.16	.15	.24	.21	.27	2.16	.97	.55	2.04	.23	.15	7.26
1958	.21	.63	.79	.41	.84	.87	.41	.22	1.80	.51	1.15	.27	8.11
1959	.21	1.31	.26	.44	3.46	1.87	1.65	1.72	.54	1.20	.33	.28	12.05
1960	1.09	1.42	1.08	1.75	1.94	1.56	1.56	.65	1.60	.43	.24	.21	13.53

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	59.7	14.86
1951	1208	738	Feb. 19, 1951	5.6	40.3	0.739	10.05	46.6	11.61
1952	1236,1388	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-
1954	1338	1,000	Mar. 25, 1954	-	-	-	-	45.7	11.38
1955	1388	1,840	Oct.10,11, 1954	6.8	42.7	.783	10.63	27.6	6.87
1956	1438	710	Feb. 25, 1956	5.2	24.2	.444	6.05	23.2	5.80
1957	1508	1,250	July 13, 1957	2.6	29.2	.536	7.26	34.0	8.45
1958	1558	794	June 9, 1958	5.6	32.5	.596	8.11	29.1	7.26
1959	1628	1,200	Apr. 28, 1959	8.8	48.3	.886	12.05	59.6	14.86
1960	1708	940	Feb. 10, 1960	9.4	54.2	.994	13.53	-	-

5200. Singleton ditch at Illinois, Ill.

Location.--Lat 41°11'20", long 87°31'35", in SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.8, T.31 N., R.15 E., on left bank 50 ft downstream from county highway bridge at Illinois, beside the Cleveland, Cincinnati, Chicago & St. Louis Railway, and at Indiana-Illinois State line.

Drainage area.--219 sq mi.

Records available.--October 1944 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 620.33 ft above mean sea level, datum of 1929. Prior to Aug. 28, 1953, wire-weight gage at same site and datum.

Average discharge.--16 years (1944-60), 171 cfs.

Extremes.--1944-60: Maximum discharge, 2,040 cfs Feb. 14, 23, 1959; maximum gage height, 9.94 ft Feb. 23, 1959; minimum discharge, 14 cfs Jan. 31 to Feb. 10, 1945, Oct. 1, 1953, Sept. 29, Oct. 6, 8, 25, 1956; minimum gage height, 0.71 ft Oct. 21, 1948.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	40.1	36.0	73.9	262	463	251	398	261	105	219	74.5	47.5	184
1952	77.3	304	186	469	194	311	371	168	434	103	52.8	30.3	225
1953	27.3	35.7	50.6	56.5	120	353	157	110	117	105	35.6	23.4	99.2
1954	20.3	24.0	41.1	64.4	92.3	305	444	152	112	125	45.9	25.0	121
1955	462	123	144	373	234	305	181	106	102	54.8	43.3	30.1	180
1956	52.9	60.4	50.7	39.3	305	179	135	361	103	57.6	32.1	18.8	116
1957	17.3	21.5	22.9	46.0	71.1	60.8	453	356	143	361	78.3	35.6	8.51
1958	52.6	143	199	156	168	190	97.2	54.0	328	170	184	47.4	149
1959	37.8	56.8	47.7	84.6	915	491	366	350	98.2	265	89.0	45.6	233
1960	241	318	229	381	440	266	364	143	359	108	46.7	30.0	243

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.21	0.16	0.39	1.38	2.20	1.32	2.03	1.37	0.54	1.15	0.39	0.24	11.40
1952	.41	1.55	.98	2.47	.96	1.64	1.89	.88	2.21	.54	.28	.15	13.96
1953	.14	.18	.27	.30	.57	1.86	.80	.58	.80	.55	.19	.12	6.16
1954	.11	.12	.22	.34	.44	1.60	2.26	.80	.57	.66	.24	.13	7.49
1955	2.43	.63	.76	1.96	1.11	1.60	.92	.56	.52	.29	.23	.15	11.16
1956	.28	.31	.27	.21	1.50	.94	.69	1.90	.52	.30	.17	.10	7.19
1957	.09	.11	.12	.24	.34	.32	2.31	1.76	.73	1.90	.41	.18	8.51
1958	.28	.73	1.05	.82	.80	1.00	.50	.28	1.67	.89	.97	.24	9.25
1959	.20	.29	.25	.44	4.35	2.58	1.86	1.84	.50	1.40	.47	.23	14.41
1960	1.27	1.62	1.21	2.01	2.17	1.40	1.85	.75	1.83	.57	.25	.15	15.08

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	277	17.15
1951	1208	1,710	Feb. 19, 1951	-	184	0.840	11.40	219	13.56
1952	1238	1,800	Jan. 1, 1952	23	225	1.03	13.96	187	11.61
1953	1278	1,590	Mar. 15, 1953	18	99.2	1.453	6.16	96.9	6.02
1954	1338	1,830	Mar. 25, 1954	16	121	.553	7.49	175	10.86
1955	1388	2,010	Oct. 11, 1954	20	180	.822	11.16	132	8.20
1956	1438	al,600	Feb. 25, 1956	15	116	.530	7.19	107	6.65
1957	1508	1,920	Apr. 28, 1957	15	137	.826	8.51	185	10.25
1958	1558	1,470	June 13, 1958	23	149	.680	9.23	128	7.91
1959	1628	2,040	Feb.14,25,1959	28	233	1.06	14.41	287	17.77
1960	1708	1,900	Feb. 11, 1960	23	243	1.11	15.08	-	-

a Maximum daily discharge.

5205. Kankakee River at Momence, Ill.

Location.--Lat 41°09'36", long 87°40'07", in NE $\frac{1}{4}$ sec.24, T.31 N., R.13 E., on right bank a quarter of a mile downstream from highway bridge in Momence and $1\frac{1}{4}$ miles upstream from Tower Creek.

Drainage area.--2,340 sq mi, approximately.

Records available.--February to December 1905, February to July 1906, December 1914 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 610.18 ft above mean sea level, datum of 1929. Prior to Aug. 1, 1938, chain gage at bridge a quarter of a mile upstream at same datum.

Average discharge.--45 years (1915-60), 1,840 cfs.

Extremes.--1905-6, 1914-60: Maximum discharge, 10,100 cfs Apr. 25, 1950 (gage height, 5.06 ft); maximum gage height observed, 8.09 ft Jan. 25, 1930, site then in use (ice jam); minimum discharge observed, 306 cfs Sept. 1, 16, 17, 1919.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	992	983	1,764	2,691	3,282	3,051	3,912	3,195	1,985	2,782	1,690	1,202	2,289
1952	1,617	3,748	3,246	4,811	3,722	3,358	3,877	2,955	3,715	1,531	966	678	2,844
1953	654	732	892	1,113	1,391	2,675	2,046	1,817	1,455	1,511	808	492	1,299
1954	471	514	655	780	1,258	2,263	3,831	2,546	1,677	1,596	1,041	761	1,448
1955	3,874	3,683	2,143	3,775	2,321	3,284	2,640	1,828	2,096	1,233	806	714	2,368
1956	1,146	1,216	1,046	857	1,799	2,529	1,481	4,404	1,912	1,041	747	552	1,663
1957	499	568	607	968	1,151	1,001	3,052	3,535	1,873	2,588	1,057	746	1,472
1958	1,056	1,983	2,484	2,371	1,761	2,736	1,525	1,042	2,843	1,938	1,949	1,010	1,893
1959	759	942	899	1,280	4,482	4,588	4,010	3,537	1,555	1,701	925	612	2,091
1960	1,833	2,774	2,212	2,827	3,990	2,357	4,579	2,566	2,690	1,535	1,079	782	2,424

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.49	0.47	0.87	1.33	1.46	1.50	1.87	1.57	0.95	1.37	0.83	0.57	13.28
1952	.80	1.79	1.60	2.37	1.72	1.65	1.85	1.45	1.77	.75	.48	.32	16.55
1953	.32	.35	.44	.55	.62	1.32	.98	.90	.69	.74	.40	.23	7.54
1954	.23	.25	.32	.38	.56	1.11	1.83	1.25	.80	.79	.51	.36	8.39
1955	1.91	1.76	1.06	1.86	1.03	1.62	1.26	.90	1.00	.61	.40	.34	13.75
1956	.56	.58	.52	.42	.83	1.25	.71	2.17	.91	.51	.37	.26	9.09
1957	.25	.27	.30	.48	.51	.49	1.46	1.74	.89	1.27	.52	.36	8.54
1958	.52	.95	1.22	1.17	.78	1.35	.73	.51	1.36	.95	.96	.48	10.98
1959	.37	.45	.44	.63	1.99	2.26	1.91	1.74	.74	.84	.46	.29	12.12
1960	.90	1.32	1.09	1.39	1.84	1.16	2.18	1.26	1.28	.76	.53	.37	14.08

Yearly discharge, in cubic feet per second

Year	WSP	water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	3,227	18.72
1951	1208	a8,400	Feb. 19, 1951	864	2,289	0.978	13.28	2,695	15.64
1952	1238	6,960	June 14, 1952	632	2,844	1.22	16.55	2,316	13.47
1953	1278	4,560	Mar. 15, 1953	470	1,299	.555	7.54	1,246	7.23
1954	1338	4,960	Mar. 25, 1954	400	1,448	.619	8.39	2,124	12.32
1955	1398	5,890	Jan. 6, 1955	570	2,368	1.01	13.75	1,840	10.68
1956	1438	5,460	May 11, 1956	490	1,583	.668	9.09	1,418	8.25
1957	1508	6,960	July 13, 1957	472	1,472	.629	8.54	1,795	10.41
1958	1558	5,670	June 14, 1958	622	1,893	.809	10.98	1,648	9.55
1959	1628	a7,100	Feb. 18, 1959	511	2,091	.894	12.12	2,445	14.17
1960	1708	6,520	Feb. 11, 1960	690	2,424	1.04	14.08	-	-

a About.

5210. Iroquois River at Rosebud, Ind.

Location.--Lat 41°02', long 87°11', in SW $\frac{1}{4}$ sec.24, T.30 N., R.7 W., 100 ft downstream from bridge on county road, half a mile north of Rosebud, half a mile downstream from confluence of Swain and Dexter ditches, 1.5 miles upstream from Davidson ditch, and 2 miles east of Parr.

Drainage area.--30.3 sq mi.

Records available.--July 1948 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 661.47 ft above mean sea level, datum of 1929 (levels by Indiana Flood Control and Water Resources Commission). Prior to Oct. 1, 1953, wire-weight gage on downstream side of county bridge at same datum.

Average discharge.--12 years (1948-60), 25.3 cfs (revised).

Extremes.--1948-60: Maximum discharge, 422 cfs Apr. 4, 1950; maximum gage height, 8.86 ft Feb. 10, 1959; minimum discharge, 1.5 cfs Dec. 30, 1955 (gage height, 0.68 ft), result of freezeup.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	13.1	14.0	19.9	33.5	58.5	46.7	64.9	33.6	24.1	47.0	9.44	5.12	30.6
1952	19.1	43.9	33.2	56.8	36.4	40.8	57.4	39.0	41.5	9.87	11.4	4.44	32.7
1953	4.14	5.00	6.70	12.3	19.6	57.8	34.2	17.6	13.5	13.5	6.41	3.91	16.2
1954	6.51	7.26	5.93	7.40	16.3	30.6	42.4	22.2	18.3	15.9	6.69	7.09	15.5
1955	11.6	6.70	9.47	32.8	22.6	39.0	38.2	29.0	35.1	11.0	7.69	8.26	20.9
1956	9.94	13.0	9.46	7.31	28.1	18.4	22.5	40.1	18.9	10.2	7.48	4.57	15.8
1957	3.81	3.78	4.25	6.85	7.90	7.69	97.5	48.5	47.6	35.7	11.0	6.63	23.4
1958	15.2	25.6	49.8	32.1	18.4	29.8	19.0	10.2	99.9	43.7	15.9	8.06	30.7
1959	6.05	9.47	9.92	16.0	*91.1	4.80	44.4	29.1	9.34	8.43	4.62	4.24	*22.9
1960	15.3	38.2	27.9	31.4	*54.7	*40.3	53.8	25.5	32.7	11.3	5.70	4.17	*28.2

* Revised.

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.50	0.52	0.76	1.28	2.01	1.78	2.39	1.28	0.89	1.79	0.36	0.19	13.75
1952	.73	1.62	1.27	2.16	1.29	1.56	2.11	1.49	1.52	.38	.43	.16	14.72
1953	.16	.18	.26	.47	.67	2.20	1.26	.67	.50	.51	.24	.14	7.26
1954	.25	.27	.22	.28	.56	1.16	1.56	.85	.67	.61	.26	.26	6.95
1955	.44	.25	.36	1.24	.78	1.49	1.41	1.10	1.29	.42	.29	.30	9.37
1956	.38	.48	.36	.28	1.00	.70	.83	1.52	.70	.39	.28	.17	7.09
1957	.15	.14	.16	.26	.27	.29	3.59	1.84	1.75	1.36	.42	.25	10.48
1958	.58	.94	1.89	1.22	.63	1.13	.70	.39	3.68	1.66	.60	.30	13.73
1959	.23	.35	.58	.61	*3.13	1.82	1.64	1.11	.34	.32	.18	.16	*10.27
1960	.58	1.41	1.06	1.20	*1.95	*1.53	1.99	.97	1.20	.43	.22	.15	*12.69

* Revised.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	46.2	20.71
1951	1338	235	July 9, 1951	4.3	30.6	1.01	13.75	34.7	15.59
1952	1338	263	Apr. 23, 1952	3.1	32.7	1.08	14.72	26.0	11.70
1953	1278, 1338	183	Mar. 15, 1953	3.1	16.2	*.535	7.26	16.5	7.40
1954	1338	130	Mar. 25, 1954	3.5	15.5	.512	6.95	16.2	7.26
1955	1388	126	Jan. 6, 1955	4.5	20.9	.690	9.37	21.3	9.54
1956	1438	225	Apr. 29, 1956	3.9	15.8	.521	7.09	14.1	6.32
1957	1508	290	Apr. 28, 1957	3.2	23.4	.772	10.48	30.0	13.44
1958	1558	308	June 10, 1958	5.8	30.7	1.01	13.73	25.2	11.27
1959	1628	*383	Feb. 10, 1959	2.6	*22.9	*.758	*10.27	*27.6	*12.36
1960	1708	*206	Feb. 10, 1960	3.1	*28.2	*.931	*12.69	-	-

* Revised.

ILLINOIS RIVER BASIN

5215. Oliver ditch near Aix, Ind.

Location.--Lat 41°01', long 87°08', in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.20, T.30 N., R.6 W., at county highway bridge, five-eighths of a mile upstream from Jungles ditch, $1\frac{1}{2}$ miles southeast of Aix, $4\frac{7}{8}$ miles downstream from Davidson ditch, and $5\frac{1}{2}$ miles northeast of Rensselaer.

Drainage area.--66.3 sq mi.

Records available.--July 1948 to December 1951.

Gage.--Wire-weight gage. Altitude of gage is 666 ft (by barometer).

Extremes.--1948-51: Maximum discharge, 891 cfs Apr. 4, 1950 (gage height, 9.4 ft); minimum, 1.1 cfs Sept. 7, 1948 (gage height, 1.04 ft).

Remarks.--Water is diverted from Oliver ditch into Ryan ditch, 4 miles above station. Ryan ditch enters the Iroquois River 2 miles above Rensselaer.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	16.2	28.1	46.9	72.4	144	130	192	94.0	51.3	102	24.7	16.5	76.0
1952	56.2	124	90.0	-	-	-	-	-	-	-	-	-	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	112	-
1951	1208	579	Feb. 21, 1951	3.4	76.0	-	-	91.0	-
1952	1238	-	-	-	-	-	-	-	-

5220. Iroquois River near North Marion, Ind.

Location.--Lat 40°58', long 87°07', in S $\frac{1}{2}$ sec.9, T.29 N., R.6 W., on left bank at upstream side of county highway bridge, $\frac{1}{2}$ miles upstream from Ryan ditch, 2 miles east of North Marion, and $\frac{3}{2}$ miles northeast of Rensselaer.

Drainage area.--134 sq mi.

Records available.--December 1948 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 646.68 ft above mean sea level, datum of 1929. Prior to Sept. 6, 1955, wire-weight gage at same site and datum.

Average discharge.--11 years (1949-60), 120 cfs.

Extremes.--1948-60: Maximum discharge, 2,040 cfs June 10, 1958 (gage height, 15.09 ft); minimum, 1.8 cfs Nov. 28, 1956, result of freezeup.

Remarks.--Water is diverted from Oliver ditch, a tributary, into Ryan ditch. Ryan ditch enters the Iroquois River $\frac{1}{2}$ miles below this station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	43.2	53.5	90.6	149	258	214	309	163	88.5	198	50.3	28.8	136
1952	80.4	205	163	271	177	195	253	187	266	66.7	47.2	16.2	160
1953	11.2	14.9	30.6	65.1	92.6	241	174	93.6	57.2	57.2	14.0	13.7	72.0
1954	13.0	11.0	14.4	18.9	59.6	131	222	76.3	81.5	39.9	19.8	8.08	57.7
1955	58.3	29.5	46.7	146	100	193	153	101	166	25.3	18.1	13.5	87.5
1956	44.6	53.9	38.4	27.1	146	103	73.2	272	93.9	36.7	16.1	11.9	76.2
1957	5.69	7.35	14.3	20.4	45.5	36.7	441	294	162	266	44.9	23.7	114
1958	100	156	289	164	77.0	125	90.1	41.6	632	157	110	28.3	164
1959	21.8	56.8	41.8	73.4	396	268	237	141	34.0	22.6	12.1	15.0	108
1960	77.1	194	146	156	283	172	330	144	132	48.2	22.1	14.8	140

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.37	0.45	0.78	1.28	2.01	1.84	2.58	1.41	0.74	1.71	0.43	0.24	13.84
1952	.69	1.71	1.41	2.33	1.42	1.68	2.11	1.61	2.22	.57	.41	.14	16.30
1953	.10	.12	.26	.56	.72	2.08	1.45	.81	.48	.49	.12	.11	7.30
1954	.11	.09	.12	.16	.46	1.13	1.85	.66	.68	.34	.17	.07	5.84
1955	.50	.25	.40	1.26	.78	1.66	1.27	.87	1.38	.22	.16	.11	8.66
1956	.38	.45	.33	.23	1.18	.89	.61	2.34	.78	.32	.14	.10	7.75
1957	.05	.06	.12	.18	.35	.32	3.67	2.52	1.35	2.29	.39	.20	11.50
1958	.86	1.29	2.49	1.41	.60	1.08	.75	.36	5.27	1.35	.95	.24	16.65
1959	.19	.47	.36	.63	3.08	2.31	1.98	1.21	.28	.19	.10	.12	10.92
1960	.66	1.62	1.26	1.34	2.28	1.48	2.74	.98	1.10	.42	.19	.12	14.19

Note.--Figures of runoff prior to October 1955 not previously published.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	200	#20.31
1951	1208	690	Feb. 22, 1951	16	136	#1.01	#13.84	158	#16.05
1952	1238	790	June 16, 1952	12	160	#1.19	#16.30	128	#12.97
1953	1278	545	Mar. 16, 1953	6.2	72.0	#.537	#7.30	70.5	#7.14
1954	1338	460	Apr. 11, 1954	7.0	57.7	#.431	#5.84	65.8	#6.67
1955	1388	455	Jan. 7, 1955	6.2	87.5	#.653	#8.86	87.6	#8.87
1956	1438	910	May 1, 1956	5.3	76.2	.569	7.75	67.1	6.82
1957	1508	1,230	Apr. 29, 1957	4.4	114	.851	11.50	157	15.91
1958	1558	2,040	June 10, 1958	13	164	1.22	16.65	128	13.03
1959	1628	1,080	Feb. 13, 1959	4.3	108	.806	10.92	133	13.44
1960	1708	843	Mar. 31, 1960	5.4	140	1.04	14.19	-	-

* Not previously published.

ILLINOIS RIVER BASIN

5225. Iroquois River at Rensselaer, Ind.

Location.--Lat 40°56', long 87°08', in NE¼NW¼SE¼ sec.29, T.29 N., R.6 W., on right bank 20 ft downstream from bridge on State Highway 114, three-quarters of a mile east of Rensselaer, 1.5 miles downstream from Ryan ditch, and 5.5 miles upstream from Big Slough Creek.

Drainage area.--194 sq mi.

Records available.--July 1948 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 642.29 ft above mean sea level, datum of 1929 (levels by Indiana Flood Control and Water Resources Commission). Prior to July 8, 1949, wire-weight gage at same site and datum.

Average discharge.--12 years (1948-60), 161 cfs.

Extremes.--1948-60: Maximum discharge, 2,550 cfs June 10, 1958 (gage height, 16.54 ft); minimum, 4.9 cfs Oct. 24, 1956; minimum gage height, 2.73 ft Sept. 15, 1948.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	65.4	79.2	129	204	406	324	462	212	110	316	71.6	46.0	201
1952	116	277	215	378	243	263	351	293	354	77.7	58.0	20.7	220
1953	17.5	20.8	52.4	94.5	142	378	258	124	76.5	64.7	23.0	14.6	105
1954	14.0	15.5	15.1	35.6	71.5	153	286	94.6	119	49.6	22.6	9.80	71.7
1955	73.6	38.0	64.9	209	132	269	215	152	238	32.1	24.7	15.6	122
1956	55.1	67.0	45.5	32.6	205	137	132	368	116	42.0	16.6	13.1	102
1957	7.65	11.2	17.7	23.2	50.9	40.8	572	354	209	378	47.5	23.5	145
1958	112	163	351	186	87.8	157	106	47.6	863	221	118	31.5	205
1959	22.6	62.5	58.8	83.5	520	352	331	185	39.9	29.0	12.5	14.1	140
1960	77.1	246	176	187	383	229	471	145	195	66.1	27.1	20.3	184

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.39	0.46	0.76	1.21	2.16	1.92	2.66	1.26	0.63	1.88	0.43	0.26	14.04
1952	.69	1.59	1.28	2.24	1.35	1.56	2.02	1.74	2.04	.46	.34	.12	15.43
1953	.10	.12	.31	.56	.76	2.25	1.48	.74	.44	.38	.14	.08	7.36
1954	.08	.08	.09	.21	.38	.91	1.53	.56	.68	.30	.13	.06	5.01
1955	.44	.22	.39	1.24	.71	1.60	1.24	.90	1.37	.19	.15	.09	6.54
1956	.33	.38	.27	.19	1.14	.81	.76	2.19	.68	.25	.11	.06	7.19
1957	.04	.06	.10	.14	.27	.24	3.29	2.10	1.20	2.25	.28	.14	10.11
1958	.67	1.05	2.09	1.11	.47	.93	.61	.28	4.96	1.31	.70	.18	14.36
1959	.13	.36	.35	.50	2.79	2.09	1.91	1.10	.23	.17	.07	.08	9.78
1960	.46	1.42	1.05	1.11	2.12	1.36	2.71	.86	1.13	.39	.16	.12	12.69

Yearly discharge, in cubic feet per second

Year	WSF	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	297	20.76
1951	1208	1,260	Feb. 21, 1951	32	201	1.04	14.04	229	15.99
1952	1238	1,070	June 16, 1952	16	220	1.13	15.43	177	12.40
1953	1278	808	Mar. 15, 1953	8.2	108	.541	7.56	101	7.08
1954	1338	608	Apr. 12, 1954	7.2	71.7	.370	5.01	83.0	5.81
1955	1388	664	Jan. 6, 1955	6.2	122	.629	8.54	121	8.47
1956	1438	1,440	Apr. 30, 1956	5.3	102	.526	7.19	91.5	6.41
1957	1508	1,560	Apr. 29, 1957	5.5	145	.747	10.11	186	13.72
1958	1558	2,550	June 10, 1958	15	205	1.06	14.36	163	11.39
1959	1628	1,400	Feb. 13, 1959	5.0	140	.722	9.78	170	11.67
1960	1708	1,230	Mar. 31, 1960	13	184	.948	12.69	-	-

5230. Bice ditch near South Marion, Ind.

Location.--Lat 40°52', long 87°06', on line between secs.15 and 22, T.28 N., R.6 W., on left bank at upstream side of bridge on State Highway 16, 2 miles upstream from Big Slough Creek, 3 miles southeast of South Marion, and 5 miles southeast of Rensselaer.

Drainage area.--22.6 sq mi.

Records available.--December 1948 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 653.30 ft above mean sea level, datum of 1929. Prior to Aug. 5, 1955, wire-weight gage at same site and datum.

Average discharge.--11 years (1949-60), 18.8 cfs.

Extremes.--1948-60: Maximum discharge, 780 cfs June 13, 1958 (gage height, 12.02 ft); no flow at times during September 1952 and August 1955.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	7.11	11.4	12.4	28.6	53.2	37.1	45.8	23.9	14.1	56.8	6.67	2.55	24.8
1952	17.4	28.3	30.7	44.9	27.5	31.2	41.4	36.2	38.8	1.43	1.44	.14	24.9
1953	.24	.31	2.07	6.33	11.2	42.0	25.7	21.0	9.99	28.6	.47	.13	12.4
1954	.30	.25	.29	2.21	3.19	6.40	16.1	7.52	29.0	3.80	2.06	.49	5.93
1955	7.32	2.92	10.4	25.5	10.6	32.9	26.8	36.1	47.3	11.9	.66	.31	17.8
1956	2.06	3.16	3.08	1.94	21.5	23.6	27.4	39.5	3.70	.93	.84	.18	10.6
1957	.1	.2	.3	1.76	2.52	1.89	59.5	20.5	30.9	39.0	2.68	1.61	13.4
1958	10.3	13.8	61.3	16.8	9.52	15.0	8.57	3.43	159	18.4	5.86	3.46	27.0
1959	3.03	17.4	4.79	14.4	50.6	45.1	53.3	12.5	2.28	.56	.23	.11	16.7
1960	1.79	14.7	15.6	16.5	32.1	26.4	42.1	21.4	36.4	2.81	.61	.47	17.4

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.56	0.56	0.63	1.45	2.45	1.89	2.26	1.22	0.70	2.90	0.54	0.13	14.89
1952	.89	1.40	1.57	2.29	1.31	1.59	2.04	1.85	1.92	.07	.07	.01	15.01
1953	.01	.02	.11	.32	.52	2.14	1.27	1.07	1.49	1.46	.02	.006	7.44
1954	.02	.01	.02	.11	.15	.33	.79	.38	1.43	.19	.11	.02	3.56
1955	.37	.14	.53	1.30	.49	1.68	1.33	1.84	2.33	.61	.03	.02	10.67
1956	.11	.16	.16	.10	1.03	1.20	1.35	2.02	.18	.05	.04	.009	6.41
1957	.005	.01	.01	.09	.12	.10	2.93	1.05	1.53	1.99	.14	.08	8.06
1958	.53	.68	3.12	.86	.44	.77	.42	.18	7.86	.94	.30	.17	16.27
1959	.15	.86	.24	.73	2.33	2.31	2.63	.64	.11	.03	.01	.006	10.05
1960	.09	.72	.80	.84	1.53	1.35	2.08	1.09	1.80	.14	.03	.02	10.49

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	35.3	21.14
1951	1208	610	July 9, 1951	1.7	24.8	1.10	14.89	28.6	17.20
1952	1238	556	June 14, 1952	0	24.9	1.10	15.01	18.6	11.29
1953	1278	374	July 5, 1953	.1	12.4	.549	7.44	12.2	7.35
1954	1358	339	June 22, 1954	.1	5.93	.262	5.56	7.61	4.55
1955	1368	353	June 11, 1955	0	17.8	.788	10.67	16.7	10.06
1956	1438	504	Apr. 29, 1956	.1	10.6	.469	6.41	9.99	6.00
1957	1508	458	July 13, 1957	-	13.4	.593	8.06	20.6	12.37
1958	1558	780	June 13, 1958	.1	27.0	1.19	16.27	21.9	13.19
1959	1628	480	Feb. 10, 1959	.1	16.7	.739	10.05	17.3	10.41
1960	1708	346	Apr. 17, 1960	.1	17.4	.770	10.49	-	-

5235. Big Slough Creek near Collegeville, Ind.

Location.--Lat 40°53', long 87°09', in SW¼NW¼ sec.7, T.28 N., R.6 W., on right bank on downstream side of bridge on State Highway 53, 1½ miles south of Collegeville, 2½ miles upstream from mouth, and 2½ miles downstream from Bice ditch.

Drainage area.--84.1 sq mi.

Records available.--July 1948 to December 1951, October 1952 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 634.75 ft above mean sea level, datum of 1929. Prior to Aug. 5, 1955, wire-weight gage and Aug. 5, 1955, to Oct. 8, 1958, water-stage recorder, at same site at datum 3.00 ft higher.

Average discharge.--11 years (1948-51, 1952-60), 67.8 cfs.

Extremes.--1948-51, 1952-60: Maximum discharge, 2,030 cfs June 13, 1958 (gage height, 13.7 ft, from graph based on gage readings); minimum, 1.0 cfs Oct. 15, 23, 1953.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	S:pt.	The year
1951	30.8	33.9	50.3	101	186	147	172	84.6	35.7	246	22.8	10.0	93.0
1952	48.4	100	77.5	-	-	-	-	-	-	-	-	-	-
1953	2.28	3.31	8.77	21.1	47.4	152	96.1	54.0	30.7	56.9	10.3	1.79	40.4
1954	1.25	1.71	2.87	14.7	21.1	36.6	58.0	40.5	84.6	20.0	9.37	3.17	24.4
1955	35.9	15.5	41.3	92.4	131	98.2	124	169	35.8	6.09	2.92	-	66.1
1956	14.7	22.9	16.8	12.5	88.8	77.0	88.6	191	32.5	11.0	7.73	4.50	47.2
1957	1.74	2.97	4.28	8.57	19.9	13.2	271	81.2	107	213	22.4	5.89	62.7
1958	47.9	83.6	205	86.9	35.4	62.8	31.3	12.7	505	52.6	13.5	8.18	91.9
1959	6.79	53.3	189	33.0	232	167	159	57.9	18.4	8.18	5.09	5.41	62.4
1960	10.5	62.9	56.7	57.2	109	87.8	164	94.7	123	30.1	8.65	6.24	67.1

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	S:pt.	The year
1951	0.42	0.45	0.69	1.39	2.30	2.02	2.28	1.16	0.47	3.38	0.31	0.13	15.00
1952	.66	1.33	1.06	-	-	-	-	-	-	-	-	-	-
1953	.03	.04	.12	.29	.59	2.09	1.27	.74	.41	.78	.14	.02	6.52
1954	.02	.02	.04	.20	.26	.50	.77	.56	1.13	.27	.13	.04	3.94
1955	.49	.21	.57	1.27	.49	1.80	1.30	1.70	2.24	.49	.08	.04	10.68
1956	.20	.30	.23	.17	1.14	1.06	1.17	2.62	.43	.15	.11	.06	7.64
1957	.02	.04	.06	.13	.25	.18	3.59	1.11	1.42	2.92	.31	.06	10.11
1958	.66	.84	2.81	.92	.44	.66	.42	.17	6.69	.72	.19	.11	14.83
1959	.09	.71	.26	.45	2.87	2.29	2.11	.79	.24	.11	.07	.07	10.06
1960	.14	.63	.78	.78	1.40	1.20	2.18	1.30	1.63	.41	.12	.08	10.85

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	1175	-	-	-	-	-	-	132	21.22
1951	1208	-	-	-	-	-	-	102	16.49
1952	1258	1,450	July 10, 1951	-	5.2	93.0	1.11	-	-
1953	1278	655	Apr. 1, 1953	-	1.2	40.4	.480	6.52	39.7
1954	1338	390	June 22, 1954	-	1.0	24.4	.290	3.94	5.13
1955	1388, 1558	1,110	June 11, 1955	-	2.0	66.1	.786	10.68	10.14
1956	1438, 1558	1,470	Apr. 29, 1956	-	1.6	47.2	.561	7.64	7.03
1957	1508, 1558	1,470	July 14, 1957	-	1.2	62.7	.746	10.11	14.30
1958	1558	2,030	June 13, 1958	-	2.1	91.9	1.09	14.83	71.7
1959	1628	al, 800	Feb. 10, 1959	-	4.4	62.4	.742	10.06	66.7
1960	1708	600	Apr. 18, 1960	-	5.2	67.1	.798	10.85	-

a Maximum daily discharge.

5240. Carpenter Creek at Egypt, Ind.

Location.--Lat 40°52', long 87°12', on line between SW $\frac{1}{4}$ sec.15 and NW $\frac{1}{4}$ sec.22, T.28 N., R.7 W., on left bank on downstream side of bridge on State Highway 16, 0.5 mile north of Egypt, $2\frac{1}{4}$ miles upstream from mouth, and 4 miles southwest of Collegeville.

Drainage area.--48.1 sq mi.

Records available.--July 1948 to December 1951, October 1952 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 641.79 ft (revised) above mean sea level, datum of 1929. Prior to Sept. 6, 1955, wire-weight gage at same site and datum.

Average discharge.--11 years (1948-51, 1952-60), 39.1 cfs.

Extremes.--1948-51, 1952-60: Maximum discharge, 3,720 cfs June 10, 1958 (gage height, 11.66 ft); no flow at times during 1953, 1955-56, 1959.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	6.65	15.9	27.1	67.0	136	78.6	85.8	48.3	24.5	114	11.6	3.92	51.1
1952	15.3	51.5	48.8	-	-	-	-	-	-	-	-	-	-
1953	.71	.90	2.98	12.5	25.5	123	69.3	47.5	35.2	57.1	1.37	.31	31.3
1954	.37	.60	.82	6.90	4.44	9.42	40.1	21.5	66.6	13.0	7.85	.48	14.3
1955	16.6	2.83	12.8	47.1	21.8	62.4	60.7	58.3	123	16.5	.96	.50	35.2
1956	3.45	11.5	6.09	3.54	51.9	35.7	48.5	59.1	12.0	2.34	.35	.02	19.4
1957	.53	.43	.70	3.75	6.52	3.41	127	43.2	51.4	78.5	3.58	1.45	26.7
1958	17.8	31.6	127	39.5	21.6	29.4	16.6	9.10	338	57.8	10.4	2.39	58.3
1959	1.00	21.8	10.6	38.9	192	92.0	143	35.7	6.41	.735	.235	.553	44.1
1960	4.67	40.7	36.3	38.2	83.3	63.0	93.6	35.1	67.0	7.99	1.72	.94	39.0

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.16	0.37	0.65	1.61	2.94	1.88	1.99	1.16	0.57	2.74	0.28	0.09	14.44
1952	.37	1.19	1.17	-	-	-	-	-	-	-	-	-	-
1953	.02	.02	.07	.30	.55	2.95	1.61	1.14	.77	1.37	.03	.007	8.84
1954	.009	.01	.02	.16	.10	.23	.93	.52	1.54	.31	.19	.01	4.03
1955	.40	.07	.31	1.13	.47	1.50	1.41	1.40	2.86	.40	.02	.01	9.98
1956	.08	.27	.15	.09	1.16	.86	1.13	1.42	.28	.06	.008	.0005	5.51
1957	.01	.01	.02	.09	.14	.08	2.94	1.04	1.19	1.88	.09	.03	7.52
1958	.43	.75	3.04	.95	.47	.70	.38	.22	7.84	1.38	.25	.05	16.44
1959	.02	.51	.25	.93	4.16	2.20	3.31	.85	.15	.02	.006	.01	12.43
1960	.11	.94	.87	.92	1.87	1.51	2.18	.84	1.55	.19	.04	.02	11.04

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	71.9	20.30
1951	1208	*2,150	July 9, 1951	1.0	51.1	1.06	14.44	56.6	15.99
1952	1238	-	-	-	-	-	-	-	-
1953	1278	735	July 6, 1953	0	31.3	.651	8.84	31.0	8.77
1954	1338	655	June 22, 1954	.1	14.3	.297	4.03	16.9	4.77
1955	1389, 1558	984	June 8, 1955	0	35.2	.732	9.98	34.3	9.70
1956	1438, 1558	1,040	Apr. 29, 1956	0	19.4	.403	5.51	17.8	5.05
1957	1508, 1558	810	July 13, 1957	.1	26.7	.555	7.52	41.4	11.68
1958	1558	3,720	June 10, 1958	.2	58.3	1.21	16.44	46.2	13.02
1959	1628	2,690	Feb. 10, 1959	0	44.1	.917	12.43	48.1	13.57
1960	1708	784	Apr. 17, 1960	.3	39.0	.811	11.04	-	-

* Revised.

5245. Iroquois River near Foresman, Ind.

Location.--Lat 40°52', long 87°18', on line between secs. 14 and 15, T.28 N., R.8 W., on right bank at downstream side of bridge on State Highway 55, a quarter of a mile north of intersection of Highways 16 and 55, 0.6 mile west of Foresman, and 3 miles east of Brook.

Drainage area.--452 sq mi. Prior to September 1955, 410 sq mi.

Records available.--December 1948 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 624.00 ft above mean sea level, datum of 1929. Prior to Sept. 7, 1955, wire-weight gage 2.5 miles upstream at datum 3.54 ft higher.

Average discharge.--11 years (1949-60), 360 cfs.

Extremes.--1948-60: Maximum discharge, 5,930 cfs June 14, 1958 (gage height, 24.42 ft); minimum, 7.6 cfs Oct. 12, 1956; minimum gage height, 2.92 ft Sept. 27-29, 1956.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	125	166	243	456	863	672	910	374	185	816	117	54.7	412
1952	217	535	388	711	466	494	679	586	683	123	91.4	28.9	416
1953	22.7	33.0	69.8	175	301	789	551	320	193	279	61.7	16.7	233
1954	16.8	20.6	23.2	60.9	128	253	453	193	339	100	60.4	18.5	138
1955	151	69.1	124	458	244	582	519	490	725	94.9	37.1	19.8	293
1956	82.2	140	83.2	70.8	485	323	286	978	250	61.9	28.0	23.1	233
1957	9.70	16.5	24.4	46.8	105	81.7	1,331	765	479	964	88.4	30.4	329
1958	254	405	969	452	170	374	216	108	2,314	557	182	66.1	506
1959	40.5	164	96.8	193	1,556	870	950	521	102	60.6	29.7	29.3	360
1960	120	518	397	435	884	439	1,119	343	617	139	45.7	31.4	420

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.35	0.45	0.68	1.28	2.19	1.89	2.48	1.05	0.50	2.29	0.33	0.15	13.84
1952	.61	1.46	1.09	2.00	1.22	1.39	1.85	1.65	1.86	.35	.26	.08	13.82
1953	.06	.09	.20	.49	.76	2.21	1.50	.90	.53	.78	.15	.05	7.72
1954	.05	.06	.07	.17	.32	.71	1.23	.54	.92	.28	.17	.05	4.57
1955	.42	.19	.35	1.29	.62	1.64	1.42	1.38	1.98	.27	.10	.05	9.71
1956	.21	.35	.21	.18	1.15	.82	.71	2.49	.62	.16	.07	.06	7.03
1957	.02	.04	.06	.12	.24	.21	3.28	1.95	1.18	2.46	.23	.07	9.86
1958	.65	1.00	2.47	1.15	.39	.95	.53	.28	5.71	1.42	.46	.16	15.17
1959	.10	.40	.25	.49	3.12	2.21	2.34	1.33	.25	.15	.08	.07	10.79
1960	.31	1.28	1.01	1.11	2.11	1.12	2.77	.88	1.53	.36	.12	.08	12.68

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	604	19.98
1951	1208	2,950	July 11, 1951	42	412	1.00	13.64	463	15.32
1952	1238	2,120	June 16, 1952	22	416	1.01	13.82	331	11.01
1953	1278, 1338	1,580	Apr. 2, 1953	9.0	233	.568	7.72	228	7.55
1954	1338	890	Apr. 13, 1954	10	138	.337	4.57	162	5.55
1955	1338, 1438	al, 900	June 13, 1955	13	293	.715	9.71	289	9.52
1956	1438, 1508	2,890	Apr. 30, 1956	11	233	.515	7.03	212	6.38
1957	1508	3,210	Apr. 28, 1957	7.6	329	.728	9.86	462	13.86
1958	1558	5,930	June 14, 1958	20	506	1.12	15.17	394	11.80
1959	1628	3,440	Feb. 13, 1959	12	360	.796	10.79	422	12.64
1960	1708	2,590	Mar. 30, 31, 1960	15	420	.929	12.68	-	-

a Maximum daily discharge.

5250. Iroquois River at Iroquois, Ill.

Location.--Lat 40°49'25", long 87°34'55", in SE $\frac{1}{4}$ sec.15, T.27 N., R.11 W., on left bank at upstream side of bridge on U.S. Highway 52 at Iroquois, 500 ft upstream from Cleveland, Cincinnati, Chicago & St. Louis Railway bridge and 4 $\frac{1}{2}$ miles downstream from Indiana-Illinois State line.

Drainage area.--682 sq mi.

Records available.--October 1944 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 614.34 ft above mean sea level, datum of 1929. Prior to Aug. 5, 1945, chain gage at same site and datum.

Average discharge.--16 years (1944-60), 533 cfs.

Extremes.--1944-60: Maximum discharge, 10,400 cfs June 13, 1958 (gage height, 26.31 ft); minimum, 8.2 cfs Oct. 10, 1956.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	164	223	371	790	1,650	1,000	1,493	750	352	1,958	215	63.0	749
1952	318	876	566	1,218	765	834	1,222	919	1,071	147	130	34.3	673
1953	24.3	33.7	65.2	216	387	1,295	868	556	374	574	60.6	17.8	373
1954	16.5	24.2	34.3	91.9	146	302	691	348	530	117	74.4	21.3	199
1955	155	75.7	137	667	330	888	844	723	986	232	43.8	34.7	427
1956	123	178	104	73.3	748	535	336	1,620	472	112	34.4	29.0	363
1957	10.6	18.0	25.4	54.0	120	94.8	1,914	1,277	659	1,808	172	46.0	518
1958	278	529	1,311	648	245	545	295	141	3,496	925	269	76.1	730
1959	42.5	283	162	289	2,165	1,305	1,448	1,000	156	62.6	27.8	23.8	569
1960	128	628	507	646	1,321	561	1,740	521	960	199	62.6	31.6	602

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.31	0.37	0.63	1.34	2.52	1.69	2.44	1.27	0.58	3.31	0.36	0.10	14.92
1952	.54	1.43	.96	2.06	1.21	1.41	2.00	1.55	1.75	.25	.22	.06	13.44
1953	.04	.06	.11	.37	.59	2.19	1.42	.94	.61	.97	.10	.03	7.43
1954	.03	.04	.06	.16	.22	.51	1.13	.59	.87	.20	.13	.03	3.97
1955	.26	.12	.23	1.13	.50	1.50	1.38	1.22	1.61	.39	.07	.06	8.47
1956	.21	.29	.18	.12	1.18	.90	.55	2.74	.77	.19	.06	.05	7.24
1957	.02	.03	.04	.09	.18	.16	3.13	2.16	1.08	3.06	.29	.08	10.32
1958	.47	.87	2.22	1.10	.37	.92	.48	.24	5.72	1.56	.45	.12	14.52
1959	.07	.46	.27	.49	3.31	2.21	2.37	1.69	.26	.11	.05	.04	11.33
1960	.22	1.03	.86	1.09	2.09	.95	2.85	.88	1.57	.34	.11	.05	12.04

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	1,085	21.59
1951	1208	6,460	July 10, 1951	44	749	1.10	14.92	831	16.54
1952	1238	2,580	June 17, 1952	22	673	.987	13.44	537	10.72
1953	1278	2,610	Mar. 19, 1953	13	373	.547	7.43	363	7.35
1954	1358	1,370	Apr. 13, 1954	13	199	.292	3.97	221	4.45
1955	1388	2,250	June 13, 1955	16	427	.626	8.47	423	8.54
1956	1438	3,990	May 2, 1956	12	363	.532	7.24	334	6.65
1957	1508	5,600	July 13, 1957	8.4	518	.760	10.32	692	13.79
1958	1558	10,400	June 13, 1958	27	730	1.07	14.52	592	11.76
1959	1628	85,400	Feb. 13, 1959	11	569	.834	11.33	633	12.64
1960	1708	3,580	Apr. 1, 1960	16	602	.883	12.04	-	-

a About.

5255. Sugar Creek at Milford, Ill.

Location.--Lat 40°37'50", long 87°43'25", in N $\frac{1}{2}$ sec.16, T.25 N., R.12 W., near right bank on downstream side of highway bridge, 200 ft downstream from Mud Creek and 1 mile west of Milford.

Drainage area.--430 sq mi.

Records available.--July 1948 to September 1960.

Gage.--Wire-weight and crest-stage gages. Datum of gage is 622.00 ft above mean sea level, datum of 1929.

Average discharge.--12 years (1948-60), 347 cfs.

Extremes.--1948-60: Maximum discharge, 22,900 cfs Feb. 21, 1951 (gage height, 20.90 ft), from rating curve extended above 8,200 cfs; maximum gage height, 23.74 ft Feb. 10, 1959 (ice jam); minimum discharge observed, 2.8 cfs Dec. 14, 1952, result of freezeup.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	88.9	104	245	688	1,918	578	827	455	287	977	91.6	53.1	517
1952	200	531	220	593	446	663	931	597	956	82.1	51.0	14.1	439
1953	10.3	12.4	14.0	104	124	682	448	305	134	1,006	37.0	8.60	242
1954	8.79	11.2	20.8	51.2	43.1	105	497	141	135	24.1	10.2	4.35	87.2
1955	16.8	8.40	15.9	198	161	493	477	446	416	110	13.0	8.07	197
1956	46.1	68.8	26.8	18.3	479	303	280	601	401	227	37.8	8.88	207
1957	7.66	9.45	11.4	41.2	114	72.8	1,357	995	698	1,393	104	40.4	405
1958	150	279	849	344	128	209	177	940	1,603	706	404	38.1	416
1959	19.4	202	83.5	172	994	853	902	374	69.4	17.1	8.01	6.73	303
1960	28.3	163	176	218	675	512	704	218	981	154	34.6	47.8	322

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.24	0.27	0.66	1.84	4.65	1.55	2.15	1.22	0.74	2.62	0.25	0.14	16.33
1952	.54	1.38	.59	1.59	1.12	1.78	2.42	1.60	2.48	.22	.14	.04	13.90
1953	.03	.03	.04	.28	.30	1.83	1.16	.82	.35	2.70	.10	.02	7.66
1954	.02	.03	.06	.14	.10	1.28	1.29	.58	.35	.06	.03	.01	2.75
1955	.05	.02	.04	.53	.39	1.32	1.24	1.20	1.08	.29	.03	.02	6.21
1956	.12	.18	.07	.05	1.20	.81	.73	1.61	1.04	.61	.10	.02	6.54
1957	.02	.02	.03	.11	.28	.20	3.52	2.67	1.81	3.74	.28	.10	12.78
1958	.40	.72	2.28	.92	.31	.56	.46	.25	4.16	1.89	1.08	.10	13.13
1959	.05	.52	.22	.46	2.41	2.29	2.34	1.00	.18	.05	.02	.02	9.56
1960	.08	.42	.47	.59	1.69	1.37	1.83	.59	2.54	.41	.09	.12	10.20

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	601	18.98
1951	1208	22,900	Feb. 21, 1951	17	517	1.20	16.33	559	17.67
1952	1238	14,400	June 14, 1952	8.0	439	1.02	13.90	363	11.49
1953	1278	8,800	July 6, 1953	4.0	242	.563	7.66	243	7.67
1954	1338	1,890	Apr. 12, 1954	3.7	87.2	.203	2.75	87.3	2.75
1955	1388	1,720	June 12, 1955	5.4	197	.458	6.21	205	6.47
1956	1438	4,180	Apr. 30, 1956	6.5	207	.481	6.54	197	6.24
1957	1508	16,700	July 13, 1957	5.6	405	.942	12.78	510	16.11
1958	1558	9,450	June 13, 1958	18	416	.967	13.13	354	10.52
1959	1628	as 8,000	Feb. 10, 1959	3.5	303	.705	9.56	308	9.74
1960	1708	4,950	June 24, 1960	8.9	322	.749	10.20	-	-

a About.

5260. Iroquois River near Chebanse, Ill.

Location.--Lat 41°00'29", long 87°49'22", in SW $\frac{1}{4}$ sec.10, T.29 N., R.13 W., near center of left span on downstream side of highway bridge, 3 miles downstream from Beaver Creek, $\frac{1}{2}$ miles east of Chebanse, and 6 miles upstream from mouth.

Drainage area.--2,120 sq mi, approximately.

Records available.--April 1923 to September 1960.

Gage.--Wire-weight gage. Datum of gage is 597.99 ft above mean sea level, datum of 1929. Prior to June 11, 1947, chain gage at same site and datum.

Average discharge.--37 years (1923-60), 1,562 cfs.

Extremes.--1923-60: Maximum discharge, 27,000 cfs May 13, 1933 (gage height, 18.1 ft, from floodmark); minimum, 9 cfs Oct. 6-8, 1956.
Maximum stage known, about 19.6 ft in spring of 1913 (discharge, about 34,000 cfs).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	455	421	798	2,745	5,799	2,853	4,298	2,228	1,497	5,834	612	323	2,301
1952	808	2,571	1,213	3,524	2,022	2,746	4,230	2,755	3,482	478	431	94.3	2,023
1953	64.3	85.2	176	500	806	3,636	2,230	1,566	865	3,520	216	50.4	1,149
1954	45.4	63.8	111	201	381	922	2,320	924	1,111	205	144	57.6	538
1955	383	161	283	1,826	1,069	2,266	2,557	2,393	2,653	655	96.2	90.6	1,202
1956	325	365	241	126	2,217	1,403	869	3,785	1,884	606	132	54.6	978
1957	25.5	57.4	74.9	151	372	283	6,498	4,795	1,969	6,592	494	113	1,792
1958	507	1,148	3,248	1,767	636	1,346	898	533	7,934	3,257	945	155	1,867
1959	99.8	610	433	690	6,631	3,629	3,818	3,176	531	199	81.4	70.3	1,828
1960	349	1,160	1,151	1,679	3,367	1,717	4,107	1,322	3,115	625	188	115	1,559

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.25	0.22	0.43	1.49	2.85	1.55	2.26	1.21	0.79	5.17	0.33	0.17	14.72
1952	.44	1.35	.66	1.92	1.03	1.49	2.23	1.50	1.83	.26	.23	.05	12.99
1953	.03	.04	.10	.27	.40	1.96	1.17	.85	.46	1.91	.12	.03	7.36
1954	.02	.03	.06	.11	.19	.50	1.22	.80	.58	.11	.08	.03	3.43
1955	.21	.08	.15	.99	.53	1.23	1.35	1.30	1.40	.36	.05	.05	7.70
1956	.18	.19	.13	.07	1.13	.76	.46	2.05	.89	.33	.07	.03	6.29
1957	.01	.03	.04	.08	.18	.15	3.42	2.61	1.04	3.58	.26	.06	11.46
1958	.28	.60	1.77	.96	.31	.73	.47	.29	4.18	1.77	.51	.08	11.95
1959	.05	.32	.24	.36	3.26	1.97	2.01	1.73	.26	.11	.04	.04	10.43
1960	.19	.61	.63	.91	1.71	.93	2.16	.72	1.64	.34	.10	.06	10.00

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	2,994	19.17
1951	1208	19,100	July 11, 1951	140	2,301	1.09	14.72	2,543	16.27
1952	1238	9,850	Jan. 2, 1952	63	2,023	.954	12.99	1,669	10.71
1953	1278	11,800	July 8, 1953	39	1,149	.542	7.36	1,147	7.30
1954	1338	5,530	Apr. 13, 1954	32	538	.254	3.43	589	3.76
1955	1368	7,370	Apr. 21, 1955	40	1,202	.567	7.70	1,217	7.76
1956	1438	10,800	May 2, 1956	24	978	.461	6.29	914	5.87
1957	1508	19,900	July 15, 1957	10	1,792	.845	11.46	2,192	14.03
1958	1558	21,800	June 15, 1958	42	1,887	.881	11.95	1,549	9.91
1959	1628	a23,500	Feb. 13, 1959	32	1,628	.768	10.43	1,755	11.25
1960	1708	11,300	Mar. 31, 1960	29	1,559	.735	10.00	-	-

a About.

5265. Terry Creek near Custer Park, Ill.

Location--Lat 41°14'00", long 88°05'55", near southwest corner of SE $\frac{1}{4}$ sec.20, T.32 N., R.10 E., on right bank at downstream side of bridge on State Highway 113S, a third of a mile upstream from mouth and 1.7 miles southeast of Custer Park.

Drainage area--12.0 sq mi.

Records available--July 1949 to September 1960.

Gage--Water-stage recorder and concrete control. Datum of gage is 542.33 ft above mean sea level, datum of 1929.

Average discharge--11 years (1949-60), 8.93 cfs.

Extremes--1949-60: Maximum discharge, 545 cfs July 13, 1957 (gage height, 11.15 ft); minimum, 0.01 cfs Oct. 18, 19, 1956.

Remarks--Occasional regulation during summer by dams above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1.52	1.95	2.31	6.96	20.5	15.2	18.6	8.79	6.33	12.2	4.06	3.87	8.44
1952	6.92	12.2	8.03	14.3	9.62	15.1	16.0	10.6	18.5	3.44	1.33	.84	9.71
1953	.577	1.21	2.49	4.70	8.35	20.3	11.2	6.17	3.83	15.1	2.04	.572	6.38
1954	.775	.970	2.25	3.25	4.44	12.3	20.8	6.95	5.81	4.41	1.95	.770	5.55
1955	8.09	3.60	5.40	11.4	8.99	12.5	11.1	6.65	5.93	2.34	1.05	.837	6.49
1956	2.01	2.47	1.74	1.24	8.50	4.37	2.33	4.33	2.69	1.54	.509	.121	2.63
1957	.057	.445	.700	1.52	1.89	1.87	22.8	12.5	23.6	52.2	6.93	1.96	10.6
1958	4.56	11.1	11.6	7.25	9.29	11.8	5.72	2.93	67.0	23.9	5.25	2.02	13.5
1959	1.87	2.18	1.71	2.20	24.5	16.8	14.4	22.1	4.38	5.96	2.04	1.51	8.21
1960	7.07	10.2	14.0	16.6	24.0	14.8	18.9	10.7	24.9	4.48	5.02	1.48	12.6

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.15	0.18	0.22	0.67	1.78	1.46	1.73	0.84	0.59	1.17	0.39	0.36	9.54
1952	.67	1.14	.77	1.38	.86	1.46	1.49	1.02	1.72	.33	.13	.08	11.05
1953	.06	.11	.24	.45	.72	1.95	1.04	.59	.36	1.45	.20	.05	7.22
1954	.07	.09	.22	.31	.38	1.37	1.94	.67	.54	.42	.19	.07	6.27
1955	.78	.34	.52	1.10	.78	1.20	1.04	.64	.55	.22	.10	.08	7.35
1956	.19	.23	.17	.12	.76	.42	.22	.42	.25	.15	.05	.01	2.99
1957	.006	.04	.07	.15	.16	.18	2.12	1.20	2.19	5.01	.67	.18	11.98
1958	.44	1.03	1.11	.70	.81	1.13	.53	.28	6.22	2.29	.50	.19	15.23
1959	.18	.20	.16	.21	2.13	1.62	1.34	2.12	.41	.57	.20	.14	9.28
1960	.68	.95	1.35	1.60	2.16	1.42	1.75	1.03	2.32	.43	.46	.14	14.31

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	12.8	14.51
1951	1208, 1508	152	Feb. 19, 1951	1.0	8.44	0.703	9.54	10.2	11.57
1952	1238	134	June 14, 1952	.3	9.71	.909	11.05	7.82	8.86
1953	1278	150	July 6, 1953	.17	6.38	.532	7.22	6.36	7.19
1954	1338	112	Mar. 25, 1954	.34	5.55	.462	6.27	6.66	7.53
1955	1388	71	Oct. 11, 1954	.19	6.49	.541	7.35	5.57	6.30
1956	1438	154	Feb. 24, 1956	.04	2.63	.219	2.99	2.21	2.52
1957	1508	545	July 13, 1957	.01	10.6	.883	11.98	12.8	14.44
1958	1558	286	June 8, 1958	1.6	13.5	1.12	15.23	11.7	13.19
1959	1628	al40	Feb. 10, 1959	.46	8.21	.684	9.28	10.4	11.72
1960	1708	155	June 13, 1960	.74	12.6	1.05	14.31	-	-

a About.

5275. Kankakee River near Wilmington, Ill.

Location.--Lat 41°20'48", long 88°11'11", in NW $\frac{1}{4}$ sec.15, T.33 N., R.9 E., on right bank 0.4 mile downstream from Prairie Creek and 5 miles downstream from Wilmington.

Drainage area.--5,250 sq mi, approximately.

Records available.--October 1933 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 510.86 ft above mean sea level, datum of 1929.

Average discharge.--27 years (1933-60), 3,860 cfs.

Extremes.--1933-60: Maximum discharge, 75,900 cfs July 13, 1957 (gage height, 11.40 ft); maximum gage height, 11.57 ft Feb. 1, 1949 (ice jam); minimum discharge, 204 cfs Aug. 1, 1936; minimum gage height, 0.75 ft Sept. 22, 1956.
Maximum stage known, 16.73 ft in 1883, 1887.

Remarks.--Slight diurnal fluctuation at low flow caused by powerplants above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,500	1,456	2,708	5,703	10,820	6,713	9,260	6,131	3,707	9,269	2,538	1,760	5,096
1952	2,531	6,756	4,851	9,215	5,938	6,885	8,718	5,928	6,522	2,123	1,408	787	5,293
1953	777	901	1,129	1,797	2,626	7,354	4,617	3,619	2,462	5,969	1,326	582	2,770
1954	527	605	748	933	1,787	4,116	7,717	3,989	3,217	2,446	1,350	881	2,356
1955	4,789	3,999	2,709	6,447	4,512	6,492	6,390	4,671	5,223	2,079	907	905	4,074
1956	1,610	1,865	1,447	1,129	4,413	4,665	2,678	9,349	4,088	1,855	957	594	2,884
1957	550	644	753	1,117	1,676	1,443	10,600	9,435	5,015	12,310	1,647	981	3,875
1958	1,755	3,779	6,544	4,819	2,689	4,847	2,892	1,820	12,380	6,219	3,447	1,302	4,381
1959	940	1,708	1,595	2,505	11,230	8,917	8,445	8,401	2,277	2,148	1,189	658	4,123
1960	2,603	4,240	4,111	5,274	8,205	4,654	9,592	4,100	6,560	2,442	1,492	958	4,493

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.33	0.31	0.59	1.25	2.15	1.47	1.97	1.35	0.79	2.04	0.56	0.37	13.18
1952	.56	1.44	1.07	2.02	1.22	1.51	1.85	1.30	1.81	.47	.31	.17	13.73
1953	.17	.19	.25	.39	.52	1.61	.98	.79	.52	1.31	.29	.12	7.14
1954	.12	.13	.16	.20	.35	.90	1.64	.88	.68	.54	.30	.19	6.09
1955	1.05	.85	.59	1.42	.86	1.43	1.36	1.03	1.11	.46	.20	.19	10.55
1956	.35	.40	.32	.25	.91	1.02	.57	2.05	.87	.40	.21	.13	7.48
1957	.12	.14	.17	.25	.33	.32	2.25	2.07	1.07	2.70	.41	.21	10.04
1958	.39	.80	1.44	1.06	.53	1.06	.61	1.40	2.63	1.37	.76	.28	11.33
1959	.21	.36	.35	.55	2.23	1.96	1.79	1.84	.48	.47	.26	.15	10.65
1960	.57	.90	.90	1.16	1.69	1.02	2.04	.90	1.39	.54	.33	.21	11.65

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Near	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	6,941	17.94
1951	1208	a30,000	Feb. 19, 1951	1,110	5,096	0.971	13.18	5,801	15.02
1952	1258	29,000	June 14, 1952	724	5,293	1.01	13.73	4,349	11.27
1953	1278	19,500	July 6, 1953	532	2,770	.528	7.14	2,692	6.94
1954	1358	15,000	Mar. 25, 1954	490	2,356	.449	6.09	3,164	8.17
1955	1388	14,400	Jan. 8, 1955	625	4,074	.776	10.55	3,522	9.13
1956	1438	16,200	May 2, 1956	390	2,884	.549	7.48	2,633	6.84
1957	1508	75,900	July 13, 1957	480	3,875	.738	10.04	4,729	12.24
1958	1558	30,600	June 14, 1958	570	4,381	.834	11.33	3,721	9.62
1959	1628	a30,000	Feb. 14, 1959	509	4,123	.785	10.65	4,686	12.10
1960	1708	19,500	Feb. 11, 1960	780	4,493	.856	11.65	-	-

a About.

ILLINOIS RIVER BASIN

5280. Des Plaines River near Gurnee, Ill.

Location.--Lat 42°20'40", long 87°56'30", in SW $\frac{1}{4}$ sec.27, T.45 N., R.11 E., on right bank at upstream side of bridge on State Highway 120, 600 ft east of intersection of State Highways 120 and 63, 2 $\frac{1}{2}$ miles southwest of Gurnee, 2 $\frac{1}{2}$ miles upstream from Bull Creek, and 6 miles downstream from Mill Creek.

Drainage area.--215 sq mi.

Records available.--October 1945 to September 1958, water year 1960 (annual maximum).

Gage.--Crest-stage gage. Datum of gage is 650.3 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark). Prior to May 26, 1946, wire-weight gage at downstream side of bridge at same datum. May 26, 1946, to Sept. 30, 1958, water-stage recorder at same site and datum.

Average discharge.--13 years (1945-58), 120 cfs.

Extremes.--1945-58, 1959-60: Maximum discharge, 4,070 cfs Apr. 3, 1960 (gage height, 10.64 ft), from rating curve extended above 2,620 cfs.
1945-58: No flow Sept. 26 to Oct. 19, 1956.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	6.25	5.80	12.9	21.3	435	677	519	252	188	117	55.6	16.0	190
1952	68.8	486	160	491	255	698	545	86.0	130	132	89.8	5.49	262
1953	2.08	3.74	24.1	16.1	66.0	183	156	120	28.0	3.57	2.14	4.29	50.5
1954	.37	.26	1.30	1.06	14.1	48.8	189	125	428	325	95.1	26.9	105
1955	208	56.8	95.6	395	141	304	160	65.4	183	19.1	1.84	.27	136
1956	.67	1.94	1.97	2.08	13.2	25.5	52.3	205	30.4	28.0	18.1	4.05	32.2
1957	.04	.75	3.16	15.6	91.8	113	172	380	154	14.8	5.32	56.2	85.7
1958	8.21	67.6	66.6	45.0	53.9	372	125	24.6	59.1	15.1	6.00	.88	70.4
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.03	0.03	0.07	0.11	2.11	3.63	2.69	1.35	0.97	0.63	0.30	0.08	12.00
1952	.37	2.52	.86	2.63	1.28	3.74	2.83	.46	.68	.71	.48	.03	16.59
1953	.01	.02	.13	.09	.33	.98	.61	.64	.15	.02	.01	.002	3.19
1954	.002	.001	.007	.006	.07	.26	.98	.67	2.22	1.74	.51	.14	6.61
1955	1.12	.29	.51	2.12	.66	1.63	.83	.35	.95	.10	.01	.001	8.59
1956	.004	.01	.01	.01	.07	.14	.27	1.10	.16	.15	.10	.02	2.04
1957	.0002	.004	.02	.08	.44	.60	.89	2.04	.80	.08	.03	.29	5.27
1958	.04	.35	.36	.24	.26	1.99	.64	.13	.31	.08	.03	.005	4.44
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	160	9.97
1951	1208	1,600	Feb. 28, 1951	2.4	190	0.884	12.00	248	15.62
1952	1238	1,830	Apr. 15, 1952	2.1	262	1.22	16.59	205	13.00
1953	1278	391	Mar. 16, 1953	.1	50.5	.235	3.19	48.1	3.04
1954	1338	960	July 8, 1954	.2	105	.488	6.61	135	8.52
1955	1388	1,100	Jan. 9, 1955	.1	136	.633	8.59	106	6.70
1956	1438	420	May 1-3, 1956	0	32.2	.150	2.04	32.1	2.04
1957	1508	745	May 21, 22, 1957	0	85.7	.389	5.27	95.3	6.00
1958	1558	845	Mar. 5, 1958	.1	70.4	.327	4.44	-	-
1959	-	-	-	-	-	-	-	-	-
1960	-	4,070	Apr. 3, 1960	-	-	-	-	-	-

5285. Buffalo Creek near Wheeling, Ill.

Location--Lat 42°09'05", long 87°57'25", in NE1/4 sec.4, T.42 N., R.11 E., on left bank at downstream side of highway bridge, 1 mile downstream from unnamed tributary and 2.5 miles west of Wheeling.

Drainage area--19.4 sq mi.

Records available--August 1952 to September 1960.

Gage--Water-stage recorder. Datum of gage is 658.60 ft above mean sea level, datum of 1923 (Cook County Highway Department bench mark).

Average discharge--8 years (1952-60), 11.3 cfs.

Extremes--1952-60: Maximum discharge, 457 cfs Mar. 29, 1960; maximum gage height, 6.26 ft July 12, 1957; no flow for many days most years.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	0.00 ^a	-
1953	0	0.12	0.88	0.91	4.73	14.9	8.76	6.57	4.38	0.06	0.04	0	3.44
1954	0	0	0.03	.04	.90	10.0	39.8	12.9	34.7	16.2	5.75	.27	10.0
1955	22.7	5.44	11.0	27.7	17.6	33.4	19.9	6.86	12.2	1.55	0	0	13.2
1956	.02	.04	.17	.12	5.86	4.80	10.8	16.0	2.99	.24	.07	.04	3.41
1957	.05	.02	.05	.19	3.26	7.88	14.3	35.3	8.99	55.3	11.5	3.44	10.1
1958	2.97	19.0	15.4	7.00	16.4	26.3	17.2	5.73	10.6	7.78	.47	.28	10.7
1959	.15	.26	.06	.16	52.3	51.9	26.0	14.9	2.30	5.57	12.9	.19	15.8
1960	5.96	18.9	32.2	50.7	31.4	45.9	62.0	27.5	12.4	14.8	2.61	.96	25.4

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	0.00 ^a	-
1953	0	0.007	0.05	0.05	0.25	0.89	0.50	0.39	0.25	0.003	0.002	0	2.39
1954	0	0	.002	.002	.05	.60	2.29	.77	2.00	.97	.34	.02	7.04
1955	1.35	.31	.66	1.65	.94	1.98	1.15	.41	.70	.09	0	0	9.24
1956	.001	.002	.01	.007	.33	.29	.62	.95	.17	.01	.004	.002	2.40
1957	.003	.001	.003	.01	.18	.47	.82	2.10	.52	2.10	.68	.20	7.08
1958	.18	1.09	.79	.42	.88	1.68	.99	.34	.61	.46	.03	.02	7.49
1959	.009	.02	.003	.009	2.81	3.08	1.61	.89	.13	.33	.77	.01	9.67
1960	.35	1.06	1.92	3.01	1.75	2.73	3.57	1.63	.72	.88	.15	.06	17.85

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-
1952	1278	0.8	Sept. 1, 1952	-	-	-	-	-	-
1953	1278	55	Mar. 15, 1953	0	3.44	0.177	2.39	3.36	2.34
1954	1358	268	Apr. 25, 1954	0	10.0	.515	7.04	13.3	9.36
1955	1388	161	Oct. 10, 1954	0	13.2	.680	9.24	9.91	6.93
1956	1438	110	Apr. 29, 1956	0	3.41	.176	2.40	3.40	2.39
1957	1508	430	July 12, 1957	0	10.1	.521	7.08	13.1	9.14
1958	1558	130	Feb. 27, 1958	0	10.7	.552	7.49	7.79	5.46
1959	1628	a320	Feb. 24, 1959	0	13.8	.711	9.67	18.6	12.99
1960	1708	457	Mar. 29, 1960	.6	25.4	1.31	17.85	-	-

a About.

5290. Des Plaines River near Des Plaines, Ill.

Location.--Lat 42°04'55", long 87°53'25", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.25, T.42 N., R.11 E., on right bank 50 ft upstream from dam No. 2 of Cook County Forest Preserve, 0.3 mile downstream from Lake Avenue Bridge, 1.2 miles upstream from Central Road Bridge, and 2 $\frac{1}{2}$ miles north of Des Plaines.

Drainage area.--359 sq mi.

Records available.--October 1940 to September 1960.

Gage.--Water-stage recorder and masonry dam. Datum of gage is 626.31 ft above mean sea level, datum of 1929. Prior to Apr. 8, 1941, staff gage at same site and datum.

Average discharge.--20 years (1940-60), 217 cfs.

Extremes.--1940-60: Maximum discharge, 4,670 cfs Apr. 2, 1960 (gage height, 8.56 ft); no flow for many days in 1944, 1946.

Flood of July 4, 1936, reached a stage of 9.7 ft, from floodmark (discharge, 5,500 cfs).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	13.4	10.0	19.7	33.5	711	1,126	878	447	297	227	163	43.2	328
1952	162	821	260	775	385	1,077	868	153	321	185	117	12.6	427
1953	5.16	10.7	37.5	24.7	88.3	277	241	195	57.6	10.7	5.84	.87	79.4
1954	1.80	3.02	6.23	4.85	26.0	110	415	231	655	501	154	39.2	179
1955	408	95.2	156	617	234	519	265	127	307	31.4	6.57	2.34	231
1956	7.42	10.7	7.85	3.60	23.5	48.8	116	328	65.1	46.4	22.2	8.60	57.6
1957	14.1	11.0	12.9	11.2	83.8	180	283	578	238	295	92.6	54.1	155
1958	26.4	153	134	82.9	105	548	228	68.3	121	53.5	11.8	5.61	128
1959	7.69	13.0	10.0	8.35	117	646	409	319	43.2	20.8	68.7	17.5	140
1960	180	374	402	1,046	415	426	1,596	569	200	288	97.0	17.6	467

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.04	0.03	0.06	0.11	2.06	3.61	2.73	1.44	0.92	0.73	0.52	0.13	12.38
1952	.52	2.55	.84	2.49	1.16	3.46	2.70	.49	1.00	.60	.37	.04	16.22
1953	.02	.03	.12	.08	.26	.89	.75	.62	.18	.03	.02	.003	3.00
1954	.006	.009	.02	.02	.08	.35	1.29	.74	2.04	1.61	.49	.12	6.78
1955	1.31	.30	.50	1.98	.68	1.67	.82	.41	.95	.10	.02	.007	8.75
1956	.02	.03	.03	.01	.07	.16	.36	1.05	.20	.15	.07	.03	2.18
1957	.05	.03	.04	.04	.24	.58	.88	1.86	.74	.95	.30	.17	5.88
1958	.08	.48	.43	.27	.30	1.76	.71	.22	.38	.17	.04	.02	4.86
1959	.02	.04	.03	.03	.34	2.07	1.27	1.02	.13	.07	.22	.05	5.29
1960	.58	1.16	1.29	3.36	1.25	1.37	4.96	1.83	.62	.92	.31	.05	17.70

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	257	9.70
1951	1208	-	Feb. 26, 1951	6.6	328	0.914	12.38	427	16.16
1952	1238	2,410	Nov. 15, 1951	4.0	427	1.19	16.22	329	12.48
1953	1278	669	Mar. 15, 1953	.2	79.4	.221	3.00	75.8	2.87
1954	1338	1,770	Apr. 26, June 4	.3	179	.499	6.78	234	8.85
1955	1388	1,800	Oct. 11, 1954	.4	231	.643	6.75	178	6.72
1956	1438	880	Apr. 29, 1956	2.3	57.6	.160	2.18	58.6	2.22
1957	1508	2,810	July 13, 1957	1.0	155	.432	5.88	178	6.75
1958	1558	1,220	Mar. 6, 1958	.7	128	.357	4.86	105	3.96
1959	1628	1,190	Apr. 28, 1959	1.5	140	.390	5.29	218	8.23
1960	1708	4,670	Apr. 2, 1960	4.5	467	1.30	17.70	-	-

5295. McDonald Creek near Mount Prospect, Ill.

Location.--Lat 42°05'42", long 87°54'46", in NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.26, T.42 N., R.11 E., on right bank at downstream side of bridge on McDonald Road, 2 miles upstream from mouth and 2.5 miles northeast of Mount Prospect.

Drainage area.--7.52 sq mi.

Records available.--August 1952 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 638.12 ft above mean sea level, datum of 1929 (Cook County Highway Department bench mark).

Average discharge.--8 years (1952-60), 4.71 cfs (revised).

Extremes.--1952-60: Maximum discharge, 430 cfs July 13, 1957 (gage height, 8.04 ft); no flow for many days each year.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	0.11	-
1953	0	0.07	1.17	0.87	1.96	6.78	3.92	2.66	2.00	0.02	0	0	1.62
1954	0	0	0	0	0	4.95	15.0	6.01	11.9	6.65	2.92	.39	3.99
1955	16.9	3.22	3.49	9.54	7.81	11.0	7.32	4.47	7.55	1.21	0	0	6.04
1956	0	.04	.24	.08	1.95	1.58	3.80	6.66	1.19	.06	.02	.003	1.30
1957	0	0	.01	.17	1.79	3.37	6.39	19.7	9.37	26.2	6.24	2.09	6.34
1958	2.32	*7.32	*4.78	*3.28	*5.64	*12.2	*7.64	*3.49	*5.96	*5.64	*1.0	0	*4.85
1959	.10	.13	.07	.007	9.56	14.3	6.90	3.61	.74	1.09	3.54	.05	3.31
1960	4.28	7.87	10.8	17.4	10.9	18.9	22.6	11.8	7.76	7.72	2.38	.16	10.2

* Revised.

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	0.02	-
1953	0	0.01	0.18	0.13	0.27	1.04	0.58	0.41	0.30	0.003	0	0	2.92
1954	0	0	0	0	0	.76	2.23	.92	1.76	1.02	.45	.06	7.20
1955	2.59	.48	.53	1.46	1.08	1.68	1.09	.69	1.12	.19	0	0	10.91
1956	0	.005	.04	.01	.28	.24	.56	1.02	.18	.009	.003	.0005	2.35
1957	0	0	.001	.03	.25	.52	.95	3.02	1.39	4.02	.96	.31	11.45
1958	.36	1.09	*.73	*.50	*.78	*1.87	*1.13	.54	*.88	*.86	*.02	0	*8.76
1959	.01	.02	.01	*.001	1.32	2.20	1.02	.55	.11	.17	.54	.007	5.96
1960	.66	1.17	1.65	2.67	1.56	2.89	3.35	1.81	1.15	1.18	.37	.02	18.48

* Revised.

† Corrected.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-
1952	-	1278	0.9	Sept. 1, 1952	-	-	-	-	-
1953	-	1278	27	Mar. 15, 1953	0	1.62	0.215	2.92	2.73
1954	-	1338	103	June 3, 1954	0	3.99	.531	7.20	10.80
1955	-	1388	146	Oct. 11, 1954	0	6.04	.803	10.91	7.36
1956	-	1438	45	Apr. 29, 1956	0	1.30	.173	2.35	2.31
1957	-	1508	430	July 13, 1957	0	6.34	.843	11.45	13.63
1958	-	1558	*42	Feb. 28, 1958	0	*4.85	*.645	*8.76	*6.62
1959	-	1628	76	Feb. 24, 1959	0	3.31	.440	5.96	9.40
1960	-	1708	261	Mar. 30, 1960	0	10.2	1.36	18.48	-

* Revised.

5300. Weller Creek at Des Plaines, Ill.

Location.--Lat 42°02'57", long 87°55'05", in NW¼NW¼ sec.18, T.41 N., R.12 E., on right bank at downstream side of bridge on State Highway 58 in Des Plaines, 2 miles west of U.S. Highway 45 and 3.0 miles upstream from mouth.

Drainage area.--13.1 sq mi.

Records available.--October 1950 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 635.02 ft above mean sea level, datum of 1929 (Cook County Highway Department bench mark).

Average discharge.--10 years (1950-60), 10.5 cfs (revised).

Extremes.--1950-60: Maximum discharge, 668 cfs July 13, 1957 (gage height, 12.37 ft), from rating curve extended above 190 cfs by logarithmic plotting; no flow for many days during 1958 and 1959, and Sept. 10, 1960.

Remarks.--Prior to Nov. 15, 1958, effluent from Arlington Heights sewage treatment plant entered Weller Creek above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	3.11	4.16	4.43	5.51	29.3	31.3	32.6	18.3	11.2	11.3	6.91	5.25	13.5
1952	6.96	17.8	11.8	32.2	12.5	42.7	32.8	12.0	18.2	15.8	6.42	5.10	17.9
1953	3.56	4.92	5.30	4.98	6.98	16.6	11.5	8.48	12.0	6.93	4.13	4.47	7.48
1954	2.54	2.23	2.41	2.58	4.04	12.6	28.5	8.61	21.6	12.2	9.28	4.45	9.25
1955	35.6	5.28	7.13	13.2	10.7	15.5	11.9	12.2	22.1	6.70	6.57	4.60	12.7
1956	5.83	3.02	3.25	2.34	4.32	4.15	12.9	15.1	4.23	3.42	7.29	3.76	5.64
1957	2.08	2.79	2.20	4.11	8.42	7.66	15.9	*27.6	*11.4	*38.4	*15.3	14.3	*12.6
1958	*10.2	13.3	9.04	7.55	11.5	14.6	16.0	8.14	*14.1	*16.7	6.83	7.78	*11.3
1959	5.21	.62	.14	.08	*15.2	11.4	4.59	5.62	*3.56	*5.45	3.78	*2.54	*4.79
1960	*6.61	5.08	*6.89	*22.3	7.41	*15.1	*20.2	*7.65	6.04	*8.72	*5.27	1.82	*9.43

* Revised.

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.27	0.35	0.39	0.48	2.33	2.75	2.77	1.61	0.95	0.99	0.61	0.45	13.95
1952	.61	1.51	1.04	2.83	1.03	3.75	2.80	1.06	1.55	1.39	.56	.43	18.56
1953	.31	.42	.47	.44	.55	1.46	.98	.75	1.02	.61	.36	.38	7.75
1954	.22	.19	.21	.23	.32	1.11	2.43	.76	1.84	1.08	.82	.39	9.59
1955	3.13	.45	.63	1.16	.85	1.37	1.02	1.07	1.88	.59	.58	.39	13.12
1956	.51	.26	.29	.21	.36	.37	1.10	1.15	.36	.30	.64	.32	5.87
1957	.18	.24	.19	.36	.67	.67	1.35	*2.43	*.97	*3.38	*1.35	1.22	*13.01
1958	*.90	1.13	.80	.66	.92	1.28	1.56	.72	*1.20	*1.47	.60	.66	*11.70
1959	.46	.05	.01	.007	*1.21	1.00	.39	.49	*.30	*.48	.33	*.22	*4.95
1960	*.58	.43	*.61	*1.97	.61	*1.33	*1.72	*.67	.51	*.77	*.46	.14	*9.80

* Revised.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	1208	245	Feb. 19, 1951	2.2	13.5	1.03	13.85	15.6	16.10
1952	1238	328	June 17, 1952	3.4	17.3	1.37	18.58	16.0	16.60
1953	1278	169	June 10, 1953	2.1	7.48	.571	7.75	6.93	7.17
1954	1338	461	Apr. 25, 1954	4.4	9.25	.706	9.59	12.7	13.18
1955	1388	535	Oct. 10, 1954	2.1	12.7	.969	13.12	9.61	9.97
1956	1438	245	Apr. 29, 1956	1.2	5.64	.431	5.67	5.21	5.42
1957	1508	*668	July 13, 1957	1.9	*12.6	*.962	*13.01	*14.5	*15.23
1958	1558	*394	June 13, 1958	1.6	*11.3	*.863	*11.70	*9.07	*9.39
1959	1628	*376	July 30, 1959	0	*4.78	*.365	*4.95	*5.84	*6.05
1960	1708	*562	Apr. 16, 1960	0	*9.43	*.720	*9.60	-	-

* Revised.

Location.--Lat 41°59'22", long 87°52'24", in SW¹/₄ sec.4, T.40 N., R.12 E., on right bank at downstream side of bridge on Byron Street, 0.4 mile south of State Highway 72, 1.3 miles upstream from mouth, and 2½ miles southwest of Park Ridge.

Extremes.--1950-58: Maximum discharge, 1,300 cfs July 13, 1957 (gage height, 9.40 ft); no flow for several days in 1953, 1955-57.

[illegible][illegible][illegible]

5310. Salt Creek near Arlington Heights, Ill.

Location.--Lat 42°03'02", long 88°00'37", on north boundary of sec.17, T.41 N., R.11 E., on right bank at downstream side of bridge on State Highway 58, 2 $\frac{1}{4}$ miles southwest of Arlington Heights.

Drainage area.--33.7 sq mi.

Records available.--August 1950 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 682.32 ft above mean sea level, datum of 1929 (Cook County Highway Department bench mark).

Average discharge.--10 years (1950-60), 23.5 cfs.

Extremes.--1950-60: Maximum discharge, 721 cfs Mar. 30, 1960 (gage height, 9.37 ft); maximum gage height, 9.82 ft July 13, 1957; no flow Sept. 25, 30, Oct. 1, 2, 1959.

Remarks.--Diurnal fluctuation at low flow.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.34	0.88	2.83	12.8	72.6	87.2	80.3	41.2	18.4	20.0	2.24	1.28	28.0
1952	6.42	41.8	22.0	71.8	28.1	121	80.5	9.95	34.4	15.6	1.96	.90	56.2
1953	.43	1.51	6.45	4.10	10.1	32.6	17.4	9.62	13.9	2.01	1.49	.37	8.23
1954	.30	.30	.76	1.10	4.55	28.5	85.6	25.1	45.5	23.5	9.10	2.62	18.9
1955	67.6	12.0	17.7	48.3	33.8	46.8	31.9	11.7	52.2	4.29	1.72	2.15	27.5
1956	3.52	2.81	2.79	1.33	9.56	8.43	19.0	41.6	2.86	1.48	2.43	.94	8.08
1957	.77	1.06	1.40	6.73	16.5	13.4	28.6	62.2	16.4	85.6	20.7	6.63	21.8
1958	7.06	28.3	22.5	11.9	22.1	44.4	25.5	12.4	23.1	29.7	2.94	1.79	19.3
1959	1.67	2.48	1.56	1.64	67.0	121	52.8	23.8	13.7	11.8	1.70	1.70	25.0
1960	13.7	31.2	46.9	85.6	38.8	66.1	108	49.6	24.4	33.2	4.47	.68	41.9

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.01	0.03	0.10	0.44	2.24	2.98	2.66	1.41	0.61	0.68	0.08	0.04	11.28
1952	.22	1.38	.75	2.46	.90	4.13	2.66	.34	1.14	.53	.07	.03	14.61
1953	.01	.05	.22	.14	.31	1.12	.57	.33	.46	.07	.02	.01	3.31
1954	.01	.01	.03	.04	.14	.97	2.84	.86	1.51	.80	.31	.09	7.81
1955	2.31	.40	.60	1.65	1.05	1.60	1.06	.40	1.73	.15	.06	.07	11.08
1956	.12	.09	.10	.05	.31	.29	.63	1.42	.09	.05	.08	.03	3.26
1957	.03	.03	.05	.23	.51	.46	.95	2.13	.54	2.93	.71	.22	8.79
1958	.24	.94	.77	.41	.68	1.52	.84	.42	.76	1.02	.10	.06	7.76
1959	.06	.08	.05	.06	2.07	4.14	1.75	.81	.13	.47	.40	.06	10.08
1960	.47	1.03	1.60	2.93	1.24	2.26	3.58	1.70	.81	1.13	.15	.03	16.93

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	1208	a350	Feb. 19, 1951	0.2	28.0	0.831	11.28	33.5	13.49
1952	1238	430	Apr. 13, 1952	.4	36.2	1.07	14.61	31.0	12.54
1953	1278	139	Mar. 15, 1953	.1	8.23	.244	3.31	7.63	3.08
1954	1358	540	Apr. 25, 1954	.1	18.9	.561	7.61	27.0	10.87
1955	1388	516	Oct. 10, 1954	.8	27.5	.816	11.08	20.0	8.08
1956	1438	188	Apr. 29, 1956	.4	8.08	.240	3.26	7.58	3.06
1957	1508	572	July 13, 1957	.6	21.8	.647	8.79	26.4	10.63
1958	1558	200	July 3, 1958	1.2	19.3	.573	7.76	14.9	6.00
1959	1628	a350	Feb. 24, 1959	0	25.0	.742	10.08	32.3	12.99
1960	1708	721	Mar. 30, 1960	0	41.9	1.24	16.93	-	-

a About.

5315. Salt Creek at Western Springs, Ill.

Location.--Lat 41°49'35", long 87°54'00", on boundary between secs. 31 and 32, T.39 N., R.12 E., on left bank at upstream side of bridge on Wolf Road, in Cook County Forest Preserve, half a mile north of Western Springs and 8.8 miles upstream from mouth.

Drainage area.--122 sq mi.

Records available.--October 1945 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 624.9S ft above mean sea level, datum of 1929. Prior to July 26, 1946, wire-weight gage at upstream side of bridge at same datum.

Average discharge.--15 years (1945-60), 88.4 cfs.

Extremes.--1945-60: Maximum discharge, 1,920 cfs Mar. 20, 1948 (gage height, 8.06 ft); maximum gage height, 8.27 ft Oct. 11, 1954; minimum discharge, 0.4 cfs July 13, 1953.

Remarks.--Occasional regulation by dam above station. Some diversion for irrigation above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	11.5	10.7	13.6	50.3	264	276	290	171	54.5	102	30.4	17.0	106
1952	45.7	159	79.8	332	95.5	347	246	47.0	74.0	37.5	10.2	3.33	123
1953	3.46	9.97	20.2	19.2	30.2	112	73.5	66.5	79.3	12.2	6.05	6.55	36.6
1954	6.43	5.81	8.14	5.79	12.4	106	278	110	161	86.5	51.4	11.9	70.2
1955	331	46.4	57.8	164	107	177	103	88.5	219	16.4	9.45	8.40	111
1956	28.3	25.4	19.6	10.6	47.2	46.1	74.5	224	25.6	20.3	17.5	10.0	45.8
1957	10.3	11.0	10.5	26.6	48.9	75.5	134	228	98.8	236	90.0	39.1	84.4
1958	39.1	115	90.2	53.0	70.5	183	90.4	52.7	158	114	22.8	19.4	84.1
1959	15.6	23.9	14.8	12.3	175	257	148	121	70.4	64.2	51.4	19.7	81.4
1960	65.3	114	145	317	137	147	360	163	109	109	30.0	20.1	143

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.11	0.10	0.13	0.48	2.25	2.61	2.65	1.61	0.50	0.96	0.29	0.16	11.85
1952	.43	1.46	.75	3.13	.84	3.28	2.25	.44	.68	.35	.10	.03	13.74
1953	.03	.09	.19	.18	.26	1.06	.67	.63	.75	.12	.06	.06	4.08
1954	.06	.05	.08	.05	.11	1.01	2.54	1.04	1.47	.82	.49	.11	7.83
1955	3.13	.42	.55	1.55	.91	1.68	.95	.84	2.01	.15	.09	.08	12.36
1956	.27	.23	.19	.10	.42	.44	.68	2.11	.23	.19	.17	.09	5.12
1957	.10	.10	.10	.25	.42	.71	1.22	2.15	.90	2.23	.85	.56	9.39
1958	.37	1.06	.85	.50	.60	1.73	.83	.50	1.45	1.08	.22	.18	9.37
1959	.15	1.22	.14	.12	1.50	2.43	1.36	1.14	.64	.61	.58	.18	15.92
1960	.62	1.04	1.37	2.99	1.21	1.38	3.29	1.54	.99	1.03	.28	.18	15.92

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	110	12.31
1951	1208	al, 200	Feb. 19, 1951	1.4	106	0.869	11.85	127	14.15
1952	1238	925	Jan. 19, 1952	1.3	123	1.01	13.74	102	11.41
1953	1278	506	June 10, 1953	2.0	36.6	.300	4.08	35.5	3.96
1954	1338	1,140	Apr. 27, 1954	2.2	70.2	.575	7.83	105	11.74
1955	1398	1,710	Oct. 11, 1954	3.8	111	.910	12.36	80.3	8.95
1956	1438	624	May 11, 1956	1.4	45.8	.375	5.12	42.4	4.73
1957	1508	1,020	July 14, 1957	5.2	84.4	.692	9.39	102	11.37
1958	1558	778	June 13, 1958	3.6	84.1	.689	9.37	68.1	7.60
1959	1628	al, 200	Feb. 24, 1959	6.8	81.4	.667	9.07	104	11.59
1960	1708	1,220	Apr. 1, 1960	3.7	143	1.17	15.92	-	-

a About.

5320. Addison Creek at Bellwood, Ill.

Location.--Lat 41°52'48", long 87°52'07", in SE $\frac{1}{4}$ sec.9, T.39 N., R.12 E., on right bank at downstream side of bridge on Washington Boulevard in Bellwood, 500 ft upstream from Chicago Great Western Railway bridge and 3.2 miles upstream from mouth.

Drainage area.--18.2 sq mi.

Records available.--August 1950 to June 1951, October 1951 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 617.65 ft above mean sea level, datum of 1929 (Cook County Highway Department bench mark). Prior to Oct. 26, 1951, at datum 2.00 ft higher.

Average discharge.--9 years (1951-60), 10.2 cfs.

Extremes.--1950-60: Maximum discharge, 598 cfs Oct. 11, 1954 (gage height, 9.48 ft), from rating curve extended above 190 cfs by logarithmic plotting; minimum, 0.1 cfs for many days in 1951-54, Sept. 7, 1959.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1.41	0.99	2.39	8.09	32.0	27.4	29.7	18.4	-	-	-	-	-
1952	7.62	23.6	9.55	37.7	8.48	27.9	20.4	4.25	5.53	1.92	0.97	0.31	12.4
1953	.22	1.64	5.69	3.03	4.76	12.4	8.62	6.88	4.15	1.25	.42	.70	3.98
1954	.28	.46	1.63	.98	3.38	20.3	38.2	7.00	22.3	9.07	17.1	2.31	10.2
1955	46.5	5.98	6.84	15.9	11.6	19.1	14.5	12.2	19.3	.68	1.02	1.26	12.9
1956	5.71	4.53	3.93	1.74	7.89	6.69	13.7	24.8	1.64	2.35	1.30	.87	6.27
1957	1.37	1.84	2.19	3.75	7.61	9.08	18.1	24.5	16.4	46.6	22.1	5.55	13.3
1958	6.20	11.5	6.96	3.97	13.5	14.3	19.9	6.93	19.8	18.5	2.70	3.06	10.6
1959	2.26	3.19	1.98	2.11	20.6	25.0	15.5	13.1	7.15	10.5	6.69	3.98	9.10
1960	12.1	10.2	13.1	32.4	13.7	19.7	22.7	14.2	8.30	10.1	2.43	2.90	13.5

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.09	0.06	0.15	0.51	1.83	1.74	1.82	1.16	-	-	-	-	-
1952	.48	1.44	.61	2.39	.50	1.77	1.25	.27	0.34	0.12	0.06	0.02	9.25
1953	.01	1.10	.23	.19	.27	.78	.53	.44	.25	.08	.03	.04	2.95
1954	.02	.03	.10	.06	.19	1.29	2.34	.44	1.37	.57	1.09	.14	7.64
1955	2.94	.37	.43	1.01	.66	1.21	.89	.77	1.18	.04	.06	.08	9.64
1956	.36	.28	.25	.11	.47	.42	.84	1.57	.10	.15	.08	.05	4.68
1957	.09	.11	.14	.24	.44	.58	1.11	1.55	1.01	2.95	1.40	.33	9.95
1958	.39	.71	.44	.25	.77	.90	1.22	.44	1.21	1.17	.17	.19	7.86
1959	.14	.20	.13	.13	1.18	1.46	.95	.83	.44	.67	.42	.24	6.79
1960	.76	.63	.83	2.05	.81	1.25	1.39	.90	.51	.64	.15	.18	10.10

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	1208	295	Feb. 19, 1951	-	-	-	-	-	-
1952	1208,1338	200	Apr. 13, 1952	0.1	12.4	0.681	9.25	9.45	7.06
1953	1278,1338	57	Mar. 15, 1953	.1	3.98	.219	2.95	3.71	2.76
1954	1338	548	Mar. 25, 1954	.1	10.2	.560	7.64	15.1	11.23
1955	1388	598	Oct. 11, 1954	.2	12.9	.709	9.64	9.11	6.79
1956	1438	228	July 19, 1956	.4	6.27	.345	4.68	5.53	4.13
1957	1508	560	July 13, 1957	1.1	13.3	.731	9.95	14.9	11.15
1958	1558,1708	405	June 13, 1958	1.1	10.6	.582	7.86	9.12	6.79
1959	1628,1708	273	June 26, 1959	.4	9.10	.500	6.79	11.5	8.54
1960	1708	295	Jan. 12, July 2	.2	13.5	.742	10.10	-	-

5325. Des Plaines River at Riverside, Ill.

Location.--Lat 41°49'20", long 87°49'15", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.36, T.39 N., R.12 E., on left bank 200 ft northwest of Riverside-Lyons boundary, 300 ft downstream from Barry Point Road Bridge in Riverside, 500 ft downstream from Hoffman Dam, 4,000 ft downstream from Salt Creek, and $\frac{1}{2}$ miles downstream from Chicago, Burlington & Quincy Railroad bridge.

Drainage area.--635 sq mi.

Records available.--October 1943 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder and concrete dam. Datum of gage is 594.68 ft above mean sea level, datum of 1923. Prior to Nov. 27, 1946, wire-weight gage on downstream side of Barry Point Road Bridge at same datum.

Average discharge.--17 years (1943-60), 372 cfs.

Extremes.--1943-60: Maximum discharge, 6,510 cfs Mar. 20, 1948 (gage height, 8.28 ft); maximum gage height, 8.89 ft Jan. 25, 1960 (ice jam); minimum discharge, 0.4 cfs Oct. 31, 1955.

Maximum discharge since 1914, 7,450 cfs Mar. 18, 1919, from information furnished by Sanitary District of Chicago.

Remarks.--Occasional regulation by gates of Hoffman Dam.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	26.3	32.1	51.9	138	983	1,602	1,454	777	392	439	243	85.9	515
1952	258	1,092	386	1,290	535	1,726	1,316	226	482	272	157	29.5	647
1953	16.7	41.9	86.4	68.7	165	530	382	334	206	38.3	20.4	14.7	159
1954	4.27	11.8	30.1	16.4	60.2	340	993	435	962	655	298	76.2	324
1955	1,202	191	267	899	449	872	450	327	716	83.9	47.7	22.6	462
1956	104	54.1	39.0	26.2	107	130	289	780	106	87.1	72.8	27.8	153
1957	21.5	28.6	30.6	85.6	202	336	550	1,006	471	910	332	15.9	344
1958	103	345	263	166	244	932	493	202	429	289	64.5	47.7	298
1959	50.1	48.9	23.9	23.8	412	1,107	690	546	141	145	167	66.6	285
1960	334	607	670	1,711	631	607	2,287	869	413	483	147	52.1	734

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.05	0.06	0.09	0.25	1.61	2.91	2.56	1.41	0.69	0.80	0.44	0.15	11.02
1952	.47	1.82	.70	2.34	.91	3.13	2.31	.41	.85	.49	.28	.05	13.86
1953	.03	.07	.16	.12	.27	.96	.87	.61	.36	.07	.04	.03	3.39
1954	.008	.02	.05	.03	.10	.62	1.74	.79	1.69	1.19	.54	.13	6.91
1955	2.18	.33	.48	1.63	.74	1.58	.79	.59	1.26	.15	.09	.04	9.86
1956	.19	.09	.07	.05	.18	.24	.51	1.42	.19	.16	.13	.05	3.28
1957	.04	.05	.06	.12	.33	.61	.97	1.83	.83	1.65	.60	.28	7.37
1958	.19	.61	.48	.30	.40	1.69	.87	.37	.75	.53	.12	.08	6.39
1959	.09	.09	.04	.04	.68	2.01	1.21	.99	.25	.26	.30	.12	6.08
1960	.61	1.07	1.22	3.11	1.07	1.10	4.02	1.53	.73	.88	.27	.09	15.75

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	485	10.35
1951	1208	3,100	Feb. 27 or 28	7.2	515	0.811	11.02	650	13.91
1952	1238	3,620	Apr. 15, 1952	1.8	647	1.02	13.86	515	11.03
1953	1278	1,470	Mar. 15, 1953	2.6	159	.250	3.39	150	3.21
1954	1338	3,980	Apr. 26, 1954	.5	324	.510	6.91	460	9.82
1955	1388	6,340	Oct. 11, 1954	6.5	462	.728	9.86	338	7.22
1956	1438	2,460	Apr. 30, 1956	.7	153	.241	3.28	143	3.08
1957	1508	5,950	July 14, 1957	5.0	344	.542	7.37	397	8.50
1958	1558	2,100	June 13, 1958	19	298	.469	6.39	249	5.33
1959	1628	1,680	Apr. 28, 29	18	285	.449	6.08	409	8.76
1960	1708	5,500	Apr. 3, 1960	31	734	1.16	15.75	-	-

5330. Flag Creek near Willow Springs, Ill.

Location.--Lat 41°44'20", long 87°53'48", in SE 1/4 sec. 31, T. 38 N., R. 12 E., on left bank at upstream side of bridge on German Church Road, 1.1 miles northwest of Willow Springs and 2.3 miles upstream from mouth.

Drainage area.--16.2 sq mi.

Records available.--July 1951 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 609.64 ft above mean sea level, datum of 1929 (Cook County Highway Department bench mark).

Average discharge.--9 years (1951-60), 14.4 cfs.

Extremes.--1951-60: Maximum discharge, 1,550 cfs Apr. 28, 1959 (gage height, 7.53 ft); minimum daily, 0.1 cfs Dec. 9, 1957.

Remarks.--Diurnal fluctuation at low flow.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	15.4	36.1	16.9	46.7	11.2	40.8	31.5	6.87	6.65	4.94	5.41	5.30	19.0
1953	2.47	3.61	4.48	3.32	5.52	17.1	10.7	16.7	14.5	5.86	4.65	4.51	7.79
1954	2.30	2.37	3.85	2.77	5.16	31.8	37.1	8.95	20.5	7.69	7.97	3.01	11.1
1955	100	9.76	10.1	22.3	19.1	23.8	15.7	17.2	33.1	6.32	5.89	3.22	22.3
1956	7.57	5.53	4.66	2.44	13.7	8.20	13.7	29.2	5.64	5.26	5.11	3.71	8.72
1957	3.83	3.65	3.83	2.63	5.55	5.88	20.0	17.4	14.4	47.4	22.1	5.95	12.8
1958	5.33	13.3	8.26	6.10	14.8	17.5	8.09	4.94	30.9	22.7	11.5	6.59	12.6
1959	6.06	5.14	2.83	3.94	18.3	33.8	41.3	24.4	16.7	23.2	10.7	7.41	16.0
1960	10.5	16.5	21.1	47.1	20.1	29.2	35.6	17.6	9.11	11.8	5.65	5.89	19.2

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	1.10	2.48	1.21	3.32	0.74	2.90	2.17	0.49	0.46	0.35	1.12	1.09	15.97
1953	.18	.25	.32	.24	.35	1.22	.73	1.19	1.00	.42	.38	.31	6.54
1954	.16	.16	.27	.20	.33	2.26	2.55	1.64	1.41	.55	.57	.21	9.31
1955	7.15	.67	.72	1.59	1.23	1.69	1.08	1.23	2.28	.45	.42	.22	18.73
1956	.54	.38	.33	.17	.91	.58	.94	2.08	.39	.37	.36	.26	7.31
1957	.27	.25	.27	.20	.36	.42	1.38	1.24	.99	3.37	1.57	.41	10.73
1958	.38	.92	.59	.58	.95	1.24	.56	1.35	2.13	1.61	.82	.45	10.58
1959	.43	.35	.20	.21	1.18	2.41	2.86	1.74	1.15	1.85	.76	.51	13.44
1960	.75	1.14	1.50	3.35	1.34	2.08	2.45	1.26	.63	.84	.40	.41	16.15

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	1238	540	Sept. 26, 1951	-	-	-	-	-	-
1952	1238	398	Nov. 13, 1951	1.5	19.0	1.17	15.97	14.2	11.93
1953	1278	306	June 10, 1953	1.8	7.79	.481	6.54	7.62	6.38
1954	1378	770	Mar. 25, 1954	1.5	11.1	.685	9.31	20.6	17.26
1955	1388	1,300	Oct. 10, 1954	2.4	22.3	1.38	18.73	13.7	11.44
1956	1438	285	May 11, 1956	1.7	8.72	.538	7.31	8.18	6.85
1957	1508	1,350	July 13, 1957	1.7	12.8	.790	10.73	14.1	11.83
1958	1558	388	June 13, 1958	1.7	12.6	.778	10.58	11.6	9.67
1959	1628	1,550	Apr. 28, 1959	.6	16.0	.988	13.44	18.9	15.85
1960	1708	800	Jan. 12, 1960	4.4	19.2	1.19	16.15	-	-

5345. North Branch Chicago River at Deerfield, Ill.

Location--Lat 42°09'09", long 87°49'05", in NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.3, T.42 N., R.12 E., on left bank at downstream side of bridge on county line road, 1.7 miles southeast of Deerfield and 5.7 miles upstream from Skokie River.

Drainage area--20.7 sq mi.

Records available--August 1952 to September 1960.

Gage--Water-stage recorder. Datum of gage is 638.88 ft above mean sea level, datum of 1929 (Cook County Highway Department bench mark).

Average discharge--8 years (1952-60), 9.88 cfs.

Extremes--1952-60: Maximum discharge, 292 cfs Apr. 28, 1959 (gage height, 9.63 ft); no flow for several periods in most years.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	0.36	0.16	-
1953	0.28	0.66	1.29	0.96	2.53	16.9	10.6	8.03	3.09	1.05	.27	.15	3.83
1954	.20	.55	.41	.18	1.53	15.4	44.8	9.54	26.0	24.1	6.63	.85	10.8
1955	24.6	2.69	10.7	25.2	16.1	32.7	14.1	10.7	32.2	.77	.23	.13	14.2
1956	.40	.65	.45	.28	3.67	4.75	16.8	18.4	4.01	.79	.73	.26	4.25
1957	.17	.45	.49	.39	4.02	14.2	29.4	36.4	11.0	8.27	6.36	.34	9.32
1958	.71	6.71	5.27	2.65	16.1	22.4	14.1	6.25	7.10	2.57	.47	.14	6.96
1959	.35	1.22	.30	.09	22.2	43.1	32.2	10.1	1.67	1.13	4.47	.49	9.68
1960	3.65	18.8	31.4	37.6	22.7	38.0	40.4	22.2	12.3	11.8	.70	.12	20.0

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	0.02	0.009	-
1953	0.02	0.04	0.07	0.05	0.13	0.94	0.57	0.45	0.17	0.06	.01	.008	2.52
1954	.01	.03	.02	.01	.08	.86	2.41	.53	1.40	1.34	.37	.05	7.11
1955	1.37	.14	.60	1.41	.81	1.82	.76	.60	1.74	.04	.01	.007	9.31
1956	.02	.03	.02	.02	.19	.26	.90	1.02	.22	.04	.04	.01	2.77
1957	.01	.02	.03	.02	.20	.79	1.58	2.03	.59	.46	.35	.02	6.10
1958	.04	.56	.29	.15	.81	1.25	.76	.35	.38	.14	.03	.007	4.57
1959	.02	.07	.02	.005	1.11	2.40	1.74	.56	.09	.06	.25	.03	6.36
1960	.20	1.02	1.75	2.09	1.18	2.12	2.18	1.24	.66	.66	.04	.006	13.15

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-
1952	-	1278	3.9	Sept. 1, 1952	-	-	-	-	-
1953	-	1278	79	Mar. 15, 1953	0.1	3.83	0.185	2.52	3.74
1954	-	1338	247	Mar. 25, 1954	0	10.8	.522	7.11	14.0
1955	-	1388	247	June 11, 1955	0	14.2	.686	9.31	11.1
1956	-	1438	207	Apr. 29, 1956	0	4.25	.205	2.77	4.22
1957	-	1508	284	May 19, 1957	0	9.32	.450	6.10	10.3
1958	-	1558	178	Feb. 27, 1958	0	6.96	.336	4.57	6.06
1959	-	1628	292	Apr. 28, 1959	0	9.68	.468	6.36	14.0
1960	-	1708	284	Mar. 30, 1960	0	20.0	.966	13.15	-

5350' Skokie River at Lake Forest, Ill.

Location.--Lat 42°13'57", long 87°50'41", in NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 4, T.43 N., R.12 E., on left bank at downstream side of bridge on State Highway 59A at Lake Forest, 1 $\frac{1}{2}$ miles upstream from mouth.

Drainage area.--12.8 sq mi.

Records available.--October 1951 to September 1960. Prior to October 1952, records published with those for streams in the St. Lawrence River basin (WSP 1237).

Gage.--Water-stage recorder. Datum of gage is 648.69 ft above mean sea level, datum of 1929.

Average discharge.--9 years (1951-60), 10.4 cfs.

Extremes.--1951-60: Maximum discharge, 321 cfs Nov. 13, 1951 (gage height, 7.16 ft); no flow for many days in 1959.

Remarks.--Diurnal fluctuation at low flow.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	12.9	35.1	11.6	31.1	8.97	42.3	35.2	6.10	17.3	6.24	2.34	1.46	17.5
1953	1.41	2.87	3.62	2.24	4.65	13.7	10.7	9.45	5.45	1.87	1.38	2.26	4.96
1954	1.57	1.38	3.27	1.95	4.23	11.6	34.3	9.59	22.8	23.0	9.70	3.33	10.6
1955	19.6	4.38	11.7	27.2	16.5	27.8	14.8	16.0	23.6	2.00	1.26	1.36	13.9
1956	1.96	1.82	2.49	1.51	5.53	4.01	13.4	14.5	4.67	2.87	3.51	1.85	4.84
1957	.83	1.55	1.37	1.53	6.42	11.3	11.5	20.5	9.78	5.41	3.33	1.95	6.29
1958	2.85	7.83	5.85	4.15	12.9	20.0	13.7	5.80	10.9	6.83	4.46	3.15	8.13
1959	2.39	1.85	1.20	.29	10.3	28.4	27.0	10.8	3.43	4.66	6.96	3.70	8.38
1960	9.74	20.7	23.6	28.8	21.7	30.9	30.6	19.8	18.2	13.8	2.85	2.67	18.6

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	1.16	3.06	1.04	2.80	0.76	3.81	3.07	0.55	1.51	0.56	0.21	0.13	18.66
1953	.13	.25	.33	.20	.38	1.23	.93	.85	.48	.17	.12	.20	5.27
1954	.14	.12	.29	.18	.34	1.05	2.99	.86	1.99	2.08	.87	.29	11.20
1955	1.77	.38	1.05	2.45	1.35	2.50	1.29	1.44	2.06	.18	.11	.12	14.70
1956	.18	.16	.22	.14	.47	.36	1.17	1.31	.41	.26	.32	.16	5.16
1957	.07	.14	.12	.14	.52	1.02	1.00	1.84	.85	.49	.30	.17	6.66
1958	.26	.68	.53	.37	1.05	1.80	1.19	.52	.95	.60	.40	.27	8.62
1959	.22	.16	.11	.03	.84	2.55	2.35	.97	.30	.42	.63	.32	8.90
1960	.88	1.80	2.12	2.60	1.82	2.78	2.66	1.79	1.59	1.24	.26	.23	19.77

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches	
		Discharge	Date							
1950	-	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-	-
1952	1237	321	Nov. 13, 1951	0.9	17.5	1.37	18.66	13.2	14.11	
1953	1278	92	Mar. 14, 1953	.8	4.96	.388	5.27	4.83	5.11	
1954	1338	257	Apr. 25, 1954	.8	10.6	.828	11.20	13.1	13.85	
1955	1388	194	Jan. 5, 1955	.7	13.9	1.09	14.70	11.4	12.06	
1956	1438	155	Apr. 29, 1956	.8	4.84	.378	5.16	4.63	4.93	
1957	1508	201	May 19, 1957	.5	6.29	.491	6.66	7.35	7.80	
1958	1558	98	Feb. 27, 1958	1.2	8.13	.635	8.62	7.21	7.64	
1959	1628	313	Apr. 28, 1959	0	8.38	.655	8.90	12.5	13.21	
1960	1708	250	Mar. 29, 1960	1.3	18.6	1.45	19.77	-	-	

5355. West Fork of North Branch Chicago River at Northbrook, Ill.

Location.--Lat 42°08'18", long 87°50'04", in SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.4, T.42 N., R.12 E., on left bank at upstream side of bridge on State Highway 68, 2.0 miles northwest of Northbrook and 7.9 miles above mouth.

Drainage area.--11.5 sq mi.

Records available.--August 1952 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 637.98 ft above mean sea level, datum of 1929 (Cook County Highway Department bench mark).

Average discharge.--8 years (1952-60), 8.05 cfs.

Extremes.--1952-60: Maximum discharge, 930 cfs July 13, 1957 (gage height, 9.65 ft), from rating curve extended above 330 cfs; no flow at times in 1952, 1956-57.

Remarks.--Diurnal fluctuation at low flow.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	0.24	-
1953	0.29	1.27	2.30	1.20	2.45	12.3	6.58	4.61	1.97	1.38	0.66	.48	2.96
1954	.24	.34	.54	.38	2.87	16.3	31.2	5.11	17.3	12.3	5.16	.60	7.69
1955	20.3	2.18	5.94	17.5	15.3	16.9	7.15	9.13	25.2	1.84	.47	.44	10.2
1956	.86	1.18	1.09	.52	2.59	3.01	13.4	10.4	1.51	.50	.82	.56	3.05
1957	.60	.34	.67	.35	5.29	6.82	16.5	28.7	8.74	25.8	17.4	3.06	9.64
1958	4.50	12.7	5.62	3.50	16.0	18.2	12.6	4.90	9.92	5.31	2.97	3.19	8.20
1959	2.89	3.20	1.06	.89	17.3	28.1	20.3	12.4	4.31	4.88	5.52	3.02	8.60
1960	7.50	11.9	19.1	21.1	18.4	24.5	24.5	18.8	6.90	9.28	2.10	2.71	14.1

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	0.02	-
1953	0.03	0.12	0.23	0.12	0.22	1.23	0.64	0.46	0.19	0.14	0.07	.05	3.50
1954	.02	.03	.05	.04	.26	1.64	3.03	.51	1.68	1.23	.52	.06	9.07
1955	2.04	.21	.60	1.75	1.38	1.69	.69	.92	2.44	.18	.05	.04	11.99
1956	.09	.11	.11	.05	.24	.30	1.30	1.04	.15	.05	.08	.05	3.57
1957	.06	.03	.07	.09	.48	.68	1.61	2.88	.85	2.58	1.75	.30	11.38
1958	.45	1.23	.56	.35	1.45	1.82	1.23	.49	.96	.53	.30	.31	9.68
1959	.29	.31	.11	.09	1.57	2.82	1.97	1.25	.42	.49	.55	.29	10.16
1960	.75	1.16	1.92	2.11	1.72	2.45	2.37	1.89	.86	.93	.21	.26	16.63

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-
1952	1278	12	Sept. 1, 1952	-	-	-	-	-	-
1953	1278	86	Mar. 14, 1953	0.1	2.96	0.257	3.50	2.73	3.22
1954	1338	411	Mar. 25, 1954	.2	7.69	.669	9.07	10.0	11.82
1955	1388	404	June 11, 1955	.2	10.2	.887	11.99	8.02	9.45
1956	1438	199	Apr. 28, 1956	.2	3.03	.263	3.57	2.90	3.42
1957	1508	930	July 13, 1957	0	9.64	.838	11.38	11.4	13.46
1958	1558	159	Feb. 27, 1958	.9	8.20	.713	9.68	6.90	8.15
1959	1628	366	Apr. 28, 1959	.5	8.60	.748	10.16	11.2	13.28
1960	1708	275	Mar. 29, 1960	1.4	14.1	1.23	16.63	-	-

ILLINOIS RIVER BASIN

5360. North Branch Chicago River at Niles, Ill.

Location--Lat 42°00'44", long 87°47'45", in SW¹SE¹ sec.30, T.41 N., R.13 E., on right bank at downstream side of bridge on Touhy Avenue in Niles, 3.6 miles downstream from West Fork of North Branch, 7.9 miles upstream from North Shore Channel, and 15.6 miles upstream from mouth.

Drainage area--102 sq mi.

Records available--October 1950 to September 1960. Prior to October 1952, records published with those for streams in the St. Lawrence River basin (WSP 1207, 1237).

Gage--Water-stage recorder. Datum of gage is 601.99 ft above mean sea level, datum of 1929.

Average discharge--10 years (1950-60), 72.7 cfs.

Extremes--1950-60: Maximum discharge, 1,850 cfs July 13, 1957 (gage height, 9.28 ft); minimum daily, 0.1 cfs Sept. 30, 1953.

Remarks--Occasional regulation at low flow.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	6.89	17.7	6.56	27.2	254	249	226	159	89.0	69.0	56.2	15.4	96.8
1952	90.5	201	60.1	221	60.5	271	167	24.9	124	79.3	10.8	6.82	110
1953	2.83	14.2	26.0	13.2	27.7	97.5	58.2	51.8	24.9	10.5	6.81	4.54	28.4
1954	4.00	5.53	12.0	6.41	22.4	98.1	266	70.9	156	114	44.7	5.93	67.0
1955	216	23.4	65.4	146	99.4	165	68.1	74.9	202	12.3	6.15	4.99	90.3
1956	31.1	17.2	15.7	5.62	35.8	35.3	101	147	19.2	9.46	17.5	5.18	36.6
1957	6.33	9.94	9.56	21.0	47.7	62.0	108	216	60.0	153	91.0	18.5	67.1
1958	28.5	76.5	45.6	28.0	81.9	119	69.3	42.2	65.2	48.5	18.4	16.1	53.0
1959	15.1	18.4	12.4	12.8	126	188	130	111	38.0	48.2	68.7	24.2	65.7
1960	67.1	92.7	119	204	116	164	266	137	73.6	78.4	16.4	12.5	112

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.08	0.19	0.07	0.31	2.59	2.81	2.47	1.80	0.97	0.78	0.63	0.17	12.87
1952	1.02	2.20	.68	2.50	.64	3.07	1.83	.28	1.36	.90	.12	.07	14.67
1953	.03	.16	.32	.15	.28	1.10	.64	.59	.27	1.12	.08	.05	3.79
1954	.05	.06	.14	.07	.23	1.11	2.91	.80	1.70	1.26	.50	.06	8.91
1955	2.44	.26	.74	1.65	1.01	1.86	.74	.85	2.20	.14	.07	.05	12.01
1956	.35	.19	.18	.06	.38	.40	1.10	1.66	.21	.11	.20	.06	4.90
1957	.07	.11	.11	.24	.49	.70	1.19	2.44	.66	1.73	1.03	.18	8.95
1958	.32	.84	.52	.32	.84	1.34	.76	.48	.71	.55	.21	.18	7.07
1959	.17	.20	.14	.14	1.29	2.12	1.42	1.25	.42	.54	.78	.27	8.74
1960	.76	1.01	1.35	2.31	1.22	1.85	2.91	1.55	.81	.89	.16	.14	14.96

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	1207	952	May 11, 1951	0.6	96.8	0.949	12.67	124	16.43
1952	1237	870	Apr. 14, 1952	1.5	110	1.08	14.67	84.5	11.28
1953	1278	428	Mar. 15, 1953	1.1	28.4	.278	3.79	26.4	3.53
1954	1338	1,510	Apr. 26, 1954	.7	67.0	.657	8.91	91.0	12.10
1955	1388	1,700	Oct. 11, 1954	1.3	90.3	.885	12.01	69.9	9.29
1956	1438	1,030	Apr. 29, 1956	.6	36.6	.359	4.90	33.4	4.47
1957	1508	1,850	July 13, 1957	1.7	67.1	.858	8.95	77.5	10.34
1958	1568	847	Feb. 28, 1958	2.8	53.0	.520	7.07	44.3	5.90
1959	1628	695	Apr. 29, 1959	3.6	65.7	.644	8.74	65.3	11.35
1960	1708	1,340	Mar. 31, 1960	7.7	112	1.10	14.98	-	-

5365. Tinley Creek near Palos Park, Ill.

Location--Lat 41°38'48", long 87°45'59", in SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.32, T.37 N., R.13 E., on left bank at downstream side of 135th Street Bridge, 1.5 miles west of State Highway 50, 1.5 miles upstream from mouth, and 3 miles southeast of Palos Park.

Drainage area--11.3 sq mi.

Records available--July 1951 to September 1960. Prior to October 1952, records published with those for streams in the St. Lawrence River basin (WSP 1237).

Gage--Water-stage recorder. Datum of gage is 607.40 ft above mean sea level, datum of 1929.

Average discharge--9 years (1951-60), 8.64 cfs.

Extremes--1951-60: Maximum discharge, 1,120 cfs Oct. 10, 1954 (gage height, 10.30 ft); no flow for many days most years.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	6.10	15.0	-
1952	10.5	27.6	4.80	34.6	5.16	28.5	19.0	3.22	9.92	0.26	.52	.15	12.0
1953	0	.18	.71	2.06	4.91	17.5	12.1	16.1	17.0	.41	.82	0	5.98
1954	.02	.17	.77	1.15	2.86	20.6	27.3	2.74	8.97	11.1	4.20	.23	6.68
1955	87.0	6.23	11.0	26.9	8.15	22.9	8.11	3.96	17.5	1.32	.94	.55	16.4
1956	4.68	4.55	1.25	.69	29.7	11.6	8.86	32.5	.87	.15	.16	.04	7.85
1957	.03	.22	.21	.58	2.01	3.99	25.6	14.5	24.8	26.8	.97	.09	8.33
1958	.40	3.86	3.72	1.95	9.07	9.80	4.69	3.67	16.2	4.94	8.64	.26	5.56
1959	.28	.57	.34	.37	22.7	25.6	19.8	10.6	1.43	.65	.45	.01	6.78
1960	.39	.83	5.43	20.7	14.6	24.5	22.1	5.44	2.81	1.14	.06	0	8.14

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	0.62	1.48	-
1952	1.07	2.73	0.49	3.53	0.49	2.90	1.88	0.33	0.98	0.03	.05	.01	14.49
1953	0	.02	.07	.21	.45	1.79	1.19	1.64	1.68	.04	.08	0	7.17
1954	.002	.02	.08	.12	.26	2.10	2.70	.28	.89	1.13	.43	.02	8.03
1955	8.87	.61	1.12	2.75	.75	2.34	.80	.40	1.73	.13	.10	.05	19.65
1956	.48	.45	.13	.07	2.84	1.18	.87	3.31	.09	.02	.02	.004	9.46
1957	.003	.02	.02	.06	.18	.41	2.53	1.48	2.45	2.73	.10	.009	9.99
1958	.04	.38	.38	.20	.84	1.00	.46	.37	1.60	.50	.88	.03	6.68
1959	.03	.06	.03	.04	2.09	2.61	1.95	1.08	.14	.07	.05	.001	8.15
1960	.04	.08	.55	2.11	1.39	2.49	2.18	.55	.28	.12	.007	0	9.60

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	1237	505	Sept. 26, 1951	-	-	-	-	-	-
1952	1237	405	Nov. 13, 1951	0	12.0	1.06	14.49	8.55	10.29
1953	1278	550	June 10, 1953	0	5.98	.529	7.17	5.99	7.16
1954	1338	367	Mar. 25, 1954	0	6.68	.591	8.03	15.4	18.53
1955	1388	1,120	Oct. 10, 1954	0	16.4	1.45	19.65	8.42	10.11
1956	1438	510	May 12, 1956	0	7.85	.695	9.46	7.01	8.45
1957	1508	695	July 13, 1957	0	8.33	.737	9.99	8.96	10.75
1958	1558	227	Aug. 15, 1958	0	5.56	.492	6.68	4.99	6.00
1959	1628	455	Apr. 28, 1959	0	6.78	.800	8.15	7.25	8.70
1960	1708	395	Mar. 27, 1960	0	8.14	.720	9.60	-	-

5370. Chicago Sanitary and Ship Canal at Lockport, Ill.

Location.--Lat 41°34'11", long 88°04'42", in SW $\frac{1}{4}$ sec.27, T.36 N., R.10 E., at upper end of 9-foot navigation channel in Des Plaines River at Lockport.

Records available.--February 1900 to September 1960. Monthly discharge only prior to October 1936, published in WSP 1308.

Average discharge.--60 years (1900-60), 5,924 cfs.

Extremes.--1900-60: Maximum total discharge, 24,585 cfs Oct. 10, 1954; minimum total, 91 cfs Dec. 15, 1938.

Remarks.--Total mean daily discharge includes governmental and private pumpage, inflow from Des Plaines River basin, and diversion from Lake Michigan. This total is obtained by adding the mean daily discharges, based on half-hourly discharge readings at dams, sluice gates, lockages, exciter turbines in operation and main turbines in operation as corrected for variable efficiencies, and the leakage of lock gates, dams, sluice gates, and turbines not in operation.

Chicago pumpage includes water from Lake Michigan to supply Chicago metropolitan area, water from wells within the main-channel drainage area including pumpage to municipalities served by Chicago, and an average of about 188 cfs from agencies not served by Chicago.

Mean net diversion is obtained by deducting from total discharge the Chicago pumpage and inflow from Des Plaines River basin.

The Federal permit of June 26, 1930, issued by the Secretary of War, limits the diversion of water from Lake Michigan to an annual average of 1,500 cfs, exclusive of pumpage for municipal supplies. The U.S. Supreme Court on Dec. 17, 1956, authorized an increase in diversion from 1,500 cfs to an amount not exceeding 8,500 cfs through Jan. 31, 1957; on Jan. 28, 1957, the authorization was extended through Feb. 28, 1957.

Cooperation.--Records furnished by the Metropolitan Sanitary District of Greater Chicago.

Monthly and yearly mean discharge, in cubic feet per second (observed)

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	3,020	2,466	3,176	2,846	3,728	3,656	3,894	3,863	3,901	4,016	3,965	3,995	3,542
1952	3,326	3,319	2,309	3,624	2,519	4,079	3,732	3,321	4,275	4,203	4,158	3,468	3,530
1953	2,815	2,951	3,482	2,590	2,549	3,062	2,912	3,362	3,740	3,706	4,286	4,548	3,338
1954	2,856	3,123	3,320	2,968	2,776	3,236	3,922	3,393	3,667	4,233	4,212	3,338	3,425
1955	5,200	2,296	2,990	3,127	3,109	2,976	3,779	3,971	4,035	3,837	3,938	3,332	3,555
1956	3,013	2,996	3,618	2,948	3,032	2,948	3,915	3,954	3,778	4,016	4,221	3,386	3,488
1957	3,556	3,005	5,957	9,195	8,148	3,034	3,703	3,675	3,595	4,423	3,614	3,118	4,553
1958	3,272	3,281	3,587	3,035	3,555	3,067	3,484	3,580	3,887	3,848	3,669	3,273	3,480
1959	3,109	3,512	3,555	4,778	3,071	3,193	3,288	3,167	3,584	3,944	4,365	3,413	3,582
1960	3,325	3,267	3,806	3,820	3,160	3,288	3,950	3,621	3,460	3,348	3,273	3,466	3,482

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year				
		Momentary maximum		Minimum day	Mean	Mean inflow (a)	Mean pumpage	Mean net diversion	Mean	Mean inflow (a)	Mean pumpage	Mean net diversion
		Discharge	Date									
1951	1208	*17,003	May 10, 1951*	2,205	3,542	373	1,628	1,541	3,474	365	1,608	1,501
1952	1238	*13,795	Apr. 14, 1952	1,789	3,530	503	1,628	1,399	3,564	456	1,617	1,492
1953	1278	*13,638	June 10, 1953	2,306	3,338	141	1,670	1,526	3,565	423	1,638	1,505
1954	1338	20,485	Aug. 18, 1954	2,453	3,425	226	1,718	1,481	3,342	147	1,693	1,502
1955	1386	24,585	Oct. 10, 1954	1,932	3,555	311	1,740	1,504	3,528	315	1,709	1,503
1956	1438	19,078	Apr. 29, 1956	2,478	3,488	220	1,771	1,497	3,480	238	1,740	1,501
1957	1508	23,395	July 13, 1957	2,738	4,553	199	1,802	2,552	3,715	206	1,805	1,705
1958	1558	16,582	June 13, 1958	2,546	3,460	215	1,762	1,484	4,367	217	1,785	2,365
1959	1628	21,073	June 26, 1959	2,801	3,582	272	1,805	1,504	3,465	206	1,760	1,498
1960	1708	16,834	Jan. 12, 1960	2,789	3,482	216	1,770	1,497	3,600	310	1,803	1,487

* Revised.

a Mean inflow from Des Plaines River basin.

5375. Long Run near Lemont, Ill.

Location.--Lat 41°38'33", long 87°59'57", in SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.32, T.37 N., R.11 E., on left bank at downstream side of highway bridge, 2 miles south of Lemont and 5.4 miles upstream from mouth.

Drainage area.--20.8 sq mi.

Records available.--July 1951 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 637.10 ft above mean sea level, datum of 1929.

Average discharge.--9 years (1951-60), 15.6 cfs.

Extremes.--1951-60: Maximum discharge, 3,160 cfs Oct. 10, 1954 (gage height, 9.81 ft); no flow for several days in most years.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	13.2	5.70	24.1	-
1952	19.5	42.2	11.6	56.2	11.7	53.4	35.0	5.38	40.0	2.04	1.24	.42	23.2
1953	.33	.56	3.18	4.04	9.56	45.0	22.7	36.6	29.9	2.23	3.35	.10	13.1
1954	.17	.23	.65	1.46	5.58	43.1	47.2	6.86	13.5	14.0	9.71	.68	11.9
1955	163	9.68	11.6	35.6	31.6	34.5	15.4	15.2	56.5	2.18	3.22	.23	31.7
1956	11.8	9.22	3.69	1.01	25.8	10.3	10.6	37.9	1.60	.06	.23	.01	9.30
1957	.02	.11	.19	.26	4.44	6.89	36.7	21.3	23.6	66.0	3.69	.20	13.7
1958	.37	3.94	5.56	3.72	20.9	18.3	6.34	2.83	37.1	12.0	9.30	.43	9.96
1959	.62	.73	.21	.67	36.9	42.1	32.7	19.5	3.56	2.40	1.19	.07	11.5
1960	1.07	4.69	14.5	43.6	20.3	38.5	43.3	17.4	6.48	1.60	.13	.07	16.0

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	0.73	0.32	1.30	-
1952	1.08	2.26	0.64	3.11	0.61	2.96	1.88	0.30	2.15	.11	.07	.02	15.19
1953	.02	.03	.18	.22	.48	2.49	1.22	2.03	1.60	.12	.19	.005	8.58
1954	.009	.01	.04	.08	.28	2.39	2.53	.38	.72	.78	.54	.04	7.80
1955	9.04	.52	.64	1.97	1.58	1.91	.83	.84	3.03	.12	.18	.01	20.67
1956	.65	.49	.20	.06	1.34	.57	.57	2.10	.09	.003	.01	.0007	6.08
1957	.0009	.006	.01	.01	.22	.38	1.97	1.18	1.27	3.66	.20	.01	8.92
1958	.02	.21	.31	.21	1.05	1.01	.34	.16	1.99	.67	.52	.02	6.51
1959	.63	.04	.01	.04	1.65	2.33	1.75	1.08	.19	.13	.07	.004	7.52
1960	.06	.25	.80	2.41	1.05	2.13	2.32	.97	.35	.09	.007	.004	10.44

† Corrected.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	1238	390	Sept. 27, 1951	-	-	-	-	-	-
1952	1238,1338	1,000	June 13, 1952	0.1	23.2	1.12	15.19	17.5	11.44
1953	1278	495	June 10, 1953	0	13.1	.630	8.58	12.9	8.41
1954	1338	658	Mar. 25, 1954	.1	11.9	.572	7.80	27.5	17.94
1955	1388	3,160	Oct. 10, 1954	0	31.7	1.52	20.67	18.1	11.81
1956	1438	348	Feb. 24, 1956	0	9.30	.447	6.08	7.26	4.76
1957	1508	2,390	July 13, 1957	0	13.7	.659	8.92	14.5	9.44
1958	1558	358	June 13, 1958	0	9.96	.479	6.51	9.26	6.05
1959	1628	397	Apr. 28, 1959	0	11.5	.553	7.52	13.1	8.55
1960	1708	477	Jan. 12, 1960	0	16.0	.769	10.44	-	-

5390. Hickory Creek at Joliet, Ill.

Location.--Lat 41°31'10", long 88°04'10", in SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.15, T.35 N., R.10 E., on right bank at Third Avenue in Joliet, 0.25 mile downstream from Spring Creek and $1\frac{1}{4}$ miles upstream from mouth.

Drainage area.--107 sq mi.

Records available.--October 1944 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 537.00 ft above mean sea level, datum of 1929. Prior to Oct. 9, 1946, staff gage at same site and datum.

Average discharge.--16 years (1944-60), 80.9 cfs.

Extremes.--1944-60: Maximum discharge, 15,200 cfs July 13, 1957 (gage height, 12.77 ft), from rating curve extended above 6,300 cfs; minimum observed, 1.8 cfs Dec. 22-24, 1944.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	14.9	14.9	14.9	99.6	208	115	191	203	33.1	57.7	21.0	75.7	86.6
1952	61.3	208	43.8	243	56.6	230	157	38.6	193	23.0	11.3	7.82	106
1953	6.96	9.31	16.4	21.6	46.5	165	79.0	98.4	130	18.6	18.4	6.25	51.4
1954	5.86	8.32	11.6	14.2	30.8	203	243	39.7	50.4	91.6	32.5	11.6	61.9
1955	458	39.1	57.5	171	131	127	70.6	51.6	153	24.6	15.8	9.51	109
1956	32.9	27.7	16.5	11.3	127	61.4	74.3	184	22.3	7.76	7.13	5.05	47.9
1957	5.64	8.90	9.32	8.51	15.8	30.2	179	142	208	432	32.9	11.0	30.8
1958	14.3	45.5	54.5	35.6	79.1	75.0	40.6	39.1	227	56.3	122	14.0	66.5
1959	13.2	14.2	6.41	11.3	283	182	186	94.0	26.6	20.0	12.6	7.41	69.8
1960	13.3	40.5	64.9	163	127	187	155	62.0	71.9	22.0	26.1	9.94	78.4

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.16	0.16	0.16	1.07	2.02	1.24	1.99	2.19	0.35	0.62	0.23	0.79	10.98
1952	.66	2.17	.47	2.62	.57	2.48	1.63	.42	2.01	.25	.12	.08	13.48
1953	.07	.10	.18	.23	.45	1.78	.82	1.06	1.35	.20	.27	.07	6.51
1954	.06	.09	.12	.15	.30	2.19	2.53	.43	1.53	.99	.33	.12	7.86
1955	4.93	.41	.62	1.84	1.27	1.37	.74	.56	1.59	.27	.17	.10	13.87
1956	.35	.29	.18	.12	1.28	.66	.77	1.99	.23	.08	.03	.05	6.08
1957	.06	.09	.10	.09	.15	.33	1.87	1.53	2.17	4.66	.33	.11	11.51
1958	.15	.45	.59	.38	.77	.81	.42	.42	2.37	.61	1.32	.15	8.44
1959	.14	.15	.07	.12	2.75	1.97	1.94	1.01	.28	.22	.14	.08	8.87
1960	.14	.42	.70	1.76	1.28	2.02	1.61	.67	.75	.24	.23	.10	9.97

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	131	16.58
1951	1208	2,550	Feb. 19, 1951	3.8	86.6	0.809	10.98	109	13.80
1952	1238	3,580	June 13, 1952	6.0	106	.991	13.48	82.8	10.53
1953	1278	2,350	June 10, 1953	4.3	51.4	.480	6.51	50.8	6.43
1954	1338	3,150	Mar. 25, 1954	2.9	61.9	.579	7.86	107	13.55
1955	1388	8,130	Oct. 11, 1954	5.2	109	1.02	13.87	68.7	8.73
1956	1438	2,300	May 10, 1956	2.7	47.9	.448	6.08	43.4	5.51
1957	1508	15,200	July 13, 1957	3.2	90.8	.849	11.51	98.2	12.45
1958	1558	1,980	June 9, 1958	6.9	66.5	.621	8.44	59.9	7.61
1959	1628	2,870	Apr. 28, 1959	4.2	69.8	.652	8.87	77.0	9.77
1960	1708	1,980	Mar. 27, 1960	7.2	78.4	.733	9.97	-	-

5405. Du Page River at Troy, Ill.

Location.--Lat 41°31'20", long 88°11'35", in SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.10, T.35 N., R.9 E., on left bank at Troy, 400 ft upstream from U.S. Highway 52 and 3.8 miles downstream from Lilly Cache Creek.

Drainage area.--325 sq mi.

Records available.--October 1940 to September 1960.

Gage.--Water-stage recorder and masonry dam. Datum of gage is 564.62 ft above mean sea level, datum of 1929 (Illinois Division of Waterways bench mark). Prior to Apr. 11, 1941, staff gage at same site and datum.

Average discharge.--20 years (1940-60), 220 cfs.

Extremes.--1940-60: Maximum discharge, 12,000 cfs Oct. 11, 1954 (gage height, 11.06 ft); minimum, 0.2 cfs Nov. 17, 1955, result of freezeup.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	53.1	43.7	45.5	136	674	469	625	570	176	297	141	117	276
1952	166	332	208	466	255	721	548	177	247	91.6	70.6	44.4	277
1953	41.7	46.1	60.1	56.5	79.5	263	164	226	433	122	120	44.4	138
1954	30.0	34.8	42.4	30.8	63.6	335	559	211	389	183	161	67.4	175
1955	1,474	209	205	427	381	463	301	371	593	125	76.5	50.2	391
1956	99.3	77.1	84.4	45.9	190	114	114	448	79.0	45.8	40.4	30.9	114
1957	28.2	27.4	28.9	38.2	93.8	113	254	378	145	591	216	66.3	166
1958	67.8	157	150	112	215	346	156	99.5	566	304	79.1	48.5	191
1959	45.3	45.4	37.1	34.3	546	538	433	365	159	123	91.9	49.9	203
1960	110	233	321	724	295	440	742	370	228	179	75.7	51.6	314

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.19	0.15	0.16	0.48	2.16	1.66	2.15	2.02	0.61	1.05	0.50	0.40	11.53
1952	.59	1.14	.74	1.65	.85	2.56	1.88	.63	.85	.32	.25	.15	11.61
1953	.15	.16	.21	.20	.25	.93	.58	.80	1.49	.43	.42	.15	5.75
1954	.11	.12	.15	.11	.20	1.19	1.91	.75	1.34	.65	.57	.23	7.33
1955	5.23	.72	.73	1.52	1.22	1.64	1.03	1.32	2.04	.44	.27	.17	16.33
1956	.35	.26	.30	.16	.63	.40	.39	1.59	.27	.16	.14	.11	4.76
1957	.09	.09	.10	.14	.30	.40	.87	1.34	.50	2.10	.77	.23	6.93
1958	.24	.54	.53	.40	.69	1.23	.54	1.35	1.94	1.08	.28	.16	7.98
1959	.18	.16	.13	.12	1.75	1.91	1.49	1.29	.55	.44	.33	.17	8.50
1960	.39	.80	1.14	2.57	.98	1.56	2.55	1.31	.78	.63	.27	.18	13.18

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	302	12.62
1951	1208	4,230	Feb. 19, 1951	29	276	0.849	11.53	323	13.50
1952	1238	2,390	June 14, 1952	36	277	.852	11.61	251	9.66
1953	1278	5,100	June 10, 1953	31	138	.425	5.75	155	5.61
1954	1338	3,830	Mar. 25, 1954	16	175	.538	7.33	326	13.63
1955	1388	12,000	Oct. 11, 1954	40	391	1.20	16.33	253	10.56
1956	1438	1,880	May 11, 1956	25	114	.351	4.76	93.0	4.13
1957	1508	6,040	July 13, 1957	17	166	.511	6.93	190	7.96
1958	1558	2,880	June 13, 1958	36	191	.588	7.98	170	7.12
1959	1628	4,360	Apr. 28, 1959	30	203	.625	8.50	248	10.38
1960	1708	3,460	Jan. 13, 1960	43	314	.966	13.16	-	-

5420. Mazon River near Coal City, Ill.

Location.--Lat 41°17'10", long 88°21'35", in SW¹/₄SW¹/₄ sec.31, T.33 N., R.8 E., on right bank at downstream side of bridge on State Highway 113S, a quarter of a mile downstream from Johnny Run and 4 miles west of Coal City.

Drainage area.--470 sq mi.

Records available.--October 1939 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 527.41 ft above mean sea level, datum of 1929. Prior to Apr. 30, 1940, wire-weight gage at same site and datum.

Average discharge.--21 years (1939-60), 307 cfs.

Extremes.--1939-60: Maximum discharge, 17,600 cfs July 15, 1958 (gage height, 19.70 ft); no flow at times in most years.
Maximum stage known, about 21 ft Aug. 8, 1924.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	S-rt.	The year
1951	53.1	22.6	47.0	373	1,120	516	876	417	160	795	63.7	122	375
1952	166	641	213	874	284	803	982	347	753	81.0	25.1	5.47	422
1953	1.09	3.49	25.7	113	193	764	191	235	84.3	278	5.69	.17	158
1954	.27	.51	3.67	12.0	71.7	757	856	140	295	40.1	65.6	2.65	187
1955	91.3	24.4	64.7	396	359	379	541	145	153	15.0	2.39	1.83	180
1956	3.30	2.52	.63	.89	80.9	34.4	32.1	46.7	129	159	7.07	3.42	41.4
1957	0	.15	1.26	12.5	33.3	88.8	1,459	557	1,297	793	33.0	2.10	355
1958	29.7	179	297	161	270	242	99.3	52.9	1,290	1,551	98.5	5.39	357
1959	3.36	9.49	4.26	12.5	747	569	656	473	76.4	46.2	6.42	22.5	215
1960	242	341	464	578	725	678	726	243	1,018	78.7	91.6	4.88	430

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	S-rt.	The year
1951	0.13	0.05	0.12	0.92	2.48	1.26	2.08	1.02	0.38	1.95	0.16	0.29	10.84
1952	.41	1.52	.52	2.14	.65	1.97	2.09	.85	1.79	.20	.06	.01	12.21
1953	.003	.008	.06	.28	.43	1.87	.45	.58	.20	.68	.01	.0004	4.57
1954	.0007	.001	.009	.03	.16	1.86	2.03	.34	.70	.10	.16	.006	5.40
1955	.22	.06	.16	.97	.79	.93	1.29	.36	.36	.04	.006	.004	5.19
1956	.008	.006	.002	.002	.19	.08	.08	.11	.31	.39	.02	.008	1.21
1957	0	.0004	.003	.05	.07	.22	3.46	1.37	3.08	1.94	.08	.005	10.26
1958	.07	.42	.73	.39	.60	.59	.24	.13	3.06	3.80	.24	.01	10.28
1959	.008	.02	.01	.03	1.66	1.40	1.56	1.16	.18	.11	.02	.05	6.21
1960	.59	.81	1.14	1.42	1.66	1.66	1.72	.60	2.42	.19	.22	.01	12.44

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	540	15.60
1951	1208	11,100	Feb. 19, 1951	4.1	375	0.798	10.84	450	12.99
1952	1238	5,880	Nov. 14, 1951	.9	422	.898	12.21	340	9.85
1953	1278	5,180	Mar. 13, 1953	0	358	.336	4.57	156	4.51
1954	1338	10,300	Mar. 25, 1954	0	187	.398	5.40	202	5.83
1955	1588	3,760	Apr. 20, 1955	0	180	.383	5.19	165	4.77
1956	1438	2,070	July 16, 1956	0	41.4	.088	1.21	41.0	1.19
1957	1508	7,800	June 19, 1957	0	355	.755	10.26	398	11.48
1958	1558	17,600	July 15, 1958	.3	357	.760	10.28	316	9.10
1959	1628	8,200	Apr. 28, 1959	0	215	.457	6.21	301	8.71
1960	1708	5,800	June 14, 1960	.7	430	.915	12.44	-	-

5435. Illinois River at Marseilles, Ill.

Location.--Lat 41°19'40", long 88°43'10", in SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.13, T.33 N., R.4 E., or right bank 0.4 mile downstream from dam in Marseilles, 6.9 miles upstream from Fox River, and at mile 246.6.

Drainage area.--7,640 sq mi, approximately.

Records available.--October 1919 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 462.91 ft above mean sea level, datum of 1929. October 1919 to January 1935, chain and wire-weight gages at site at Morris, 16.6 miles upstream, at datum 478.5 ft above mean sea level, datum of 1929. January 1935 to September 1939, water-stage recorder at site 300 ft downstream from site used 1919-35 and at that datum.

Average discharge.--41 years (1919-60), 11,090 cfs.

Extremes.--1919-60: Maximum discharge, 93,900 cfs July 14, 1957 (gage height, 15.20 ft); minimum daily, 1,460 cfs Oct. 16, 1943.
A stage of 26.2 ft at Morris occurred in 1831, and a stage of 25.4 ft (ice jam) occurred at present site on Jan. 21, 1916.

Remarks.--Figures of daily discharge include flow through navigation locks. Flow regulated by powerplants and navigation dam above station. Since Jan. 17, 1900, flow has included diversion from Lake Michigan through Chicago Sanitary and Ship Canal.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	5,085	4,201	6,274	10,120	18,180	14,150	18,200	14,080	9,046	15,990	7,389	6,790	10,750
1952	7,333	13,690	8,203	16,410	10,600	16,250	16,910	10,810	16,180	7,486	6,499	5,097	11,270
1953	4,245	4,688	5,695	5,522	6,671	13,840	9,396	9,173	8,218	10,990	6,240	5,821	7,555
1954	4,029	4,464	4,857	4,578	5,558	10,630	16,420	9,218	9,811	8,476	6,812	5,073	7,493
1955	15,000	6,970	6,455	12,290	9,213	12,310	12,160	10,400	12,030	6,348	5,463	4,628	9,445
1956	5,313	5,298	5,495	4,431	8,647	8,140	7,429	15,830	8,593	6,410	5,705	4,514	7,150
1957	4,272	4,034	7,679	11,590	11,450	5,578	17,740	16,940	11,650	21,020	6,525	4,857	10,280
1958	5,666	6,268	11,270	8,737	7,671	10,530	7,738	6,211	20,510	13,450	7,981	4,982	9,419
1959	4,605	5,761	5,459	6,813	18,360	16,590	15,190	15,020	6,852	7,015	6,350	4,637	9,327
1960	7,247	9,876	10,480	13,810	14,910	11,000	19,760	10,340	12,850	6,919	5,503	4,953	10,600

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	13,000	-
1951	1208	51,900	Feb. 19, 1951	3,450	10,750	-	-	11,880	-
1952	1238	44,100	June 15, 1952	4,410	11,270	-	-	10,060	-
1953	1278	32,600	Mar. 15, 1953	3,720	7,555	-	-	7,447	-
1954	1338	44,700	Mar. 26, 1954	2,220	7,493	-	-	8,767	-
1955	1388	56,600	Oct. 12, 1954	4,120	9,445	-	-	8,403	-
1956	1438	30,900	Feb. 25, 1956	3,440	7,150	-	-	7,143	-
1957	1508	93,900	July 14, 1957	3,370	10,280	-	-	11,050	-
1958	1558	48,900	June 14, 1958	4,090	9,419	-	-	8,829	-
1959	1628	49,500	Apr. 29, 1959	3,720	9,327	-	-	10,320	-
1960	1708	42,300	Mar. 31, 1960	4,140	10,600	-	-	-	-

ILLINOIS RIVER BASIN

5465. Fox River at Wilmot, Wis.

Location.--Lat 42°30'40", long 88°10'45", in SW $\frac{1}{4}$ sec.30, T.1 N., R.20 E., near center of span on downstream side of highway bridge, 400 ft upstream from Wilmot Dam, 1 mile north of Wisconsin-Illinois State line, and 6 miles upstream from Fox chain of lakes.

Drainage area.--880 sq mi.

Records available.--October 1939 to September 1960.

Gage.--Wire-weight gage and concrete control. Datum of gage is 735.22 ft (corrected) above mean sea level, datum of 1929.

Average discharge.--21 years (1939-60), 450 cfs.

Extremes.--1939-60: Maximum discharge observed, 7,520 cfs Mar. 31, 1960 (gage height, 9.25 ft, from graph used on gage readings); no flow part of day Oct. 26, 1945; minimum daily discharge, 35 cfs Sept. 9, 1958.

Remarks.--Discharge is computed by weir and orifice formulas for flow through gates and added to flow over dam.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	176	150	190	212	645	2,078	1,589	1,087	659	328	285	200	633
1952	590	1,098	558	777	691	2,117	1,402	497	436	893	902	227	851
1953	177	254	430	290	834	908	550	651	379	140	259	112	413
1954	105	128	190	130	246	252	690	357	854	786	556	302	581
1955	796	415	365	716	400	829	694	470	776	170	148	106	491
1956	161	164	127	125	156	305	337	875	275	220	148	113	251
1957	79.5	118	125	133	290	326	476	558	581	155	157	153	262
1958	112	285	213	157	177	427	256	108	164	69.2	57.2	65.6	174
1959	99.2	226	106	98.8	139	1,575	1,266	610	161	163	268	133	405
1960	897	896	688	1,818	707	808	2,841	1,538	607	689	636	461	1,049

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.23	0.19	0.25	0.28	0.76	2.72	2.02	1.43	0.84	0.43	0.37	0.25	9.77
1952	.77	1.39	.73	1.02	.85	2.77	1.78	.65	.55	1.17	1.18	.29	13.15
1953	.23	.32	.56	.38	.99	1.19	.70	.85	.48	.18	.34	.14	6.36
1954	.14	.16	.25	.17	.29	.33	.87	.47	1.06	1.03	.73	.38	5.88
1955	1.04	.53	.48	.94	.47	1.09	.88	.62	.98	.22	.19	.13	7.57
1956	.21	.21	.17	.16	.19	.40	.43	1.15	.35	.29	.19	.14	3.89
1957	.10	.15	.16	.17	.34	.43	.60	.73	.74	.20	.21	.19	4.02
1958	.15	.36	.28	.21	.21	.56	.32	.14	.21	.09	.07	.08	2.68
1959	.13	.29	.14	.13	.16	2.08	1.61	.80	.20	.21	.35	.17	6.25
1960	1.18	1.14	.90	2.38	.87	1.06	3.60	2.02	.77	.90	.83	.59	16.24

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	472	7.28
1951	1208	3,660	Mar. 1, 1951	125	633	0.719	9.77	777	11.99
1952	1258	4,010	Mar. 20, 1952	193	851	.967	13.15	736	11.37
1953	1278	1,780	Feb. 24, 1953	78	413	.469	6.36	376	5.80
1954	1338	2,050	June 5, 1954	91	361	.433	5.88	478	7.38
1955	1388	1,810	June 13, 1955	77	491	.558	7.57	396	6.11
1956	1438	1,680	May 12, 1956	71	251	.285	3.89	241	3.71
1957	1508	1,350	June 15, 1957	63	262	.298	4.02	285	4.40
1958	1558	1,010	Feb. 28, 1958	35	174	.198	2.68	159	2.45
1959	1628	3,010	Mar. 21, 1959	49	405	.460	6.25	578	8.91
1960	1708	7,520	Mar. 31, 1960	133	1,049	1.19	16.24	-	-

5490. Boone Creek near McHenry, Ill.

Location.--Lat 42°19'15", long 88°18'45", in W½ sec. 4, T.44 N., R.8 E., on left bank at upstream side of county highway bridge, half a mile west of Clemens School, 2½ miles southwest of McHenry, and 4 miles upstream from mouth.

Drainage area.--15.3 sq mi.

Records available.--July 1948 to September 1960.

Gage.--Water-stage recorder and concrete control. Datum of gage is 769.63 ft above mean sea level, datum of 1929.

Average discharge.--12 years (1948-60), 11.0 cfs.

Extremes.--1948-60: Maximum discharge, 246 cfs Feb. 24, 1949 (gage height, 4.52 ft); minimum, 1.6 cfs Dec. 25, 1948 (gage height, 0.30 ft), result of freezeup.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	6.54	7.79	9.99	9.88	26.8	24.7	22.2	14.5	12.1	15.9	13.1	8.23	14.2
1952	11.2	16.4	10.7	18.1	13.5	29.4	21.7	12.9	16.3	14.0	11.6	8.10	15.3
1953	7.49	9.28	11.8	9.38	11.8	13.7	12.5	10.9	8.66	10.8	6.85	6.02	9.92
1954	6.10	6.26	8.02	6.28	10.1	10.2	18.4	10.6	13.5	11.3	8.31	6.86	9.65
1955	13.3	9.33	9.30	10.5	12.0	22.1	14.3	10.8	19.5	8.75	6.55	5.79	11.9
1956	7.47	7.54	7.44	5.51	7.08	8.15	12.1	11.7	6.79	4.59	5.19	4.33	7.32
1957	4.41	5.41	4.94	5.40	9.36	9.61	11.4	16.0	8.55	11.3	7.97	6.63	8.41
1958	6.33	9.93	8.26	8.01	9.05	12.4	9.89	6.54	7.48	6.53	4.92	4.22	7.78
1959	5.19	5.35	5.46	5.23	17.3	23.6	14.0	8.05	5.32	6.92	6.88	4.86	8.97
1960	11.7	12.8	14.2	21.5	15.0	21.3	30.1	24.6	17.0	14.4	9.27	8.18	16.7

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.49	0.57	0.75	0.74	1.83	1.86	1.62	1.09	0.88	1.20	0.98	0.60	12.61
1952	.85	1.19	.81	1.36	.95	2.21	1.58	.97	1.19	1.06	.87	.59	13.63
1953	.56	.68	.89	.71	.80	1.03	.91	.82	.63	.81	.52	.44	8.80
1954	.46	.46	.60	.47	.69	.77	1.34	.80	.99	.85	.63	.50	8.56
1955	1.00	.68	.70	.79	.81	1.67	1.05	.82	1.42	.66	.49	.42	10.51
1956	.56	.55	.56	.42	.50	.61	.88	.88	.50	.35	.39	.32	6.52
1957	.33	.39	.37	.41	.64	.72	.83	1.20	.82	.85	.60	.48	7.44
1958	.48	.72	.62	.60	.62	.93	.72	.49	.55	.49	.37	.31	6.90
1959	.39	.39	.41	.39	1.18	1.78	1.02	.61	.39	.52	.52	.35	7.95
1960	.88	.94	1.07	1.62	1.06	1.60	2.20	1.85	1.24	1.09	.70	.60	14.85

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches	
		Discharge	Date							
1950	-	-	-	-	-	-	-	-	-	-
1951	1208	118	July 9, 1951	5.9	14.2	0.928	12.61	12.9	11.49	
1952	1238	186	Mar. 11, 1952	7.3	15.3	1.00	13.63	14.5	13.65	
1953	1278	52	July 4, 1953	5.3	9.92	.648	8.80	9.23	8.19	
1954	1338	167	Apr. 25, 1954	5.5	9.65	.631	8.56	10.6	9.42	
1955	1388	187	Mar. 3, 1955	4.7	11.9	.778	10.51	11.1	9.80	
1956	1438	59	Feb. 24, 1956	3.6	7.32	.478	6.52	6.68	5.94	
1957	1508	90	July 30, 1957	4.1	8.41	.550	7.44	9.22	8.17	
1958	1558	34	Nov. 19, 1957	3.4	7.78	.508	6.90	7.07	6.27	
1959	1628	137	Feb. 23, 1959	4.3	8.97	.586	7.95	10.9	9.65	
1960	1708	149	Mar. 29, 1960	5.7	16.7	1.09	14.85	-	-	

5500. Fox River at Algonquin, Ill.

Location.--Lat 42°09'59", long 88°17'25", in NW $\frac{1}{4}$ sec.34, T.43 N., R.8 E., or right bank 20 ft upstream from Chicago Street Bridge at Algonquin and 400 ft upstream from Crystal Lake Outlet.

Drainage area.--1,364 sq mi.

Records available.--October 1915 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder and concrete dam. Datum of gage is 729.48 ft above mean sea level, datum of 1929. Prior to Oct. 20, 1933, staff gage at site 20 ft downstream at same datum.

Average discharge.--45 years (1915-60), 762 cfs.

Extremes.--1915-60: Maximum discharge, 6,610 cfs Apr. 6, 1960; maximum gage height, 4.50 ft Apr. 1, 1916, from graph based on gage readings; no flow for part of Nov. 26, 1952, Nov. 20, 1953, Oct. 25, 1956, and Sept. 9, 14, 1958, result of windstorms; minimum daily discharge, 12 cfs Aug. 30, 31, 1934, July 28, 1942.

Remarks.--Flow occasionally regulated by dam near McHenry, 16 miles above station, and occasionally affected by wind action on Fox chain of lakes.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	284	227	378	288	695	3,054	2,527	1,573	1,062	745	629	331	984
1952	746	1,789	1,198	1,447	1,553	2,772	2,689	772	1,049	1,201	1,188	354	1,395
1953	279	315	621	590	853	1,239	799	861	392	209	335	118	550
1954	151	147	311	215	388	411	989	821	1,249	1,247	746	493	597
1955	1,260	626	709	1,400	801	1,617	1,028	662	1,337	349	226	129	846
1956	288	335	322	211	274	360	650	1,241	373	267	229	166	394
1957	31.8	218	201	237	502	499	697	1,059	896	403	294	230	442
1958	178	553	419	450	309	941	535	212	288	171	90.5	67.4	351
1959	173	302	254	188	352	2,209	2,001	997	274	195	475	274	637
1960	1,248	1,533	1,044	2,675	1,484	921	4,538	2,607	1,043	1,082	744	425	1,610

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.24	0.19	0.32	0.24	0.53	2.58	2.07	1.33	0.87	0.63	0.53	0.27	9.80
1952	.63	1.46	1.01	1.22	1.23	2.34	2.20	.85	.86	1.01	1.00	.29	13.90
1953	.24	.26	.52	.50	.65	1.05	.65	.73	.32	.18	.28	.10	5.48
1954	.13	.12	.26	.18	.30	.35	.81	.69	1.02	1.05	.63	.40	5.94
1955	1.06	.51	.60	1.18	.61	1.37	.84	.56	1.09	.29	.19	.11	8.41
1956	.24	.27	.27	.18	.22	.30	.53	1.05	.31	.23	.19	.14	3.93
1957	.03	.18	.17	.20	.38	.42	.57	.89	.73	.34	.25	.23	4.39
1958	.15	.45	.35	.38	.24	.80	.44	.18	.24	.14	.08	.06	3.51
1959	.15	.25	.21	.16	.27	1.87	1.64	.84	.22	.17	.40	.17	6.35
1960	1.05	1.25	.88	2.26	1.17	.78	3.71	2.20	.85	.91	.63	.35	16.04

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	815	8.11
1951	1208	3,900	Mar. 7-9, 1951	192	994	0.721	9.80	1,222	12.15
1952	1238	4,400	Mar. 24, 25, 1952	286	1,395	1.02	13.90	1,185	11.82
1953	1278	1,870	Mar. 2, 1953	82	550	.403	5.48	499	4.97
1954	1338	2,400	Apr. 28, 29, 1954	32	597	.438	5.94	764	7.60
1955	1388	2,470	June 15, 1955	54	846	.620	8.41	707	7.02
1956	1438	1,770	May 15, 1956	38	394	.289	3.93	352	3.53
1957	1508	1,980	May 20, 1957	13	442	.324	4.39	500	4.96
1958	1558	1,260	Mar. 9, 1958	31	351	.257	3.51	316	3.17
1959	1628	3,340	Apr. 3, 1959	57	637	.467	6.35	897	8.92
1960	1708	6,610	Apr. 6, 1960	244	1,610	1.18	16.04	-	-

5505. Poplar Creek at Elgin, Ill.

Location.--Lat 42°01'35", long 88°15'20", in SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.19, T.41 N., R.9 E., on right bank just upstream from bridge on U.S. Highway 20 in Elgin, 2 miles upstream from mouth.

Drainage area.--35.8 sq mi.

Records available.--August 1951 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 716.00 ft above mean sea level, datum of 1929.

Average discharge.--9 years (1951-60), 18.5 cfs.

Extremes.--1951-60: Maximum discharge, 340 cfs Mar. 30, 1960; maximum gage height, 3.96 ft Feb. 23, 1959 (ice jam); no flow for part of July 10, 1957, Sept. 14, 1958.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	1.18	-
1952	8.05	33.3	17.9	67.7	28.7	91.8	57.6	10.2	25.1	12.7	3.19	1.28	29.8
1953	.79	1.29	5.45	3.10	8.71	25.0	19.4	16.7	29.0	3.42	1.36	.74	9.56
1954	.59	.25	.99	1.27	3.67	27.3	70.1	23.7	33.8	21.9	5.90	2.00	15.9
1955	53.8	9.29	13.2	40.5	41.9	46.8	23.4	15.0	47.1	5.58	1.59	.55	24.8
1956	1.80	1.42	1.60	1.14	9.83	4.76	16.0	49.4	4.08	1.48	.87	.25	7.74
1957	.50	.49	.60	1.04	7.72	11.4	22.3	56.6	13.4	47.3	9.37	2.76	14.6
1958	2.96	20.1	19.1	8.36	27.9	46.3	19.2	7.99	19.9	26.1	2.46	.30	16.7
1959	1.61	1.57	.98	.91	42.4	81.1	28.7	10.9	2.05	1.71	1.97	.66	14.4
1960	4.27	19.0	33.9	70.9	30.0	39.9	107	48.5	20.9	16.5	2.67	1.13	32.9

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	0.04	-
1952	0.26	1.04	0.58	2.18	0.87	2.96	1.79	0.33	0.78	0.41	0.10	.04	11.34
1953	.03	.04	.18	.10	.25	.81	.61	.54	.91	.11	.04	.02	3.64
1954	.02	.008	.03	.04	.11	.88	2.18	.76	1.05	.70	.19	.06	6.03
1955	1.73	.29	.43	1.30	1.22	1.51	.73	.48	1.47	.18	.05	.02	9.41
1956	.06	.04	.05	.04	.30	.15	.50	1.59	.13	.05	.03	.008	2.95
1957	.02	.02	.02	.03	.22	.37	.70	1.82	.42	1.52	.30	.09	5.53
1958	.10	.63	.61	.27	.91	1.49	.60	.28	.62	.84	.08	.009	6.32
1959	.05	.05	.03	.03	1.23	2.61	.89	.35	.06	.05	.06	.02	5.43
1960	.14	.59	1.09	2.28	.90	1.29	3.34	1.56	.65	.53	.09	.04	12.50

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	1238	23	Sept. 26, 1951	-	-	-	-	-	-
1952	1238, 1338	303	Mar. 11, 1952	0.5	29.8	0.832	11.34	25.5	9.71
1953	1278, 1338	282	June 10, 1953	.3	9.56	.267	3.64	9.08	3.45
1954	1338	310	Apr. 25, 1954	.2	15.9	.444	6.03	22.3	8.42
1955	1388	291	Oct. 10, 1954	.2	24.8	.693	9.41	18.8	7.11
1956	1438	175	May 10, 1956	.1	7.74	.216	2.95	7.47	2.86
1957	1508	286	July 13, 1957	.1	14.6	.408	5.53	18.0	6.81
1958	1558	210	Feb. 28, 1958	.1	16.7	.466	6.32	13.5	5.11
1959	1628	258	Feb. 23, 1959	.3	14.4	.402	5.43	18.8	7.12
1960	1708	340	Mar. 30, 1960	.7	32.9	.919	12.50	-	-

5525. Fox River at Dayton, Ill.

Location.--Lat 41°23'14", long 88°47'21", in SE $\frac{1}{4}$ sec.29, T.34 N., R.4 E., on right bank in tailwater of plant of North Counties Hydro-Electric Co. at Dayton, 5.6 miles upstream from mouth.

Drainage area.--2,570 sq mi, approximately.

Records available.--November 1914 to September 1960. Prior to April 1925, published as "at Wedron." Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 462.30 ft above mean sea level, datum of 1929. Prior to Apr. 13, 1925, chain gage at site 4 miles upstream at datum 496.80 ft above Memphis datum. Apr. 13, 1925, to Sept. 30, 1941, float-tape headwater gage and kilowatt-hour meters at datum 7.70 ft below mean sea level, datum of 1929. Oct. 1, 1941, to Sept. 30, 1942, float-tape tailwater gage at present site at datum 7.70 ft below mean sea level, datum of 1929. Oct. 1, 1942, to Apr. 10, 1951, float-tape tailwater gage read hourly at present site and datum.

Average discharge.--45 years (1915-60), 1,498 cfs (discharge for site at Weirton adjusted for difference in drainage area).

Extremes.--1914-60: Maximum discharge, 47,100 cfs Oct. 11, 1954 (gage height, 24.63 ft), from rating curve extended above 15,000 cfs on basis of computation of peak flow over dam; maximum gage height, 36.47 ft Jan. 25, 1960 (ice jam); minimum daily discharge, 1 cfs Aug. 29, 1934, when wheels were shut down; minimum daily with plant operating, 78 cfs Oct. 29, 1956.

Remarks.--Low flow regulated by powerplant above station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	489	438	539	665	2,865	4,507	4,379	3,511	1,839	2,665	1,449	918	2,018
1952	1,419	3,351	2,022	3,237	2,709	5,274	4,873	1,508	2,537	1,673	1,818	577	2,563
1953	515	580	1,001	968	1,450	2,337	1,570	1,858	1,319	599	595	263	1,087
1954	283	329	550	462	765	1,552	2,468	1,664	3,162	2,225	1,600	812	1,323
1955	5,239	1,514	1,480	3,104	3,382	3,355	2,534	1,497	2,568	845	575	292	2,194
1956	725	683	663	439	1,063	887	1,174	2,660	690	505	455	308	855
1957	141	344	381	570	1,045	966	1,855	2,410	1,515	1,093	695	475	956
1958	380	266	865	859	1,145	2,180	1,383	549	2,031	1,721	425	241	1,068
1959	373	598	492	389	2,986	4,194	3,500	2,033	704	500	771	382	1,398
1960	1,733	2,377	2,041	4,941	2,786	2,641	7,442	4,303	2,016	1,698	1,456	781	2,848

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.22	0.19	0.24	0.31	1.16	2.02	1.90	1.58	0.80	1.20	0.65	0.40	10.67
1952	.64	1.45	.91	1.45	1.14	2.37	2.12	.68	1.10	.75	.73	.25	13.59
1953	.23	.25	.45	.43	.59	1.05	.68	.85	.57	.27	.27	.11	5.73
1954	.13	.14	.25	.21	.31	.70	1.07	.75	1.37	1.00	.72	.35	7.00
1955	2.35	.66	.66	1.39	1.37	1.50	1.10	.67	1.11	.38	.26	.13	11.58
1956	.33	.30	.30	.20	.45	.40	.51	1.19	.30	.23	.20	.13	4.54
1957	.06	.15	.17	.26	.42	.43	.81	1.08	.66	.49	.31	.21	5.05
1958	.17	.42	.38	.39	.45	.96	.60	.29	.68	.77	.22	.10	5.63
1959	.17	.26	.22	.17	1.21	1.68	1.92	.91	.31	.22	.35	.17	7.39
1960	.78	1.03	.92	2.22	1.17	1.18	3.23	1.93	.88	.76	.65	.34	15.09

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum			Minimum day	Mean	Per square mile	Runoff in inches	Mean
		Discharge		Date					
1950	-	-	-	-	-	-	-	-	-
1951	1208	14,000	July 9, 1951	216	2,018	0.785	10.67	2,424	9.64
1952	1238	10,500	June 14, 1952	470	2,563	.997	13.59	2,173	11.52
1953	1278	6,130	June 11, 1953	168	1,087	.423	5.73	1,008	5.32
1954	1338	11,000	June 4, 1954	168	1,323	.515	7.00	1,921	10.15
1955	1388	47,100	Oct. 11, 1954	166	2,194	.854	11.58	1,673	8.84
1956	1438	5,790	May 12, 1956	152	855	.333	4.54	753	3.99
1957	1508	5,450	July 13, 1957	44	956	.372	5.05	1,067	5.64
1958	1558	10,200	June 14, 1958	120	1,068	.416	5.63	1,006	5.31
1959	1628	11,200	Apr. 28, 1959	200	1,398	.544	7.39	1,792	9.47
1960	1708	16,300	Mar. 31, Apr. 18	435	2,848	1.11	15.09	-	-

5540. North Fork Vermilion River near Charlotte, Ill.

Location.--Lat 40°50'08", long 88°17'58", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.4, T.27 N., R.8 E., on right bank at downstream side of Foreman highway bridge, half a mile downstream from Illinois Central Railroad bridge, 1 $\frac{1}{4}$ miles northwest of Charlotte, 5 $\frac{1}{2}$ miles north of Chatsworth, and 15 miles upstream from confluence with South Fork.

Drainage area.--184 sq mi.

Records available.--October 1942 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 638.00 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark). Prior to Jan. 14, 1943, wire-weight gage and Jan. 14, 1943, to Sept. 30, 1954, water-stage recorder, at same site at datum 2.00 ft higher.

Average discharge.--18 years (1942-60), 126 cfs.

Extremes.--1942-60: Maximum discharge, 4,350 cfs Apr. 26, 1957 (gage height, 14.70 ft); maximum gage height, 17.01 ft, present datum, July 10, 1951; no flow for many days in several years.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	18.6	7.97	24.0	105	510	228	327	136	209	776	99.3	38.1	205
1952	30.8	222	63.9	241	95.7	226	396	177	302	23.3	13.6	1.45	149
1953	.47	.80	3.50	28.9	75.5	304	140	60.6	40.6	263	15.9	.87	78.2
1954	.30	.76	.82	6.54	22.4	115	254	107	109	6.37	5.74	.50	52.2
1955	45.5	6.04	23.6	218	131	157	99.0	70.0	48.4	14.8	1.27	.16	67.7
1956	5.28	3.31	3.11	2.27	31.8	29.9	108	129	197	109	12.4	2.77	52.7
1957	.30	1.54	1.38	3.15	12.9	13.5	1,058	305	131	184	15.4	2.52	142
1958	13.0	68.0	133	85.5	55.9	78.6	73.2	60.5	747	429	21.3	1.42	147
1959	2.61	7.41	1.43	5.17	378	238	302	180	25.2	6.69	5.22	3.73	94.1
1960	28.4	41.9	112	144	286	237	232	96.0	202	22.9	10.7	2.89	117

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.12	0.05	0.15	0.66	2.89	1.43	1.99	0.85	1.27	4.86	0.62	0.23	15.12
1952	.19	1.34	.40	1.51	.56	1.41	2.40	1.11	1.83	.15	.08	.009	10.99
1953	.003	.005	.02	.18	.43	1.91	.85	.38	.28	1.65	.10	.005	5.78
1954	.002	.005	.005	.04	.13	.72	1.54	.67	.66	.04	.04	.003	3.86
1955	.28	.04	.15	1.36	.74	.99	.60	.44	.29	.09	.008	.0009	4.99
1956	.03	.02	.02	.01	.19	.19	.66	.81	1.20	.68	.08	.02	3.91
1957	.002	.009	.009	.02	.07	.08	6.42	1.91	.79	1.03	.08	.02	10.44
1958	.08	.41	.83	.54	.31	1.49	.44	1.38	4.53	2.69	1.13	.009	10.84
1959	.02	.04	.009	.03	2.14	1.49	1.83	1.13	1.15	.04	.03	.02	6.93
1960	.18	.25	.70	.90	1.67	1.49	1.41	.60	1.22	.14	.07	.02	8.65

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	209	15.46
1951	1208	2,180	July 10, 1951	2.3	205	1.11	15.12	227	16.73
1952	1258	1,050	Apr. 24, 1952	.4	149	.810	10.99	123	9.09
1953	1278	978	Mar. 15, 1953	.1	78.2	.425	5.78	78.0	5.77
1954	1338	680	May 29, 1954	.1	52.2	.284	3.86	58.4	4.31
1955	1388	1,150	Jan. 6, 1955	0	67.7	.368	4.99	62.3	4.59
1956	1458	2,540	Apr. 29, 1956	.7	52.7	.286	3.91	52.0	3.86
1957	1508	4,350	Apr. 26, 1957	.2	142	.772	10.44	159	11.74
1958	1558	4,150	June 13, 1958	.4	147	.799	10.84	133	9.59
1959	1628	2,940	Apr. 27, 1959	0	94.1	.511	6.93	109	8.00
1960	1708	2,160	Feb. 10, 1960	.1	117	.636	8.65	-	-

ILLINOIS RIVER BASIN

5545. Vermilion River at Pontiac, Ill.

Location.--Lat 40°52'40", long 88°38'10", in SW¼ sec.22, T.28 N., R.5 E., rear center of span on downstream side of Vermilion Street Bridge in Pontiac, 0.1 mile upstream from Gulf, Mobile and Ohio Railroad bridge and State Highway 116, three-quarters of a mile upstream from Turtle Creek, and 1½ miles downstream from Wabash Railroad bridge.

Drainage area.--568 sq mi.

Records available.--October 1942 to September 1960.

Gage.--Wire-weight gage. Datum of gage is 619.45 ft above mean sea level, datum of 1929.

Average discharge.--18 years (1942-60), 369 cfs.

Extremes.--1942-60: Maximum discharge, 13,600 cfs July 10, 1951 (gage height, 17.90 ft, from graph based on gage readings); no flow Oct. 13, 14, 1953.
Maximum stage known 1911-42, 17.0 ft in May 1933 (discharge, about 11,000 cfs).

Remarks.--An average of 1.4 cfs, diverted half a mile above station for water supply of city of Pontiac, is not included in records.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	34.8	21.7	60.1	275	1,401	607	954	493	572	2,468	304	177	609
1952	110	554	160	624	294	744	1,295	568	1,145	116	34.3	9.45	471
1953	2.82	7.50	18.6	70.2	165	795	473	175	129	712	29.4	1.81	216
1954	.36	1.46	4.58	10.8	55.7	318	913	333	332	22.5	20.7	1.96	167
1955	66.0	14.9	36.4	547	368	408	510	329	261	109	16.9	5.50	222
1956	15.7	13.5	9.25	6.95	131	106	186	305	398	233	34.1	5.77	120
1957	1.04	4.11	5.90	13.9	51.3	67.7	2,938	1,008	484	734	55.2	9.01	447
1958	45.9	235	466	261	156	218	230	141	1,715	1,174	258	22.6	409
1959	12.7	40.6	21.6	37.9	982	695	777	882	103	26.5	10.5	10.8	261
1960	79.0	128	314	433	740	664	755	248	840	142	47.8	12.2	364

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.07	0.04	0.12	0.56	2.57	1.23	1.87	1.00	1.12	5.01	0.62	0.35	14.56
1952	.22	1.09	.33	1.27	.56	1.51	2.54	1.19	2.25	.24	.07	.02	11.29
1953	.006	.01	.04	.14	.30	1.61	.93	.36	.25	1.45	.06	.004	5.16
1954	.0007	.003	.009	.02	.10	.64	1.79	.68	.65	.05	.04	.004	5.99
1955	.13	.03	.07	1.11	.68	.93	1.00	.67	.51	.22	.03	.01	5.29
1956	.03	.03	.02	.01	.25	.22	.37	.62	.78	.47	.07	.01	2.88
1957	.002	.006	.01	.03	.09	.14	5.77	2.05	.95	1.49	.11	.02	10.67
1958	.09	.46	.95	.53	.29	.44	.41	.29	3.37	2.38	.52	.04	9.77
1959	.03	.08	.04	.08	1.80	1.41	1.53	.98	.20	.05	.02	.02	6.24
1960	.16	.25	.64	.88	1.41	1.35	1.46	.50	1.65	.29	.10	.02	8.73

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	576	13.76
1951	1208	13,600	July 10, 1951	8.4	609	1.07	14.56	576	15.97
1952	1238	3,570	Apr. 25, 1952	3.4	471	.829	11.29	405	9.71
1953	1278	2,470	July 8, 1953	.2	216	.380	5.16	214	5.12
1954	1338	2,110	Apr. 13, 1954	0	167	.294	3.99	177	4.20
1955	1388	2,770	Jan. 7, 1955	.2	222	.391	5.29	215	5.14
1956	1438	4,000	Apr. 30, 1956	2.8	120	.211	2.88	118	2.82
1957	1508	12,000	Apr. 28, 1957	.5	447	.787	10.67	506	12.15
1958	1556	6,670	July 15, 1958	6.3	409	.720	9.77	353	6.42
1959	1628	5,820	Apr. 28, 1959	.6	261	.460	6.24	299	7.14
1960	1708	4,840	Mar. 30, 1960	3.0	364	.641	8.73	-	-

5555. Vermilion River at Lowell, Ill.

Location.--Lat 41°15'19", long 89°00'44", in NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.8, T.32 N., R.2 E., near center of span on downstream side of bridge on State Highway 178, 0.2 mile north of Lovell and 10 miles upstream from mouth.

Drainage area.--1,230 sq mi, approximately.

Records available.--May 1931 to September 1960.

Gage.--Wire-weight gage. Datum of gage is 500.61 ft above mean sea level, datum of 1929. Prior to Aug. 20, 1952, chain or wire-weight gage at site 500 ft downstream at same datum.

Average discharge.--29 years (1931-60), 753 cfs.

Extremes.--1931-60: Maximum discharge, 33,500 cfs July 15, 1958 (gage height, 15.30 ft, from graph based on gage readings); minimum, 5.9 cfs Aug. 2-4, 1934. Maximum stage known, about 16 ft (former site) during ice jam, date unknown.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	79.2	53.3	203	834	2,982	1,373	2,412	1,233	1,226	4,394	698	704	1,339
1952	541	1,541	509	1,447	729	2,062	2,910	1,170	2,575	340	78.5	26.8	1,156
1953	14.4	29.3	58.8	194	348	1,394	866	643	291	1,018	46.1	11.0	411
1954	8.82	9.12	15.3	104	227	941	1,775	735	1,192	109	172	26.3	441
1955	241	88.0	156	974	769	833	1,385	788	723	204	49.5	30.7	518
1956	48.7	44.2	25.0	18.0	393	213	158	513	579	375	63.3	18.5	203
1957	10.5	9.23	10.7	36.7	149	152	4,110	2,123	1,350	1,185	115	28.9	772
1958	104	317	634	461	534	504	474	359	2,408	3,660	887	89.8	873
1959	46.3	95.2	57.8	124	2,148	1,263	1,686	1,204	382	99.6	32.4	40.6	586
1960	277	393	726	1,075	1,409	1,786	1,819	828	1,752	395	137	41.6	883

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.07	0.05	0.19	0.78	2.52	1.29	2.19	1.16	1.11	4.12	0.65	0.64	14.77
1952	.51	1.40	.48	1.36	.64	1.93	2.64	1.10	2.34	.32	.07	.02	12.81
1953	.01	.03	.06	.18	.29	1.31	.79	.60	.26	.95	.04	.01	4.53
1954	.008	.008	.01	.10	.19	.88	1.61	.69	1.08	.10	.16	.02	4.86
1955	.23	.08	.15	.91	.65	.78	1.26	.74	.66	.19	.05	.03	5.73
1956	.05	.04	.02	.34	.20	.14	.48	.53	.35	.06	.02	.02	2.25
1957	.01	.008	.01	.03	.13	.14	3.73	1.99	1.22	1.11	.11	.03	8.52
1958	.10	.29	.59	.43	.45	.47	.43	.34	2.18	3.43	.83	.08	9.62
1959	.04	.09	.05	.12	1.82	1.18	1.53	1.13	.35	.09	.03	.04	6.47
1960	.26	.36	.68	1.01	1.24	1.67	1.65	.78	1.59	.37	.13	.04	9.78

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches	
		Discharge	Date							
1950	-	-	-	-	-	-	-	1,319	14.56	
1951	1208	27,700	July 10, 1951	32	1,339	1.09	14.77	1,526	16.85	
1952	1238	12,100	Apr. 13, 1952	12	1,156	.940	12.81	950	10.52	
1953	1278	5,540	July 6, 1953	7.5	411	.334	4.53	405	4.46	
1954	1338	9,000	Mar. 25, 1954	7.0	441	.359	4.86	479	5.29	
1955	1388	7,450	Apr. 21, 1955	14	518	.421	5.73	487	5.38	
1956	1438	4,040	Apr. 30, 1956	11	203	.165	2.25	196	2.17	
1957	1508	15,100	Apr. 30, 1957	6.0	772	.628	8.52	858	9.47	
1958	1558	33,500	July 15, 1958	16	875	.710	9.62	801	8.82	
1959	1628	15,500	Apr. 28, 1959	10	586	.476	6.47	687	7.59	
1960	1708	19,100	Mar. 30, 1960	22	883	.718	9.78	-	-	

5565. Bureau Creek at Princeton, Ill.

Location.--Lat 41°21'55", long 89°29'55", in SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.18, T.16 N., R.9 E., on right bank 500 ft downstream from bridge on U.S. Highways 6 and 34, 0.6 mile downstream from Eperson Run, and $1\frac{1}{2}$ miles west of Princeton.

Drainage area.--186 sq mi.

Records available.--March 1936 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 555.24 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to July 18, 1940, wire-weight gage at bridge 400 ft upstream at datum 30.00 ft lower. July 18, 1940, to Sept. 30, 1944, water-stage recorder at site 500 ft upstream at present datum.

Average discharge.--24 years (1936-60), 122 cfs.

Extremes.--1936-60: Maximum discharge, 11,800 cfs Jan. 24, 1938 (gage height, 15.88 ft, from graph based on gage readings); no flow during January 1940 and for several days in October and November 1953.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	3.78	2.82	3.43	51.0	489	95.5	196	397	179	509	238	72.9	185
1952	80.5	238	101	351	138	513	328	101	221	71.2	14.8	2.71	180
1953	3.20	2.64	8.81	5.50	102	101	61.5	125	48.4	59.6	17.8	2.57	44.5
1954	.92	.37	2.22	4.02	39.8	85.6	216	70.7	283	38.7	146	27.0	75.9
1955	422	128	144	292	359	201	204	105	281	71.5	56.9	4.97	188
1956	47.6	34.3	27.2	10.3	†90.7	29.6	56.1	134	48.3	91.4	45.6	2.67	51.4
1957	6.41	3.85	2.83	17.1	110	262	110	244	71.4	28.2	14.5	2.28	72.0
1958	6.37	12.0	40.7	40.5	126	150	91.5	49.1	278	443	102	11.9	113
1959	8.02	9.49	2.63	2.21	431	266	162	130	38.1	15.5	13.3	3.31	87.7
1960	43.5	115	154	430	123	436	612	350	244	67.5	42.2	9.89	219

† Corrected.

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.02	0.02	0.02	0.32	2.74	0.59	1.18	2.46	1.07	3.16	1.47	0.44	13.49
1952	.50	1.43	.62	2.17	.80	3.18	1.97	.63	1.33	.44	.09	.02	13.18
1953	.02	.02	.05	.03	.57	.62	.37	.77	.29	.37	.11	.02	3.24
1954	.006	.002	.01	.02	.22	.53	1.30	.44	1.70	.24	.90	.16	5.53
1955	2.61	.77	.89	1.81	2.01	1.25	1.22	.65	1.69	.44	.35	.03	13.72
1956	.30	.21	.17	.06	.53	.18	.34	.83	.29	.57	.28	.02	3.78
1957	.04	.02	.02	.11	.60	.68	1.57	1.51	.43	.17	.09	.01	5.25
1958	.04	.07	.25	.25	.70	.93	.55	.30	1.67	2.74	.63	.07	8.20
1959	.05	.06	.02	.01	2.41	1.65	.97	.80	.23	.10	.08	.02	6.40
1960	.27	.69	.95	2.67	.71	2.70	3.67	2.17	1.46	.42	.26	.06	16.03

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	147	10.76
1951	1208	5,870	July 9, 1951	2.2	185	0.995	13.49	219	15.98
1952	1238	2,590	Mar. 11, 1952	.9	180	.968	13.18	146	10.72
1953	1278	2,110	July 6, 1953	.6	44.5	.239	3.24	43.6	3.17
1954	1338	2,180	June 1, 1954	0	75.9	.408	5.53	134	9.78
1955	1388	5,410	Oct. 11, 1954	1.4	188	1.01	13.72	139	10.13
1956	1438	2,200	July 20, 1956	1.2	51.4	.276	3.78	43.3	3.18
1957	1508	1,350	Apr. 27, 1957	1.2	72.0	.387	5.25	75.8	5.53
1958	1558	3,220	June 13, 1958	1.7	113	.608	8.20	109	7.97
1959	1628	a2,300	Feb. 23, 1959	.9	87.7	.472	6.40	112	8.18
1960	1708	6,120	Mar. 31, 1960	4.4	219	1.18	16.03	-	-

a About.

5570. West Bureau Creek at Wyanet, Ill.

Location.--Lat 41°21'54", long 89°34'08", at northeast corner of sec.21, T.16 N., R.8 E., on left bank at upstream side of bridge on U.S. Highways 6 and 34, half a mile east of Wyanet.

Drainage area.--83.3 sq mi.

Records available.--March 1936 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 573.14 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Oct. 1, 1937, wire-weight gage at same site at datum 30.00 ft lower. Oct. 1, 1937, to Feb. 20, 1939, wire-weight gage at present site and datum.

Average discharge.--24 years (1936-60), 46.3 cfs.

Extremes.--1936-60: Maximum discharge, 6,620 cfs July 8, 1951 (gage height, 12.48 ft), from rating curve extended above 3,900 cfs; maximum gage height, 12.90 ft Jan. 24, 1938; no flow at times in many years.
Maximum stage known, 14.5 ft Oct. 11, 1931.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1.23	1.06	0.94	27.0	165	20.4	70.9	156	134	256	107	38.4	81.1
1952	33.6	94.6	56.6	166	66.4	179	110	46.9	143	50.4	5.38	.41	79.4
1953	.46	1.35	4.86	3.42	42.1	35.9	28.5	44.6	30.1	34.2	3.65	.56	19.0
1954	.10	.40	1.18	1.35	7.60	26.3	86.0	33.0	90.6	15.9	31.2	14.6	25.6
1955	123	58.5	78.7	138	151	93.7	109	66.0	146	15.0	2.55	1.47	81.2
1956	14.4	4.05	2.51	1.35	45.2	7.39	29.5	23.5	7.57	12.2	6.00	.13	12.7
1957	0	.03	.20	7.03	29.9	19.4	57.6	27.5	13.2	3.42	.60	.10	13.0
1958	.64	2.02	4.45	4.30	62.6	37.3	19.8	9.32	63.2	47.4	37.3	8.43	24.4
1959	2.25	2.06	.42	.40	113	65.1	57.9	57.4	13.1	5.02	2.17	.95	26.1
1960	6.85	13.0	33.0	120	40.1	139	229	126	116	26.2	54.9	10.5	76.3

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.02	0.01	0.01	0.37	2.07	0.28	0.95	2.15	1.80	3.54	1.49	0.51	13.20
1952	.47	1.27	.78	2.30	.86	2.48	1.48	.65	1.92	.70	.07	.005	12.98
1953	.006	.02	.07	.05	.53	.50	1.38	.62	.40	.47	.05	.007	3.10
1954	.001	.005	.02	.02	.10	.36	1.15	.46	1.21	.22	.43	.20	4.18
1955	1.70	.78	1.09	1.91	1.89	1.30	1.45	.91	1.95	.21	.04	.02	13.25
1956	.20	.05	.03	.02	.58	.10	.39	.32	.10	.17	.08	.003	2.04
1957	0	.0004	.03	.10	.37	.26	.77	.35	.18	.05	.008	.001	2.12
1958	.009	.03	.06	.06	.78	.52	.27	.13	.85	.66	.52	.11	4.00
1959	.03	.03	.006	.005	1.42	.90	.78	.79	.18	.07	.03	.01	4.25
1960	.09	.17	.46	1.67	.52	1.93	3.06	1.75	1.56	.36	.76	.14	12.47

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year			
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches		
		Discharge	Date								
1950	-	-	-	-	-	-	-	-	-	57.7	9.39
1951	1208	6,620	July 8, 1951	0.6	81.1	0.974	13.20	96.3	15.68		
1952	1238	3,450	June 13, 1952	.1	79.4	.953	12.98	64.6	10.56		
1953	1278	1,340	July 6, 1953	0	19.0	.228	3.10	16.6	3.03		
1954	1358	1,640	June 1, 1954	0	25.6	.307	4.18	47.4	7.72		
1955	1388	2,870	Oct. 10, 1954	0	81.2	.975	13.25	61.1	9.96		
1956	1438	1,190	Apr. 27, 1956	0	12.7	.152	2.04	10.9	1.77		
1957	1508	1,340	Feb. 9, 1957	0	13.0	.156	2.12	13.6	2.22		
1958	1558	1,670	June 13, 1958	0	24.4	.293	4.00	24.2	3.97		
1959	1628	1,430	Feb. 23, 1959	0	26.1	.313	4.25	33.1	4.90		
1960	1708	2,920	Mar. 29, 1960	.1	76.3	.916	12.47	-	-		

5575. East Bureau Creek near Bureau, Ill.

Location.--Lat 41°20'06", long 89°22'53", in SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.30, T.16 N., R.10 E., on left bank at downstream side of highway bridge, half a mile downstream from Brush Creek, 2 $\frac{1}{2}$ miles upstream from mouth, and 3 $\frac{1}{2}$ miles north of Bureau.

Drainage area.--101 sq mi.

Records available.--March 1936 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 484.45 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Oct. 1, 1939, wire-weight gage at same site at datum 30.00 ft lower. Oct. 1, 1939, to Apr. 9, 1941, wire-weight gage at present site and datum.

Average discharge.--24 years (1936-60), 50.2 cfs.

Extremes.--1936-60: Maximum discharge, 6,200 cfs Jan. 24, 1938 (gage height, 17.39 ft), from rating curve extended above 2,300 cfs; no flow for several days in most years.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1.11	0.28	0.62	35.8	226	47.2	93.5	154	63.8	134	39.1	10.6	66.2
1952	16.8	100	34.3	192	63.5	203	134	54.4	158	22.2	3.73	1.01	61.8
1953	.06	.48	3.44	1.72	30.9	24.5	16.4	23.9	8.19	53.5	5.87	0	14.0
1954	0	0	4.44	1.15	9.32	139	102	45.6	209	6.77	22.6	2.98	44.9
1955	†66.2	29.5	52.0	124	188	80.0	107	45.7	138	16.7	3.33	.21	70.0
1956	12.1	3.68	3.99	1.60	51.5	5.43	31.7	38.8	14.2	29.6	18.7	1.13	17.4
1957	0	.12	0	17.0	35.1	32.5	126	98.8	43.9	17.4	2.12	1.67	31.1
1958	1.39	5.23	9.85	7.66	106	59.5	34.5	12.7	65.6	223	15.4	9.02	45.5
1959	.28	.40	.08	.76	155	87.8	59.9	57.9	23.6	13.0	3.14	.65	32.7
1960	10.2	25.8	50.2	144	47.0	257	265	145	115	27.1	14.5	3.00	92.1

† Corrected.

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.01	0.003	0.007	0.41	2.33	0.54	1.03	1.75	0.70	1.53	0.45	0.12	8.88
1952	.19	1.11	.39	2.19	.68	2.32	1.48	.62	1.74	.25	.04	.01	11.02
1953	.0007	.0005	.04	.02	.32	.26	.18	.27	.09	.61	.07	0	1.89
1954	0	0	.005	.01	.10	1.59	1.13	.52	2.31	.08	.26	.03	6.04
1955	.76	.33	.59	1.41	1.94	.91	1.18	.52	1.52	.19	.04	.002	9.39
1956	.14	.04	.05	.02	.55	.06	.35	.44	.16	.34	.19	.01	2.35
1957	0	.001	0	.19	.36	.37	1.39	1.13	.48	.20	.02	.02	4.16
1958	.02	.08	.11	.09	1.09	.68	.36	.14	.72	2.54	.16	.10	6.11
1959	.003	.004	.0009	.009	1.60	1.00	.66	.66	.26	.15	.04	.007	4.39
1960	.12	.29	.57	1.65	.50	2.93	2.92	1.66	1.27	.31	.17	.03	12.42

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year			
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches	
		Discharge	Date							
1950	-	-	-	-	-	-	-	79.0	10.62	
1951	1208	4,740	July 8, 1951	0	66.2	0.655	8.88	78.4	10.55	
1952	1238	4,290	June 12, 1952	0	81.8	.810	11.02	69.6	9.38	
1953	1278	3,340	July 5, 1953	0	14.0	.139	1.89	13.7	1.64	
1954	1338	4,830	Mar. 25, 1954	0	44.9	.445	6.04	57.3	7.71	
1955	1388	1,720	Feb. 27, 1955	0	70.0	.693	9.39	59.2	7.94	
1956	1438	1,020	Feb. 24, 1956	0	17.4	.172	2.35	15.7	2.12	
1957	1508	845	Jan. 22, 1957	0	31.1	.308	4.16	32.4	4.35	
1958	1558	1,910	July 14, 1958	0	45.5	.450	6.11	44.1	5.93	
1959	1628	a950	Feb. 23, 1959	0	32.7	.324	4.39	39.9	5.37	
1960	1708	4,230	Mar. 30, 1960	.3	92.1	.912	12.42	-	-	

a About.

5580. Bureau Creek at Bureau, Ill.

Location.--Lat 41°16'40", long 89°23'00", in SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.18, T.15 N., R.10 E., on downstream side of bridge on State Highway 29, 1 mile southwest of Bureau and 2 $\frac{1}{4}$ miles downstream from East Bureau Creek.

Drainage area.--481 sq mi.

Records available.--October 1940 to September 1951.

Gage.--Wire-weight and crest-stage gages. Datum of gage is 449.22 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark).

Average discharge.--11 years (1940-51), 341 cfs.

Extremes.--1940-51: Maximum discharge, 18,000 cfs July 9, 1951 (gage height, 13.00 ft); maximum gage height, 13.10 ft Feb. 19, 1951 (backwater from ice); minimum discharge observed, 23 cfs Feb. 8-15, Oct. 31, Nov. 1, 1948.
A stage of about 13 ft occurred sometime in spring of 1921.

Remarks.--Records include leakage from Illinois and Mississippi Canal above gage.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	47.3	49.9	37.5	165	1,844	272	552	878	459	1,053	564	212	502

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.11	0.12	0.09	0.40	3.99	0.65	1.28	2.10	1.06	2.52	1.35	0.49	14.16

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	335	9.45
1951	1208	18,000	July 9, 1951	25	502	1.04	14.16	-	-

5585. Crow Creek (West) near Henry, Ill.

Location.--Lat 41°09'00", long 89°25'00", in SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.36, T.14 N., R.9 E., on right bank at downstream side of bridge No. 7, 2 miles upstream from Sugar Grove Creek, 2.4 miles west of State Highway 29, and 3.6 miles northwest of Henry.

Drainage area.--55.3 sq mi.

Records available.--May 1949 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 520.61 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark).

Average discharge.--11 years (1949-60), 35.0 cfs.

Extremes.--1949-60: Maximum discharge, 2,680 cfs May 26, 1960 (gage height, 8.34 ft), from rating curve extended above 1,000 cfs by logarithmic plotting; maximum gage height, 9.04 ft July 9, 1951; no flow Jan. 12, 1954, and for many days in 1956-59.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1.42	1.68	1.29	36.5	129	28.8	105	72.7	31.3	135	53.6	34.2	52.0
1952	32.5	78.0	36.1	110	42.2	168	99.7	43.1	105	18.9	33.4	4.88	64.3
1953	1.83	3.79	12.0	10.1	27.7	45.2	43.0	45.6	32.8	24.5	.79	.37	20.6
1954	.54	.23	.73	2.88	8.86	60.3	64.3	27.7	84.2	3.43	3.97	.31	23.0
1955	18.5	8.79	12.9	60.2	88.5	44.5	109	55.3	174	11.9	1.56	.56	48.2
1956	3.84	1.60	.75	.38	33.3	4.20	5.40	9.49	3.42	14.0	1.52	.04	6.39
1957	.10	.22	.11	6.37	6.19	8.35	104	47.9	36.9	26.1	5.43	1.23	20.2
1958	3.39	11.9	18.7	14.8	72.5	44.4	29.1	17.7	101	30.3	9.26	1.57	29.1
1959	1.72	1.64	.16	1.24	101	36.8	29.1	31.3	13.9	8.33	1.43	1.06	18.4
1960	22.8	27.2	30.8	61.8	40.6	115	158	202	101	28.6	22.4	7.67	68.2

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.03	0.03	0.03	0.76	2.42	0.60	2.11	1.52	0.63	2.82	1.12	0.69	12.76
1952	.68	1.57	.75	2.29	.82	3.51	2.01	.90	2.11	.39	.70	.10	15.83
1953	.04	.08	.25	.21	.52	.94	.87	.95	.66	.51	.02	.007	5.06
1954	.01	.005	.02	.06	.17	1.26	1.70	.58	1.70	.07	.08	.006	5.66
1955	.39	.18	.27	1.25	1.67	.93	2.20	1.15	3.51	.25	.03	.01	11.84
1956	.08	.03	.02	.008	.65	.09	.11	.20	.07	.29	.03	.0007	1.58
1957	.002	.004	.002	.13	.12	.17	2.11	1.00	.74	.54	.11	.02	4.95
1958	.07	.24	.39	.31	1.37	.93	.59	.37	2.03	.63	.19	.03	7.15
1959	.04	.03	.003	.03	1.90	.77	.59	.65	.28	.17	.03	.02	4.51
1960	.48	.55	.64	1.29	.79	2.40	3.18	4.20	2.03	.60	.47	.15	16.78

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	34.0	8.34
1951	1208	2,650	July 9, 1951	0.3	52.0	0.940	12.76	63.8	15.67
1952	1278	1,640	June 14, 1952	1.2	64.3	1.16	15.83	53.6	13.20
1953	1278	1,520	June 13, 1953	.2	20.6	.373	5.06	19.2	4.72
1954	1338	2,400	Mar. 25, 1954	0	23.0	.416	5.66	26.3	6.47
1955	1398	2,300	June 11, 1955	.2	48.2	.872	11.84	45.3	11.13
1956	1438	1,400	Feb. 24, 1956	0	6.39	.116	1.58	5.91	1.46
1957	1508	565	June 12, 1957	0	20.2	.365	4.95	23.0	5.64
1958	1558	1,570	June 10, 1958	.6	29.1	.526	7.15	26.5	6.52
1959	1628	850	Feb. 14, 1959	0	18.4	.333	4.51	24.9	6.11
1960	1708	2,680	May 26, 1960	.6	68.2	1.23	16.78	-	-

a About.

5590. Gimlet Creek at Sparland, Ill.

Location.--Lat 41°01'35", long 89°26'20", in SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.14, T.12 N., R.9 E., on left bank 120 ft upstream from bridge on State Highway 29 and 200 ft upstream from Rock Island Railroad bridge in Sparland.

Drainage area.--5.42 sq mi.

Records available.--October 1945 to September 1947, October 1949 to September 1960.

Gage.--Water-stage recorder. Concrete control since Oct. 1, 1949. Datum of gage is 454.55 ft above mean sea level, datum of 1929. Prior to June 21, 1946, wire-weight gage at site 120 ft downstream at same datum.

Average discharge.--13 years (1945-47, 1949-60), 3.86 cfs.

Extremes.--1945-47, 1949-60: Maximum discharge, 2,650 cfs July 2, 1958 (gage height, 8.45 ft), from rating curve extended above 220 cfs on basis of slope-area measurement at gage height 4.99 ft and logarithmic plotting; no flow at times each year. Maximum stage known, about 10 ft on Aug. 20, 1924 (from information by local resident).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.93	0.12	0.08	7.19	32.3	5.16	10.0	3.67	1.61	10.2	3.48	4.15	6.39
1952	2.68	4.22	3.57	12.5	4.43	19.4	10.8	3.68	20.7	2.17	4.59	1.43	7.51
1953	.09	.71	1.56	.76	2.08	5.97	7.19	4.51	1.86	4.23	.03	0	2.42
1954	.01	0	.01	.05	.70	6.06	6.83	1.76	14.9	.97	1.78	.003	2.74
1955	4.82	.36	.53	5.30	27.9	5.15	9.86	4.25	13.4	.46	.12	.18	5.85
1956	.26	.10	.11	0	4.50	.28	.21	.20	0	.65	.04	0	.51
1957	0	.05	0	1.05	.05	.23	6.13	3.34	2.50	5.02	.02	.09	1.55
1958	.34	.60	2.23	.83	7.06	2.69	2.36	1.67	18.3	17.3	1.96	.93	4.66
1959	.25	.14	.12	.45	8.77	6.90	7.40	3.19	.63	.55	.003	.93	2.39
1960	2.43	2.24	3.39	5.59	4.00	12.2	8.77	11.9	6.24	2.45	4.08	1.27	5.39

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.20	0.03	0.02	1.53	6.20	1.10	2.06	0.78	0.33	2.16	0.74	0.85	16.00
1952	.57	.87	.76	2.66	.88	4.12	2.21	.78	4.27	.46	.98	.29	18.85
1953	.02	.15	.33	.16	.40	1.27	1.48	.96	.38	.90	.005	0	6.06
1954	.001	0	.001	.01	.14	1.29	1.41	.37	3.06	.21	.38	.0007	6.87
1955	1.03	.07	.11	1.13	5.35	1.10	2.03	.91	2.75	.10	.03	.04	14.65
1956	.06	.02	.02	0	.90	.06	.04	.04	0	.14	.008	0	1.29
1957	0	.01	0	.22	.01	.05	1.26	.71	.51	1.07	.005	.02	3.86
1958	.07	.12	.47	.18	1.36	.57	.49	.36	3.77	3.67	.42	.19	11.67
1959	.05	.03	.03	.10	1.68	1.47	1.52	.68	.13	.12	.0007	.19	6.00
1960	.52	.46	.72	1.19	.80	2.59	1.80	2.52	1.28	.52	.87	.26	13.53

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	4.55	11.40
1951	1208	1,290	July 8, 1951	0	6.39	1.18	16.00	7.17	17.95
1952	1238	1,950	Aug. 20, 1952	0	7.51	1.39	18.85	6.83	17.15
1953	1278	650	July 5, 1953	0	2.42	.446	6.06	2.22	5.56
1954	1338	1,070	June 1, 1954	0	2.74	.506	6.87	3.22	8.08
1955	1388	1,220	June 11, 1955	0	5.85	1.08	14.65	5.40	13.54
1956	1438	390	Feb. 24, 1956	0	.51	.094	1.29	.48	1.20
1957	1508	895	July 22, 1957	0	1.55	.286	3.86	1.81	4.52
1958	1558	2,650	July 2, 1958	0	4.66	.860	11.67	4.43	11.12
1959	1628	216	Apr. 26, 1959	0	2.39	.441	6.00	3.03	7.59
1960	1708	495	Mar. 30, 1960	0	5.39	.994	13.53	-	-

5595. Crow Creek near Washburn, Ill.

Location.--Lat 40°57'15", long 89°18'30", in SW $\frac{1}{4}$ sec.23, T.29 N., R.2 W., on left bank at downstream side of highway bridge, 200 ft downstream from Atchison, Topeka and Santa Fe Railway bridge, 2.0 miles downstream from unnamed tributary, and 2 $\frac{1}{2}$ miles northwest of Washburn.

Drainage area.--123 sq mi.

Records available.--October 1944 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 557.70 ft above mean sea level, datum of 1929. Prior to July 2, 1945, chain gage at same site and datum.

Average discharge.--16 years (1944-60), 60.2 cfs.

Extremes.--1944-60: Maximum discharge, 5,750 cfs May 28, 1954 (gage height, 11.85 ft), from rating curve extended above 2,100 cfs; no flow for several days in most years.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	6.81	3.11	6.84	119	296	104	213	88.8	54.7	246	32.5	71.8	102
1952	92.5	131	75.1	196	87.6	173	211	89.5	264	33.2	12.8	5.51	114
1953	.93	2.85	11.1	28.1	32.6	78.7	82.1	69.9	73.6	62.6	2.59	.05	37.1
1954	.01	0	.15	1.81	5.48	64.6	122	197	236	12.1	15.8	.74	54.7
1955	13.7	17.5	30.9	90.7	91.1	80.9	162	74.7	125	13.7	2.24	.31	58.1
1956	2.51	2.49	1.21	.79	16.7	3.89	3.01	4.35	.61	23.2	.38	0	4.90
1957	0	0	0	.98	.26	2.00	132	191	133	46.0	3.87	.59	42.6
1958	7.89	16.4	29.1	28.7	80.5	58.5	78.6	32.7	207	181	63.6	10.3	66.0
1959	3.26	4.34	2.55	3.89	186	109	113	110	40.1	10.7	.20	3.15	47.8
1960	17.5	17.3	38.5	78.3	72.8	174	174	108	164	38.2	12.3	1.25	74.6

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.06	0.03	0.06	1.11	2.51	0.97	1.93	0.83	0.50	2.31	0.30	0.65	11.26
1952	.87	1.19	.70	1.83	.77	1.63	1.92	.84	2.40	.31	.12	.05	12.63
1953	.009	.03	.10	.26	.28	.74	.74	.66	.67	.59	.02	.0005	4.10
1954	.00009	0	.001	.02	.05	.61	1.11	1.84	2.14	.11	.15	.007	6.04
1955	.13	.16	.29	.85	.77	.76	1.47	.70	1.13	.13	.02	.003	6.41
1956	.02	.02	.01	.007	.15	.04	.03	.04	.006	.22	.004	0	.55
1957	0	0	0	.009	.002	.02	1.20	1.79	1.21	.43	.04	.005	4.71
1958	.07	.15	.27	.27	.68	.55	.71	.31	1.88	1.69	.60	.09	7.27
1959	.03	.04	.02	.04	1.57	1.02	1.03	1.03	.36	.10	.002	.03	5.27
1960	.16	.16	.36	.73	.64	1.63	1.58	1.01	1.49	.36	.12	.01	8.25

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	103	11.35
1951	1208	4,850	July 9, 1951	2.0	102	0.829	11.26	126	13.87
1952	1238	1,950	Apr. 13, 1952	.8	114	.927	12.63	90.4	10.01
1953	1278	1,450	June 13, 1953	0	37.1	.302	4.10	35.9	3.96
1954	1358	5,750	May 28, 1954	0	54.7	.445	6.04	59.9	6.62
1955	1398	1,650	Apr. 20, 1955	.1	58.1	.472	6.41	53.4	5.88
1956	1438	700	July 8, 1956	0	4.90	.040	.55	4.38	.50
1957	1508	2,180	June 28, 1957	0	42.6	3.46	4.71	47.1	5.20
1958	1558	2,360	June 13, 1958	.2	66.0	.537	7.27	62.3	6.87
1959	1628	1,350	Feb. 10, 1959	0	47.8	.389	5.27	53.1	5.86
1960	1708	3,570	Mar. 30, 1960	.1	74.6	.607	8.25	-	-

5605. Farm Creek at Farmdale, Ill.

Location--Lat 40°39'55", long 89°30'15", in NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.36, T.26 N., R.4 W., on left bank 200 ft downstream from highway bridge, 0.2 mile southeast of Farmdale, 0.2 mile upstream from Lake Erie & Western Railroad bridge, and 0.3 mile downstream from Toledo, Peoria & Western Railroad bridge.

Drainage area--27.6 sq mi.

Records available--October 1948 to September 1960.

Gage--Water-stage recorder. Datum of gage is 530.12 ft above mean sea level, datum of 1929.

Average discharge--12 years (1948-60), 14.7 cfs.

Extremes--1948-60: Maximum gage height, 7.58 ft Apr. 24, 1950 (discharge not determined); no flow for several days in most years.

Remarks--High flow regulated by Farmdale Dam, 1 mile upstream, beginning in September 1950.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1.83	1.51	0.42	42.4	85.7	35.0	60.0	44.2	17.7	18.9	3.58	2.93	25.8
1952	1.81	14.1	10.4	32.4	19.2	55.6	65.7	26.3	51.6	5.08	5.96	1.11	23.2
1953	.33	.93	1.76	6.18	6.37	24.3	28.1	12.5	10.7	22.9	1.54	.25	9.59
1954	.46	.47	.70	.99	3.95	14.3	43.1	30.5	37.3	7.83	27.7	1.68	14.1
1955	3.39	4.36	6.94	22.8	48.3	26.0	35.7	24.3	27.3	2.72	1.24	1.94	16.8
1956	1.51	1.26	1.05	.80	8.01	1.39	4.57	2.37	.34	1.05	2.00	.23	2.02
1957	.08	.80	.82	.84	1.97	2.32	21.2	61.5	7.67	8.51	.87	.40	8.97
1958	3.67	2.80	9.22	8.65	31.3	11.7	18.1	5.78	47.4	22.5	15.7	1.63	14.6
1959	.90	1.66	2.16	2.21	27.9	21.7	29.6	27.6	6.91	1.15	1.30	2.36	10.3
1960	2.48	2.80	4.11	8.13	16.3	42.3	50.4	30.6	36.7	6.76	3.42	1.93	17.1

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.08	0.06	0.02	1.77	3.23	1.46	2.43	1.85	0.73	0.79	0.15	0.12	12.67
1952	.08	.57	.44	1.35	.75	2.32	2.25	1.10	2.09	.21	.25	.05	11.46
1953	.01	.04	.07	.26	.24	1.01	1.14	.52	.43	.96	.02	.01	4.71
1954	.02	.02	.03	.04	.15	.60	1.74	1.27	1.51	.33	1.16	.07	6.94
1955	.14	.18	.29	.95	1.82	1.08	1.44	1.01	1.11	.11	.05	.08	8.26
1956	.06	.05	.04	.03	.31	.06	.18	.10	.01	.04	.08	.009	.97
1957	.003	.02	.03	.04	.07	.10	.86	2.57	.31	.36	.04	.02	4.42
1958	.15	.11	.38	.36	1.18	.49	.73	.24	1.92	.94	.57	.07	7.14
1959	.04	.07	.09	.09	1.05	.91	1.20	1.15	1.28	.05	.05	.10	5.08
1960	.10	.11	.17	.34	.64	1.77	2.04	1.28	1.48	.28	.14	.08	8.43

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	1208	900	Jan. 2, 1951	0	25.8	0.935	12.67	26.7	13.14
1952	1258	435	June 14, 1952	0	23.2	.841	11.46	21.3	10.49
1953	1278	419	July 6, 1953	0	9.59	.347	4.71	9.47	4.66
1954	1338	520	Aug. 25, 1954	0	14.1	.511	6.94	15.2	7.48
1955	1388	522	Feb. 19, 1955	0	16.8	.609	8.26	15.9	7.80
1956	1438	324	Feb. 24, 1956	0	2.02	.073	.97	1.83	.87
1957	1508	800	May 19, 1957	0	8.97	.325	4.42	10.2	5.01
1958	1558	500	June 13, 1958	0	14.6	.529	7.14	13.6	6.70
1959	1628	482	May 19, 1959	0	10.3	.373	5.08	10.7	5.26
1960	1708	518	Apr. 17, 1960	.5	17.1	.620	8.43	-	-

5610. Ackerman Creek at Farmdale, Ill.

Location.--Lat 40°39'43", long 89°30'13", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.36, T.26 N., R.4 W., on right bank at upstream side of New York, Chicago and St. Louis Railroad bridge, 0.3 mile upstream from mouth and 0.45 mile southeast of Farmdale.

Drainage area.--11.8 sq mi.

Records available.--December 1953 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 527.22 ft above mean sea level, datum of 1929.

Average discharge.--6 years (1954-60), 3.51 cfs.

Extremes.--1953-60: Maximum discharge, 1,110 cfs May 28, 1954 (gage height, 8.81 ft), from rating curve extended above 210 cfs by logarithmic plotting; no flow for many days each year.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	-	-	0.04	0.20	0.58	3.39	17.2	4.85	11.8	0.82	11.0	0.03	-
1955	0.33	0.81	2.14	14.0	19.7	9.38	11.6	4.42	4.03	.003	.003	.02	5.42
1956	.24	.02	.01	0	.64	.25	2.66	1.47	.08	0	0	0	.44
1957	0	0	0	1.02	.81	1.80	18.4	28.9	1.38	2.34	.68	0	4.65
1958	1.42	1.67	4.60	2.80	6.02	3.22	6.63	1.83	10.1	5.43	.83	0	3.68
1959	0	.17	0	.07	10.6	6.76	3.56	1.12	.02	0	0	.003	1.80
1960	.30	0	1.41	2.08	5.17	16.3	18.1	6.01	10.1	1.21	.45	.11	5.08

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	-	-	0.004	0.02	0.05	0.33	1.63	0.47	1.11	0.08	1.07	0.003	-
1955	0.03	0.08	.21	1.36	1.73	.92	1.09	.43	.38	.0003	.0003	.002	6.23
1956	.02	.002	.001	0	.06	.02	.25	.14	.008	0	0	0	.50
1957	0	0	0	.10	.07	.18	1.74	2.82	.13	.23	.07	0	5.34
1958	.14	.16	.45	.27	.53	.31	.65	.18	.95	.53	.08	0	4.25
1959	0	.02	0	.007	.94	.66	.34	.11	.002	0	0	.0003	2.08
1960	.03	0	.14	.20	.47	1.59	1.71	.59	.95	.12	.04	.01	5.85

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-
1954	1338	1,110	May 28, 1954	-	-	-	-	4.43	5.08
1955	1388	530	Jan. 5, 1955	0	5.42	0.459	6.23	5.17	5.94
1956	1438	111	Apr. 29, 1956	0	.44	.037	.50	.42	.48
1957	1508	880	July 17, 1957	0	4.63	.392	5.34	5.28	6.09
1958	1558	380	June 12, 1958	0	3.68	.312	4.23	3.05	3.50
1959	1628	102	Mar. 5, 1959	0	1.80	.153	2.08	1.93	2.23
1960	1708	158	Mar. 30, 1960	0	5.08	.431	5.85	-	-

5615. Fondulac Creek near East Peoria, Ill.

Location.--Lat 40°40'38", long 89°31'52", on line between SW $\frac{1}{4}$ and SE $\frac{1}{4}$ sec.26, T.26 N., R.4 W., on left bank at upstream side of bridge on U.S. Highway 24, 0.2 mile upstream from New York, Chicago and St. Louis Railroad bridge, 0.4 mile upstream from mouth, and 3 miles northeast of East Peoria.

Drainage area.--5.47 sq mi.

Records available.--January 1948 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 505.00 ft above mean sea level (Corps of Engineers bench mark). Prior to Aug. 5, 1948, wire-weight gage at same site and datum.

Average discharge.--12 years (1948-60), 3.33 cfs.

Extremes.--1948-60: Maximum discharge, 496 cfs July 25, 1948 (gage height, 3.83 ft), from rating curve extended above 160 cfs; no flow for many days each year.

Remarks.--High flow regulated by Fondulac Dam, 0.5 mile upstream.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.01	0.03	0.04	3.67	29.6	4.41	10.0	1.59	0.89	3.52	0.05	0.11	4.30
1952	0.53	3.39	1.03	6.52	1.04	9.56	12.2	4.67	15.7	21	1.76	0.58	4.57
1953	0	0.36	.85	0.71	.53	5.36	3.81	1.68	1.83	6.84	0.003	0	1.80
1954	0	0	.003	0	.19	2.29	8.12	4.98	5.03	1.19	8.18	.01	2.51
1955	.40	.29	.37	4.88	13.3	3.91	10.8	4.57	5.14	.29	2.52	1.92	3.95
1956	.87	.02	.01	0	.98	.05	1.31	1.43	.02	.79	.08	0	.46
1957	0	.06	.01	.46	.07	.52	5.39	32.4	1.13	4.46	.03	.003	3.76
1958	1.14	.57	2.06	.05	5.75	1.29	3.69	1.81	16.6	15.3	3.41	.01	4.29
1959	.01	.03	0	.03	5.02	3.77	7.64	12.8	.12	.003	1.10	.98	2.61
1960	.72	0	.31	.93	5.86	14.0	15.5	10.7	8.48	.36	1.34	.02	4.83

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.002	0.006	0.009	0.77	5.63	0.93	2.04	0.33	0.18	0.74	0.01	0.02	10.67
1952	.11	.69	.22	1.37	.20	1.97	2.50	.98	2.79	.04	.37	.12	11.36
1953	0	.07	.07	0.15	.10	1.13	.78	1.35	1.37	1.44	1.0007	0	4.46
1954	0	0	.0007	0	.04	.48	1.66	1.05	1.03	.25	1.72	.003	6.23
1955	.08	.06	.08	1.03	2.53	.82	2.20	.96	1.05	.06	.53	.39	9.79
1956	.18	.003	.002	0	.19	.01	.27	.30	.003	.17	.02	0	1.15
1957	0	.01	.002	.10	.01	.11	1.10	6.83	.23	.94	.007	.0007	9.34
1958	.24	.12	.43	.01	1.09	.27	.75	3.38	3.39	3.23	.72	.002	10.63
1959	.001	.006	0	.006	.96	.79	1.56	2.69	.03	.0007	.23	.20	6.47
1960	.15	0	.06	.20	1.16	2.94	3.16	2.26	1.73	.08	.28	.004	12.02

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	5.18	12.84
1951	1208	-	-	-	-	-	-	4.71	11.67
1952	1238	279	Feb. 11, 1951	0	4.30	0.786	10.67	4.71	11.67
1953	1252	176	June 13, 1952	0	4.57	.835	11.36	4.71	11.67
1954	1278	272	July 5, 1953	0	1.80	.329	4.46	1.75	4.52
1954	1358	259	Aug. 25, 1954	0	2.51	.459	6.23	2.60	6.45
1955	1388	230	Feb. 19, 1955	0	3.95	.722	9.79	3.94	9.76
1956	1438	190	Apr. 29, 1956	0	.46	.084	1.15	.39	.98
1957	1508	308	May 18, 1957	0	3.76	.687	9.34	4.08	10.12
1958	1558	328	July 31, 1958	0	4.29	.784	10.63	3.97	9.85
1959	1628	390	May 18, 1959	0	2.61	.477	6.47	2.69	6.68
1960	1708	318	May 25, 1960	0	4.83	.883	12.02	-	-

ILLINOIS RIVER BASIN

5620. Farm Creek at East Peoria, Ill.

Location--Lat 40°40'04", long 89°34'40", in SW $\frac{1}{4}$ sec.33, T.26 N., R.4 W., on left bank 30 ft upstream from Main Street Bridge in East Peoria, 300 ft downstream from Coal Creek, 400 ft upstream from Peoria and Pekin Union Railway bridge, 1,200 ft upstream from entrance to Farm Creek diversion channel, and 1.3 miles upstream from mouth.

Drainage area--60.9 sq mi.

Records available--May 1943 to September 1960.

Gage--Water-stage recorder. Datum of gage is 450.39 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark). Prior to July 31, 1945, wire-weight gage at site 400 ft downstream at same datum. July 31, 1945, to Sept. 2, 1948, wire-weight gage at site 30 ft downstream at same datum.

Average discharge--17 years (1943-60), 37.5 cfs.

Extremes--1943-60: Maximum discharge, 22,000 cfs Apr. 29, 1947 (gage height, 15.00 ft), from rating curve extended above 4,200 cfs on basis of velocity-area studies and slope-area measurement of peak flow; no flow for many days in most years.

A stage of about 15.6 ft, present site, occurred in 1927, from information by Corps of Engineers.

Remarks--High flow regulated by Farmdale and Fondulac Dams beginning in September 1950.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2.87	4.68	5.83	69.0	149	71.0	158	53.4	61.4	69.9	14.6	10.6	55.1
1952	4.85	158	18.6	72.8	43.0	95.7	110	47.8	144	18.6	17.7	4.76	60.9
1953	3.11	2.61	1.36	5.20	5.72	74.7	82.8	40.9	22.9	86.8	4.95	1.62	27.9
1954	3.48	1.52	1.90	2.67	6.46	29.2	94.0	38.6	73.6	17.7	54.9	3.82	27.3
1955	7.50	7.36	10.4	60.2	110	51.9	64.8	37.1	43.2	4.39	6.75	9.07	33.8
1956	6.86	3.22	2.85	2.07	38.3	1.09	9.69	5.98	6.46	12.1	19.9	1.35	9.02
1957	1.26	5.18	2.34	3.32	6.28	7.48	78.7	141	14.6	29.6	5.24	1.22	24.8
1958	16.7	6.84	21.6	7.96	57.5	14.3	35.2	13.8	95.9	26.8	20.3	7.96	26.9
1959	3.54	4.96	4.66	4.89	55.9	58.9	73.8	58.7	13.7	4.33	7.13	9.42	24.7
1960	9.10	4.17	7.09	18.2	30.7	96.7	104	77.1	57.2	9.06	7.20	1.75	35.1

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.05	0.09	0.11	1.31	2.55	1.34	2.90	1.01	1.12	1.32	0.28	0.19	12.27
1952	.09	2.90	.35	1.38	.76	1.81	2.01	.90	2.63	.35	.33	.09	13.60
1953	.06	.05	.03	.10	.10	1.41	1.52	.77	.42	1.84	.03	.03	6.22
1954	.07	.03	.04	.05	.11	.55	1.72	.73	1.35	.34	1.04	.07	6.10
1955	.14	.13	.20	1.14	1.88	.98	1.19	.70	.79	.08	.11	.17	7.53
1956	.13	.06	.05	.04	.67	.02	.18	.11	.12	.23	.36	.02	2.01
1957	.02	.09	.04	.06	.11	.14	1.44	2.66	.27	.56	.17	.02	5.51
1958	.32	.16	.41	.15	.99	.27	.64	.26	1.76	.51	.36	.15	6.00
1959	.07	.09	.09	.09	.98	1.11	1.35	1.11	.25	.08	.11	.17	5.50
1960	.17	.06	.13	.35	.54	1.83	1.90	1.46	1.05	.17	.14	.03	7.85

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	61.7	13.75
1951	1208	5,120	July 9, 1951	0	55.1	0.905	12.27	69.0	15.36
1952	1238	2,290	June 8, 1952	.3	60.9	1.00	13.60	46.5	10.40
1953	1278	5,670	July 6, 1953	0	27.9	.458	6.22	27.9	6.22
1954	1338	1,330	Aug. 25, 1954	.2	27.3	.448	6.10	28.9	6.43
1955	1388	1,260	Feb. 19, 1955	.3	33.8	.555	7.53	32.8	7.30
1956	1438	2,020	Aug. 13, 1956	.1	9.02	.148	2.01	8.68	1.92
1957	1508	3,530	May 13, 18, 1957	.1	24.8	.407	5.51	28.1	6.25
1958	1558	1,230	Oct. 23, 1957	.9	26.9	.442	6.00	24.0	5.36
1959	1628	2,210	Mar. 26, 1959	.6	24.7	.406	5.50	25.3	5.63
1960	1708	1,020	Mar. 30-31, 1960	0	35.1	.576	7.85	-	-

5630. Kickapoo Creek near Kickapoo, Ill.

Location.--Lat 40°48'00", long 89°48'00", in SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.34, T.10 N., R.6 E., on left bank at downstream side of bridge on U.S. Highway 150, three-quarters of a mile upstream from West Fork Kickapoo Creek and 2 $\frac{1}{2}$ miles northwest of Kickapoo.

Drainage area.--120 sq mi.

Records available.--October 1944 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 514.85 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark). Prior to June 7, 1945, chain or wire-weight gage at same site and datum.

Average discharge.--16 years (1944-60), 68.2 cfs.

Extremes.--1944-60: Maximum discharge, 18,400 cfs July 22, 1951 (gage height, 15.35 ft), from rating curve extended above 7,300 cfs; minimum, 0.4 cfs Oct. 28, 29, 1945, July 30 to Aug. 1, 1956.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	8.12	7.01	5.95	104	388	97.9	213	112	86.9	294	47.5	35.5	115
1952	34.6	72.9	40.6	87.0	63.4	222	192	108	230	50.2	41.0	12.4	96.0
1953	5.60	19.4	26.7	26.0	45.8	84.4	133	96.2	71.7	79.8	8.98	2.77	50.0
1954	2.75	4.13	6.57	14.2	12.6	56.1	114	109	163	12.4	60.2	7.49	46.9
1955	32.8	23.9	25.9	119	256	120	338	198	112	23.7	12.8	11.0	105
1956	9.48	6.57	5.43	4.73	22.8	8.52	8.18	22.1	8.24	24.7	5.80	1.71	10.7
1957	1.26	2.47	2.62	14.3	7.08	7.07	88.1	111	170	27.9	4.88	1.74	36.5
1958	11.0	16.8	29.9	19.7	63.8	35.8	35.3	26.4	216	215	37.5	8.56	59.5
1959	6.18	5.67	2.52	4.48	195	60.2	102	79.9	23.9	17.5	4.43	24.6	42.7
1960	47.8	17.7	50.3	83.0	53.8	232	168	321	225	49.3	39.8	15.1	109

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.08	0.07	0.06	1.00	3.36	0.94	1.98	1.08	0.81	2.82	0.46	0.33	12.99
1952	.33	.68	.39	.84	.57	2.13	1.79	1.03	2.14	.49	.39	.12	10.89
1953	.05	.16	.28	.25	.40	.81	1.23	.92	.67	.77	.09	.03	5.66
1954	.03	.04	.06	.14	.11	.54	1.06	1.05	1.51	.12	.58	.07	5.31
1955	.32	.22	.25	1.15	2.22	1.16	3.15	1.90	1.04	.23	.12	.10	11.86
1956	.08	.06	.05	.05	.21	.08	.08	.21	.08	.24	.06	.02	1.23
1957	.01	.02	.03	.14	.06	.07	.82	1.07	1.58	.27	.05	.02	4.14
1958	.11	.16	.29	.19	1.55	.54	.53	.25	2.01	2.06	.36	.08	6.73
1959	.06	.05	.02	.04	1.69	.58	.94	.77	.22	.17	.04	.23	4.81
1960	.46	.16	.48	.80	.48	2.23	1.57	3.08	2.09	.47	.38	.14	12.34

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	95.1	10.77
1951	1208	18,400	July 22, 1951	4.5	115	0.958	12.99	125	14.18
1952	1238	3,800	June 14, 1952	3.9	96.0	.800	10.89	88.0	9.98
1953	1278	2,420	July 21, 1953	1.9	50.0	.417	5.66	46.7	5.30
1954	1358	3,950	June 1, 1954	2.0	46.9	.391	5.31	52.7	5.97
1955	1388	8,590	Apr. 24, 1955	2.0	105	.875	11.86	99.6	11.27
1956	1438	1,300	May 27, 1956	.4	10.7	.089	1.23	9.40	1.09
1957	1508	7,310	June 14, 1957	.8	56.5	.304	4.14	40.8	4.64
1958	1558	12,100	July 2, 1958	.5	59.5	.496	6.73	55.8	6.30
1959	1628	6,000	Apr. 26, 1959	.5	42.7	.356	4.81	51.2	5.78
1960	1708	10,000	Mar. 30, 1960	6.4	109	.908	12.34	-	-

a About.

5635. Kickapoo Creek at Peoria, Ill.

Location.--Lat 40°40'52", long 89°39'19", in NE¼NW¼ sec.13, T.8 N., R.7 E., on right bank at downstream side of pier of bridge on State Highway 116, half a mile west of Peoria, 1.5 miles downstream from Dry Run, and 4 miles upstream from mouth.

Drainage area.--296 sq mi.

Records available.--March 1942 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder. Datum of gage is 448.37 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Nov. 19, 1942, wire-weight gage at same site and datum.

Average discharge.--18 years (1942-60), 171 cfs.

Extremes.--1942-60: Maximum discharge, 18,600 cfs July 22, 1951 (gage height, 21.41 ft); minimum, 0.4 cfs Oct. 10-12, 1956.
Maximum stage known, 24.6 ft in May 1927 (from information by Corps of Engineers).

Monthly and yearly mean discharge*, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	29.9	21.9	15.3	168	846	241	511	246	180	789	136	69.5	267
1952	71.1	144	66.8	210	171	464	478	247	600	140	92.5	41.6	227
1953	14.2	51.8	65.8	64.4	87.3	192	304	202	136	367	20.1	8.17	126
1954	5.49	7.58	15.9	55.8	59.0	254	337	291	451	28.4	142	10.7	158
1955	69.3	56.4	52.7	243	486	232	503	370	224	54.4	42.9	21.0	194
1956	34.2	16.4	13.5	12.1	86.0	21.6	28.8	59.7	15.9	53.1	50.3	4.31	32.9
1957	2.46	6.96	8.79	35.5	24.1	21.2	274	331	291	66.7	17.1	3.71	90.2
1958	42.2	38.7	63.8	38.7	158	92.2	94.0	56.1	660	400	94.2	29.8	147
1959	14.4	22.8	11.7	16.9	455	132	243	224	50.7	70.8	12.3	67.3	107
1960	127	51.6	111	170	112	666	398	827	556	127	125	45.1	277

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.12	0.08	0.06	0.66	2.98	0.94	1.93	0.96	0.68	3.07	0.53	0.26	12.27
1952	.28	.54	.26	.82	.62	1.81	1.80	.96	2.26	.54	.36	.16	10.41
1953	.06	.20	.26	.25	.31	.75	1.14	.79	.51	1.43	.08	.03	5.81
1954	.02	.03	.06	.22	.21	.99	1.27	1.13	1.70	.11	.5	.04	6.33
1955	.27	.21	.21	.95	1.71	.90	1.92	1.44	.84	.21	1	.08	8.91
1956	.13	.06	.05	.05	.31	.08	.11	.23	.06	.21	.20	.02	1.51
1957	.01	.03	.03	.14	.08	.08	1.03	1.29	1.10	.26	.0	.01	4.13
1958	.16	.15	.25	.15	.56	.36	.35	.22	2.49	1.56	.37	.11	6.73
1959	.06	.09	.05	.07	1.60	.52	.92	.87	.19	.28	.0	.25	4.95
1960	.50	.19	.43	.66	.41	2.59	1.50	3.22	2.10	.49	.45	.17	12.75

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	270	12.39
1951	1208	18,600	July 22, 1951	8	267	0.902	12.27	285	13.09
1952	1298	4,560	June 21, 1952	12	227	.767	10.41	214	9.85
1953	1278	4,980	July 6, 1953	5.0	125	.426	5.81	118	5.40
1954	1338	7,320	June 1, 1954	4.6	138	.466	6.33	151	6.91
1955	1398	7,100	Feb. 20, 1955	3.7	194	.655	8.91	185	8.46
1956	1438	1,880	Feb. 24, 1956	1.9	32.9	.111	1.51	29.0	1.34
1957	1508	2,630	June 15, 1957	.4	90.2	.305	4.13	101	4.62
1958	1558	8,230	July 3, 1958	8	147	.497	6.73	138	6.37
1959	1628	6,290	Feb. 10, 1959	1.0	107	.361	4.95	128	5.87
1960	1708	12,600	Mar. 31, 1960	13	277	.936	12.75	-	-

5644. Money Creek near Towanda, Ill.

Location.--Lat 40°36'19", long 88°53'56", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.20, T.25 N., R.3 E., on right bank 25 ft downstream from highway bridge, 3 miles north of Towanda, and 5 miles east of Hudson.

Drainage area.--47.9 sq mi.

Records available.--May 1958 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 723.65 ft above mean sea level, datum of 1929 (State Water Survey bench mark).

Extremes.--1958-60: Maximum discharge, about 1,600 cfs Feb. 10, 1959 (gage height, 11.15 ft, backwater from ice); no flow for many days each year.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1958	-	-	-	-	-	-	-	-	83.8	17.9	58.6	1.71	-
1959	0.49	2.72	1.45	2.00	125	51.1	25.8	22.1	6.00	.51	0	0	19.0
1960	.66	.38	3.20	10.6	33.6	71.9	75.5	20.3	74.5	29.0	5.22	1.00	27.0

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1958	-	-	-	-	-	-	-	-	1.95	0.43	1.41	0.04	-
1959	0.01	0.06	0.04	0.05	2.72	1.23	0.60	0.53	.14	.01	0	0	5.39
1960	.02	.009	.08	.25	.76	1.73	1.76	.49	1.74	.70	.13	.02	7.69

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1958	1558	715	June 14, 1958	-	-	-	-	-	-
1959	1628	al, 600	Feb. 10, 1959	0	19.0	0.397	5.39	19.0	5.39
1960	1708	920	June 24, 1960	0	27.0	.564	7.68	-	-

a About.

5645. Money Creek above Lake Bloomington, Ill.

Location.--Lat 40°37'13", long 88°54'59", in SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.18, T.25 N., R.3 E., on left bank 200 ft north of line between secs. 18 and 19, 1 mile upstream from Lake Bloomington and 4 miles northeast of Hudson.

Drainage area.--51.9 sq mi.

Records available.--June 1933 to September 1958.

Gage.--Water-stage recorder and concrete control. Datum of gage is 715.77 ft above mean sea level, datum of 1929 (Warren & Van Praag, Inc., bench mark).

Average discharge.--24 years (1933-40, 1941-58), 32.6 cfs.

Extremes.--1933-58: Maximum discharge, 3,900 cfs Apr. 30, 1947 (gage height, 9.16 ft), from flood-routing study; no flow at times during most years.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.238	0.420	0.545	19.5	131	44.0	111	49.5	33.3	58.3	5.17	1.31	37.1
1952	1.00	26.2	11.2	46.1	29.6	76.8	132	63.3	93.8	15.4	11.2	.562	42.1
1953	.123	.659	2.23	9.60	15.8	78.6	80.1	19.6	20.9	52.2	2.46	.055	23.6
1954	0	.046	.533	1.62	5.24	24.4	102	19.6	13.9	1.00	5.49	.132	14.2
1955	10.9	2.48	4.61	60.8	58.3	46.4	44.6	24.9	24.3	3.25	.145	.016	23.2
1956	.443	.117	.089	.143	8.59	2.45	8.74	35.0	11.7	6.96	.623	.001	6.24
1957	0	0	.059	.952	2.78	5.19	172	103	35.7	17.6	.676	.010	28.1
1958	.617	1.38	17.6	19.2	10.0	11.9	14.5	5.79	93.4	19.1	65.9	2.01	21.8
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.005	0.009	0.01	0.43	2.83	0.98	2.39	1.10	0.72	1.29	0.11	0.03	9.70
1952	.02	.56	.25	1.02	.61	1.71	2.84	1.41	2.02	.34	.25	.01	11.04
1953	.003	.01	.05	.21	.32	1.75	1.72	.44	.45	1.16	.05	.001	6.16
1954	0	.001	.01	.04	.11	.54	2.18	.44	.30	.02	.08	.003	3.72
1955	.24	.05	.10	1.35	1.17	1.03	.96	.55	.52	.07	.003	.0004	6.04
1956	.01	.003	.002	.003	.18	.05	.19	.78	.25	.15	.01	.00003	1.63
1957	0	0	.001	.02	.06	.12	3.69	2.29	.77	.39	.02	.0002	7.36
1958	.01	.03	.39	.43	.20	.26	.31	.13	2.01	.42	1.46	.04	5.69
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	53.6	14.02
1951	1208	1,200	Feb. 19, 1951	0.11	37.1	0.715	9.70	40.2	10.51
1952	1238	770	Apr. 23, 1952	.08	42.1	.811	11.04	39.2	10.27
1953	1278	600	July 6, 1953	0	23.6	.455	6.16	23.4	6.11
1954	1358	720	Apr. 11, 1954	0	14.2	.274	3.72	15.7	4.10
1955	1388	645	Feb. 19, 1955	0	23.2	.447	6.04	21.7	5.67
1956	1438	515	May 28, 1956	0	6.24	.120	1.63	6.19	1.61
1957	1508	945	Apr. 27, 1957	0	28.1	.541	7.36	29.7	7.79
1958	1558	a740	June 14, 1958	0	21.8	.420	5.69	-	-
1959	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-

a About.

Location.--Lat 40°38'15", long 88°57'00", in SE $\frac{1}{4}$ sec.11, T.25 N., R.2 E., on left bank 300 ft downstream from small tributary, a quarter of a mile upstream from Lake Bloomington, and 3 miles northeast of Hudson.

Records available.--October 1938 to September 1958.

Average discharge.--20 years (1938-58), 6.78 cfs.

Extremes.--1938-58: Maximum discharge, 1,690 cfs July 9, 1951 (gage height, 7.57 ft); no flow at times in each year.

[illegible][illegible][illegible]

5655. Money Creek at Lake Bloomington, Ill.

Location.--Lat 40°39'47", long 88°56'23", in NW¼ sec.1, T.25 N., R.2 E., on right bank 1,300 ft downstream from dam at Lake Bloomington, 2.1 miles upstream from mouth, and 4 miles northeast of Hudson.

Drainage area.--68.6 sq mi.

Records available.--October 1930 to September 1958.

Gage.--Water-stage recorder and artificial control. Datum of gage is 678.05 ft above mean sea level. Prior to Oct. 1, 1940, water-stage recorder in pumping plant just upstream from dam at datum 700.00 ft above mean sea level. Recorder at former site now used as auxiliary gage to give stage of lake.

Average discharge.--28 years (1930-58), 36.8 cfs (adjusted for storage and diversion).

Remarks.--Flow regulated by Lake Bloomington (area of lake at level of crest of spillway, 531 acres). Water is diverted from lake by pumping for municipal supply of Bloomington. Discharge past gage is made up of discharge through spillway, seepage through dam, runoff from area below dam (0.4 sq mi), and return flow from water diverted from lake for use at pumping plant and not otherwise measured. The last three items were not included in records prior to Oct. 1, 1940. Records adjusted for storage and pumpage, but not for evaporation and seepage.

Monthly and yearly mean discharge, in cubic feet per second (adjusted) a/

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-0.68	0.22	0.15	23.5	182	61.3	155	66.2	71.3	109	7.00	0.16	55.3
1952	2.20	41.2	16.7	57.2	39.9	102	161	74.8	110	14.2	14.9	-1.30	52.5
1953	-2.15	1.37	4.32	16.7	21.7	106	102	26.3	28.1	83.0	.62	-2.54	32.2
1954	-1.51	-1.03	2.20	3.84	10.5	42.1	137	34.1	26.5	-10	10.8	-2.47	21.7
1955	22.7	3.91	7.55	80.9	73.4	63.9	74.1	41.0	34.6	1.17	-1.30	-1.72	33.1
1956	1.30	-.03	.29	-.52	14.9	5.01	20.8	47.9	12.8	9.26	3.50	-3.70	9.26
1957	-2.22	-.51	1.13	3.81	4.45	7.55	263	114	44.5	26.6	-.73	-2.15	38.2
1958	7.71	5.74	33.7	26.3	17.2	17.0	21.5	5.52	109	22.7	66.5	1.26	27.9

a Adjusted for storage and pumpage.

Note.--Negative figures indicate that evaporation and seepage from reservoir exceeded inflow.

Monthly and yearly runoff, in inches (adjusted) a/

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-0.01	0.004	0.03	0.39	2.76	1.03	2.52	1.11	1.16	1.83	0.12	0.003	10.95
1952	.04	.67	.28	.98	.63	1.72	2.61	1.26	1.80	.24	.25	-.02	10.44
1953	-.04	.02	.07	.28	.33	1.78	1.65	.44	.46	1.39	.01	-.04	6.35
1954	-.03	-.02	.04	.06	.16	.71	2.23	.57	.43	-.002	.18	-.04	4.29
1955	.38	.06	.13	1.36	1.11	1.07	1.20	.69	.56	.02	-.02	-.03	6.53
1956	.02	-.0005	.005	-.009	.23	.08	.34	.80	.21	.16	.06	-.06	1.84
1957	-.04	-.008	.02	.06	.07	.13	4.27	1.91	.72	.45	-.01	-.03	7.54
1958	.13	.09	.57	.44	.26	.29	.35	.09	1.77	.38	1.12	.02	5.51

a Adjusted for storage and pumpage.

Note.--Negative figures indicate that evaporation and seepage from reservoir exceeded inflow.

Yearly discharge of Money Creek and rainfall at Lake Bloomington, Ill.

Year	WSP	Water year ending Sept. 30						Calendar year			
		Discharge past gage (millions of gallons)	Pumpage (millions of gallons)	Change in contents (millions of gallons)	Adjusted for change in reservoir contents and pumpage			Rainfall (inches)	Adjusted		Rainfall (inches)
					Runoff (millions of gallons)	Discharge per square mile			Mean in cubic feet per second	Runoff (inches)	
						Millions of gallons per day	Cubic feet per second				
1950	-	-	-	-	-	-	-	-	-	-	-
1951	1208	11,516.6	1,432.3	107.9	13,056.8	0.521	0.806	32.13	70.7	13.91	32.68
1952	1238	11,138.1	1,446.1	-148.1	12,436.1	.495	.766	36.88	61.3	11.93	35.55
1953	1278	6,074.4	1,570.7	-60.3	7,584.8	.303	.469	32.07	47.9	9.50	35.23
1954	1338	3,653.5	1,631.4	-156.3	5,128.6	.205	.317	28.02	31.8	6.29	29.24
1955	1388	6,236.4	1,812.7	-247.1	7,802.0	.312	.483	25.51	24.6	4.87	30.10
									33.4	5.98	27.38
1956	1438	87.2	1,998.8	107.7	2,193.7	.087	.135	27.00	9.01	1.78	25.62
1957	1508	6,925.7	1,974.9	100.6	9,001.2	.359	.557	27.38	42.3	8.36	30.10
1958	1558	4,392.7	1,847.6	337.9	6,578.2	.263	.407	29.78	-	-	-

5660. East Branch Panther Creek near Gridley, Ill.

Location.--Lat 40°46'00", long 88°54'35", between secs. 29 and 30, T.27 N., R.3 E., on left bank at downstream side of highway bridge, 2 miles northwest of Gridley and 9 miles upstream from mouth.

Drainage area.--6.3 sq mi, approximately.

Records available.--October 1949 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 707.89 ft above mean sea level, datum of 1929.

Average discharge.--11 years (1949-60), 3.81 cfs.

Extremes.--1949-60: Maximum discharge, 1,470 cfs July 9, 1951 (gage height, 10.68 ft), from rating curve extended above 220 cfs by logarithmic plotting; no flow at times each year.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.01	0.02	0.34	4.06	14.9	8.81	16.0	6.58	22.9	28.2	2.52	0.44	8.67
1952	1.47	11.0	2.51	5.58	4.03	10.7	15.6	4.17	6.27	.623	.043	.005	5.13
1953	0	.0001	.037	.406	.985	6.37	3.78	2.04	3.00	10.5	.108	0	2.29
1954	0	0	0	.18	.50	4.47	9.16	4.32	7.30	.23	.37	0	2.20
1955	.35	.09	.38	6.10	5.08	4.24	6.97	5.24	7.01	.31	.04	0	2.96
1956	.05	.003	0	0	3.16	.50	1.33	6.66	1.06	.17	0	0	1.07
1957	0	0	.06	.23	.22	.85	15.8	10.3	5.51	1.38	.003	0	2.86
1958	.27	.14	.99	.82	3.33	1.41	2.36	.67	12.1	3.09	10.8	.17	3.00
1959	.003	.35	.14	.63	11.4	9.59	11.3	6.71	2.44	.50	.01	.02	3.51
1960	.56	.05	1.16	5.23	6.04	6.78	7.34	3.43	9.20	.97	.57	.08	3.24

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.002	0.004	0.06	0.74	2.46	1.61	2.84	1.20	4.06	5.16	0.46	0.08	18.68
1952	.27	1.94	.46	1.02	.69	1.95	2.41	.76	1.47	.11	.008	.0009	11.09
1953	0	.0002	.007	.07	.16	1.17	1.67	.37	.53	1.92	.02	0	4.92
1954	0	0	0	.03	.08	.82	1.62	.79	1.29	.04	.07	0	4.74
1955	.06	.02	.07	1.12	.84	.78	1.23	.96	1.24	.06	.006	0	6.39
1956	.009	.0006	0	0	.54	.09	.23	1.22	.19	.03	0	0	2.31
1957	0	0	.01	.04	.04	.16	2.81	1.89	.98	.25	.0006	0	6.18
1958	.05	.03	.18	.15	.55	.26	.42	.12	2.14	.56	1.98	.03	6.47
1959	.0006	.06	.03	.11	1.88	1.76	2.01	1.23	.43	.05	.002	.004	7.57
1960	.07	.008	.21	.59	1.03	1.24	1.30	.63	1.63	.18	.11	.01	7.01

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	6.57	14.15
1951	1208	1,470	July 9, 1951	0	8.67	1.37	18.68	9.88	21.28
1952	1258	205	Nov. 13, 1951	0	5.13	.814	11.09	3.90	8.43
1953	1278	112	July 22, 1953	0	2.29	.363	4.92	2.28	4.91
1954	1358	161	June 3, 1954	0	2.20	.349	4.74	2.27	4.89
1955	1388	78	June 11, 1955	0	2.96	.470	6.39	2.90	6.25
1956	1438	120	May 28, 1956	0	1.07	.170	2.31	1.07	2.31
1957	1508	112	Apr. 26, 1957	0	2.86	.454	6.18	2.98	6.43
1958	1558	179	Aug. 7, 1958	0	3.00	.476	6.47	2.92	6.30
1959	1628	170	Apr. 27, 1959	0	3.51	.557	7.57	3.60	7.76
1960	1708	125	Mar. 29, 1960	0	3.24	.514	7.01	-	-

5665. East Branch Panther Creek at El Paso, Ill.

Location.--Lat 40°45'15", long 89°00'20", at line between secs. 32 and 33, T.27 N., R.2 E, on left bank at downstream side of highway bridge, 0.7 mile upstream from Illinois Central Railroad bridge, 0.9 mile north of El Paso, and 4 miles upstream from mouth.

Drainage area.--28.8 sq mi.

Records available.--October 1949 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 688.08 ft above mean sea level, datum of 1929.

Average discharge.--11 years (1949-60), 18.3 cfs.

Extremes.--1949-60: Maximum discharge, 5,300 cfs July 9, 1951 (gage height, 14.21 ft), from rating curve extended above 2,600 cfs; no flow at times each year.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.698	0.420	0.971	15.3	76.6	42.1	78.4	25.6	103	193	7.03	0.932	45.1
1952	2.94	42.9	11.2	24.3	14.6	48.7	67.3	21.8	37.6	4.84	.44	.13	23.0
1953	.12	.23	.25	1.39	3.62	24.5	22.6	6.96	15.3	30.3	.73	.08	8.88
1954	.24	.31	.14	1.64	1.72	21.4	50.0	28.3	37.8	1.65	3.77	.41	12.3
1955	1.62	.87	1.62	34.1	23.8	20.4	37.9	22.0	24.3	4.15	.34	.05	14.2
1956	.27	.20	.11	.06	6.74	1.09	2.91	15.9	4.53	1.49	.90	.10	2.84
1957	.04	.01	.08	.97	1.12	2.30	71.0	60.0	24.4	5.40	.24	0	15.8
1958	.81	.57	4.22	3.65	10.5	6.56	9.90	3.87	61.8	14.5	50.9	.83	14.0
1959	.22	2.19	1.18	4.26	50.9	38.7	43.4	26.0	11.0	1.92	.15	.04	14.7
1960	1.00	.59	3.58	12.2	24.2	37.8	45.2	22.0	79.0	8.57	3.83	.24	19.7

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.03	0.02	0.04	0.61	2.77	1.69	3.04	1.02	3.98	7.73	0.28	0.04	21.25
1952	.12	1.86	.45	.97	.55	1.95	2.61	.87	1.46	.19	.02	.005	10.86
1953	.005	.009	.01	.06	.13	.98	.88	.28	.59	1.21	.03	.003	4.19
1954	.009	.01	.005	.07	.06	.86	1.94	1.13	1.46	.07	.15	.02	5.78
1955	.06	.03	.06	1.37	.86	.82	1.47	.88	.94	.17	.01	.002	6.67
1956	.01	.008	.004	.003	.25	.04	.11	.63	.18	.06	.04	.004	1.34
1957	.002	.0005	.003	.04	.04	.09	2.75	2.40	.94	.22	.003	0	6.49
1958	.03	.02	.17	.15	.38	.26	.58	.15	2.39	.58	2.04	.03	6.58
1959	.009	.08	.05	.17	1.84	1.55	1.68	1.04	4.43	.08	.003	.002	6.94
1960	.04	.02	.14	.49	.91	1.51	1.75	.88	3.06	.34	.15	.009	9.30

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	31.0	14.59
1951	1208	5,300	July 9, 1951	0	45.1	1.57	21.25	49.6	23.39
1952	1238	626	Apr. 13, 1952	0	23.0	.799	10.86	18.3	8.65
1953	1278	408	July 5, 1953	0	8.88	.308	4.19	8.88	4.19
1954	1338	592	May 28, 1954	0	12.3	.427	5.78	12.5	5.91
1955	1388	252	Apr. 20, 1955	0	14.2	.493	6.67	13.9	6.54
1956	1438	268	May 29, 1956	0	2.84	.099	1.34	2.81	1.32
1957	1508	391	May 13, 1957	0	13.8	.479	6.49	14.3	6.71
1958	1558	354	Aug. 8, 1958	0	14.0	.486	6.58	13.8	6.50
1959	1628	417	Apr. 26, 1959	0	14.7	.510	6.94	14.8	7.00
1960	1708	680	June 13, 1960	0	19.7	.684	9.30	-	-

5670. Panther Creek near El Paso, Ill.

Location.--Lat 40°46'05", long 89°04'30", in center of sec.26, T.27 N., R.1 E., on right bank at downstream side of highway bridge, just downstream from East Branch Panther Creek, 2 miles upstream from West Fork, and $3\frac{1}{2}$ miles northwest of El Paso.

Drainage area.--95.0 sq mi.

Records available.--October 1949 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 658.86 ft above mean sea level, datum of 1929.

Average discharge.--11 years (1949-60), 56.1 cfs.

Extremes.--1949-60: Maximum discharge, 10,900 cfs July 9, 1951 (gage height, 15.15 ft, from floodmark), from rating curve extended above 2,000 cfs by logarithmic plotting; no flow for many days in 1959.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2.61	2.34	4.59	63.6	274	104	214	77.3	201	392	31.2	11.4	114
1952	23.9	129	32.8	95.8	57.6	165	220	72.7	181	22.2	4.45	1.87	83.5
1953	.95	1.66	5.26	32.0	21.0	82.1	79.1	31.2	48.0	62.6	2.50	.44	28.7
1954	.44	1.36	1.49	4.71	5.36	65.6	152	92.4	134	6.70	19.1	1.53	40.3
1955	6.35	7.55	11.8	93.5	86.9	61.5	125	66.3	61.5	10.5	2.88	.65	44.1
1956	1.62	1.79	1.62	1.14	19.6	4.19	5.30	34.4	9.12	5.89	1.96	.14	7.20
1957	.22	.58	.94	4.87	4.14	7.19	171	161	91.4	18.8	1.35	.34	38.5
1958	5.95	8.42	20.1	16.7	31.6	22.7	54.0	13.5	184	68.1	106	3.31	42.8
1959	1.51	4.70	3.48	8.51	168	96.9	153	175	56.6	7.96	1.56	1.03	55.6
1960	8.20	7.14	16.3	42.3	63.2	131	138	59.1	217	32.7	7.91	1.66	60.0

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.03	0.03	0.06	0.77	3.00	1.27	2.52	0.94	2.36	4.76	0.38	0.13	16.25
1952	.29	1.52	.40	1.16	.65	2.00	2.59	.88	2.13	.27	.05	.02	11.96
1953	.01	.02	.04	.15	.23	1.00	.93	.58	.56	.76	.03	.005	4.12
1954	.005	.02	.02	.06	.06	.80	1.79	1.12	1.57	.08	.23	.02	15.78
1955	.08	.09	.14	1.13	.95	.75	1.47	.80	.72	.13	.03	.008	6.30
1956	.02	.02	.02	.01	.22	.05	.06	.42	.11	.07	.02	.002	1.02
1957	.003	.007	.01	.06	.05	.09	2.01	1.95	1.07	.23	.02	.004	5.50
1958	.07	.10	.24	.20	.35	.28	.40	.16	2.17	.83	1.28	.04	6.12
1959	.02	.06	.04	.10	1.84	1.18	1.80	2.12	.66	.10	.02	.01	7.95
1960	.10	.08	.20	.51	.72	1.59	1.63	.72	2.54	.40	.10	.02	8.61

† Corrected.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	96.3	13.76
1951	1208	10,900	July 9, 1951	1.5	114	1.20	16.25	128	18.34
1952	1258	2,350	Apr. 13, 1952	.8	83.5	.879	11.96	68.6	9.82
1953	1278	780	July 6, 1953	.2	29.7	.302	4.12	28.5	4.09
1954	1358	1,950	May 28, 1954	.2	40.3	.424	15.78	42.2	6.04
1955	1388	825	Apr. 20, 1955	.1	44.1	.464	6.30	42.4	6.05
1956	1438	525	May 28, 1956	.1	7.20	.076	1.02	6.92	.98
1957	1508	762	June 22, 1957	.1	38.5	.405	5.50	41.3	5.89
1958	1558	1,650	Aug. 8, 1958	.3	42.8	.451	6.12	40.7	5.85
1959	1628	3,020	Apr. 27, 1959	0	55.6	.595	7.95	57.5	8.21
1960	1708	2,500	June 13, 1960	.8	60.0	.632	8.61	-	-

† Corrected.

5675. Mackinaw River near Congerville, Ill.

Location.--Lat 40°37'25", long 89°14'30", in NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.17, T.25 N., R.1 W., on right bank at downstream side of bridge on U.S. Highway 150, 900 ft downstream from New York, Chicago and St. Louis Railroad bridge, a quarter of a mile downstream from Walnut Creek, and 2 miles northwest of Congerville.

Drainage area.--764 sq mi.

Records available.--October 1944 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 607.01 ft above mean sea level, datum of 1929. Prior to July 11, 1945, chain or wire-weight gage at same site and datum.

Average discharge.--16 years (1944-60), 465 cfs.

Extremes.--1944-60: Maximum discharge, 36,000 cfs July 9, 1951 (gage height, 19.41 ft); minimum, 0.2 cfs Oct. 21-24, Oct. 27 to Nov. 3, 1956, Oct. 6, 1957.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	22.9	23.3	32.1	362	2,089	700	1,718	720	1,184	2,687	183	71.1	806
1952	81.5	639	204	832	426	1,206	1,924	890	1,451	240	109	21.8	666
1953	9.25	19.6	36.5	105	165	823	†928	316	336	981	54.6	9.70	316
1954	2.79	8.83	18.5	40.0	80.1	413	1,433	770	764	80.5	204	24.1	319
1955	156	76.2	108	861	766	641	949	678	638	91.6	45.1	10.7	415
1956	24.7	20.8	15.5	14.3	150	68.1	158	366	135	111	70.8	4.47	94.8
1957	59	2.54	6.35	38.8	59.6	88.4	2,231	1,552	490	343	47.7	11.2	406
1958	55.8	84.8	306	341	306	262	315	114	1,271	418	769	49.8	357
1959	18.1	63.2	35.2	40.6	1,570	887	859	720	254	34.3	13.7	8.80	366
1960	43.9	31.1	79.8	255	526	975	1,317	486	1,282	384	133	22.5	459

† Corrected.

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.03	0.03	0.05	0.55	2.85	1.06	2.51	1.09	1.73	4.05	0.23	0.10	14.33
1952	.12	.93	.31	1.26	.60	1.82	2.81	1.34	2.12	.36	.17	.03	11.87
1953	.01	.03	.06	.16	.22	1.24	1.36	.48	1.49	1.48	.07	.01	5.62
1954	.004	.01	.03	.06	.11	.62	2.09	1.16	1.12	.12	.31	.04	5.67
1955	.24	.11	.16	1.30	1.04	.97	1.39	1.02	.93	.14	.07	.02	7.39
1956	.04	.03	.02	.02	.21	.10	.23	.55	.20	.17	.11	.007	1.69
1957	.0009	.004	.01	.06	.08	.13	3.28	2.34	.72	.52	.07	.02	7.21
1958	.08	.12	.46	.51	.42	.40	.46	.17	1.86	.63	1.16	.07	6.34
1959	.03	.09	.05	.06	2.14	1.34	1.25	1.09	.37	.05	.07	.01	6.50
1960	.07	.05	.12	.38	.74	1.47	1.92	.73	1.87	.58	.26	.03	8.16

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	806	14.30
1951	1208	36,000	July 9, 1951	16	806	1.05	14.33	877	15.58
1952	1238	8,900	Apr. 13, 1952	11	666	.872	11.87	595	10.61
1953	1278	6,250	July 6, 1953	1.0	316	.414	5.62	313	5.56
1954	1338	9,100	May 29, 1954	.5	319	.418	5.67	345	6.14
1955	1388	5,130	Apr. 20, 1955	1.5	415	.543	7.39	392	6.97
1956	1438	2,740	May 29, 1956	1.6	94.8	.124	1.69	90.5	1.61
1957	1508	11,100	Apr. 29, 1957	.2	406	.531	7.21	443	7.86
1958	1558	6,700	June 14, 1958	1.3	357	.467	6.34	329	5.85
1959	1628	a7,800	Feb. 11, 1959	.5	366	.479	6.50	370	6.57
1960	1708	10,000	Mar. 30, 1960	12	459	.601	8.16	-	-

a About.

5680. Mackinaw River near Green Valley, Ill.

Location.--Lat 40°26'43", long 89°39'10", in SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.15, T.23 N., R.5 W., near center of span on downstream side of bridge on State Highway 29, 3 miles north of Green Valley and 13 miles upstream from mouth.

Drainage area.--1,100 sq mi, approximately.

Records available.--March 1921 to October 1956, water years 1957-60 (annual maximum).

Gage.--Crest-stage gage. Datum of gage is 477.10 ft above mean sea level, datum of 1929. Prior to Jan. 17, 1933, chain gage 250 ft upstream on Chicago and North Western Railway bridge at datum 2.00 ft higher. Jan. 17, 1933, to May 13, 1940, chain gage and May 14, 1940, to Sept. 30, 1952, wire-weight gage, at present site at datum 2.00 ft higher. Oct. 1, 1952, to Oct. 31, 1956, wire-weight gage at present site and datum.

Average discharge.--35 years (1921-56), 688 cfs.

Extremes.--1921-60: Maximum discharge, 31,000 cfs July 10, 1951 (gage height, 15.12 ft, present datum, from graph based on gage readings).

1921-56: Minimum discharge observed, 17 cfs Oct. 26, 27, 1940.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	104	78.8	78.6	600	2,494	1,123	2,296	980	1,353	3,109	348	163	1,050
1952	148	945	300	1,049	597	1,632	2,488	1,216	1,880	409	308	97.9	920
1953	59.2	72.9	95.7	184	252	1,053	1,315	460	391	1,267	145	57.0	447
1954	41.7	41.1	53.7	71.9	136	826	1,912	825	1,050	177	370	77.5	439
1955	261	131	164	1,117	1,121	930	1,246	853	782	164	127	62.9	576
1956	87.6	62.0	52.4	43.3	215	118	192	766	278	162	148	44.0	181
1957	25.9	-	-	-	-	-	-	-	-	-	-	-	-
1958	-	-	-	-	-	-	-	-	-	-	-	-	-
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.11	0.08	0.08	0.63	2.36	1.18	2.33	1.03	1.37	3.26	0.37	0.17	12.97
1952	.16	.96	.31	1.10	.59	1.71	2.52	1.27	1.91	.43	.32	.10	11.38
1953	.06	.07	.10	.19	.24	1.10	1.33	.48	.40	1.33	.15	.06	5.51
1954	.04	.04	.06	.08	.13	.55	1.94	.86	1.06	.19	.39	.08	5.42
1955	.27	.13	.17	1.17	1.06	.97	1.26	.89	.79	.17	.13	.06	7.07
1956	.09	.06	.05	.05	.21	.12	.20	.80	.28	.17	.16	.04	2.23
1957	.03	-	-	-	-	-	-	-	-	-	-	-	-
1958	-	-	-	-	-	-	-	-	-	-	-	-	-
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches	
		Discharge	Date							
1950	-	-	-	-	-	-	-	1,166	-	14.38
1951	1208	31,000	July 10, 1951	60	1,050	0.955	12.97	1,143	-	14.13
1952	1258	6,700	Apr. 15, 1952	65	920	.836	11.38	823	-	10.18
1953	1278	4,990	July 7, 1953	48	447	.406	5.51	440	-	5.42
1954	1338	4,790	May 30, 1954	35	439	.399	5.42	474	-	5.85
1955	1388	5,020	Feb. 20, 1955	47	576	.524	7.07	546	-	6.70
1956	1438	5,520	May 27, 1956	28	181	.165	2.23	-	-	-
1957	-	9,280	Apr. 30, 1957	-	-	-	-	-	-	-
1958	-	5,950	June 14, 1958	-	-	-	-	-	-	-
1959	-	-	-	-	-	-	-	-	-	-
1960	-	9,550	Mar. 31, 1960	-	-	-	-	-	-	-

5685. Illinois River at Kingston Mines, Ill.

Location.--Lat 40°33'10", long 89°46'40", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.26, T.7 N., R.6 E., on right bank at Kingston Mines, 2.3 miles downstream from Mackinaw River and at mile 145.3.

Drainage area.--15,200 sq mi, approximately.

Records available.--October 1939 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 428.00 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Oct. 1, 1940, staff gage at same site at datum 1.65 ft higher. Oct. 1, 1940, to Mar. 31, 1942, staff gage at present site and datum. Auxiliary water-stage recorder at mouth of Copperas Creek, 7.9 miles downstream.

Average discharge.--21 years (1939-60), 13,870 cfs.

Extremes.--1939-60: Maximum discharge, 83,100 cfs May 23, 1943; maximum gage height, 26.02 ft May 25, 1943; minimum daily discharge, 2,300 cfs Sept. 27, 1943.

Remarks.--Occasional regulation at low flow by navigation dam at Peoria. Since Jan. 17, 1900, flow has included diversion from Lake Michigan through Chicago Sanitary and Ship Canal.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	6,506	5,505	7,292	13,890	21,890	28,620	29,990	27,350	15,260	29,550	13,250	10,220	17,430
1952	11,090	19,900	14,670	23,100	20,630	26,200	31,860	20,850	25,550	14,090	10,200	6,056	18,600
1953	5,065	6,065	7,895	7,656	9,525	16,890	16,180	13,590	11,240	15,290	7,414	6,754	10,470
1954	5,233	5,514	5,820	5,441	7,416	12,410	23,720	15,810	17,670	11,570	9,159	5,454	10,430
1955	21,140	11,630	9,552	20,380	13,810	21,800	18,640	16,470	20,680	8,588	6,784	5,460	14,590
1956	7,614	7,141	6,966	5,475	9,914	12,010	8,847	20,870	10,870	9,108	7,191	5,497	9,302
1957	4,799	5,174	8,122	12,390	15,000	7,733	20,110	30,340	18,170	25,020	8,745	4,993	13,380
1958	6,799	10,730	13,780	13,740	9,858	17,720	11,730	8,090	26,300	26,520	12,770	6,278	13,720
1959	5,572	6,628	6,172	7,972	22,600	29,330	20,870	24,150	9,976	7,353	6,431	4,423	12,560
1960	9,877	13,990	13,790	23,700	22,870	13,250	40,200	24,090	21,160	13,080	8,681	6,131	17,510

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	19,570	-
1951	1208	47,500	Feb. 23, 1951	4,130	17,430	-	-	19,580	-
1952	1238	40,000	Apr. 17, 1952	4,630	18,600	-	-	16,430	-
1953	1278	27,500	Mar. 20, 1953	2,820	10,470	-	-	10,270	-
1954	1338	30,400	Mar. 29, 1954	3,400	10,430	-	-	12,600	-
1955	1388	38,200	Oct. 16, 1954	4,430	14,590	-	-	12,850	-
1956	1438	24,700	May 7, 1956	3,670	9,302	-	-	9,001	-
1957	1508	44,600	May 2, 1957	2,320	13,380	-	-	14,520	-
1958	1558	42,700	June 18, 1958	3,260	13,720	-	-	12,640	-
1959	1628	38,300	Feb. 16, 1959	2,580	12,560	-	-	14,180	-
1960	1708	50,800	Apr. 3, 1960	5,380	17,510	-	-	-	-

5688. Indian Creek near Wyoming, Ill.

Location.--Lat 41°01'06", long 89°50'07", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.17, T.12 N., R.6 E., on left bank at upstream side of county highway bridge, $\frac{3}{4}$ miles upstream from mouth and $4\frac{1}{2}$ miles southwest of Wyoming.

Drainage area.--62.9 sq mi.

Records available.--October 1959 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 616.78 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge, 1,180 cfs Mar. 30, 1960 (gage height, 10.15 ft); minimum, 1 cfs Oct. 2-4.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1960	16.3	18.6	36.3	91.0	40.4	136	199	90.0	100	27.8	14.1	5.11	64.6

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1960	0.30	0.33	0.66	1.67	0.69	2.50	3.54	1.65	1.78	0.51	0.26	0.09	13.98

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1960	1708	1,180	Mar. 30, 1960	1	64.6	1.03	13.98	-	-

5690. Brush Creek at Lake Bracken, near Galesburg, Ill.

Location.--Lat 40°51'30", long 90°20'57", in NE $\frac{1}{4}$ sec.14, T.10 N., R.1 E., on left bank of outlet channel below spillway of Lake Bracken, 6 miles south of Galesburg.

Drainage area.--9.14 sq mi.

Records available.--April 1932 to September 1958.

Gage.--Water-stage recorder and 23 V-notch weirs. Auxiliary staff gage near pumping plant 1 mile northwest of lake outlet at datum 670.00 ft above mean sea level, adjustment of 1912, gives stage of lake.

Average discharge.--26 years (1932-58), 5.45 cfs or 1,286.5 million gallons per year (adjusted for storage and diversion).

Remarks.--Flow regulated by Lake Bracken (area at level of crest of lake spillway, 700 ft above mean sea level, 184 acres). Records adjusted for change in contents, leakage from lake around outlet channel as determined from readings on lake gage, and pumpage, but not for evaporation and seepage losses.

Monthly and yearly mean discharge, in cubic feet per second (adjusted) $\frac{a}{b}$

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.47	0.39	0.70	2.63	20.7	8.13	13.8	10.1	18.6	27.7	4.58	1.91	9.05
1952	3.67	6.15	3.15	7.37	6.13	18.4	12.0	13.0	13.9	3.55	5.94	.70	7.85
1953	.29	1.64	2.66	2.09	6.42	6.64	7.44	8.86	10.1	4.31	-4.48	-.21	4.11
1954	.62	.89	1.17	.88	3.02	12.4	15.5	7.75	11.2	.14	2.69	-.10	4.68
1955	6.05	7.07	5.15	14.8	17.5	9.51	13.5	10.3	11.8	1.97	.87	.69	8.19
1956	1.17	.77	.34	.33	5.67	.96	.57	3.52	4.06	15.4	1.29	-.27	2.80
1957	-.32	.66	1.13	4.23	3.95	5.41	15.8	7.72	12.7	1.92	-.25	1.79	4.53
1958	1.58	1.20	3.57	1.46	5.68	3.73	5.28	2.53	8.46	6.61	3.47	1.22	3.71

a Adjusted for storage and pumpage.

Note.--Negative figures indicate that evaporation and seepage from reservoir exceeded inflow.

Monthly and yearly runoff, in inches (adjusted) $\frac{a}{b}$

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.06	0.05	0.09	0.33	2.36	1.03	1.68	1.28	2.26	3.49	0.50	0.23	13.44
1952	.46	.75	.40	.93	.72	2.32	1.46	1.64	1.70	.45	.75	.08	11.67
1953	.04	.20	.34	.26	.73	.84	.91	1.12	1.24	.54	-.06	-.03	6.13
1954	.08	.11	.15	.11	.34	1.57	1.90	.98	1.36	.02	.34	-.01	6.95
1955	.76	.86	.65	1.87	2.00	1.20	1.65	1.30	1.44	.25	.08	.08	12.14
1956	.15	.09	.04	.04	.67	.12	.07	.44	.50	1.95	.16	-.03	4.20
1957	-.04	.08	.14	.53	.45	.68	1.93	.97	1.55	.24	-.03	.22	6.72
1958	.20	.15	.45	.18	.65	.47	.64	.32	1.03	.83	.44	.15	5.51

a Adjusted for storage and pumpage.

Note.--Negative figures indicate that evaporation and seepage from reservoir exceeded inflow.

Yearly discharge of Brush Creek and rainfall at Lake Bracken, near Galesburg, Ill.

Water year ending Sept. 30												Calendar year		
Year	WSP	Discharge from spillway (millions of gallons)	Pumpage (millions of gallons)	Change in contents (millions of gallons)	Adjusted for change in reservoir contents and pumpage			Rainfall (inches)	Adjusted		Rainfall (inches)			
					Runoff (millions of gallons)	Discharge per square mile			Mean in cubic feet per second	Runoff (inches)				
						Millions of gallons	Cubic feet per day							
1950	-	-	-	-	-	-	-	-	7.17	10.66	36.76			
1951	1208	1,794.31	324.9	+15.9	2,135.11	0.640	0.990	38.97	9.96	14.77	43.84			
1952	1238	1,581.51	287.91	-17.1	1,852.32	.554	.857	34.19	7.13	10.64	32.44			
1953	1278	726.1	300.0	-55.6	970.5	.291	.450	28.09	3.96	5.89	27.24			
1954	1338	854.5	274.1	-25.7	1,102.9	.331	.512	35.03	5.98	8.88	41.05			
1955	1398	1,665.2	251.1	+13.7	1,930.0	.579	.896	37.13	6.85	10.15	32.99			
1956	1438	414.0	261.9	-10.6	665.3	.198	.306	31.12	2.75	4.10	28.65			
1957	1508	782.2	251.1	+35.3	1,068.6	.320	.495	31.48	4.94	7.34	36.58			
1958	1558	640.5	204.3	+30.9	875.7	.262	.405	-	-	-	-			

5695. Spoon River at London Mills, Ill.

Location.--Lat 40°42'51", long 90°16'00", in NW $\frac{1}{4}$ sec.3, T.8 N., R.2 E., or left bank at downstream side of highway bridge in London Mills, 0.5 mile upstream from Minneapolis & St. Louis Railway bridge, 1.4 miles upstream from Cedar Creek, and 2.8 miles downstream from Littlers Creek.

Drainage area.--1,070 sq mi, approximately.

Records available.--October 1942 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 508.97 ft above mean sea level, datum of 1929. Prior to July 13, 1945, wire-weight gage at same site and datum.

Average discharge.--18 years (1942-60), 642 cfs.

Extremes.--1942-60: Maximum discharge, 35,300 cfs July 22, 1951 (gage height, 23.73 ft), from rating curve extended above 20,000 cfs; minimum, 5.6 cfs Sept. 16, 17, 1959. Maximum stage known, 27.08 ft Aug. 26, 1924, from information by local residents.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	82.0	59.4	53.3	473	2,536	692	1,638	1,349	629	3,998	707	458	1,048
1952	452	806	368	1,310	816	1,892	1,444	930	1,594	413	448	90.9	880
1953	55.4	130	218	136	511	576	749	858	535	601	48.1	16.3	368
1954	30.0	32.0	37.7	31.3	149	890	1,529	601	1,666	127	353	75.0	459
1955	635	363	411	1,539	2,116	1,034	1,579	1,109	1,503	218	128	74.7	883
1956	116	74.3	38.8	33.8	505	132	71.2	285	176	1,005	444	65.1	246
1957	17.6	44.9	46.2	262	242	280	1,345	761	828	232	62.4	35.4	345
1958	74.8	102	232	196	568	463	326	189	2,330	1,060	491	127	511
1959	82.2	86.4	40.7	33.3	2,666	676	713	643	197	279	105	150	457
1960	780	437	617	1,099	586	1,955	3,479	1,588	1,877	504	388	112	1,117

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.09	0.06	0.06	0.51	2.47	0.75	1.71	1.45	0.66	4.31	0.76	0.48	13.31
1952	.49	.84	.40	1.41	.82	2.04	1.51	1.00	1.66	.44	.48	.09	11.18
1953	.06	.14	.24	.15	.50	.62	.78	.92	.56	.65	.05	.02	4.69
1954	.03	.03	.04	.03	.15	.96	1.59	.65	1.74	.14	.38	.08	5.82
1955	.68	.38	.44	1.66	2.06	1.11	1.65	1.20	1.57	.24	.14	.08	11.21
1956	.13	.08	.04	.04	.51	.14	.07	.31	.18	1.08	.48	.07	3.13
1957	.02	.05	.05	.28	.24	.30	1.40	.82	.86	.25	.07	.04	4.38
1958	.08	.11	.25	.21	.55	.50	.34	.20	2.45	1.14	.53	.13	6.47
1959	.09	.09	.04	.04	2.59	.73	.74	.69	.21	.30	.11	.16	5.79
1960	.84	.46	.66	1.18	.59	2.11	3.63	1.71	1.96	.54	.42	.12	14.22

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	858	10.90
1951	1208	35,300	July 22, 1951	39	1,048	0.979	15.31	1,167	14.83
1952	1238	5,900	June 22, 1952	41	880	.822	11.18	778	9.89
1953	1278	4,950	July 6, 1953	9.5	368	.344	4.69	343	4.35
1954	1338	10,300	June 2, 1954	9.5	459	.429	5.82	569	7.22
1955	1388	12,400	Feb. 20, 1955	39	883	.825	11.21	783	9.96
1956	1438	9,500	July 9, 1956	16	246	.230	3.13	236	3.00
1957	1508	4,950	June 14, 1957	10	345	.322	4.38	370	4.70
1958	1558	11,200	June 13, 1958	14	511	.478	6.47	494	6.25
1959	1628	a7,800	Feb. 14, 1959	5.6	457	.427	5.79	594	7.53
1960	1708	19,400	Mar. 31, 1960	75	1,117	1.04	14.22	-	-

a About.

5700. Spoon River at Seville, Ill.

Location--Lat 40°29'10", long 90°20'34", in SW 1/4 sec.24, T.6 N., R.1 E., near center of span on downstream side of highway bridge in Seville.

Drainage area--1,600 sq mi, approximately.

Records available--July 1914 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage--Wire-weight gage. Datum of gage is 467.04 ft above mean sea level, datum of 1929. Prior to May 9, 1935, chain gage at site 200 ft downstream at same datum.

Average discharge--46 years (1914-60), 980 cfs.

Extremes--1914-60: Maximum discharge, 37,300 cfs Aug. 22, 1924 (gage height, 30.77 ft, from graph based on gage readings); minimum observed, 3.8 cfs July 31, Aug. 27-29, 1914. Flood in 1883 reached a stage of about 33.0 ft (backwater from ice).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	127	110	106	744	3,887	1,115	2,537	1,731	866	4,217	919	595	1,397
1952	564	953	508	1,952	1,528	2,755	2,403	1,663	2,689	755	965	201	1,411
1953	87.8	249	359	291	772	1,025	1,311	1,245	804	750	88.9	30.4	584
1954	74.9	53.8	78.1	74.8	277	1,359	2,430	842	2,489	197	56.4	85.7	708
1955	940	494	520	2,285	3,269	1,623	2,183	1,673	1,991	435	229	111	1,298
1956	166	103	57.8	56.2	689	188	89.7	317	267	1,156	730	130	329
1957	26.5	63.8	66.5	458	451	449	1,773	1,255	1,309	342	97.1	59.1	527
1958	154	148	329	264	825	689	482	276	3,362	1,544	715	228	746
1959	139	159	78.3	63.3	3,806	1,004	921	956	343	421	192	215	669
1960	1,329	522	782	1,545	906	2,015	4,921	2,607	3,182	1,071	1,020	216	1,675

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.09	0.08	0.08	0.54	2.53	0.80	1.77	1.25	0.60	3.04	0.66	0.42	11.86
1952	.41	.69	.37	1.41	1.03	1.98	1.68	1.20	1.88	.53	.70	.14	12.02
1953	.06	.17	.27	.21	.50	.74	.91	.90	.56	.55	.06	.02	4.85
1954	.05	.04	.06	.05	.18	.98	1.69	.61	1.74	.14	.41	.05	6.01
1955	.68	.34	.37	1.65	2.13	1.17	1.52	1.21	1.39	.31	.17	.08	11.02
1956	.12	.07	.04	.04	.46	.14	.06	.23	.19	.83	.53	.09	2.80
1957	.02	.04	.05	.33	.29	.32	1.24	.90	.91	.25	.07	.04	4.46
1958	.10	.10	.24	.19	.54	.50	.34	.20	2.34	1.11	.52	.16	6.34
1959	.10	.11	.06	.05	2.48	.72	.64	.69	.24	.30	.14	.15	5.68
1960	.96	.56	.56	1.11	.61	1.45	3.43	1.88	2.22	.77	.74	.15	14.24

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	1,357	11.53
1951	1208	23,200	Feb. 20, 1951	78	1,397	0.873	11.86	1,540	13.08
1952	1258	9,180	June 23, 1952	89	1,411	.882	12.02	1,298	11.05
1953	1278	5,420	July 13, 1953	20	584	.355	4.85	542	4.60
1954	1338	13,200	June 3, 1954	27	708	.442	6.01	855	7.25
1955	1388	15,000	Feb. 21, 1955	37	1,298	.811	11.02	1,161	9.86
1956	1438	7,500	July 10, 1956	32	329	.206	2.80	315	2.68
1957	1508	5,630	June 15, 1957	23	527	.329	4.46	565	4.79
1958	1558	14,800	June 14, 1958	20	746	.466	6.34	726	6.17
1959	1628	all, 500	Feb. 13, 1959	17	669	.418	5.68	860	7.29
1960	1708	19,400	Mar. 31, 1960	131	1,675	1.05	14.24	-	-

a About.

5710. Sangamon River at Mahomet, Ill.

Location.--Lat 40°11'30", long 88°24'00", in NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.15, T.20 N., R.7 E., on right bank at downstream side of bridge on U.S. Highway 150 in Mahomet, 0.7 mile upstream from Cleveland, Cincinnati, Chicago & St. Louis Railway bridge.

Drainage area.--356 sq mi.

Records available.--March 1948 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 665.11 ft above mean sea level, datum of 1929. Prior to Dec. 21, 1948, wire-weight gage at same site and datum.

Average discharge.--12 years (1948-60), 243 cfs.

Extremes.--1948-60: Maximum discharge, 14,600 cfs May 28, 1956 (gage height, 19.96 ft); no flow Sept. 25 to Oct. 3, 1954.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	66.3	54.5	78.7	467	1,285	494	853	237	189	615	90.8	54.8	351
1952	120	447	155	455	313	681	827	468	811	104	16.2	8.87	364
1953	4.65	10.0	9.97	17.1	24.6	439	499	135	65.8	194	7.94	1.76	118
1954	.85	3.35	3.56	17.7	16.5	48.5	239	49.9	79.1	7.28	22.7	2.50	40.7
1955	11.1	4.50	6.73	116	189	235	213	251	268	67.7	6.53	6.21	114
1956	45.3	41.6	22.4	11.2	214	136	102	1,083	312	230	103	6.76	194
1957	4.11	5.99	7.64	41.3	128	64.5	1,281	885	402	431	47.0	10.9	275
1958	11.8	55.3	359	277	83.5	98.4	123	103	909	399	584	29.4	254
1959	13.3	121	60.9	101	1,277	484	374	212	57.8	9.19	4.14	9.62	219
1960	26.2	51.9	60.0	124	278	294	570	209	491	235	28.6	29.7	199

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.21	0.17	0.28	1.51	3.78	1.60	2.05	0.77	0.59	1.99	0.29	0.17	13.37
1952	.39	1.40	.50	1.47	.95	2.14	2.59	1.52	2.54	.34	.05	.03	13.92
1953	.02	.03	.03	.06	.07	1.42	1.57	.44	.21	.63	.03	.006	4.52
1954	.003	.01	.01	.06	.05	.16	.75	.16	.25	.02	.07	.008	1.55
1955	.04	.50	.02	.37	.55	.76	.67	.81	.84	.22	.02	.02	4.33
1956	.15	.13	.07	.04	.65	.44	.32	3.54	.98	.74	.33	.02	7.41
1957	.01	.02	.02	.13	.37	.21	4.01	2.86	1.26	1.40	.15	.03	10.47
1958	.04	.17	1.16	.90	.24	.32	.39	.33	2.85	1.29	1.89	.09	9.67
1959	.04	.38	.20	.33	3.73	1.57	1.17	.69	.18	.03	.01	.03	8.36
1960	.08	.16	.19	.40	.84	.95	1.79	.68	1.54	.76	.09	.09	7.57

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	464	17.70
1951	1208	9,100	Feb. 22, 1951	19	351	0.986	13.37	394	15.02
1952	1238	3,200	June 23, 1952	5.4	364	1.02	13.92	308	11.71
1953	1278	2,470	Apr. 2, 1953	.3	118	.331	4.52	117	4.46
1954	1338	1,020	Apr. 12, 1954	0	40.7	.114	1.55	41.9	1.60
1955	1388	1,340	May 30, 1955	0	114	.320	4.33	121	4.61
1956	1438	14,600	May 28, 1956	2.2	194	.545	7.41	186	7.11
1957	1508	5,850	Apr. 28, 1957	1.9	275	.772	10.47	310	11.79
1958	1558	4,100	June 14, 1958	4.3	354	.713	9.67	234	8.92
1959	1628	a7,600	Feb. 11, 1959	.3	219	.615	8.36	215	8.17
1960	1708	3,200	June 23, 1960	5.0	199	.559	7.57	-	-

a About.

5715. Goose Creek near De Land, Ill.

Location.--Lat 40°05'40", long 88°37'52", in NW $\frac{1}{4}$ sec.22, T.19 N., R.5 E., on right bank at downstream side of highway bridge, 2 miles southeast of De Land and 4.5 miles upstream from mouth.

Drainage area.--47.3 sq mi.

Records available.--May 1951 to September 1959.

Gage.--Water-stage recorder. Datum of gage is 661.44 ft above mean sea level, datum of 1929. Prior to Apr. 23, 1959, at datum 2.00 ft higher.

Average discharge.--8 years (1951-59), 25.4 cfs.

Extremes.--1951-59: Maximum discharge, 3,340 cfs Feb. 10, 1959 (gage height, 12.13 ft); no flow for many days each year.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	47.3	96.4	5.29	1.21	-
1952	9.61	58.7	25.1	70.6	52.5	89.3	116	41.7	90.2	9.72	.46	0	46.7
1953	0	.06	.17	.93	4.15	98.7	79.2	12.6	18.3	31.7	.88	0	20.7
1954	0	0	.05	.12	.06	.98	12.9	2.20	58.4	.29	.72	0	6.24
1955	.12	0	0	4.15	21.3	23.1	19.9	21.3	61.6	4.67	.05	.03	12.9
1956	4.43	2.87	1.18	.51	22.3	14.3	17.5	40.2	23.7	2.88	9.38	.06	11.6
1957	0	.03	.14	5.42	30.9	13.9	130	101	65.2	27.5	.65	.02	31.1
1958	.08	.80	22.1	30.9	10.5	10.8	11.8	14.2	117	204	69.9	5.06	41.8
1959	1.46	18.0	8.62	20.0	189	90.5	50.3	18.7	5.31	.45	.01	.24	32.4
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	1.12	2.35	0.13	0.03	-
1952	0.23	1.38	0.61	1.72	1.20	2.18	2.73	1.02	2.13	.24	.01	0	13.45
1953	0	.001	.004	.02	.09	2.41	1.87	.31	.43	.77	.02	0	5.92
1954	0	0	.001	.003	.001	.02	.31	.05	1.38	.007	.02	0	1.79
1955	.003	0	0	.10	.47	.56	.47	.52	1.45	.11	.001	.0078	3.68
1956	.11	.07	.03	.01	.51	.35	.41	.98	.56	.07	.23	.001	3.33
1957	0	.0007	.003	.13	.68	.34	3.07	2.47	1.54	.67	.02	.0076	8.92
1958	.002	.02	.54	.75	.23	.26	.35	2.77	4.98	1.70	.12	.12	12.00
1959	.04	.42	.21	.49	4.16	2.21	1.19	.46	.13	.01	.0003	.003	9.33
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-
1951	1208	863	July 9, 1951	-	-	-	-	-	-
1952	1238	438	June 22, 1952	0	46.7	0.987	13.45	39.0	11.24
1953	1278	788	Mar. 15, 1953	0	20.7	.438	5.92	†20.6	5.92
1954	1338	1,400	June 7, 1954	0	6.24	.132	1.79	6.24	1.79
1955	1388	347	June 11, 1955	0	12.9	.273	3.68	13.6	3.69
1956	1438	326	May 28, 1956	0	11.6	.245	3.33	10.9	3.12
1957	1508	482	Apr. 27, 1957	0	31.1	.658	8.92	33.0	9.48
1958	1558	2,890	July 11, 1958	0	41.8	.884	12.00	42.2	12.11
1959	1628	3,340	Feb. 10, 1959	0	32.4	.685	9.33	-	-
1960	-	-	-	-	-	-	-	-	-

† Corrected.

5720. Sangamon River at Monticello, Ill.

Location.--Lat 40°01'40", long 88°35'25", in SW $\frac{1}{4}$ sec.12, T.18 N., R.5 E., at center of span on downstream side of Illinois Central Railroad bridge, half a mile west of Monticello.

Drainage area.--550 sq mi.

Records available.--February 1908 to December 1912, June 1914 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Wire-weight gage. Datum of gage is 625.89 ft above mean sea level, datum of 1929. Prior to Mar. 31, 1941, chain gage at same site and datum.

Average discharge.--50 years (1908-12, 1914-60), 391 cfs.

Extremes.--1908-12, 1914-60: Maximum discharge, 19,000 cfs Oct. 4, 1926 (gage height, 18.50 ft, from graph based on gage readings); minimum, 0.2 cfs Oct. 10, 1954.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	95.8	86.3	122	685	1,870	710	905	374	331	986	111	91.8	522
1952	139	567	199	657	514	888	1,104	610	1,067	163	26.2	12.9	494
1953	8.91	13.6	16.1	20.8	39.1	647	775	181	114	244	15.9	3.84	174
1954	2.97	5.98	7.98	18.3	22.8	44.9	278	60.7	349	13.9	26.7	4.99	69.1
1955	10.3	5.67	8.20	146	269	345	318	311	502	148	16.1	8.54	173
1956	164	102	47.1	25.6	326	220	124	1,215	510	249	153	16.8	263
1957	4.74	8.84	13.5	39.0	211	110	1,785	1,390	604	615	63.3	21.0	405
1958	19.8	69.7	543	466	131	150	187	222	1,319	942	869	65.9	419
1959	32.6	164	114	138	1,899	767	546	321	121	24.3	13.6	12.4	336
1960	46.4	80.3	89.8	198	417	326	650	368	924	371	48.8	32.8	310

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.20	0.17	0.26	1.44	3.54	1.49	1.84	0.78	0.67	2.07	0.23	0.19	12.88
1952	.29	1.15	.42	1.38	1.01	1.86	2.24	1.28	2.17	.34	.05	.03	12.22
1953	.02	.03	.03	.04	.07	1.36	1.57	.58	.23	.31	.03	.008	4.26
1954	.006	.01	.02	.04	.04	.09	.56	.13	.71	.03	.08	.01	1.71
1955	.02	.01	.02	.31	.51	.72	.65	.65	1.02	.31	.03	.02	4.27
1956	.34	.21	.10	.05	.64	.46	.25	2.55	1.04	.52	.32	.03	6.51
1957	.01	.02	.03	.08	.40	.23	3.62	2.91	1.23	1.29	.13	.04	9.99
1958	.04	.14	1.14	.98	.25	.31	.38	.46	2.68	1.98	1.82	.17	10.35
1959	.07	.33	.24	.29	3.59	1.65	1.11	.67	.24	.05	.03	.03	8.30
1960	.10	.16	.19	.42	.82	.68	1.72	.77	1.88	.78	.10	.07	7.69

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	658	16.25
1951	1208	9,100	Feb. 21, 1951	35	522	0.949	12.88	471	14.11
1952	1238	3,350	June 25, 1952	9.2	494	.898	12.22	422	10.44
1953	1278	2,820	Apr. 3, 1953	.8	174	.316	4.28	172	4.23
1954	1338	4,320	June 8, 1954	.9	69.1	.126	1.71	69.7	1.72
1955	1388	1,370	May 31, 1955	.3	173	.315	4.27	197	4.87
1956	1438	13,800	May 29, 1956	7.5	263	.478	6.51	239	5.92
1957	1508	7,850	Apr. 29, 1957	2.8	405	.736	9.99	456	11.25
1958	1558	4,880	July 12, 1958	11	419	.762	10.35	392	9.87
1959	1628	11,200	Feb. 10, 1959	3.0	336	.611	8.30	329	8.11
1960	1708	3,510	June 25, 1960	12	310	.564	7.69	-	-

5725. Sangamon River near Oakley, Ill.

Location.--Lat 39°55'09", long 88°48'09", in SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.24, T.17 N., R.3 E., near center of span on downstream side of bridge, 2.4 miles downstream from Friends Creek, 3 miles north of Oakley, and about 4 $\frac{1}{2}$ miles upstream from Lake Decatur.

Drainage area.--750 sq mi.

Records available.--July 1951 to September 1960 (fragmentary since September 1955).

Gage.--Wire-weight gage. Datum of gage is 603.00 ft above mean sea level, datum of 1929 (levels by Warren & Van Praag, Inc.).

Average discharge.--5 years (1951-56), 331 cfs.

Extremes.--1951-60: Maximum discharge, 13,700 cfs Feb. 11, 1959 (gage height, 18.45 ft, from graph based on gage readings); minimum observed, 0.2 cfs Oct. 8, 9, 1954. Maximum stage known, 21.85 ft May 18 or 19, 1943, from floodmark (discharge not determined).

Remarks.--Medium and low flows affected by operation of gates at Lake Decatur Dam.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	1,315	273	177	-
1952	197	909	378	1,080	793	1,327	1,694	775	1,259	248	57.9	12.2	724
1953	10.1	18.1	22.7	27.8	71.9	1,063	1,093	278	255	294	30.2	4.35	267
1954	1.34	6.14	9.60	15.2	25.6	45.1	284	79.9	396	29.8	59.9	13.5	79.9
1955	30.7	9.61	9.03	199	391	472	440	389	786	198	27.3	8.23	245
1956	366	154	70.0	35.3	440	304	174	1,067	789	365	280	33.2	340
1957	-	-	-	-	-	-	-	1,705	-	-	-	-	-
1958	-	-	-	640	190	-	-	-	1,557	1,120	-	-	-
1959	-	-	-	-	3,070	1,466	1,047	497	-	-	-	-	-
1960	-	-	-	289	692	-	1,277	572	1,308	541	-	-	-

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	2.02	0.42	0.28	-
1952	0.30	1.55	0.58	1.66	1.14	2.04	2.52	1.19	1.87	.38	.09	.02	13.14
1953	.02	.03	.03	.04	.10	1.63	1.63	.43	.42	.45	.05	.006	4.84
1954	.002	.009	.01	.02	.04	.07	.42	.12	.59	.05	.09	.02	1.44
1955	.05	.01	.01	.31	.54	.73	.66	.60	1.17	.30	.04	.01	4.43
1956	.56	.23	.11	.05	.63	.47	.26	1.64	1.17	.56	.43	.05	6.16
1957	-	-	-	-	-	-	-	2.62	-	-	-	-	-
1958	-	-	-	.98	.28	-	-	-	-	2.39	1.72	-	-
1959	-	-	-	-	4.28	2.25	1.56	.76	-	-	-	-	-
1960	-	-	-	.44	1.00	-	1.90	.88	1.95	.83	-	-	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches	
		Discharge	Date							
1950	-	-	-	-	-	-	-	-	-	-
1951	1208	4,500	July 13, 1951	-	-	-	-	-	-	-
1952	1238	3,020	June 26, 1952	8.2	724	0.965	13.14	605	10.99	-
1953	1278	3,140	Apr. 2, 1953	1.6	267	.356	4.64	264	4.78	-
1954	1338	3,020	June 10, 1954	.4	79.9	.107	1.44	82.7	1.49	-
1955	1388	2,390	June 12, 1955	.2	245	.327	4.43	290	5.26	-
1956	1438	11,800	May 30, 1956	7.9	340	.453	6.16	-	-	-
1957	1508	7,400	Apr. 30, 1957	-	-	-	-	-	-	-
1958	1558	6,150	July 13, 1958	-	-	-	-	-	-	-
1959	1628	13,700	Feb. 11, 1959	-	-	-	-	-	-	-
1960	1708	13,950	June 26, 1960	-	-	-	-	-	-	-

a About.

ILLINOIS RIVER BASIN

5735. Sangamon River at Lake Decatur, Ill.

Location.--Lat 39°49'38", long 88°57'21", in SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.22, T.16 N., R.2 E., on right bank at north end of Lake Decatur Dam at Decatur, 300 ft downstream from bridge on U.S. Highway 51, and 800 ft upstream from Illinois Central Railroad bridge.

Drainage area.--906 sq mi.

Records available.--December 1948 to September 1951.

Gage.--Wire-weight gage. Datum of gage is 607.00 ft above mean sea level, datum of 1929.

Extremes.--1948-51: Maximum discharge, 14,400 cfs Feb. 22, 1951 (gage height, 6.97 ft); minimum, 1 cfs for several days each year.
Maximum discharge known, 22,000 cfs May 18 or 19, 1943 (gage height, 9.1 ft), by computation of flow over dam.

Remarks.--Diversion above station from Lake Decatur for municipal supply of Decatur.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	71.2	104	210	983	3,374	1,205	1,773	760	756	1,476	233	221	913

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.09	0.13	0.27	1.25	3.88	1.53	2.18	0.97	0.93	1.88	0.30	0.27	13.68

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	1,060	15.88
1951	1208	14,400	Feb. 22, 1951	1.0	913	1.01	13.68	-	-

5740. South Fork Sangamon River near Nokomis, Ill.

Location.--Lat 39°21'12", long 89°15'05", in NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.36, T.11 N., R.2 W., on right bank at downstream side of highway bridge, 0.7 mile upstream from small tributary and 4.0 miles northeast of Nokomis.

Drainage area.--10.8 sq mi.

Records available.--December 1950 to September 1960.

Gage.--Water-stage recorder and concrete control. Datum of gage is 641.35 ft above mean sea level, datum of 1929.

Average discharge.--9 years (1951-60), 5.61 cfs.

Extremes.--1951-60: Maximum discharge, 8,600 cfs June 28, 1957 (gage height, 14.84 ft), from rating curve extended above 600 cfs on basis of estimate made by slope-area study; no flow for many days each year.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	5.72	56.0	31.2	40.7	0.766	20.8	0.844	0.197	0.172	-
1952	0.105	2.02	3.94	3.61	15.4	16.5	17.1	1.57	.414	.946	0	.103	5.09
1953	0	.012	.078	.121	.096	9.68	2.85	5.08	3.14	.765	0.045	0	1.84
1954	0	0	0	0	0	.011	1.22	.034	3.96	0	0	0	.430
1955	.85	0	0	.40	3.86	4.18	3.69	2.66	.15	2.48	.009	.39	1.54
1956	2.38	1.95	.024	.010	5.84	1.16	5.11	1.99	1.55	.848	8.82	.011	2.46
1957	0	.0007	.742	.614	6.39	1.63	32.6	6.76	109	12.6	11.6	.128	15.1
1958	.260	2.81	12.6	4.74	2.90	5.99	4.94	2.95	8.17	34.4	9.65	2.76	7.75
1959	.261	7.07	1.82	18.6	25.9	13.2	1.58	2.55	.262	.103	23.6	.375	7.85
1960	2.83	7.11	6.67	7.94	11.7	19.3	3.62	10.0	22.5	6.09	1.24	2.70	8.46

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	0.61	5.40	3.33	4.21	0.08	2.15	0.09	0.02	0.02	-
1952	0.01	.021	0.42	.39	1.54	1.76	1.76	.17	.04	.10	0	.01	6.41
1953	0	.001	.008	.01	.009	1.03	.29	.54	.32	.08	0.005	0	2.29
1954	0	0	0	0	0	.001	.13	.004	.41	0	0	0	.54
1955	.09	0	0	.04	.37	.45	.38	.28	.02	.26	.001	.04	1.93
1956	.25	.80	.003	.001	.58	.12	.53	.21	.16	.09	.94	.001	3.08
1957	0	.00007	.08	.07	.62	.17	3.36	.72	11.51	1.35	1.24	.01	18.93
1958	.03	.29	1.35	.51	.28	.64	.51	.32	.84	3.67	1.03	.29	9.76
1959	.03	.73	.19	1.98	2.50	1.41	.16	.27	.03	.01	2.52	.04	9.87
1960	.30	.73	.71	.85	1.17	2.06	.37	1.07	2.33	.65	.13	.28	10.65

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	1238,1508	1,510	Apr. 6, 1951	-	-	-	-	13.52	16.55
1952	1238	495	Feb. 4, Mar. 11	0	5.09	0.471	6.41	1.83	2.78
1953	1278	327	Mar. 31, 1953	0	1.84	.170	2.29	1.83	2.28
1954	1338	367	June 1, 1954	0	.430	.040	.54	.50	.64
1955	1388,1508	640	July 1, 1955	0	1.54	.143	1.93	1.83	2.29
1956	1438,1508	570	Aug. 9, 1956	0	2.46	.228	3.08	2.16	2.71
1957	1508	8,600	June 28, 1957	0	15.1	1.40	18.93	16.3	20.52
1958	1558	2,280	July 31, 1958	0	7.75	.718	9.76	7.19	9.04
1959	1628	1,380	Aug. 6, 1959	0	7.85	.727	9.87	8.49	10.66
1960	1708	860	June 21, 1960	0	8.46	.783	10.65	-	-

5745. Flat Branch near Taylorville, Ill.

Location.--Lat 39°33'14", long 89°15'12", in SE¹/₄SE¹/₄ sec.24, T.13 N., R.2 W., on right bank at downstream side of bridge on State Highway 29, 1.4 miles east of Taylorville and 1.8 miles upstream from mouth.

Drainage area.--276 sq mi.

Records available.--July 1949 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 562.44 ft above mean sea level, datum of 1929.

Average discharge.--11 years (1949-60), 179 cfs.

Extremes.--1949-60: Maximum discharge, 13,000 cfs June 29, 1957 (gage height, 19.55 ft); no flow for many days in 1953-55, Oct. 18, 1956.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	58.3	56.8	73.0	132	918	405	614	119	486	280	10.5	5.44	257
1952	7.81	60.4	44.7	278	363	355	398	115	314	114	4.77	1.29	170
1953	.60	2.71	4.02	6.15	11.4	171	170	69.0	48.8	19.1	.83	0	42.1
1954	0	0	0	.46	1.10	1.71	56.1	4.09	14.2	0	.42	.44	6.47
1955	12.4	.24	0	10.5	40.9	65.4	136	158	123	269	5.73	3.34	69.0
1956	76.8	96.3	24.4	13.7	169	96.0	56.5	125	134	128	304	7.38	103
1957	.38	2.55	56.7	47.8	175	236	1,055	635	1,627	602	136	5.53	380
1958	12.1	83.4	310	206	54.8	113	95.6	65.2	339	380	650	19.1	196
1959	6.44	63.6	46.2	138	655	289	131	134	67.4	3.43	105	2.24	133
1960	25.1	109	66.2	143	242	301	450	413	847	126	28.0	3.70	228

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.24	0.23	0.30	0.55	3.46	1.69	2.48	0.50	1.96	1.17	0.04	0.02	12.64
1952	.03	.24	.19	1.16	1.42	1.48	1.61	.48	1.27	.47	.02	.005	8.38
1953	.003	.01	.02	.03	.04	.71	.69	.29	.20	.08	.004	0	2.08
1954	0	0	0	.002	.004	.007	.23	.02	.06	0	.002	.002	.33
1955	.05	.001	0	.04	.15	.27	.55	.66	.50	1.12	.02	.01	3.37
1956	.32	.39	.10	.06	.66	.40	.23	.52	.54	.54	1.27	.03	5.06
1957	.002	.01	.24	.20	.66	.98	4.26	2.65	6.56	2.52	1.51	.02	18.69
1958	.05	.34	1.30	.86	.21	.47	.38	.27	1.37	1.59	2.72	.08	9.64
1959	.03	.26	.19	.58	2.47	1.21	.53	.56	.27	.01	.44	.009	6.56
1960	.10	.44	.28	.60	.94	1.26	1.82	1.73	3.42	.53	.12	.01	11.25

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	342	16.83
1951	1208	7,350	June 29, 1951	2.8	257	0.931	12.64	251	12.35
1952	1238	2,000	June 23, 1952	.5	170	.616	8.38	161	7.95
1953	1278	660	Apr. 3, 1953	0	42.1	.153	2.08	41.5	2.04
1954	1338	457	Apr. 17, 1954	0	6.47	.023	.33	7.54	.36
1955	1368	1,860	July 16, 1955	0	69.0	.250	3.37	84.4	4.13
1956	1438	1,930	Aug. 3, 1956	1.0	103	.373	5.06	91.2	4.50
1957	1508	13,000	June 29, 1957	0	380	1.38	18.69	409	20.13
1958	1558	5,000	Aug. 1, 1958	1.0	196	.710	9.64	171	8.43
1959	1628	5,750	Feb. 11, 1959	.4	133	.482	6.56	140	6.90
1960	1708	4,460	June 24, 1960	.4	228	.826	11.25	-	-

5755. South Fork Sangamon River at Kincaid, Ill.

Location.--Lat 39°34'40", long 89°23'30", in SW 1/4 sec. 14, T. 13 N., R. 3 W., on right bank 200 ft upstream from Chicago & Illinois Midland Railway bridge, 300 ft upstream from bridge on State Highway 104, 1 mile southeast of Kincaid, and 6 miles downstream from Bear Creek.

Drainage area.--510 sq mi.

Records available.--May 1917 to November 1927, April 1928 to September 1930, August 1931 to November 1933, October 1944 to September 1960. Prior to October 1929 published as "at power plant near Taylorville."

Gage.--Water-stage recorder and flat-crested concrete dam. Datum of gage is 538.65 ft above mean sea level (Corps of Engineers bench mark). Prior to Sept. 30, 1950, chain gage at railroad bridge 200 ft downstream at same datum. Aug. 17, 1931, to Nov. 21, 1933, chain gage at highway bridge 300 ft downstream at same datum. Oct. 1, 1944, to July 17, 1945, staff and wire-weight gages at present site and datum.

Average discharge.--30 years (1917-27, 1928-30, 1931-33, 1944-60), 414 cfs.

Extremes.--1917-33, 1944-60: Maximum discharge, 21,500 cfs June 29, 1957 (gage height, 30.02 ft); no flow Aug. 29, Oct. 6-23, 1922.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	77.3	84.5	96.2	202	1,775	885	1,245	195	611	782	31.5	17.5	490
1952	22.4	93.6	61.0	439	821	784	902	215	438	154	12.8	9.28	326
1953	2.95	8.60	11.3	14.3	29.5	382	337	138	129	45.5	3.98	1.89	92.2
1954	3.44	3.87	2.22	3.67	4.67	4.92	107	11.7	47.1	1.32	4.61	6.93	16.6
1955	27.7	2.77	2.61	17.3	70.8	113	240	225	193	410	15.9	4.34	111
1956	123	133	33.2	17.1	256	159	105	282	240	178	452	11.1	166
1957	2.25	3.48	59.9	72.3	350	438	2,295	1,552	3,177	1,925	313	20.4	849
1958	21.5	125	443	341	93.5	242	201	180	685	754	1,940	54.4	428
1959	15.6	108	80.9	289	1,392	654	290	265	146	829	502	18.8	307
1960	86.6	276	133	283	485	450	987	706	1,406	314	54.4	11.9	430

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.17	0.18	0.22	0.46	3.62	2.00	2.72	0.44	1.34	1.77	0.07	0.04	13.03
1952	.05	.20	.14	.99	1.74	1.77	1.97	.49	.96	.35	.03	.02	8.71
1953	.007	.02	.03	.03	.06	.86	.74	.31	.28	.10	.009	.004	2.45
1954	.008	.008	.005	.008	.01	.01	.23	.03	.10	.003	.01	.02	4.44
1955	.06	.006	.006	.04	.14	.26	.53	.51	.42	.93	.04	.009	2.95
1956	.28	.29	.08	.04	.54	.36	.23	.64	.53	.40	1.02	.02	4.43
1957	.005	.008	.14	.16	.71	.99	5.02	3.51	6.95	4.35	.71	.04	22.59
1958	.05	.27	1.00	.77	.19	.55	.44	.41	1.50	1.70	4.39	.12	11.38
1959	.04	.24	.18	.65	2.84	1.48	.63	.60	.32	.02	1.14	.04	8.18
1960	.20	.60	.30	.64	1.03	1.02	2.16	1.60	3.08	.71	.12	.03	11.49

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	647	17.20
1951	1208	7,590	June 30, 1951	11	490	0.961	13.03	483	12.85
1952	1238	2,370	Apr. 15, 1952	3.0	326	.639	8.71	313	8.38
1953	1278	1,110	Apr. 4, 1953	1.0	92.2	.181	2.45	91.1	2.41
1954	1358	749	Apr. 18, 1954	.6	16.6	.033	.44	18.7	.49
1955	1388	1,600	July 19, 1955	.8	111	.218	2.95	132	3.53
1956	1438	1,550	Aug. 6, 1956	2.5	166	.325	4.43	147	3.93
1957	1508	21,500	June 29, 1957	1.2	849	1.66	22.59	893	23.76
1958	1558	11,900	Aug. 2, 1958	2.5	428	.839	11.38	395	10.52
1959	1628	6,510	Feb. 12, 1959	3.6	307	.602	8.18	332	8.62
1960	1708	4,800	June 26, 1960	3.2	430	.843	11.49	-	-

5760. South Fork Sangamon River near Rochester, Ill.

Location.--Lat 39°45'50", long 89°33'45", in NW¹/₄SE¹/₄ sec.8, T.15 N., R.4 W., on left bank at downstream side of bridge on State Highway 29, 200 ft downstream from Baltimore & Ohio Railroad bridge and 1.1 miles northwest of Rochester.

Drainage area.--809 sq mi.

Records available.--July 1949 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 511.30 ft above mean sea level, datum of 1929. Auxiliary wire-weight gage at bridge 1 mile upstream. Prior to May 19, 1950, auxiliary wire-weight gage at bridge 4 miles downstream.

Average discharge.--11 years (1949-60), 481 cfs.

Extremes.--1949-60: Maximum discharge, 18,100 cfs July 1, 1957; maximum gage height, 28.36 ft July 1, 1957; minimum discharge, 0.4 cfs July 19, 20, Sept. 8, 9, 1954.

Remarks.--Diversion above station for municipal supply of Springfield beginning Apr. 14, 1955. There was no diversion during 1960 water year. Occasional regulation caused by operation of gate at diversion dam.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	71.5	90.4	116	283	2194	1,225	1,590	300	744	1,288	46.5	23.1	652
1952	25.8	111	77.9	576	1,073	1,004	1,307	329	627	208	24.3	10.1	443
1953	3.83	11.6	15.7	17.1	31.5	461	455	204	235	975	7.88	3.42	129
1954	1.76	3.66	3.84	6.56	8.99	13.1	153	17.9	66.1	1.74	34.2	6.86	26.3
1955	52.4	4.13	2.84	33.9	119	179	312	484	373	486	22.2	4.03	173
1956	239	148	55.5	29.5	290	224	132	461	391	173	512	17.0	223
1957	4.01	5.94	66.1	80.5	314	445	2,559	2,147	2,470	3,053	333	25.3	961
1958	24.5	151	605	511	135	328	326	411	937	1,052	3,046	74.0	640
1959	27.1	143	113	386	1,889	847	399	341	199	134	768	89.9	425
1960	357	360	185	432	755	568	1,946	1,105	2,097	756	72.5	23.1	719

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.10	0.12	0.17	0.40	2.82	1.75	2.19	0.43	1.03	1.84	0.07	0.03	10.95
1952	.04	.15	.11	.82	1.43	1.43	1.80	.47	.86	.30	.03	.01	7.45
1953	.005	.02	.02	.02	.04	.66	.63	.29	.32	.14	.01	.005	2.16
1954	.003	.005	.005	.009	.01	.02	.21	.03	.09	.002	.05	.009	2.44
1955	.07	.006	.004	.05	.15	.25	.43	.69	.51	.69	.03	.006	2.89
1956	.34	.20	.06	.04	.39	.32	.18	.66	.54	.25	.73	.02	3.75
1957	.006	.008	.09	.11	.40	.63	3.53	3.06	3.41	4.35	.47	.03	16.09
1958	.03	.21	.86	.73	.17	.47	.45	.59	1.29	1.50	4.31	.10	10.74
1959	.04	.20	.16	.55	2.43	1.21	.55	.49	.27	.02	1.10	1.12	7.14
1960	.51	.50	.26	.62	1.01	.84	2.68	1.58	2.89	1.08	.10	.03	12.10

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	849	14.23
1951	1208	7,160	July 2, 1951	7.9	652	0.806	10.95	647	10.86
1952	1238	3,080	June 23, 1952	4.4	443	.548	7.45	428	7.20
1953	1278	1,230	Mar. 15, 1953	1.7	129	.159	2.16	127	2.13
1954	1336	971	Apr. 15, 1954	.4	26.3	.033	.44	30.5	.51
1955	1388	2,330	May 28, 29, 1955	1.0	173	.214	2.69	205	3.43
1956	1438	2,150	Aug. 10, 1956	6.5	223	.276	3.75	192	3.23
1957	1508	18,100	July 1, 1957	2.1	961	1.19	16.09	1,020	17.09
1958	1558	14,300	Aug. 3, 1958	4.6	640	.791	10.74	598	10.04
1959	1628	86,000	Feb. 13, 1959	4.2	425	.525	7.14	477	8.01
1960	1708	5,300	Apr. 2, 1960	11	719	.889	12.10	-	-

a About.

5765. Sangamon River at Riverton, Ill.

Location.--Lat 39°50'34", long 89°32'52", in NE $\frac{1}{4}$ sec.16, T.16 N., R.4 W., near center of span on upstream side of bridge on U.S. Highway 36 at Riverton, 4 $\frac{1}{2}$ miles downstream from South Fork.

Drainage area.--2,560 sq mi, approximately.

Records available.--February 1908 to December 1912, August 1914 to October 1956, water years 1957-60 (annual maximum).

Gage.--Crest-stage gage. Datum of gage is 508.38 ft above mean sea level, datum of 1929. Prior to Aug. 14, 1934, chain gage at site 1,450 ft downstream at datum 5.61 ft lower. Aug. 14, 1934, to Oct. 30, 1946, chain gage at present site and datum. Oct. 31, 1946, to Oct. 31, 1956, wire-weight gage at same site and datum.

Average discharge.--46 years (1908-12, 1914-56), 1,695 cfs.

Extremes.--1908-12, 1914-60: Maximum discharge, 68,700 cfs May 19, 1943 (gage height, 31.52 ft, from graph based on gage readings).
1908-12, 1914-56: Minimum, 3.0 cfs Oct. 3-15, 1914 (gage height, 6.9 ft, site and datum then in use).

Remarks.--Some regulation by municipal reservoirs at Decatur and Springfield. Municipal water supply for Springfield is withdrawn from Sugar Creek basin above station and returned to Sangamon River below station.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	252	227	336	1,522	7,762	4,018	4,910	1,537	3,061	4,819	338	432	2,394
1952	243	1,120	531	2,266	2,951	5,486	5,345	2,070	3,156	885	97.7	60.1	1,839
1953	45.2	57.8	60.9	58.8	111	2,237	2,302	702	858	601	71.6	45.0	597
1954	38.0	39.2	36.7	40.1	43.1	50.8	361	113	463	49.1	106	33.6	114
1955	102	39.1	28.8	211	455	797	869	1,087	1,703	1,276	135	62.5	563
1956	1,075	449	250	90.7	953	821	469	1,353	2,227	479	1,283	77.4	793
1957	44.1	-	-	-	-	-	-	-	-	-	-	-	-
1958	-	-	-	-	-	-	-	-	-	-	-	-	-
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.11	0.10	0.15	0.69	3.16	1.81	2.14	0.69	1.33	2.17	0.15	0.19	12.69
1952	.11	.49	.24	1.02	1.24	1.57	2.33	.93	1.38	.40	.04	.03	9.78
1953	.02	.03	.03	.03	.05	1.01	1.00	.32	.37	.27	.03	.02	3.18
1954	.02	.02	.02	.02	.02	.02	.16	.05	.20	.02	.05	.01	.61
1955	.05	.02	.01	.09	.19	.36	.38	.49	.74	.57	.06	.03	2.99
1956	.48	.20	.11	.04	.40	.37	.20	.61	.97	.22	.58	.03	4.21
1957	.02	-	-	-	-	-	-	-	-	-	-	-	-
1958	-	-	-	-	-	-	-	-	-	-	-	-	-
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	2,817	14.94
1951	1208	29,000	June 29, 1951	89	2,394	0.935	12.69	2,483	13.17
1952	1238	9,600	Apr. 15, 1952	47	1,839	.718	9.78	1,695	9.02
1953	1278	5,500	Apr. 6, 1953	35	597	.233	3.18	593	3.16
1954	1358	1,830	June 12, 1954	23	114	.045	.61	119	.63
1955	1388	4,520	May 29, 1955	24	563	.220	2.99	.699	3.70
1956	1438	8,200	June 3, 1956	49	793	.310	4.21	-	-
1957	1458	22,600	July 1, 1957	-	-	-	-	-	-
1958	-	20,600	Aug. 4, 1958	-	-	-	-	-	-
1959	-	20,300	Feb. 14, 1959	-	-	-	-	-	-
1960	-	18,200	June 23, 1960	-	-	-	-	-	-

5775. Spring Creek near Springfield, Ill.

Location.--Lat 39°48'57", long 89°41'57", in NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.30, T.16 N., R.5 W., on right bank at downstream side of bridge on State Highway 125, 0.8 mile downstream from Chicago and North Western Railway bridge and 1.9 miles west of intersection of Jefferson Street (Highway 125) and MacArthur Boulevard in Springfield.

Drainage area.--107 sq mi.

Records available.--January to September 1948, December 1948 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 524.65 ft above mean sea level, datum of 1929. Prior to Dec. 22, 1948, wire-weight gage at same site and datum.

Average discharge.--11 years (1949-60), 55.7 cfs.

Extremes.--1948-60: Maximum discharge, 6,750 cfs Mar. 30, 1960 (gage height, 12.70 ft); no flow for many days in most years.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.05	4.00	1.22	41.1	253	138	165	46.3	167	67.9	16.1	5.72	73.8
1952	21.5	50.1	24.5	67.2	100	115	196	75.7	56.2	47.1	.18	0	60.7
1953	.10	.24	.12	.02	.24	25.1	33.3	16.0	8.05	2.42	.02	.03	7.16
1954	0	0	.25	.22	.23	35.66	.05	9.38	2.30	12.6	.04		2.15
1955	.80	3.17	.28	6.99	20.8	18.0	48.6	75.5	28.8	13.1	.70	.43	18.1
1956	22.5	.03	0	0	5.88	1.87	10.2	35.3	20.9	14.2	109	3.19	18.8
1957	.003	.58	8.89	11.8	40.6	60.7	605	304	264	105	30.2	1.60	119
1958	.68	.87	25.7	29.6	10.2	14.5	33.6	75.0	180	88.0	97.9	7.65	47.2
1959	.71	5.59	3.11	43.1	231	49.8	30.6	28.6	13.6	2.61	136	82.6	51.0
1960	24	27.5	19.4	33.7	83.8	330	348	141	345	82.5	10.3	1.24	139

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.0005	0.04	0.01	0.44	2.46	1.49	1.72	0.50	1.74	0.73	0.17	0.06	9.36
1952	.23	.52	.26	.72	1.01	1.24	2.04	.82	.38	.51	.002	0	7.73
1953	.001	.002	.001	.0002	.002	.27	.35	.17	.08	.05	.0002	.0003	.91
1954	0	0	0	.003	.002	.003	.007	.0006	.10	.02	.14	.0005	.28
1955	.009	.03	.003	.08	.20	.19	.51	.81	.30	.14	.008	.005	2.28
1956	.24	.0003	0	0	.06	.02	.11	.38	.22	.15	1.18	.03	2.39
1957	.00003	.006	10	.13	.39	.65	6.31	3.28	2.75	1.13	.33	.02	15.10
1958	.007	.009	.28	.32	.10	.16	.35	.81	1.88	.95	1.06	.08	6.01
1959	.008	.06	.03	.46	2.25	.54	.32	.31	.14	.03	1.46	.86	6.47
1960	2.63	.29	.21	.36	.84	3.56	3.62	1.52	3.60	.89	.11	.01	17.64

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	65.4	8.29
1951	1208	-	June 28, 1951	0	73.8	0.690	9.36	81.4	10.32
1952	1238	(a)	Apr. 23, 1952	0	60.7	.567	7.73	52.8	6.73
1953	1278	217	Mar. 15, 1953	0	7.16	.067	.91	7.12	.90
1954	1338	225	Aug. 19, 1954	0	2.15	.020	.28	2.51	.32
1955	1388	729	May 28, 1955	0	18.1	.169	2.28	19.6	2.48
1956	1438	905	Aug. 1, 1956	0	18.8	.176	2.39	17.7	2.26
1957	1508	3,000	Apr. 24, 1957	0	119	1.11	15.10	120	15.29
1958	1558	3,320	June 10, 1958	0	47.2	.441	6.01	45.7	5.81
1959	1628	3,230	Feb. 10, 1959	0	51.0	.477	6.47	74.9	9.50
1960	1708	6,750	Mar. 30, 1960	0	139	1.30	17.64	-	-

a Not determined.

5785. Salt Creek near Rowell, Ill.

Location.--Lat 40°06'54", long 89°02'57", in NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.11, T.19 N., R.1 E., on right bank at downstream side of highway bridge, half a mile upstream from U.S. Highway 54, three-quarters of a mile upstream from Illinois Central Railroad bridge and Ten Mile Creek, and 3.2 miles northwest of Rowell.

Drainage area.--334 sq mi.

Records available.--October 1942 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 610.00 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark).

Average discharge.--18 years (1942-60), 231 cfs.

Extremes.--1942-60: Maximum discharge, 12,400 cfs May 18, 1943 (gage height, 24.77 ft); maximum gage height, 24.64 ft Feb. 11, 1959 (ice jam); minimum discharge, 0.7 cfs Oct. 4, 1954.

Flood in October 1926 exceeded that of May 1943 by about 1½ ft at site of former gaging station near Kenney, 6½ miles downstream.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	21.5	26.8	32.4	271	1,395	354	629	166	300	511	156	53.4	318
1952	57.2	301	117	373	269	551	740	362	740	125	25.4	13.1	305
1953	7.58	13.8	18.4	30.5	63.0	464	470	124	156	260	33.5	8.42	138
1954	5.95	9.14	12.3	37.9	25.9	41.3	129	35.7	104	7.79	19.9	1.94	35.8
1955	15.2	6.98	9.96	52.2	170	164	162	124	268	55.1	9.35	9.11	86.1
1956	57.3	31.2	23.5	14.9	153	80.6	57.1	675	200	52.0	94.3	8.50	121
1957	3.54	8.18	12.3	58.5	125	58.9	1,027	529	205	26.7	14.5	14.5	278
1958	16.4	45.6	136	261	99.5	94.1	106	109	649	893	493	42.8	252
1959	23.2	152	92.7	92.0	934	480	288	†114	40.4	14.4	7.65	15.6	182
1960	43.3	46.3	36.8	88.3	203	247	605	277	606	216	37.4	19.3	201

† Corrected.

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.07	0.03	0.11	0.94	4.32	1.22	2.10	0.57	1.00	1.78	0.54	0.18	12.90
1952	.20	1.01	.40	1.29	.87	1.90	2.47	1.25	2.47	.43	.09	.04	12.42
1953	.03	.05	.06	.11	.20	1.60	1.57	.43	.52	.90	.12	.03	5.62
1954	.02	.03	.04	.13	.08	.14	.43	.12	.35	.03	.07	.006	1.45
1955	.05	.02	.03	.18	.53	.57	.54	.43	.89	.19	.03	.03	3.49
1956	.20	.10	.08	.05	.49	.28	.19	2.33	.67	.18	.33	.03	4.95
1957	.01	.03	.04	.20	.39	.20	4.27	3.55	1.77	.71	.09	.05	11.31
1958	.06	.15	.68	.90	.31	.32	.36	.38	2.17	5.08	1.70	.14	10.25
1959	.08	.51	.32	.32	2.91	1.66	.96	.39	.14	.05	.03	.05	7.42
1960	.15	.15	.13	.30	.66	.85	2.02	.96	2.02	.74	.13	.06	8.17

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches	
		Discharge	Date							
1950	-	-	-	-	-	-	-	386	-	15.70
1951	1208	9,390	Feb. 22, 1951	15	318	0.952	12.90	350	14.24	
1952	1238	3,170	June 24, 1952	7.2	305	.913	12.42	269	10.95	
1953	1278	2,210	Apr. 2, 1953	4.4	138	.413	5.62	137	5.57	
1954	1338	829	June 8, 1954	.9	35.8	.107	1.45	36.2	1.46	
1955	1388	1,320	June 11, 1955	.9	86.1	.258	3.49	92.8	3.77	
1956	1438	10,300	May 28, 1956	3.2	121	.362	4.93	114	4.63	
1957	1508	7,950	Apr. 28, 1957	1.2	278	.832	11.31	298	12.12	
1958	1558	5,750	July 11, 1958	8.5	252	.754	10.25	253	10.27	
1959	1628	47,500	Feb. 11, 1959	2.6	182	.545	7.42	171	6.94	
1960	1708	2,290	Mar. 31, 1960	9.9	201	.602	8.17	-	-	

a About.

ILLINOIS RIVER BASIN

5795. Lake Fork near Cornland, Ill.

Location--Lat 39°57'00", long 89°23'10", in SW $\frac{1}{4}$ sec.1, T.17 N., R.3 W., near center of span on upstream side of bridge on U.S. Highway 54, 100 ft upstream from Illinois Central Railroad bridge, 2 miles northeast of Cornland, 8 miles downstream from Jones Fork, and 14 miles upstream from mouth.

Drainage area--207 sq mi.

Records available--January 1948 to September 1960.

Gage--Wire-weight gage. Datum of gage is 555.06 ft above mean sea level, datum of 1929.

Average discharge--12 years (1948-60), 126 cfs.

Extremes--1948-60: Maximum discharge, 4,900 cfs Feb. 10, 1959; maximum gage height, 21.60 ft June 29, 1951, from graph based on gage readings; minimum discharge, 1.3 cfs Sept. 14-17, 19, 24, 1954.

Flood in May 1943 reached a stage of 23.4 ft, from floodmarks (discharge, 29,000 cfs, by contracted-opening measurement of peak flow).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	9.16	9.33	10.9	115	682	261	370	145	427	424	61.8	45.7	210
1952	28.8	122	62.6	192	202	273	484	212	258	77.7	15.5	7.29	160
1953	6.07	6.91	8.51	9.57	27.0	287	236	68.0	56.4	58.3	12.1	5.58	65.3
1954	4.55	4.54	4.51	5.55	5.67	6.56	16.7	7.27	36.2	7.20	6.84	1.57	8.89
1955	2.02	2.06	2.96	8.53	35.7	59.8	62.4	85.5	200	36.5	10.5	8.35	42.6
1956	78.1	37.2	15.4	8.95	73.4	56.9	55.3	109	86.2	81.2	44.6	9.38	54.6
1957	7.00	5.43	5.68	24.3	98.3	86.9	921	429	418	171	31.9	11.0	183
1958	8.93	11.6	52.6	98.4	45.0	58.2	84.6	111	424	645	239	27.6	152
1959	17.2	23.6	18.4	52.4	712	262	126	61.0	29.3	11.4	7.23	6.98	106
1960	48.5	30.0	19.3	48.7	93.6	180	324	164	429	209	30.8	12.7	132

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.05	0.05	0.06	0.64	3.43	1.45	1.99	0.81	2.30	2.36	0.34	0.25	15.73
1952	.16	.66	.35	1.07	1.05	1.52	2.61	1.18	1.39	.43	.09	.04	10.55
1953	.03	.04	.05	.05	.14	1.60	1.27	.38	.30	.32	.07	.03	4.28
1954	.03	.02	.03	.03	.03	.04	.09	.04	.20	.04	.04	.008	.60
1955	.01	.01	.02	.05	.18	.33	.34	.48	1.08	.20	.06	.05	2.81
1956	.44	.20	.09	.05	.38	.32	.30	.60	.46	.45	.25	.05	3.59
1957	.04	.03	.03	.14	.49	.48	4.96	2.39	2.25	.95	.18	.06	12.00
1958	.05	.06	.29	.55	.23	.32	.46	.62	2.29	3.59	1.33	.15	9.94
1959	.10	.13	.10	.29	3.58	1.46	.68	.34	1.6	.06	.04	.04	6.98
1960	.27	.16	.11	.27	.49	1.00	1.75	.92	2.31	1.17	.17	.07	8.69

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	240	15.71
1951	1208	4,570	June 29, 1951	7.0	210	1.01	13.73	225	14.75
1952	1238	1,520	Apr. 23, 1952	5.8	160	.775	10.55	144	9.50
1953	1278	1,340	Mar. 15, 1953	4.2	65.3	.315	4.28	64.6	4.24
1954	1338	152	June 1, 1954	1.3	8.89	.043	.60	8.34	.56
1955	1388	1,020	June 12, 1955	1.4	42.6	.206	2.81	53.0	3.50
1956	1438	680	Oct. 7, 1955	6.0	54.6	.264	3.59	45.1	2.96
1957	1508	3,760	Apr. 28, 1957	3.9	183	.884	12.00	188	12.30
1958	1558	1,970	July 28, 1958	7.0	152	.734	9.94	150	9.87
1959	1628	4,900	Feb. 10, 1959	3.2	106	.512	6.98	110	7.19
1960	1708	2,060	June 25, 1960	5.0	132	.638	8.69	-	-

5800. Kickapoo Creek at Waynesville, Ill.

Location--Lat 40°15'20", long 89°07'40", on line between sec. 19 and 20, T.21 N., R.1 E., near center of span on downstream side of bridge, 0.5 mile downstream from Rock Creek and 0.7 mile north of Waynesville on Waynesville-McLean road.

Drainage area--227 sq mi.

Records available--January 1948 to September 1960.

Gage--Wire-weight and crest-stage gages. Datum of gage is 620.24 ft above mean sea level (Corps of Engineers bench mark).

Average discharge--12 years (1948-60), 120 cfs.

Extremes--1948-60: Maximum discharge, 8,300 cfs Apr. 25, 1950 (gage height, 15.02 ft, from graph based on gage readings); minimum, 0.4 cfs Sept. 28, 29, 1954.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	8.72	9.31	11.8	139	693	178	437	130	117	174	74.6	16.2	182
1952	14.3	123	60.2	188	122	295	427	223	396	61.9	14.8	2.91	160
1953	2.42	5.20	8.52	18.8	23.8	248	295	69.8	113	160	17.4	2.53	80.5
1954	1.73	2.92	4.20	18.5	17.1	44.0	176	40.3	120	8.56	29.6	1.54	38.5
1955	7.30	3.28	7.93	105	172	142	145	82.4	179	36.8	14.0	2.60	73.9
1956	23.9	17.6	10.6	7.01	71.4	34.6	47.7	323	103	37.7	76.5	3.73	63.2
1957	1.17	2.41	1.63	28.3	58.9	44.2	819	428	197	96.9	18.5	3.83	141
1958	3.11	6.62	88.2	123	51.8	51.9	54.9	39.3	385	341	249	19.5	119
1959	8.44	31.4	17.3	40.9	73.1	235	137	66.5	22.1	13.3	3.39	3.71	105
1960	23.7	12.0	20.6	40.1	124	323	324	129	472	132	17.5	7.21	135

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.04	0.05	0.05	0.71	3.18	0.90	2.15	0.66	0.57	0.89	0.58	0.08	9.67
1952	0.07	.60	.31	.96	.59	1.50	2.10	1.13	1.95	.31	.08	.01	9.60
1953	.01	.03	.04	.10	.11	1.26	1.45	.35	.55	.81	.09	.01	4.81
1954	.009	.01	.02	.09	.08	.22	.86	.20	.59	.04	.15	.008	2.28
1955	.04	.02	.04	.53	.79	.72	.71	.42	.88	.19	.07	.01	4.42
1956	.12	.09	.05	.04	.34	.18	.23	1.64	.50	.19	.39	.02	3.79
1957	.006	.01	.008	.14	.27	.22	4.02	2.17	.97	.49	.09	.02	8.41
1958	.02	.03	.45	.62	.24	.26	.27	.20	1.89	1.73	1.27	.10	7.08
1959	.04	.15	.09	.21	3.35	1.19	.67	.34	.11	.07	.02	.02	6.26
1960	.12	.06	.10	.20	.59	1.64	1.59	.65	2.32	.67	.09	.04	8.07

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	239	14.27
1951	1208	5,240	Feb. 19, 1951	5.6	162	0.714	9.67	176	10.50
1952	1238	2,570	June 23, 1952	1.4	160	.705	9.60	145	9.70
1953	1278	2,700	Apr. 1, 1953	.8	80.5	.355	4.81	79.9	4.77
1954	1338	1,300	Apr. 11, 1954	.4	38.5	.170	2.28	39.3	2.34
1955	1388	1,500	Feb. 19, 1955	.8	73.9	.326	4.42	76.7	4.58
1956	1439	6,500	May 27, 1956	1.6	63.2	.278	3.79	59.2	3.55
1957	1508	3,630	Apr. 27, 1957	1.0	141	.621	8.41	149	8.89
1958	1558	2,440	June 13, 1958	1.4	118	.520	7.08	115	6.86
1959	1628	7,900	Feb. 10, 1959	.5	105	.463	6.26	105	6.26
1960	1708	4,380	June 23, 1960	1.8	135	.595	8.07	-	-

5805. Kickapoo Creek near Lincoln, Ill.

Location.--Lat 40°11'30", long 89°21'40", in NE¼NW¼ sec.18, T.20 N., R.2 W., on left bank at downstream side of highway bridge, 1,000 ft upstream from Illinois Terminal Electric Railroad, 3 miles north of Lincoln, and 7½ miles upstream from mouth.

Drainage area.--306 sq mi.

Records available.--October 1944 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 557.08 ft above mean sea level (Corps of Engineers bench mark). Prior to Sept. 18, 1945, chain gage at same site and datum.

Average discharge.--16 years (1944-60), 180 cfs.

Extremes.--1944-60: Maximum discharge, 7,800 cfs May 28, 1956; maximum gage height, 13.66 ft Apr. 26, 1950; minimum discharge, 0.8 cfs Oct. 16, 1953.
Maximum stage known, 17.4 ft July 6, 1929, from floodmarks reported by local residents.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	16.5	15.4	15.5	170	1,078	299	634	169	176	299	115	34.9	246
1952	26.5	174	69.4	282	191	419	647	293	513	91.7	21.1	10.6	227
1953	8.75	11.6	13.0	26.8	37.7	286	394	107	156	268	33.4	8.22	113
1954	5.09	6.86	8.98	25.5	23.9	50.3	208	61.4	182	16.5	30.8	3.97	51.7
1955	7.65	5.62	9.02	110	206	174	175	92.0	218	51.4	21.6	6.18	88.6
1956	28.4	21.2	13.6	9.16	97.8	42.2	52.5	471	183	61.2	174	10.2	96.6
1957	5.28	4.86	4.87	44.7	92.3	60.9	1,003	672	292	122	24.5	7.78	197
1958	9.10	15.4	11.6	188	74.0	73.1	87.2	57.1	506	520	322	29.5	164
1959	13.7	49.6	28.4	55.5	987	334	178	87.6	36.1	16.0	9.35	6.59	144
1960	25.4	16.2	24.5	52.1	141	312	476	167	734	218	32.5	11.6	183

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.06	0.06	0.08	0.64	3.67	1.12	2.31	0.64	0.64	1.13	0.43	0.13	10.89
1952	.10	.64	.28	1.06	.67	1.58	2.36	1.10	1.87	.35	.08	.04	10.11
1953	.03	.04	.05	.10	.13	1.08	1.44	.40	.57	1.01	.13	.03	5.01
1954	.02	.03	.03	.10	.08	.19	.78	.23	.66	.06	.12	.01	2.29
1955	.03	.02	.03	.41	.70	.66	.64	.35	.79	.19	.08	.02	3.92
1956	.11	.08	.05	.03	.31	.16	.19	1.77	.67	.23	.66	.04	4.30
1957	.02	.02	.02	.17	.31	.23	3.66	2.55	1.06	.46	.09	.03	8.60
1958	.03	.06	.44	.71	.25	.28	.32	.22	1.85	1.96	1.21	.11	7.44
1959	.05	.18	.11	.21	3.36	1.26	.65	.33	.13	.06	.04	.02	6.40
1960	.10	.06	.09	.20	.50	1.17	1.74	.63	2.67	.82	.12	.04	8.14

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	337	14.96
1951	1208	5,360	Feb. 19, 1951	13	246	0.804	10.89	264	11.71
1952	1238	3,590	Apr. 14, 1952	9.2	227	.742	10.11	208	9.23
1953	1278	2,460	Apr. 2, 1953	4.8	113	.369	5.01	112	4.97
1954	1338	1,400	June 8, 1954	1.0	51.7	.169	2.29	51.8	2.29
1955	1388	al,600	Feb. 20, 1955	1.9	88.6	.290	3.92	92.0	4.08
1956	1438	7,800	May 28, 1956	5.0	96.6	.316	4.30	92.5	4.12
1957	1508	4,110	Apr. 27, 1957	3.5	194	.634	8.60	205	9.07
1958	1558	2,700	June 14, 1958	4.2	167	.546	7.44	163	7.25
1959	1628	7,760	Feb. 10, 1959	2.9	144	.471	6.40	142	6.31
1960	1708	6,640	June 23, 1960	5.4	183	.598	8.14	-	-

a About.

5815. Sugar Creek near Hartsburg, Ill.

Location.--Lat 40°13'10", long 89°24'35", in NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.3, T.20 N., R.3 W., on right bank at downstream side of bridge on State Highway 121, 100 ft upstream from Illinois Central Railroad bridge, 2 $\frac{1}{2}$ miles southeast of Hartsburg, 4 miles northwest of Lincoln, and 7 miles downstream from West Fork.

Drainage area.--335 sq mi.

Records available.--October 1944 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 548.70 ft above mean sea level, datum of 1929. Prior to Sept. 10, 1945, chain gage at same site and datum.

Average discharge.--16 years (1944-60), 188 cfs.

Extremes.--1944-60: Maximum discharge, 10,100 cfs May 28, 1956; maximum gage height, 14.44 ft Apr. 30, 1947; minimum discharge, 5 cfs Sept. 11, 1945.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	30.5	30.6	29.2	216	924	317	709	203	266	348	109	43.0	263
1952	46.6	191	93.1	286	185	411	861	297	519	86.9	71.5	20.8	238
1953	15.3	23.9	24.2	52.5	69.5	317	448	117	148	447	52.1	17.0	145
1954	13.4	15.3	21.6	62.8	61.2	109	512	122	200	29.4	59.9	11.4	101
1955	40.4	21.6	26.2	237	293	238	196	110	131	45.9	35.8	17.9	115
1956	52.3	34.4	28.8	22.1	73.0	45.1	69.5	542	198	53.2	99.7	13.7	103
1957	12.9	16.2	14.3	42.5	62.1	57.9	901	557	193	157	47.7	17.2	173
1958	47.5	54.6	163	192	96.4	83.5	150	63.4	593	336	416	40.1	187
1959	24.5	53.2	31.9	67.7	72.1	254	167	106	39.8	15.0	13.0	15.1	121
1960	29.1	17.1	33.7	60.3	159	417	477	233	762	183	41.0	33.0	203

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.10	0.10	0.10	0.74	2.87	1.09	2.36	0.70	0.89	1.20	0.38	0.14	10.67
1952	.16	.63	.32	.98	.60	1.42	2.20	1.02	1.73	1.30	.25	.07	9.68
1953	.05	.08	.08	.18	.21	1.09	1.49	.40	.49	1.54	.18	.03	5.85
1954	.05	.05	.07	.22	.19	.38	1.70	.42	.67	.10	.21	.04	4.10
1955	.14	.07	.09	.82	.91	.82	.65	.38	.44	.16	.12	.03	4.66
1956	.18	.11	.10	.08	.24	.16	.23	1.86	.66	.18	.34	.05	4.19
1957	.04	.05	.05	.15	.19	.20	3.00	1.92	.64	.54	.16	.03	7.00
1958	.16	.18	.56	.66	.30	.29	.50	.22	1.97	1.16	1.43	.13	7.56
1959	.08	.18	.11	.20	2.27	.87	1.56	.37	.13	.05	.04	.05	4.91
1960	.10	.06	.12	.21	.51	1.43	1.59	.80	2.54	.63	.14	.11	8.24

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	1208	8,350	Feb. 19, 1951	24	263	0.785	10.67	330	13.35
1952	1238	2,780	June 15, 1952	13	238	.710	9.68	293	11.48
1953	1278	2,750	Apr. 2, 1953	12	145	.433	5.85	144	5.81
1954	1338	3,070	Apr. 12, 1954	6.8	101	.301	4.10	104	4.23
1955	1388	1,960	Feb. 20, 1955	8.0	115	.343	4.66	117	4.75
1956	1438	10,100	May 28, 1956	10	103	.307	4.19	97.0	3.94
1957	1508	4,400	Apr. 27, 1957	9.0	173	.516	7.00	192	7.76
1958	1558	4,320	June 14, 1958	12	187	.558	7.56	174	7.03
1959	1628	7,650	Feb. 10, 1959	5.6	121	.361	4.91	119	4.82
1960	1708	6,930	June 24, 1960	11	203	.606	8.24	-	-

5820. Salt Creek near Greenview, Ill.

Location.--Lat 40°08'01", long 89°44'08", in NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.2, T.19 N., R.6 W., near center of span on downstream side of bridge on State Highway 29, 3.3 miles downstream from Pike Creek, 3.5 miles north of Greenview, and 5 miles upstream from mouth.

Drainage area.--1,800 sq mi, approximately.

Records available.--October 1941 to September 1960.

Gage.--Wire-weight gage. Datum of gage is 479.00 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark).

Average discharge.--19 years (1941-60), 1,146 cfs.

Extremes.--1941-60: Maximum discharge, 41,200 cfs May 19, 1943 (gage height, 20.50 ft, from graph based on gage readings); minimum, 54 cfs Sept. 29, 30, 1954.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	169	148	143	976	5,363	1,706	3,111	951	1,624	3,114	614	374	1,495
1952	256	1,083	590	1,591	1,371	2,355	3,344	1,699	2,363	707	255	122	1,307
1953	104	125	138	189	280	1,660	2,196	1,50	735	1,277	219	93.7	649
1954	83.2	96.3	106	133	140	238	1,241	377	964	151	203	68.1	315
1955	111	79.5	87.9	453	830	939	907	624	1,240	375	149	82.9	486
1956	275	138	98.9	81.7	459	360	208	1,471	1,411	771	771	132	515
1957	82.5	87.9	101	175	597	470	4,621	4,005	1,898	1,213	309	140	1,132
1958	169	215	726	1,031	509	492	771	589	2,946	4,087	2,486	305	1,201
1959	185	386	297	353	5,077	2,135	1,192	630	275	131	127	115	879
1960	315	186	171	297	675	1,021	3,077	1,274	3,442	1,889	345	189	1,068

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.11	0.09	0.09	0.63	3.10	1.09	1.93	0.61	1.01	1.99	0.39	0.23	11.27
1952	.16	.67	.38	1.02	.82	1.51	2.07	1.09	1.46	.45	.16	.08	9.87
1953	.07	.08	.09	.12	.16	1.06	1.36	.48	.46	.82	.14	.06	4.90
1954	.05	.06	.07	.09	.08	.15	.77	.24	.60	.10	.13	.04	2.38
1955	.07	.05	.06	.29	.48	.60	.56	.40	.77	.24	.10	.05	3.67
1956	.18	.09	.06	.05	.27	.23	.13	.94	.87	.49	.49	.08	3.86
1957	.05	.05	.06	.11	.35	.30	2.80	2.57	1.18	.78	.20	.09	8.54
1958	.11	.13	.46	.66	.29	.32	.48	.38	1.83	2.62	1.59	.19	9.06
1959	.12	.24	.19	.23	2.94	1.37	.74	.40	.17	.08	.08	.07	6.63
1960	.20	.12	.11	.19	.40	.65	1.91	.82	2.13	1.21	.22	.12	8.08

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	1,719	12.95
1951	1208	17,400	Feb. 20, 1951	114	1,495	0.831	11.27	1,618	12.19
1952	1238	7,040	Apr. 14, 1952	100	1,307	.726	9.87	1,180	8.90
1953	1278	6,540	Apr. 2, 1953	84	649	.361	4.90	642	4.94
1954	1338	4,020	Apr. 12, 1954	54	315	.175	2.38	315	2.38
1955	1388	3,440	Feb. 20, 1955	59	486	.270	3.67	508	3.82
1956	1438	9,060	May 29, 1956	70	515	.286	3.88	495	3.71
1957	1508	17,400	Apr. 30, 1957	75	1,132	.629	8.54	1,203	9.08
1958	1558	10,600	July 15, 1958	113	1,201	.667	9.06	1,180	8.91
1959	1628	19,500	Feb. 14, 1959	72	879	.488	6.63	863	6.51
1960	1708	15,500	June 25, 1960	130	1,068	.593	8.08	-	-

5825. Crane Creek near Easton, Ill.

Location.--Lat 40°14'46", long 89°51'40", in NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.26, T.21 N., R.7 W., on right bank at downstream side of highway bridge, 0.1 mile downstream from confluence of Hardin and Central ditches, $\frac{1}{4}$ miles upstream from Samuels ditch, and $\frac{1}{4}$ miles northwest of Easton.

Drainage area.--28.7 sq mi.

Records available.--October 1949 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 486.78 ft above mean sea level, datum of 1929. Prior to Mar. 30, 1950, wire-weight gage at same site and datum.

Average discharge.--11 years (1949-60), 13.2 cfs.

Extremes.--1949-60: Maximum discharge, 425 cfs Feb. 10, 1959 (gage height, 9.08 ft); minimum, 0.4 cfs Sept. 20, 1955.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	8.39	8.19	8.36	12.8	50.5	30.1	37.7	19.3	48.2	46.5	10.9	8.57	23.9
1952	10.0	26.3	14.0	18.0	18.9	25.6	27.1	13.0	23.7	10.7	6.13	5.21	16.5
1953	5.55	6.65	9.07	9.32	9.09	19.7	24.2	17.3	12.2	9.77	4.15	3.44	10.9
1954	4.60	5.49	5.61	5.89	5.99	6.78	13.2	11.0	21.0	3.35	2.16	1.91	7.23
1955	2.98	4.59	5.13	13.1	13.7	11.9	7.06	9.55	11.2	3.63	2.04	.91	7.12
1956	11.7	9.03	7.76	6.52	6.27	6.90	5.58	9.04	8.56	5.13	3.49	3.71	6.98
1957	3.29	4.55	6.62	8.51	11.3	10.0	32.9	40.8	31.7	11.1	2.67	2.55	13.8
1958	4.70	7.47	8.47	9.72	7.05	6.31	7.08	5.18	10.4	24.7	25.6	8.26	10.5
1959	8.64	11.2	8.57	5.96	37.2	15.2	10.8	6.80	3.62	1.79	1.52	2.75	9.27
1960	4.85	3.06	3.03	5.63	7.39	13.4	33.4	18.3	26.4	24.0	15.4	9.75	13.7

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.34	0.32	0.34	0.52	1.83	1.21	1.47	0.72	1.87	1.87	0.44	0.33	11.31
1952	.40	1.02	.56	.72	.71	1.03	1.05	.52	.92	.43	.25	.20	7.81
1953	.22	.26	.36	.37	.33	.79	.94	.69	.48	.39	.17	.13	5.13
1954	.18	.21	.23	.24	.22	.27	.51	.44	.82	.13	.09	.07	3.41
1955	.12	.18	.21	.53	.50	.48	.27	.38	.44	.15	.08	.04	3.38
1956	.47	.35	.31	.26	.24	.28	.22	.36	.33	.21	.14	.14	3.31
1957	.13	.18	.27	.34	.41	.40	1.28	1.64	1.23	.45	.11	.11	6.54
1958	.19	.29	.34	.39	.26	.25	.28	.21	.40	.99	1.03	.32	4.95
1959	.35	.44	.34	.24	1.35	.61	.42	.27	.14	.07	.06	.09	4.38
1960	.20	.12	.12	.23	.28	.54	1.30	.73	1.03	.96	.62	.35	6.49

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	23.2	10.97
1951	1208	381	June 28, 1951	7.9	23.9	0.833	11.31	26.0	12.29
1952	1238	114	June 22, 1952	5.0	16.5	.575	7.81	14.1	6.67
1953	1278	68	Apr. 1, 1953	2.5	10.9	.380	5.13	10.4	4.91
1954	1358	52	June 3, 1954	1.2	7.23	.252	3.41	6.98	3.30
1955	1398	108	Feb. 19, 1955	.4	7.12	.248	3.58	8.45	4.00
1956	1438	55	Oct. 6, 1955	1.0	6.98	.243	3.31	5.81	2.76
1957	1508	110	Apr. 27, 1957	2.1	13.8	.481	6.54	14.3	6.78
1958	1558	176	Aug. 2, 1958	2.3	10.5	.366	4.95	11.1	5.26
1959	1628	425	Feb. 10, 1959	1.0	9.27	.323	4.38	7.80	3.69
1960	1708	176	Mar. 30, 1960	2.6	13.7	.477	6.49	-	-

5830. Sangamon River near Oakford, Ill.

Location.--Lat 40°07'25", long 89°59'05", in NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.3, T.19 N., R.8 W., on right bank at downstream side of bridge on State Highway 97, just upstream from Chicago & Illinois Midland Railway bridge, three-quarters of a mile downstream from Crane Creek and $\frac{1}{4}$ miles northwest of Oakford.

Drainage area.--5,120 sq mi, approximately.

Records available.--October 1909 to October 1911, December 1911 to March 1912, August 1914 to June 1919, March 1921 to September 1922, October 1928 to December 1933, October 1939 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Water-stage recorder and artificial control. Datum of gage is 452.88 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark). Prior to Jan. 1, 1934, chain gage at site 2.4 miles upstream at datum 458.66 ft above mean sea level. Oct. 1, 1939, to May 14, 1940, staff gage at present site at datum at mean sea level, datum of 1929.

Average discharge.--33 years (1909-11, 1914-18, 1921-22, 1928-33, 1939-60), 3,008 cfs.

Extremes.--1909-12, 1914-19, 1921-22, 1938-33, 1939-60: Maximum discharge, 123,000 cfs May 20, 1943 (gage height, 25.63 ft); minimum, 68 cfs Dec. 3, 1940.

Floods in February and March 1907, May 1908, and October 1910 are reported to have reached a stage of about 21 ft at old station 2.4 miles upstream. On basis of measured fall during discharge measurement of Mar. 16, 1939, these floods probably reached a stage of 23 ft at present site and datum.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	512	445	632	2,993	13,000	7,632	9,535	3,475	3,818	9,888	1,261	1,092	4,462
1952	716	2,397	1,344	4,127	4,796	6,399	9,671	4,454	5,735	2,017	500	297	4,520
1953	261	323	331	337	446	3,798	4,897	1,664	1,460	2,130	455	255	1,367
1954	221	232	249	260	339	386	1,559	1,598	1,407	328	432	204	516
1955	266	200	192	611	1,121	1,373	1,666	1,746	2,685	1,408	378	232	986
1956	1,561	678	481	291	1,294	1,249	612	3,244	4,038	1,535	2,677	385	1,506
1957	222	256	328	515	1,607	1,994	11,870	14,020	8,622	7,434	1,406	383	4,058
1958	433	620	2,449	3,408	1,555	1,683	2,159	2,739	8,497	9,919	9,187	892	3,584
1959	457	914	1,006	1,323	13,360	5,660	3,196	1,993	1,201	369	1,454	608	2,553
1960	2,476	1,258	898	1,749	3,096	2,742	10,800	4,494	8,951	5,745	989	486	3,625

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.12	0.10	0.14	0.67	2.64	1.72	2.08	0.78	0.83	2.23	0.28	0.24	11.83
1952	.16	.52	.30	.93	1.01	1.44	2.11	1.00	1.25	.45	.11	.06	9.34
1953	.06	.07	.07	.08	.09	.86	1.07	.37	.32	.48	.10	.06	3.63
1954	.05	.05	.06	.06	.07	.09	.54	.13	.31	.07	.10	.04	1.37
1955	.06	.04	.04	.14	.23	.31	.36	.39	.59	.32	.09	.05	2.62
1956	.35	.15	.11	.07	.27	.28	.13	.73	.88	.35	.60	.08	4.00
1957	.05	.05	.07	.12	.33	.45	2.59	3.16	1.88	1.67	.32	.08	10.77
1958	.10	.14	.55	.77	.32	1.37	.47	.62	1.85	2.01	2.07	.19	9.46
1959	.10	.20	.23	.30	2.72	1.27	.70	.45	.26	.08	.53	.13	6.77
1960	.56	.27	.20	.39	.65	.62	2.35	1.01	1.95	1.29	.22	.11	9.62

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30										Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches				
		Discharge	Date										
1950	-	-	-	-	-	-	-	-	-	-	-	5,217	13.84
1951	1208	36,300	July 1, 1951	335	4,462	0.871	11.83	4,701	9.34	3,226	8.56	5,217	13.84
1952	1238	15,100	Apr. 16, 1952	256	3,520	.688	9.34	4,701	9.34	3,226	8.56	5,217	13.84
1953	1278	10,500	Apr. 3, 1953	220	1,367	.267	3.63	1,349	3.59	512	1.35	5,217	13.84
1954	1338	3,800	Apr. 13, 1954	165	516	.101	1.37	512	1.35	512	1.35	5,217	13.84
1955	1388	5,960	June 15, 1955	162	986	.193	2.62	1,160	3.09	512	1.35	5,217	13.84
1956	1438	10,000	May 29, 1956	187	1,506	.294	4.00	1,343	3.56	512	1.35	5,217	13.84
1957	1508	36,500	May 1, 1957	208	4,058	.785	10.77	4,288	9.20	3,467	8.20	5,217	13.84
1958	1558	24,700	Aug. 5, 6, 1958	282	3,564	.696	9.46	3,467	8.20	3,467	8.20	5,217	13.84
1959	1628	37,900	Feb. 14, 1959	208	2,553	.499	6.77	2,744	7.27	2,744	7.27	5,217	13.84
1960	1708	26,200	June 26, 1960	427	3,625	.708	9.62	-	-	-	-	5,217	13.84

5845. La Moine River at Colmar, Ill.

Location.--Lat 40°19'45", long 90°53'55", in SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.18, T.4 N., R.4 W., on right bank at upstream side of bridge on State Highway 61, a quarter of a mile downstream from Chicago, Burlington & Quincy Railroad bridge, 1 mile southwest of Colmar, and $1\frac{1}{2}$ miles upstream from Troublesome Creek.

Drainage area.--655 sq mi.

Records available.--October 1944 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 491.53 ft above mean sea level, datum of 1929. Prior to July 13, 1945, chain gage at same site and datum.

Average discharge.--16 years (1944-60), 392 cfs.

Extremes.--1944-60: Maximum discharge, 20,300 cfs July 27, 1948 (gage height, 23.75 ft); no flow for part of each day Dec. 8, 9, 12, 13, 17, 21, 1955, due to temporary dam upstream; minimum unregulated discharge, 0.3 cfs Oct. 25, 1956, Oct. 14, 1957.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	27.5	22.1	14.1	168	1,743	681	942	314	353	530	172	45.8	408
1952	63.0	133	49.5	284	214	934	1,130	919	778	316	305	65.7	431
1953	12.6	51.5	73.8	60.9	188	385	633	519	346	36.3	8.17	3.64	192
1954	12.9	5.08	7.96	5.24	61.9	540	844	178	524	40.9	70.9	20.7	192
1955	229	76.7	59.2	962	1,297	403	745	643	364	89.3	37.3	51.9	413
1956	90.5	6.99	3.05	3.33	114	30.5	22.9	20.8	100	95.1	347	17.9	71.2
1957	1.27	5.18	8.64	152	151	143	563	577	741	170	15.9	7.44	210
1958	46.7	24.7	104	63.3	300	112	126	91.7	379	773	407	166	216
1959	52.3	58.0	26.0	28.9	1,788	281	252	328	198	66.2	666	186	316
1960	1,097	108	174	472	374	1,424	1,361	1,025	2,279	824	452	54.0	804

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.05	0.04	0.02	0.30	2.77	1.20	1.60	0.55	0.60	0.93	0.30	0.08	8.44
1952	.11	.23	.09	.46	.35	1.64	1.92	1.62	1.33	.56	.54	.11	8.96
1953	.02	.09	.13	.11	.30	.68	1.08	.91	.59	.06	.01	.006	3.99
1954	.02	.009	.01	.009	.10	.95	1.44	.31	.89	.07	.12	.04	3.97
1955	.53	.13	.10	1.69	2.06	.71	1.27	1.13	.62	.16	.07	.09	8.56
1956	.16	.01	.005	.006	.19	.05	.04	.04	.17	.17	.61	.03	1.48
1957	.002	.009	.02	.27	.24	.25	.96	1.02	1.26	.30	.03	.01	4.37
1958	.08	.04	.18	.11	.48	.20	.21	.16	.64	1.36	.72	.28	4.46
1959	.09	.10	.05	.05	2.84	.49	.43	.58	.32	.12	1.17	.32	6.56
1960	1.93	.18	.31	.83	.62	2.51	2.32	1.80	3.88	1.45	.80	.09	16.72

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches	
		Discharge	Date							
1950	-	-	-	-	-	-	-	349	7.23	
1951	1208	11,400	Feb. 21, 1951	10	408	0.623	8.44	423	8.76	
1952	1238	6,350	Apr. 25, 1952	11	431	.658	8.96	422	8.77	
1953	1278	2,950	Apr. 1, 1953	2.0	192	.293	3.99	183	3.78	
1954	1338	8,650	Mar. 26, 1954	2.0	192	.293	3.97	226	4.69	
1955	1368	11,000	Feb. 21, 1955	1.1	413	.631	8.56	385	7.98	
1956	1438	2,310	Aug. 15, 1956	.6	71.2	.109	1.48	63.9	1.34	
1957	1508	3,210	June 29, 1957	.5	210	.321	4.37	224	4.64	
1958	1558	3,830	July 5, 1958	.3	216	.330	4.46	212	4.40	
1959	1628	a6,600	Feb. 12, 1959	12	316	.482	6.56	422	8.74	
1960	1708	16,700	Mar. 30, 1960	23	804	1.23	16.72	-	-	

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5850. La Moine River at Ripley, Ill.

Location.--Lat 40°01'31", long 90°37'55", in NE $\frac{1}{4}$ sec.33, T.1 N., R.2 W., on right bank at upstream side of bridge on U.S. Highway 24, a quarter of a mile east of Ripley and 2 miles upstream from Town Branch.

Drainage area.--1,310 sq mi, approximately.

Records available.--March 1921 to September 1960. Prior to October 1931, published as Crooked Creek at Ripley.

Gage.--Water-stage recorder. Datum of gage is 431.1 ft above mean sea level, datum of 1929. Prior to July 28, 1926, chain gage at site 200 ft upstream at datum 0.02 ft higher. July 28, 1926, to Jan. 11, 1935, chain gage at downstream side of bridge at present site and datum.

Average discharge.--39 years (1921-60), 734 cfs.

Extremes.--1921-60: Maximum discharge, 17,100 cfs Apr. 25, 1944, June 8, 1947; maximum gage height, 26.03 ft Apr. 25, 1944; minimum discharge, 4.9 cfs Oct. 21, 1956.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	53.8	37.3	28.2	367	2,665	1,431	2,234	555	789	1,199	350	86.1	817
1952	87.8	249	91.9	473	396	1,878	2,067	1,503	1,003	548	389	157	737
1953	29.8	114	127	101	230	497	1,022	748	643	67.4	23.6	15.1	300
1954	36.9	12.7	17.2	13.2	94.5	439	1,169	238	658	62.3	102	27.8	238
1955	396	101	90.3	1,136	2,214	657	1,837	1,674	582	342	343	83.2	778
1956	615	53.0	28.2	23.2	151	68.6	117	118	248	190	582	35.3	187
1957	7.06	11.8	18.8	272	205	256	1,402	1,124	1,378	384	78.2	37.5	430
1958	131	50.7	157	97.6	497	198	246	153	924	1,360	1,011	263	424
1959	93.7	172	54.7	53.7	3,540	693	551	514	469	89.3	1,093	139	601
1960	1,336	168	220	603	527	1,174	3,441	1,804	3,577	2,062	847	98.0	1,320

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.05	0.03	0.02	0.32	2.28	1.26	1.90	0.49	0.67	1.06	0.31	0.07	8.46
1952	.08	.21	.08	.42	.33	1.65	1.76	1.32	.85	.48	.34	.13	7.65
1953	.03	.10	.11	.09	.18	.44	.87	.66	.55	.06	.02	.01	3.12
1954	.03	.01	.02	.01	.08	.39	1.00	.21	.56	.05	.09	.02	2.47
1955	.35	.09	.08	1.00	1.76	.58	1.56	1.47	.50	.30	.30	.07	8.06
1956	.54	.05	.02	.02	.12	.06	.10	.10	.21	.17	.51	.03	1.93
1957	.006	.01	.02	.24	.16	.23	1.19	.99	1.17	.34	.07	.03	4.46
1958	.11	.04	.14	.09	.40	.17	.21	.13	.79	1.20	.89	.22	4.39
1959	.08	.15	.05	.05	2.81	.61	.47	.45	.40	.08	.96	.12	6.23
1960	1.18	.14	.19	.53	.43	1.03	2.93	1.59	3.05	1.81	.75	.08	13.71

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	708	7.32
1951	1208	10,800	Feb. 22, 1951	16	817	0.624	8.46	843	8.73
1952	1238	7,100	May 25, 1952	24	737	.563	7.65	724	7.52
1953	1278	3,490	Apr. 1, 1953	11	300	.229	3.12	283	2.94
1954	1338	3,890	Apr. 22, 1954	10	238	.182	2.47	282	2.93
1955	1388	9,860	Feb. 23, 1955	19	778	.594	8.06	787	8.15
1956	1438	6,970	Oct. 6, 1955	10	187	.143	1.93	131	1.36
1957	1508	6,400	Apr. 28, June 12	5.3	430	.328	4.46	455	4.71
1958	1558	6,200	Aug. 1, 1958	12	424	.324	4.39	422	4.38
1959	1628	11,400	Feb. 14, 1959	27	601	.459	6.23	720	7.46
1960	1708	15,300	Apr. 1, 1960	54	1,320	1.01	13.71	-	-

5855. Illinois River at Meredosia, Ill.

Location.--Lat 39°49'36", long 90°33'53", in SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.21, T.16 N., R.13 W., on left bank 0.3 mile downstream from bridge on State Highway 104 at Meredosia, $\frac{1}{2}$ miles upstream from McKee Creek, and at mile 71.1.

Drainage area.--25,300 sq mi, approximately.

Records available.--October 1938 to September 1960 in reports of Geological Survey. October 1933 to September 1938 in reports of Mississippi River Commission.

Gage.--Water-stage recorder. Datum of gage is 418.00 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Auxiliary water-stage recorder at Wabash Railroad bridge half a mile east of Valley City and $\frac{1}{2}$ miles downstream.

Average discharge.--22 years (1938-60), 20,200 cfs.

Extremes.--1938-60: Maximum discharge, 123,000 cfs May 26-28, 1943; maximum gage height, 28.61 ft May 26, 1943; minimum daily discharge, 3,060 cfs Sept. 1, 1945; minimum gage height observed, 0.4 ft Jan. 11, 12, 1940.

Remarks.--Since Jan. 17, 1900, flow has included diversion from Lake Michigan through Chicago Sanitary and Ship Canal.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	8,055	6,958	9,075	18,850	34,250	50,670	46,380	35,470	22,050	44,610	23,050	12,126	25,930
1952	13,040	22,670	19,740	28,480	30,340	54,520	46,920	35,520	32,670	23,750	13,170	7,155	25,620
1953	5,685	6,758	9,021	8,876	11,120	25,910	27,200	19,450	15,940	19,330	8,074	6,804	13,520
1954	4,915	5,651	6,936	6,474	8,753	12,850	30,260	21,550	24,920	12,760	11,070	6,670	12,720
1955	21,860	14,180	11,430	27,030	20,500	31,730	26,000	26,350	29,270	12,850	8,035	6,813	19,670
1956	9,882	8,562	6,394	6,782	11,600	15,670	10,010	24,390	17,620	13,360	11,580	6,175	12,020
1957	4,518	5,519	6,932	14,430	17,120	12,380	29,920	53,790	34,990	34,050	15,570	6,997	19,880
1958	7,611	12,230	16,530	19,450	14,350	21,540	15,840	11,950	37,850	41,930	30,790	8,622	19,950
1959	6,024	8,174	8,888	11,220	59,320	45,570	51,170	31,040	15,640	9,558	11,600	6,291	18,410
1960	14,910	14,890	14,990	26,200	28,740	18,790	63,170	37,060	37,170	31,320	13,340	7,102	25,320

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	28,740	-
1951	1208	77,800	Feb. 28, 1951	4,740	25,930	-	-	28,560	-
1952	1238	55,700	Apr. 25, 1952	5,720	25,620	-	-	22,790	-
1953	1278	35,200	Apr. 7, 1953	3,740	13,520	-	-	13,190	-
1954	1338	33,300	Apr. 24, 1954	3,950	12,720	-	-	15,240	-
1955	1388	37,700	Feb. 27, 1955	3,460	19,670	-	-	17,930	-
1956	1438	29,700	June 2, 1956	3,490	12,020	-	-	11,360	-
1957	1508	66,300	May 6, 1957	3,130	19,880	-	-	21,340	-
1958	1558	60,800	June 22, 1958	3,620	19,950	-	-	18,830	-
1959	1628	64,500	Feb. 19, 1959	3,360	18,410	-	-	20,250	-
1960	1708	73,000	Apr. 7, 1960	5,800	25,320	-	-	-	-

5860. North Fork Mauvaise Terre Creek near Jacksonville, Ill.

Location.--Lat 39°45'38", long 90°08'07", in SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.8, T.15 N., R.9 W., on left bank at downstream side of bridge, 2 $\frac{1}{2}$ miles north of Arnold, 4 $\frac{1}{2}$ miles upstream from mouth, and 6 miles east of Jacksonville.

Drainage area.--30.0 sq mi.

Records available.--December 1949 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 579.27 ft above mean sea level, datum of 1929. Prior to Mar. 29, 1950, wire-weight gage at same site and datum.

Average discharge.--10 years (1950-60), 16.4 cfs.

Extremes.--1949-60: Maximum discharge, 2,870 cfs June 28, 1951 (gage height, 10.68 ft); no flow for many days each year.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0	0.44	0.46	6.01	32.4	38.4	45.3	11.0	121	32.4	12.7	4.20	29.7
1952	10.4	18.6	9.74	26.0	32.9	33.4	48.2	28.1	13.6	5.33	0.09	0	18.8
1953	0	0.09	.25	.24	.29	3.62	10.3	8.69	4.61	1.02	0	.19	2.44
1954	0	0	0	0	0	.08	1.75	0	0	1.49	3.50	.53	.60
1955	1.08	1.61	.28	8.18	8.53	9.26	15.8	21.1	6.78	.49	0	0	6.07
1956	1.78	.35	.003	0	1.45	.34	2.18	2.87	5.10	2.26	34.1	1.15	4.34
1957	0	2.58	14.7	11.5	16.9	19.6	114	108	91.8	15.4	3.85	.04	33.2
1958	3.58	2.90	14.9	14.0	5.85	7.25	18.2	19.9	34.2	64.2	37.8	2.18	18.9
1959	1.00	6.43	3.59	19.7	121	21.8	14.6	17.3	9.18	.98	4.72	.73	17.7
1960	19.4	5.54	3.91	9.11	23.8	81.7	88.2	49.0	74.3	32.1	2.91	.70	32.5

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0	0.02	0.02	0.23	3.21	1.47	1.69	0.42	4.51	1.24	0.49	0.16	13.46
1952	.40	.69	.37	1.00	1.18	1.28	1.79	1.08	.50	.20	.003	0	8.49
1953	0	.003	.01	.009	.01	.14	.38	.33	.17	.04	0	.007	1.10
1954	0	0	0	0	0	.003	.06	0	0	.06	.13	.01	.26
1955	.04	.06	.01	.31	.30	.36	.59	.81	.25	.02	0	0	2.75
1956	.07	.01	.0001	0	.05	.01	.08	.11	.19	.09	1.31	.04	1.96
1957	0	.10	.56	.44	.59	.75	4.25	4.15	3.41	.59	.15	.002	14.99
1958	.14	.11	.57	.54	.20	.28	.68	.76	1.27	2.47	1.45	.08	8.55
1959	.04	.24	.14	.76	4.19	.84	.54	.66	.34	.04	.18	.03	8.00
1960	.75	.21	.15	.35	.85	3.14	3.28	1.88	2.76	1.23	.11	.03	14.74

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	18.4	8.35
1951	1208	2,870	June 28, 1951	0	29.7	0.990	13.46	32.9	14.88
1952	1238	355	Apr. 23, 1952	0	18.8	.627	8.49	15.6	7.05
1953	1278	75	June 13, 1953	0	2.44	.081	1.10	2.41	1.09
1954	1338	94	Aug. 19, 1954	0	.60	.020	.26	.85	.37
1955	1388	300	May 28, 1955	0	6.07	.202	2.75	6.00	2.72
1956	1438	830	Aug. 9, 1956	0	4.34	.145	1.96	5.61	2.54
1957	1508	1,450	June 14, 1957	0	33.2	1.11	14.99	33.5	15.15
1958	1558	1,620	July 15, 1958	0	18.9	.630	8.55	18.0	8.15
1959	1628	(a)	Feb. 10, 1959	0	17.7	.590	8.00	19.2	8.69
1960	1708	1,850	Mar. 30, 1960	0	32.5	1.08	14.74	-	-

a Not determined.

5865. Hurricane Creek near Roodhouse, Ill.

Location.--Lat 39°29'20", long 90°25'00", in NE $\frac{1}{4}$ sec.15, T.12 N., R.12 W., on left bank 150 ft downstream from bridge on State Highway 106, 2 miles west of Roodhouse, and 12 miles upstream from mouth.

Drainage area.--2.33 sq mi.

Records available.--October 1950 to September 1960.

Gage.--Water-stage recorder and concrete control. Datum of gage is 597.16 ft above mean sea level, datum of 1929.

Average discharge.--10 years (1950-60), 1.13 cfs.

Extremes.--1950-60: Maximum discharge, 1,700 cfs June 14, 1957 (gage height, 11.77 ft), from rating curve extended above 73 cfs on basis of computation of peak flow through culvert and over highway embankment; no flow for many days each year.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0	0.11	0.006	0.93	6.69	4.75	3.92	0.54	1.43	0.81	1.08	0.14	1.66
1952	.55	1.77	.98	2.07	1.67	2.91	4.03	.96	1.92	.13	0	0	1.41
1953	0	0	0	0	0	.60	.62	.57	.15	0	0	0	.16
1954	0	0	0	0	0	0	0	0	.003	0	.35	.28	.05
1955	.94	.10	.003	.48	2.00	1.56	.72	1.78	.19	.59	0	.03	.69
1956	.37	0	0	0	.11	0	.19	.18	.25	.11	1.48	0	.23
1957	0	.10	.08	.07	.38	1.07	10.0	11.0	11.4	1.56	.56	.05	3.01
1958	.12	.05	.42	1.01	.36	.49	1.36	1.41	2.18	3.72	.99	.05	1.02
1959	0	.09	.11	.71	5.64	1.33	1.09	1.94	.76	.08	.53	.44	1.03
1960	1.73	.27	.40	.87	1.67	4.98	5.74	4.77	2.66	1.21	.13	0	2.04

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0	0.05	0.003	0.46	2.99	2.35	1.88	0.27	0.68	0.40	0.53	0.07	9.68
1952	.27	.85	.48	1.03	.77	1.44	1.93	.47	.92	.06	0	0	8.22
1953	0	0	0	0	0	.30	.30	.28	.07	0	0	0	.95
1954	0	0	0	0	0	0	0	0	.002	0	.17	.14	.31
1955	.46	.05	.002	.24	.89	.77	.34	.88	.09	.29	0	.01	4.02
1956	.19	0	0	0	.05	0	.09	.09	.12	.05	.73	0	1.32
1957	0	.05	.04	.04	.17	.53	4.81	5.45	5.48	.77	.18	.02	17.54
1958	.06	.02	.21	.50	.16	.24	.66	.70	1.04	1.84	.49	.03	5.95
1959	0	.04	.05	.35	2.52	.66	.52	.96	.37	.04	.26	.21	5.98
1960	.85	.13	.20	.43	.77	2.46	2.75	2.36	1.28	.60	.06	0	11.89

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	1708	310	Aug. 20, 1951	0	1.66	0.712	9.68	1.93	11.23
1952	1708	78	June 10, 1952	0	1.41	.605	8.22	1.13	6.62
1953	1708	21	June 26, 1953	0	.16	.069	.95	.16	.95
1954	1708	66	Aug. 8, 1954	0	.05	.021	.31	.14	.82
1955	1708	115	July 25, 1955	0	.69	.296	4.02	.44	3.70
1956	1708	175	Aug. 8, 1956	0	.23	.099	1.32	.21	1.22
1957	1708	1,700	June 14, 1957	0	3.01	1.29	17.54	3.04	17.74
1958	1708	157	July 30, 1958	0	1.02	.438	5.95	.59	5.75
1959	1708	233	May 30, 1959	0	1.03	.442	5.98	1.21	7.07
1960	1708	202	Apr. 15, 1960	0	2.04	.876	11.89	-	-

ILLINOIS RIVER BASIN

5868. Otter Creek near Palmyra, Ill.

Location.--Lat 39°22'42", long 89°56'50", in SE $\frac{1}{4}$ sec.23, T.11 N., R.8 W., on right bank at downstream side of county highway bridge, 3 miles downstream from confluence of East and West Forks and 4 miles southeast of Palmyra.

Drainage area.--61.6 sq mi.

Records available.--October 1959 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 544.30 ft above mean sea level, datum of 1929.

Extremes.--1959-60: Maximum discharge, 5,760 cfs May 26 (gage height, 9.87 ft), from rating curve extended above 600 cfs on basis of contracted-opening measurement at gage height 10.60 ft; no flow for many days.

Flood in May 1943 reached a stage of 10.60 ft, from floodmarks (discharge, 15,000 cfs, by contracted-opening measurement of peak flow).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1960	35.1	13.0	8.10	19.6	37.0	118	68.0	114	51.1	19.5	2.77	0	40.6

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1960	0.66	0.24	0.15	0.37	0.65	2.22	1.23	2.14	0.93	0.37	0.05	0	9.01

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1960	1708	5,760	May 26, 1960	0	40.6	0.659	9.01	-	-

5870. Macoupin Creek near Kane, Ill.

Location--Lat 39°14'00", long 90°23'45", in SE $\frac{1}{4}$ sec.11, T.9 N., R.12 W., near center of span on downstream side of bridge on U.S. Highway 67 (alternate), 1.4 miles downstream from Link Branch, and 3 $\frac{1}{2}$ miles northwest of Kane.

Drainage area--875 sq mi.

Records available--March 1921 to November 1933, May to August 1940, October 1940 to September 1960.

Gage--Wire-weight gage. Datum of gage is 426.77 ft above mean sea level, datum of 1929. Prior to Oct. 1, 1928, staff or chain gage at Chicago & Alton Railway bridge 2 miles upstream at various datums. Oct. 1, 1928, to Nov. 20, 1933, chain gage on upstream side of bridge at present site and datum. May 17, 1940, to May 17, 1943, water-stage recorder at present site and datum.

Average discharge--32 years (1921-33, 1940-60), 542 cfs.

Extremes--1921-33, 1940-60: Maximum discharge, 40,000 cfs May 18, 1943 (gage height, 28.5 ft); no flow Oct. 19-27, 1955.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	17.3	33.4	14.4	63.0	2,339	1,453	963	141	286	219	127	35.2	461
1952	54.6	121	94.9	389	740	1,118	1,479	139	412	84.9	9.57	5.14	384
1953	2.98	4.54	6.77	6.36	122	295	233	207	330	56.5	15.5	2.48	98.0
1954	6.72	6.61	10.0	7.25	3.59	3.82	32.8	289	30.0	34.0	40.0	25.7	17.0
1955	107	76.4	7.96	67.0	198	116	360	737	24.6	226	27.1	11.4	107
1956	124	8.78	1.77	.76	134	46.3	129	222	171	81.6	232	11.1	96.9
1957	2.57	9.27	31.5	35.8	200	234	2,818	2,421	3,748	888	157	15.5	†877
1958	52.7	35.3	179	122	87.4	318	306	531	583	1,149	1,018	49.7	373
1959	10.4	94.5	44.5	123	582	408	221	215	85.8	21.4	53.3	87.8	159
1960	257	80.0	52.7	116	247	917	1,082	1,015	599	461	26.4	7.73	406

† Corrected.

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.02	0.04	0.02	0.08	2.78	1.91	1.23	0.19	0.36	0.29	0.17	0.04	7.13
1952	.07	.15	.13	.51	.91	1.47	1.89	.18	.52	.11	.01	.007	5.96
1953	.004	.006	.009	.008	.01	.39	.30	.27	.42	.07	.02	.003	1.51
1954	.009	.008	.01	.01	.004	.005	.04	.004	.04	.04	.05	.03	.25
1955	.14	.10	.01	.09	.24	.15	.46	.10	.03	.30	.04	.01	1.67
1956	.16	.01	.002	.001	.17	.06	.16	.29	.22	.11	.31	.01	1.50
1957	.003	.01	.04	.05	.24	.31	3.58	3.19	4.78	1.17	.21	.02	13.61
1958	.07	.05	.24	.16	.10	.42	.39	.70	.74	1.51	1.34	.06	5.78
1959	.01	.12	.06	.16	.69	.54	.28	.28	.11	.03	.07	.11	2.46
1960	.34	.10	.07	.15	.30	1.21	1.38	1.34	.76	.61	.03	.01	6.30

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	668	10.36
1951	1208	8,480	Feb. 21, 1951	6.0	461	0.527	7.13	478	7.40
1952	1238	10,200	Apr. 13, 1952	1.4	384	.439	5.96	363	5.62
1953	1278	2,810	June 26, 1953	.8	98.0	.112	1.51	98.7	1.52
1954	1338	906	July 2, 1954	.3	17.0	.019	.25	31.0	.47
1955	1368	2,730	Apr. 24, 1955	.4	107	.122	1.67	102	1.59
1956	1438	2,640	Aug. 9, 1956	0	96.9	.111	1.50	89.2	1.38
1957	1508	17,500	June 30, 1957	1.9	†877	1.00	13.61	896	13.92
1958	1558	5,880	July 31, 1958	5.0	373	.426	5.78	363	5.61
1959	1628	2,700	Feb. 10, 1959	4.0	159	.182	2.46	180	2.78
1960	1708	8,030	Apr. 1, 1960	3.6	406	.464	6.30	-	-

† Corrected.

5875. Mississippi River at Alton, Ill.

Location.--Lat 38°53'06", long 90°10'51", in sec.14, T.5 N., R.10 W., near left bank in downstream end of intermediate lock wall of lock and dam 26 at Alton, 300 ft downstream from Missouri & Illinois Bridge & Belt Railroad bridge, 7.7 miles upstream from Missouri River, and at mile 202.7 upstream from Ohio River.

Drainage area.--171,500 sq mi, approximately.

Records available.--Discharge: October 1927 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage heights: At Grafton since August 1879 and at Alton since January 1904 in reports of Mississippi River Commission. December 1890 to September 1893 and January 1917 to December 1939 in reports of U.S. Weather Bureau.

Gage.--Water-stage recorder. Datum of gage is at mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Mar. 20, 1933, staff gage at Grafton 15.3 miles upstream at datum 403.79 ft higher. Mar. 20, 1933, to Jan. 4, 1937, and Nov. 11, 1937, to Jan. 31, 1938, wire-weight gage 300 ft upstream. Mar. 20, 1933, to Jan. 31, 1938, at datum 395.48 ft higher. Since July 11, 1940, auxiliary water-stage recorder 5.9 miles downstream; previously various combinations of gages were used.

Average discharge.--33 years (1927-60), 93,130 cfs (67,420,000 acre-ft per year).

Extremes.--1927-60: Maximum discharge, 437,000 cfs May 24, 1943 (gage height, 429.91 ft), includes 90,000 cfs floodwater overflow from Missouri River; minimum, 7,960 cfs Nov. 7, 1948, result of temporary storage in pool of lock and dam 26; minimum gage height, 390.50 ft Jan. 27, 1954.

Remarks.--Natural flow of stream affected by many reservoirs and navigation dams in upper Mississippi River basin. Floodwater from Missouri River enters above station when levees are overtopped during large floods in the Missouri River. Overflow has occurred as shown by the following table:

Period	Runoff for period (acre-feet)	Maximum	
		Date	Discharge (cfs)
May 21 to June 4, 1943..	1,075,000	May 24, 1943	90,000
Apr. 29 to May 15, 1944..	891,000	Apr. 30, 1944	90,000
June 29 to July 19, 1947..	687,000	July 2, 1947	65,000
July 5-31, 1951.....	2,534,000	July 20, 1951	110,000

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	34,940	29,400	36,790	43,360	106,200	156,100	278,500	269,000	159,200	245,100	109,800	94,510	129,800
1952	96,550	115,900	78,470	101,200	106,200	156,100	278,500	269,000	159,200	245,100	109,800	94,510	129,800
1953	33,150	40,400	45,380	43,930	76,610	118,900	166,700	121,500	114,900	114,900	102,200	46,260	85,330
1954	30,950	34,220	41,950	37,980	34,900	55,390	104,500	156,500	137,700	121,000	59,110	58,860	72,940
1955	115,700	65,110	82,860	79,010	77,700	115,600	139,900	102,600	101,800	67,490	49,160	32,710	85,340
1956	43,870	36,300	37,110	32,510	37,710	54,150	115,300	100,500	68,810	63,300	60,550	35,760	57,190
1957	22,720	35,020	35,460	37,310	46,870	57,920	115,900	127,900	130,400	130,500	63,700	49,800	71,200
1958	41,540	52,190	58,180	49,050	44,780	81,320	140,580	156,570	99,980	132,500	80,740	41,840	68,490
1959	29,670	41,990	29,740	29,060	31,620	145,800	157,500	116,000	89,950	70,360	53,700	59,350	75,980
1960	105,700	79,000	66,230	121,100	87,830	74,780	301,700	253,800	191,500	123,500	56,790	60,370	126,700

Monthly and yearly discharge, in thousands of acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2,148	1,749	2,262	2,666	5,602	9,600	16,560	16,540	9,416	15,070	6,753	5,624	93,990
1952	5,937	6,897	4,825	6,225	6,108	11,110	14,810	13,940	7,290	7,411	6,498	3,142	94,180
1953	2,038	2,404	2,790	2,701	4,255	7,309	9,917	7,473	6,838	7,017	6,284	2,753	61,780
1954	1,903	2,036	2,579	2,335	1,938	3,406	6,216	6,624	8,192	7,441	3,635	3,502	52,810
1955	7,115	3,875	3,250	4,858	4,315	7,106	8,324	6,311	6,060	4,150	3,023	1,946	60,330
1956	2,698	2,160	2,282	1,999	2,169	3,329	6,860	6,181	4,094	3,894	3,723	2,128	41,520
1957	1,397	2,084	2,180	2,294	2,603	3,561	6,899	7,864	7,761	8,025	3,917	2,965	51,550
1958	2,554	5,577	3,016	2,487	5,037	4,795	3,466	5,849	8,145	4,864	2,489	4,950	94,580
1959	1,824	2,499	1,829	1,787	5,089	8,963	9,370	7,132	5,352	4,326	3,302	5,532	55,000
1960	6,497	4,701	4,072	7,447	5,052	4,598	17,950	15,600	11,390	7,594	3,492	3,592	91,980

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	103,490	74,840,000
1951	1208	333,000	May 10, 1951	22,500	129,800	93,990,000	145,700	105,500,000
1952	1238	340,000	Apr. 30, 1952	35,400	129,700	94,180,000	115,400	83,760,000
1953	1278	232,000	Apr. 5, 1953	25,700	85,330	61,780,000	84,350	61,060,000
1954	1338	198,000	May 19, 1954	27,100	72,940	52,810,000	83,610	60,530,000
1955	1398	212,000	Apr. 28, 1955	25,800	85,340	60,330,000	73,570	53,230,000
1956	1438	166,000	Apr. 30, 1956	22,600	57,190	41,520,000	55,150	40,040,000
1957	1508	180,000	June 16, 1957	17,400	71,200	51,550,000	75,140	55,120,000
1958	1558	209,000	July 21, 1958	27,900	68,490	49,580,000	64,270	46,510,000
1959	1628	221,000	Apr. 8, 1959	18,500	75,980	55,000,000	88,570	64,120,000
1960	1708	377,000	Apr. 10, 1960	43,200	126,700	91,980,000	-	-

5880. Indian Creek at Wanda, Ill.

Location.--Lat 38°50'30", long 90°01'59", in SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 31, T.5 N., R.8 W., on right bank at upstream side of bridge on State Highway 159, three-quarters of a mile northeast of Wanda, 2 $\frac{1}{4}$ miles upstream from mouth, and 5 miles west of Edwardsville.

Drainage area.--37.0 sq mi.

Records available.--April 1940 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 431.52 ft above mean sea level, datum of 1929.

Average discharge.--20 years (1940-60), 24.8 cfs.

Extremes.--1940-60: Maximum discharge, 9,340 cfs Aug. 15, 1946 (gage height, 18.41 ft); no flow for many days in 1940-41, 1944, 1948, 1953-60.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.320	1.18	1.14	2.39	117	39.2	22.3	4.11	86.5	34.0	4.97	2.41	25.5
1952	1.16	10.9	32.9	13.1	397	50.2	94.4	5.62	65.0	53.8	3.21	.791	30.7
1953	.049	1.12	2.67	.697	3.32	30.6	37.8	27.0	14.4	2.34	.005	0	10.0
1954	0	0	0	.008	.091	.045	.258	.070	3.16	1.32	2.85	8.97	1.39
1955	30.1	.552	.86	7.26	24.1	11.7	20.4	.818	.022	5.17	4.76	0	8.72
1956	5.20	.118	0	0	7.1	.320	3.01	12.4	12.9	10.1	5.57	.705	4.82
1957	0	.023	6.43	4.73	14.0	13.7	130	67.4	202	7.74	.314	0	36.5
1958	2.65	4.87	9.26	12.1	12.0	45.2	14.4	12.6	13.1	45.3	25.8	12.1	17.6
1959	1.29	12.6	3.11	28.4	65.3	17.6	7.27	14.6	2.33	.19	5.26	1.81	13.0
1960	7.67	11.1	6.91	8.10	7.84	36.0	23.1	41.8	68.2	40.0	.27	.01	20.9

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.01	0.04	0.04	0.07	3.29	1.22	0.67	0.13	2.61	1.06	0.15	0.07	9.36
1952	.04	.33	1.03	.41	1.16	1.56	2.85	.18	1.96	1.68	.10	.02	11.32
1953	.002	.03	.08	.02	.09	.95	1.14	.84	.44	.07	.0002	0	3.66
1954	0	0	0	.0003	.003	.001	.008	.002	.10	.04	.09	.27	.51
1955	.94	.02	.03	.23	.68	.36	.61	.03	.0007	.16	.15	0	3.21
1956	.16	.004	0	0	.22	.01	.09	.39	.39	.31	.17	.02	1.76
1957	0	.0007	.20	.01	.39	.43	3.91	2.10	6.10	.24	.01	0	13.59
1958	.08	.15	.29	.38	.34	1.41	.44	.39	.39	1.41	.80	.37	6.45
1959	.04	.38	.10	.89	1.84	.55	.22	.46	.07	.006	.16	.05	4.77
1960	.24	.33	.22	.25	.23	1.12	.70	1.30	2.06	1.25	.009	.0003	7.71

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	40.4	14.81
1951	1208	2,120	June 20, 1951	0.11	25.5	0.689	9.36	29.1	10.67
1952	1238	3,680	June 10, 1952	.04	30.7	.830	11.32	27.3	10.03
1953	1278	1,070	Apr. 24, 1953	0	10.0	.270	3.66	9.70	3.55
1954	1338	482	Sept. 21, 1954	0	1.39	.038	.51	4.03	1.50
1955	1388	870	Oct. 11, 1954	0	8.72	.236	3.21	6.50	2.38
1956	1438	482	May 31, 1956	0	4.82	.130	1.76	4.92	1.80
1957	1508	7,750	June 15, 1957	0	36.5	.986	13.39	37.4	13.71
1958	1558	680	Sept. 17, 1958	0	17.6	.476	6.45	17.6	6.45
1959	1628	2,400	Feb. 10, 1959	0	13.0	.351	4.77	13.7	5.04
1960	1708	1,290	July 1, 1960	0	20.9	.565	7.71	-	-

5895. Canteen Creek at Caseyville, Ill.

Location.--Lat 38°38'35", long 90°01'00", in N $\frac{1}{2}$ NW $\frac{1}{4}$ sec.8, T.2 N., R.8 W., on right bank at upstream side of highway bridge at Caseyville, 100 ft upstream from Pennsylvania Railroad bridge and 400 ft upstream from bridge on State Highway 157.

Drainage area.--22.5 sq mi.

Records available.--October 1939 to September 1960.

Gage.--Water-stage recorder and concrete control. Datum of gage is 420.97 ft above mean sea level, datum of 1929.

Average discharge.--21 years (1939-60), 17.5 cfs.

Extremes.--1939-60: Maximum discharge, 10,200 cfs June 15, 1957 (gage height, 17.81 ft), from rating curve extended above 890 cfs on basis of contracted-opening measurement of peak flow; maximum gage height, 20.54 ft Aug. 16, 1946; no flow Sept. 8, 1953, and part of each day Sept. 6, 7, 13, 1954.

Remarks.--Diurnal fluctuation at low flow.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	4.81	13.7	8.20	15.6	75.3	32.3	30.1	11.4	57.0	8.21	9.76	4.74	22.1
1952	7.45	31.3	32.3	24.9	31.4	45.5	76.7	9.94	4.59	7.20	1.54	1.15	22.7
1953	5.41	2.16	2.07	2.63	3.80	13.4	12.0	11.8	2.32	1.55	.244	.088	4.39
1954	.388	2.450	.523	.709	.454	.345	2.87	1.19	3.44	.907	1.14	21.7	2.81
1955	1.98	.940	1.50	2.31	4.51	2.85	2.54	.958	3.70	34.2	1.55	6.66	5.34
1956	4.34	3.44	.931	.665	6.27	1.80	3.83	13.2	31.7	58.0	2.99	.725	10.7
1957	.675	1.37	7.16	2.08	13.6	14.5	75.7	104	203	8.53	8.85	.912	36.6
1958	6.27	15.2	12.2	15.1	10.7	56.4	17.4	15.4	17.3	70.8	61.3	7.16	24.2
1959	6.09	26.3	5.44	27.0	54.9	17.0	9.34	9.86	2.22	1.03	3.63	2.32	13.5
1960	3.42	6.84	6.12	6.41	9.01	16.7	15.4	19.7	31.6	16.1	1.69	.502	11.1

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.25	0.68	0.42	0.80	3.49	1.66	1.49	0.58	2.83	0.42	0.50	0.24	13.36
1952	.38	1.55	1.65	1.28	1.50	2.33	3.80	.51	.25	.37	.08	.06	13.74
1953	.03	.11	.11	.13	.18	.68	.60	.60	.12	.08	.01	.004	2.65
1954	.02	.02	.03	.04	.02	.02	.14	.06	.17	.05	.06	1.07	1.70
1955	.10	.05	.08	.12	.21	.15	.13	.05	.18	1.75	.08	.33	3.23
1956	.22	.17	.05	.03	.30	.09	.19	.68	1.57	2.97	.15	.04	6.46
1957	.03	.07	.37	.11	.63	.74	3.75	5.35	10.08	.44	.45	.05	22.07
1958	.32	.75	.63	.77	.50	1.97	.86	.79	.86	3.63	3.17	.36	14.61
1959	.31	1.30	.28	1.58	2.54	.87	.46	.51	1.11	.05	.19	.12	8.12
1960	.18	.34	.31	.33	.43	.85	.76	1.01	1.57	.82	.09	.02	6.71

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	26.2	15.80
1951	1208	2,970	June 20, 1951	1.3	22.1	0.982	13.36	25.8	15.59
1952	1238	(a)	Apr. 1, 1952	.26	22.7	1.01	13.74	17.2	10.41
1953	1278	327	May 17, 1953	0	4.39	.195	2.65	4.10	2.47
1954	1338	2,000	Sept. 20, 1954	.01	2.81	.125	1.70	3.07	1.86
1955	1388	2,080	July 5, 1955	.25	5.34	.237	3.23	5.70	3.44
1956	1438	3,650	July 4, 1956	.14	10.7	.476	6.46	10.7	6.49
1957	1508	10,200	June 15, 1957	.34	36.6	1.63	22.07	38.6	23.30
1958	1558	1,790	July 18, 1958	.64	24.2	1.08	14.61	24.5	14.80
1959	1628	1,510	Feb. 10, 1959	.22	13.5	.600	8.12	11.7	7.06
1960	1708	2,520	June 29, 1960	.31	11.1	.493	6.71	-	-

a Not determined.

5900. Kaskaskia River at Bondville, Ill.

Location.--Lat 40°06'47", long 88°20'55", in NW $\frac{1}{4}$ sec.18, T.19 N., R.8 E., on left bank at downstream side of bridge on State Highway 10, 50 ft upstream from Illinois Central Railroad bridge, 1 mile east of Bondville, and 3.8 miles west of Champaign.

Drainage area.--12.3 sq mi.

Records available.--December 1948 to September 1960.

Gage.--Water-stage recorder and concrete control. Datum of gage is 689.89 ft above mean sea level, datum of 1929.

Average discharge.--11 years (1949-60), 8.82 cfs.

Extremes.--1948-60: Maximum discharge, 1,160 cfs Feb. 10, 1959 (gage height, 13.50 ft); no flow Sept. 21-24, Oct. 1-3, 7-9, 1954.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	4.52	3.35	3.58	21.1	45.8	21.7	23.2	8.13	7.60	19.4	3.10	1.27	13.3
1952	1.39	10.2	8.28	18.1	16.1	23.4	25.2	14.8	17.3	2.81	.46	.17	11.5
1953	.18	.18	.27	.66	1.00	18.3	19.7	3.57	1.52	3.93	.34	.14	4.16
1954	.21	.14	.30	.28	.24	.30	5.08	.92	13.4	.71	.27	.09	1.81
1955	.15	.11	.13	2.28	6.30	6.82	7.89	4.57	4.95	8.27	.66	.23	3.51
1956	10.4	4.81	1.97	1.05	10.7	5.97	3.49	3.36	1.45	1.23	2.35	.22	3.90
1957	.18	.24	.55	1.77	6.06	3.98	25.7	19.3	20.5	15.6	1.07	.21	7.90
1958	.39	1.42	13.9	10.4	3.97	5.20	7.31	4.94	34.3	42.6	35.8	2.16	13.6
1959	1.11	4.46	3.39	5.53	45.7	20.5	12.1	19.1	5.60	.72	.16	1.63	9.75
1960	2.30	3.75	3.00	5.59	11.1	11.2	21.0	12.7	29.5	9.53	1.69	.14	9.24

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.42	0.30	0.34	1.98	3.88	2.04	2.10	0.76	0.69	1.82	0.29	0.12	14.74
1952	.13	.92	.78	1.70	1.41	2.19	2.29	1.39	1.57	.26	.04	.02	12.70
1953	.02	.02	.03	.06	.08	1.72	1.79	.33	.14	.37	.03	.01	4.60
1954	.02	.01	.03	.03	.02	.03	.46	.09	1.22	.07	.03	.008	2.02
1955	.01	.01	.01	.21	.53	.64	.72	.43	.45	.78	.06	.02	3.87
1956	.97	.44	.19	.10	.94	.56	.32	.32	.13	.12	.22	.02	4.33
1957	.02	.02	.05	.17	.51	.37	2.33	1.81	1.86	1.46	.10	.02	8.72
1958	.04	.13	1.30	.98	.34	.49	.66	.46	3.11	3.99	3.36	.20	15.06
1959	.10	.40	.32	.52	3.87	1.92	1.10	1.79	.51	.07	.01	.15	10.76
1960	.22	.34	.28	.52	.97	1.05	1.91	1.19	2.68	.89	.16	.01	10.22

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches	
		Discharge	Date							
1950	-	-	-	-	-	-	-	15.2	-	16.75
1951	1208	427	Feb. 21, 1951	0.8	13.3	1.08	14.74	14.0	15.51	
1952	1238	218	June 22, 1952	.1	11.5	.935	12.70	9.87	10.94	
1953	1278	299	Mar. 31, 1953	.1	4.16	.358	4.60	4.16	4.59	
1954	1338	337	June 7, 1954	0	1.81	.147	2.02	1.73	1.99	
1955	1388	180	July 23, 1955	0	3.51	.285	3.87	4.92	5.44	
1956	1438	207	Oct. 6, 1955	.1	3.90	.317	4.33	2.54	2.82	
1957	1508	235	June 28, 1957	.1	7.90	.642	8.72	9.15	10.10	
1958	1558	774	July 11, 1958	.2	13.6	1.11	15.06	13.1	14.41	
1959	1628	1,160	Feb. 10, 1959	.1	9.75	.793	10.76	9.76	10.78	
1960	1708	536	June 23, 1960	.1	9.24	.751	10.22	-	-	

5905. Kaskaskia River at Ficklin, Ill.

Location.--Lat 39°48'00", long 88°21'55", in SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.36, T.16 N., R.7 E., on left bank 0.25 mile upstream from Baltimore & Ohio Railroad bridge, 0.5 mile west of Ficklin, and 7 miles downstream from Twomile Slough.

Drainage area.--127 sq mi.

Records available.--February 1954 to September 1960.

Gage.--Water-stage recorder and concrete control. Datum of gage is 642.10 ft above mean sea level, datum of 1929.

Average discharge.--6 years (1954-60), 78.6 cfs (adjusted for pumpage and diversion).

Extremes.--1954-60: Maximum discharge, 4,400 cfs Feb. 10, 1959 (gage height, 13.98 ft); no flow for times in most years.

Remarks.--Records of daily discharge include only flow over control. Water is pumped into river from wells 21.5 miles upstream. Diversion for industrial supply above control. Waste water returns to river 2.5 ft downstream.

Monthly and yearly mean discharge, in cubic feet per second (observed)

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	-	-	-	-	-	2.32	20.1	4.37	85.8	6.87	9.97	0.78	-
1955	2.65	1.35	0.93	26.7	31.3	78.0	105	35.7	116	109	9.95	2.30	43.2
1956	64.5	110	21.5	6.47	120	61.3	26.5	30.3	10.7	7.04	9.95	1.42	38.8
1957	47	1.17	18.17	15.0	64.9	49	350	215	26.5	11	12.0	1.69	80.4
1958	3.91	12.7	141	92.7	25.6	51.0	52.4	93.7	391	280	160	7.00	110
1959	1.99	51.9	22.1	66.0	370	218	87.3	142	48.0	6.71	2.16	1.80	82.9
1960	5.87	13.4	14.9	26.7	88.3	97.9	131	75.5	224	52.6	5.50	3.40	61.1

Monthly and yearly runoff, in inches (adjusted) \pm

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	-	-	-	-	-	0.009	0.21	0.04	0.80	0.07	0.10	-0.02	-
1955	0.01	0.004	0.00009	0.26	0.29	.78	.99	.40	1.10	1.06	.11	.03	5.03
1956	.64	1.06	.27	.12	1.08	.62	.28	.34	.18	.14	.14	.02	4.89
1957	.008	.01	.09	.18	.62	.55	3.16	2.03	2.36	1.12	1.19	.06	10.40
1958	.11	.20	1.43	.94	.31	.57	.56	.95	3.54	2.65	1.56	.16	12.98
1959	.05	.47	.32	.69	3.14	2.08	.69	1.40	.53	.05	.0005	.01	9.61
1960	.06	.18	.14	.36	.85	.99	1.28	.83	2.09	.59	.06	-.005	7.42

a Adjusted for pumpage and diversion.

Note.--Negative figures indicate that seepage and other losses exceeded yield.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year		
		Observed				Adjusted			Observed	Adjusted	
		Momentary maximum		Minimum day	Mean	Mean	Per square mile	Runoff in inches	Mean	Mean	Runoff in inches
		Discharge	Date								
1950	-	-	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-
1954	1338	1,140	June 9, 1954	-	-	-	-	-	-	-	-
1955	1388, 1508	1,020	July 24, 1955	0	43.2	47.3	0.372	5.03	55.2	65.7	6.99
1956	1438, 1508	630	Oct. 7, 1955	.1	38.8	45.8	.361	4.89	23.3	28.4	3.03
1957	1508	1,320	June 28, Apr. 28	0	90.4	97.4	.767	10.40	103	113	12.03
1958	1558	3,120	June 11, 1958	.5	110	122	.961	12.98	103	113	12.08
1959	1628	4,400	Feb. 10, 1959	0	82.9	89.8	.707	9.61	75.4	85.7	9.15
1960	1708	1,640	June 23, 1960	0	61.1	69.4	.546	7.42	-	-	-

5915. Asa Creek at Sullivan, Ill.

Location.--Lat 39°37'11", long 88°36'17", in NW 1/4 sec. 36, T.14 N., R.5 E., on right bank at downstream side of highway bridge, 0.4 mile upstream from Chicago & Eastern Illinois Railroad, 0.8 mile north of Sullivan, and 5½ miles upstream from mouth.

Drainage area.--7.93 sq mi.

Records available.--July 1950 to September 1960.

Gage.--Water-stage recorder and concrete control. Datum of gage is 645.36 ft above mean sea level, datum of 1929.

Average discharge.--10 years (1950-60), 4.80 cfs.

Extremes.--1950-60: Maximum discharge, 1,110 cfs June 28, 1957 (gage height, 10.66 ft), from rating curve extended above 660 cfs on basis of velocity-area studies; no flow during part of each year.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.32	1.84	2.32	7.57	26.6	9.74	11.9	7.11	15.4	6.42	0.70	0.19	7.36
1952	.31	7.14	5.19	12.3	11.7	12.2	11.1	2.89	11.7	1.28	.02	0	6.28
1953	0	.003	0	.003	.02	5.60	5.92	4.20	4.10	1.22	.006	0	1.76
1954	.003	0	0	0	.003	.01	.09	.03	.05	0	.03	0	.02
1955	.02	0	0	.04	1.94	1.91	3.00	2.06	7.31	1.88	.03	.10	1.51
1956	.67	8.22	1.65	.45	8.81	4.35	3.73	8.66	14.7	5.34	1.08	.01	4.76
1957	0	0	1.94	1.79	5.80	6.18	22.8	13.3	44.7	10.9	.34	.08	8.93
1958	.25	.15	4.62	4.61	1.52	4.17	5.23	2.54	20.5	25.6	14.4	.82	7.08
1959	.43	3.54	2.17	4.85	22.7	8.09	4.26	3.47	1.18	.09	.16	.02	4.12
1960	.16	1.43	.77	1.78	6.60	8.15	9.93	6.63	34.4	4.27	.38	0	6.14

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.05	0.26	0.34	1.10	3.49	1.42	1.68	1.03	2.17	0.93	0.10	0.03	12.60
1952	.05	1.00	.75	1.79	1.59	1.77	1.56	.42	1.65	.18	.003	0	10.76
1953	0	.0005	.0005	0	.002	.81	.83	.61	.58	.18	.0009	0	3.01
1954	.0005	0	0	0	.0005	.001	.01	.004	.008	0	.004	0	.03
1955	.002	0	0	.005	.26	.28	.42	.30	1.03	.27	.005	.01	2.58
1956	.10	1.16	.24	.06	1.20	.63	.53	1.26	2.07	.78	.16	.002	8.19
1957	0	0	.28	.26	.76	.90	3.21	1.94	6.29	1.59	.05	.01	15.29
1958	.04	.02	.67	.67	.20	.61	.74	.37	2.88	3.72	2.09	.12	12.13
1959	.06	.50	.32	.70	2.98	1.18	.60	.50	.17	.01	.02	0	7.04
1960	.02	.20	.11	.26	.90	1.19	1.40	.96	4.83	.82	.06	0	10.55

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	1208	472	June 28, 1951	0	7.36	0.928	12.60	8.04	13.75
1952	1238	402	June 22, 1952	0	6.28	.792	10.76	5.23	8.96
1953	1278	102	June 28, 1953	0	1.76	.222	3.01	1.76	3.01
1954	1338	5.8	Apr. 15, 1954	0	.02	.0025	.03	.02	.03
1955	1388	58	June 12, 1955	0	1.51	.190	2.58	2.38	4.08
1956	1438	515	June 19, 1956	0	4.76	.600	8.19	4.06	6.97
1957	1508	1,110	June 28, 1957	0	8.93	1.13	15.29	9.19	15.74
1958	1558	189	July 31, 1958	0	7.08	.893	12.13	7.17	12.28
1959	1628	690	Feb. 9, 1959	0	4.12	.520	7.04	3.80	6.49
1960	1708	625	June 23, 1960	0	6.14	.774	10.55	-	-

5920. Kaskaskia River at Shelbyville, Ill.

Location.--Lat 39°24'20", long 88°47'00", in SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.8, T.11 N., R.4 E., on left bank 50 ft upstream from bridge on State Highway 16 in Shelbyville, 2,000 ft upstream from Chicago & Eastern Illinois Railroad bridge, 7 miles upstream from Robinson Creek, and at mile 221.42.

Drainage area.--1,030 sq mi, approximately.

Records available.--February 1908 to September 1912, November to December 1912, August to December 1914, October 1940 to September 1960.

Gage.--Water-stage recorder and concrete control. Datum of gage is 535.78 ft above mean sea level, datum of 1929. Prior to Dec. 6, 1914, chain gage on downstream side of bridge 100 ft downstream at datum 4.67 ft lower. Oct. 1 to Dec. 3, 1940, and June 1, 1950, to July 10, 1952, staff gage and Dec. 4, 1940, to May 31, 1950, water-stage recorder, at present site and datum.

Average discharge.--24 years (1908-12, 1940-60), 836 cfs.

Extremes.--1908-12, 1914, 1940-60: Maximum discharge, 25,900 cfs June 29, 1957 (gage height, 22.37 ft); no flow at times in 1953-55.

Remarks.--Municipal water supply for Shelbyville obtained from shallow wells in gravel beds along right bank just above gage.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	229	435	541	1,174	4,033	1,684	1,978	976	1,044	1,730	189	264	1,169
1952	124	1,020	457	1,704	1,757	1,834	1,887	597	1,323	316	24.3	5.88	915
1953	1.33	5.91	14.9	21.6	58.0	997	1,371	532	540	492	15.2	1.24	338
1954	.111	.72	8.84	17.7	21.8	13.6	107	51.7	158	11.3	43.3	1.17	36.1
1955	20.5	6.95	7.34	122	122	521	756	412	753	636	90.2	42.0	291
1956	396	887	235	97.1	1,171	710	380	618	680	255	216	19.7	467
1957	9.68	124	181	284	650	807	3,872	2,400	4,808	1,957	135	23.2	1,212
1958	27.7	135	1,217	907	225	458	515	582	2,259	2,528	2,347	140	953
1959	111	668	483	601	3,566	1,602	763	576	274	40.5	31.7	9.97	707
1960	35.5	112	82.2	219	674	643	1,251	787	2,811	717	48.7	15.7	611

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.26	0.47	0.61	1.31	4.08	1.89	2.14	1.09	1.13	1.94	0.21	0.29	15.42
1952	.14	1.10	.51	1.91	1.84	2.05	2.04	.67	1.43	.35	.03	.008	12.08
1953	.001	.006	.02	.02	.06	1.12	1.49	.60	.59	.55	.02	.001	4.48
1954	.0001	.0008	.01	.02	.02	.02	.12	.06	.17	.01	.05	.001	.48
1955	.02	.008	.008	.14	.12	.58	.82	.46	.82	.71	.10	.05	3.84
1956	.43	.96	.26	.11	1.23	.79	.41	.69	.74	.29	.24	.02	6.17
1957	.01	.02	.20	.32	.70	.90	3.78	2.69	4.99	2.19	.15	.03	15.98
1958	.03	.15	1.36	1.02	.23	.51	.56	.65	2.45	2.83	2.63	.15	12.57
1959	.12	.72	.54	.67	3.60	1.79	.83	.64	.30	.05	.04	.01	9.31
1960	.04	.12	.09	.25	.71	.72	1.36	.88	3.05	.80	.05	.02	8.09

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year		
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	1,529	20.14
1951	1208	16,000	Feb. 22, 1951	28	1,169	1.13	15.42	1,201	15.83
1952	1238	5,410	June 24, 1952	3.8	915	.888	12.08	784	10.35
1953	1273	3,950	Apr. 6, 1953	.52	338	.328	4.48	337	4.46
1954	1338	662	Apr. 16, 1954	0	36.1	.035	4.48	38.2	.51
1955	1388	2,350	Apr. 22, 1955	0	291	.283	3.84	414	5.45
1956	1438	3,520	Feb. 25, 1956	5.2	467	.453	6.17	360	4.75
1957	1508	25,900	June 29, 1957	4.8	1,212	1.18	15.98	1,311	17.29
1958	1558	12,600	Aug. 2, 1958	6.2	953	.925	12.57	941	12.41
1959	1628	16,200	Feb. 11, 1959	2.8	707	.686	9.31	621	8.18
1960	1708	14,200	June 25, 1960	9.0	611	.593	8.09	-	-

5923. Wolf Creek near Beecher City, Ill.

Location.--Lat 39°09'30", long 88°48'20", in NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.12, T.8 N., R.3 E., on left bank at downstream side of bridge on State Highway 128, 2.2 miles southwest of Beecher City. and 5 miles above mouth.

Drainage area.--48.0 sq mi.

Records available.--December 1958 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 535.48 ft above mean sea level, datum of 1929.

Extremes.--1958-60: Maximum discharge, 3,080 cfs (revised) Feb. 10, 1959 (gage height, 11.59 ft); no flow for many days each year.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1959	-	-	11.3	*84.7	*116	*84.9	*18.1	10.3	2.43	0.75	4.50	1.68	-
1960	3.78	7.97	7.02	*21.5	*52.0	*92.2	10.4	*20.4	*53.3	*7.66	.72	0	*23.0

* Revised.

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1959	-	-	0.27	*2.03	*2.52	*2.04	*0.42	0.25	0.06	0.02	0.11	0.04	-
1960	0.09	0.19	.17	*.52	*1.17	*2.21	.24	*.49	*1.24	*.19	.02	0	*6.53

* Revised.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches		Mean	Runoff in inches
		Discharge	Date							
1959	1628	*3,080	Feb. 10, 1959	-	-	-	-	-	*28.0	*7.94
1960	1708	*1,950	June 23, 1960	0	*23.0	*0.479	*6.53	-	-	-

* Revised.

5925. Kaskaskia River at Vandalia, Ill.

Location.--Lat 38°57'35", long 89°05'20", in SE $\frac{1}{4}$ sec.16, T.6 N., R.1 E., near center of span on upstream side of Gallatin Street Bridge in Vandalia, $\frac{3}{2}$ miles upstream from Hickory Creek and at mile 160.85.

Drainage area.--1,980 sq mi, approximately.

Records available.--February 1908 to December 1912, August 1914 to September 1960. Monthly discharge only for some periods, published in WSP 1308.

Gage.--Wire-weight gage. Datum of gage is 453.30 ft above mean sea level, datum of 1929. Prior to Oct. 1, 1933, chain gage at present site at datum 2.00 ft higher. Oct. 1, 1933, to Sept. 25, 1940, chain gage at present site and datum.

Average discharge.--50 years (1908-12, 1914-60), 1,438 cfs.

Extremes.--1908-12, 1914-60: Maximum discharge, 62,700 cfs June 29, 1957; maximum gage height, 27.39 ft June 29, 1951; minimum discharge observed, 3.5 cfs Aug. 22, 1911.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	356	778	881	1,991	6,267	3,872	3,607	1,234	2,137	3,258	279	377	2,056
1952	185	1,345	829	2,765	2,977	3,673	3,687	822	1,355	604	97.2	76.8	1,526
1953	22.6	38.0	63.1	62.9	160	1,950	2,041	1,169	555	654	63.1	22.6	569
1954	14.9	15.5	20.8	34.0	39.4	34.7	157	94.1	134	42.7	27.4	18.9	52.6
1955	64.1	17.4	18.2	211	253	893	1,192	490	868	776	176	37.2	416
1956	465	1,108	322	134	2,151	1,153	616	1,014	1,357	646	804	111	816
1957	27.6	49.5	553	385	1,390	1,505	7,006	5,003	8,641	5,112	715	120	2,518
1958	161	580	2,616	1,932	731	1,426	1,098	1,362	2,949	3,160	3,760	285	1,684
1959	330	1,541	838	1,133	5,976	3,211	1,493	1,074	580	103	481	88.3	1,372
1960	140	349	337	669	1,477	1,482	2,398	1,655	3,853	1,918	182	78.3	1,205

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.21	0.44	0.51	1.16	3.30	2.25	2.03	0.72	1.20	1.90	0.16	0.21	14.09
1952	11	.76	.48	1.61	1.62	2.14	2.08	.48	.76	.35	.06	.04	10.49
1953	.01	.02	.04	.04	.08	1.14	1.15	.68	.31	.38	.04	.01	3.90
1954	.009	.009	.01	.02	.02	.02	.09	.05	.08	.02	.02	.01	.36
1955	.04	.01	.01	.12	.13	.52	.67	.29	.49	.45	.10	.02	2.85
1956	.27	.62	.19	.08	1.17	.67	.35	.59	.76	.38	.47	.06	5.61
1957	.02	.03	.31	.22	.73	.76	3.95	2.91	4.87	2.98	.42	.07	17.27
1958	.09	.33	1.52	1.12	.58	.83	.62	.79	1.66	1.84	2.19	.16	11.53
1959	.19	.87	.49	.66	3.14	1.87	.84	.63	.33	.06	.28	.05	9.41
1960	.08	.20	.20	.39	.80	.86	1.35	.96	2.17	1.12	.11	.04	8.28

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	2,900	19.86
1951	1208	31,000	June 29, 1951	110	2,056	1.04	14.09	2,084	14.28
1952	1238	10,500	Apr. 15, 1952	28	1,526	.771	10.49	1,340	9.21
1953	1278	5,680	Mar. 5, 1953	15	569	.287	3.90	563	3.86
1954	1338	505	Apr. 19, 1954	4.8	52.6	.027	.36	56.7	.39
1955	1388	5,000	Apr. 25, 1955	4.0	416	.210	2.85	566	3.87
1956	1438	7,840	Feb. 27, 1956	39	816	.412	5.61	710	4.89
1957	1508	62,700	June 29, 1957	14	2,518	1.27	17.27	2,749	18.85
1958	1558	12,400	Aug. 4, 1958	44	1,684	.851	11.53	1,627	11.14
1959	1628	17,200	Feb. 12, 1959	35	1,372	.693	9.41	1,215	8.34
1960	1708	11,800	June 30, 1960	42	1,205	.609	8.28	-	-

5930. Kaskaskia River at Carlyle, Ill.

Location.--Lat 38°36'42", long 89°21'22", in SE $\frac{1}{4}$ sec.18, T.2 N., R.2 W., on left bank at downstream side of bridge on U.S. Highway 50 at Carlyle, 16.5 miles upstream from Crooked Creek and at mile 105.75.

Drainage area.--2,680 sq mi, approximately.

Records available.--March 1908 to September 1912, November to December 1912, August 1914 to September 1915, May 1938 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 402.92 ft above mean sea level, datum of 1929. Prior to July 1, 1938, chain, wire-weight, or staff gage at site at Baltimore & Ohio Railroad bridge 400 ft downstream at same datum. July 1, 1938, to Sept. 30, 1940, wire-weight gage at present site and datum.

Average discharge.--27 years (1908-12, 1914-15, 1938-60), 2,069 cfs.

Extremes.--1908-12, 1914-15, 1938-60: Maximum discharge, 54,400 cfs May 21, 1913 (gage height, 33.69 ft); minimum, 11 cfs Sept. 17, 1954.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	424	1,061	1,211	2,921	7,056	6,015	4,444	1,406	1,246	6,818	391	447	2,762
1952	285	1,863	1,179	3,508	4,687	5,599	5,819	980	1,489	971	141	139	2,207
1953	45.9	65.8	105	99.3	204	2,576	2,504	1,535	568	809	34.9	34.0	706
1954	24.7	25.8	31.4	54.1	68.7	57.1	176	127	144	48.3	33.0	73.6	71.5
1955	188	31.0	34.6	311	423	1,231	1,613	916	1,102	1,255	358	121	633
1956	604	1,428	398	175	2,275	2,481	870	1,339	1,728	1,001	1,000	156	1,116
1957	42.5	66.1	985	522	1,659	1,906	9,535	7,955	9,289	10,330	1,131	213	3,640
1958	242	1,039	3,520	5,281	1,069	2,443	1,608	2,039	2,892	4,360	4,815	385	2,328
1959	378	1,337	1,350	1,600	7,594	3,454	1,590	1,203	682	143	590	240	1,977
1960	203	505	898	1,213	2,219	1,472	4,178	2,313	2,937	4,804	273	125	1,757

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.18	0.44	0.52	1.26	2.74	2.59	1.85	0.60	0.52	2.93	0.17	0.19	13.99
1952	.12	.78	.51	1.51	1.89	2.41	2.42	.42	.62	.42	.06	.06	11.22
1953	.02	.03	.05	.04	.08	1.02	1.04	.68	.24	.35	.04	.01	3.58
1954	.01	.01	.01	.02	.03	.02	.07	.05	.06	.02	.01	.03	1.34
1955	.08	.01	.01	.13	.16	.53	.67	.39	.46	.54	.15	.05	3.18
1956	.26	.59	.17	.07	.92	1.07	.36	.58	.72	.43	.43	.06	5.66
1957	.02	.03	.42	.22	.64	.82	3.97	3.42	3.87	4.44	.49	.09	18.43
1958	.10	.43	1.51	1.41	.42	1.05	.67	.88	1.20	1.88	2.07	.16	11.78
1959	.16	.56	.58	.69	2.95	1.49	.66	.52	.28	.06	.25	.10	8.30
1960	.09	.21	.39	.52	.89	.63	1.74	.99	1.22	2.07	.12	.05	8.92

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	3,884	19.67
1951	1208	17,500	July 2, 1951	165	2,762	1.03	13.99	2,814	14.26
1952	1258	10,400	Mar. 14, 1952	55	2,207	.92	11.22	1,948	9.91
1953	1278	4,300	Mar. 9, 1953	26	706	.263	3.58	695	3.51
1954	1338	746	Sept. 20, 1954	12	71.5	.027	.34	86.2	.41
1955	1388	4,620	Apr. 28, 1955	14	633	.236	3.18	814	4.10
1956	1438	7,640	Mar. 3, 4, 1956	57	1,116	.416	5.66	1,006	5.11
1957	1508	33,400	July 2, 1957	31	3,640	1.36	18.43	3,952	20.00
1958	1558	12,300	Aug. 7, 8, 1958	67	2,328	.869	11.78	2,179	11.04
1959	1628	18,600	Feb. 15, 1959	76	1,537	.611	8.30	1,516	7.69
1960	1708	19,300	July 3, 1960	72	1,757	.656	8.92	-	-

KASKASKIA RIVER BASIN

5935. Centralia Reservoir Creek near Centralia, Ill.

Location.--Lat 38°33'34", long 89°00'23", in NW¼NE¼ sec.5, T.1 N., R.2 E., on left bank at upstream side of bridge over outlet of Centralia Reservoir, 1 mile upstream from mouth and 7½ miles northeast of Centralia.

Drainage area.--7 sq mi, approximately.

Records available.--March 1932 to September 1943, October 1948 to September 1955.

Gage.--Water-stage recorder and concrete control. Datum of gage is 479.76 ft above mean sea level, datum of 1929.

Average runoff.--17 years (1932-42, 1948-55), 1,077.3 million gallons per year, adjusted (equivalent to 4.56 cfs).

Extremes.--1932-43, 1948-55: Maximum discharge, 1,500 cfs May 19 or 20, 1943 (gage height, 10.87 ft), by contracted-opening measurement; no flow for long periods every year.

Remarks.--Flow regulated by reservoir (area at crest of spillway, 270 acres). Discharge adjusted for pumpage and change in contents but not for evaporation and seepage.

Monthly and yearly mean discharge, in cubic feet per second (adjusted) a/

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-2.55	9.38	9.66	10.1	26.9	13.2	5.76	-2.93	-1.86	-2.56	-2.91	-1.13	4.93
1952	2.04	8.68	8.40	3.72	6.67	21.6	13.5	-1.64	7.42	-2.07	-2.39	-2.81	5.23
1953	-2.44	-5.92	-0.040	-5.53	-0.34	14.7	10.5	4.98	-2.21	-2.88	-3.36	-3.09	.924
1954	-1.06	-.973	.791	-.511	-.224	-1.02	-.420	-1.06	-1.45	.050	.050	2.90	-.350
1955	1.71	-.182	1.90	1.88	8.05	7.42	10.0	-.497	-.896	-.889	-.777	-.973	2.19

a Adjusted for storage and pumpage.

Note.--Negative figures indicate that evaporation and seepage from reservoir exceeded inflow.

Monthly and yearly runoff, in inches (adjusted) a/

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-0.42	1.50	1.59	1.66	4.00	2.18	0.92	-0.48	-0.30	-0.42	-0.48	-0.18	9.57
1952	.34	1.38	1.38	.81	1.03	3.56	2.12	-.27	1.18	-.34	-.39	-.45	10.15
1953	.40	-.94	-.007	.09	-.005	2.42	1.67	.82	-.35	-.47	-.55	-.49	1.79
1954	-.18	-.16	-.13	-.08	.03	-.17	-.07	-.18	-.23	.008	.008	.46	-.69
1955	.28	-.03	.31	.31	1.20	1.22	1.60	-.08	-.14	-.15	-.13	-.16	4.23

a Adjusted for storage and pumpage.

Note.--Negative figures indicate that evaporation and seepage from reservoir exceeded inflow.

Yearly discharge of Centralia Reservoir Creek and rainfall at Centralia Reservoir, Ill.

Water year ending Sept. 30												Calendar year		
Year	WSP	Discharge from spillway (millions of gallons)	Pumpage (millions of gallons)	Change in contents (millions of gallons)	Adjusted for change in reservoir contents and pumpage			Rainfall (inches)	Adjusted		Rainfall (inches)			
					Runoff (millions of gallons)	Discharge per square mile			Mean in cubic feet per second	Runoff (inches)				
						Millions of gallons per day	Cubic feet per second							
1950	-	-	-	-	-	-	-	-	10.9	21.27	49.85			
1951	1208	987.2	573.7	-397.6	1,163.3	0.455	0.704	35.06	5.15	10.00	37.44			
1952	1238	470.5	643.2	123.9	1,237.6	.483	.747	39.85	2.93	5.70	35.14			
1953	1278	3.8	616.2	-403.3	-216.7	.085	.132	26.85	1.37	2.66	25.34			
1954	1358	2.2	261.4	-345.6	-82.0	-.032	-.050	25.60	1.81	.34	29.03			
1955	1388	8.6	60.3	446.5	515.4	.202	.313	31.84	-	-	29.03			

Note.--Negative figures indicate that evaporation and seepage from reservoir exceeded inflow.

5936. Blue Grass Creek near Raymond, Ill.

Location.--Lat 39°16'07", long 89°32'02", in SE¼NE¼ sec.33, T.10 N., R.4 W., on right bank at downstream side of highway bridge, 0.8 mile east of State Highway 127, 2.7 miles upstream from mouth, and 4 miles southeast of Raymond.

Drainage area.--17.2 sq mi.

Records available.--May to September 1960.

Gage.--Water-stage recorder. Datum of gage is 598.08 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during period May to September, 332 cfs May 26 (gage height, 11.42 ft, from rating curve extended above 210 cfs by logarithmic plotting); no flow for many days.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1960	-	-	-	-	-	-	-	-	8.64	7.75	0.31	0.01	-

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1960	-	-	-	-	-	-	-	-	0.56	0.52	0.02	0.0009	-

5940. Shoal Creek near Breese, Ill.

Location.--Lat 38°36'35", long 89°29'40", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.13, T.2 N., R.4 W., near center of span on upstream side of bridge on U.S. Highway 50, 0.35 mile upstream from Faltimore & Ohio Railroad bridge, 1.7 miles east of Breese, and 7 miles upstream from Peaver Creek.

Drainage area.--760 sq mi, approximately.

Records available.--November 1909 to December 1912, August to December 1914, October 1945 to September 1960.

Gage.--Wire-weight gage. Datum of gage is 413.97 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Dec. 8, 1914, chain gage at site 0.35 mile downstream at different datum.

Average discharge.--17 years (1910-12, 1945-1960), 516 cfs.

Extremes.--1909-12, 1914, 1945-60: Maximum discharge, 23,100 cfs Jan. 6, 1950 (gage height, 22.63 ft, from graph based on gage readings); no flow for many days in 1954-56. Maximum discharge known, 52,000 cfs May 19, 1943 (gage height, 25.6 ft, present site and datum), on basis of contracted-opening measurement of peak flow.

Remarks.--About 0.4 cfs diverted above station for municipal supply of Breese is not included in records.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	75.9	151	72.2	368	2,978	1,560	1,580	124	487	1,518	78.6	32.7	736
1952	54.6	283	178	611	924	1,318	1,763	133	171	120	16.8	22.6	463
1953	3.79	10.8	19.0	26.7	69.3	667	428	528	449	51.2	7.38	2.32	189
1954	6.66	21.0	16.5	11.7	8.97	11.9	56.0	12.3	77.4	2.50	23.4	95.7	28.5
1955	116	4.65	8.03	138	310	289	488	68.5	56.1	351	54.8	50.7	160
1956	43.7	127	13.4	14.7	509	161	223	227	299	93.3	182	14.8	157
1957	1.19	7.85	167	36.4	241	247	2,070	2,237	3,697	1,853	385	17.1	913
1958	72.9	308	521	309	199	898	347	407	383	794	1,228	135	479
1959	47.5	284	86.0	328	1,724	599	263	518	313	25.6	166	11.3	354
1960	298	263	398	770	842	749	1,751	400	619	635	39.9	41.2	565

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.12	0.22	0.11	0.56	.08	2.37	2.32	0.19	0.71	2.30	0.12	0.05	13.15
1952	.08	.42	.27	.93	.31	2.00	2.59	.20	.25	.18	.03	.03	8.29
1953	.006	.02	.03	.04	.09	1.01	.63	.80	.66	.08	.01	.003	3.38
1954	.01	.03	.03	.02	.01	.02	.08	.02	.11	.004	.04	.14	.51
1955	.18	.007	.01	.21	.43	.44	.72	.10	.24	.53	.08	.07	2.86
1956	.07	.19	.02	.02	.72	.24	.33	.34	.44	.14	.28	.02	2.81
1957	.002	.01	.25	.06	.33	.37	3.04	3.39	5.43	2.81	.58	.03	16.30
1958	.11	.45	.79	.47	.27	1.36	.51	.62	.56	1.21	2.01	.20	8.56
1959	.07	.42	.13	.50	2.36	.91	.39	.79	.46	.04	.25	.02	6.34
1960	.45	.39	.60	1.17	1.19	1.14	2.57	.61	.91	.96	.06	.06	10.11

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	854	15.28
1951	1208	11,800	July 1, 1951	11	736	0.968	13.15	754	13.47
1952	1238	5,870	Apr. 16, 1952	2.7	463	.609	8.29	423	7.58
1953	1278	85,000	June 28, 1953	.6	189	.249	3.38	190	3.39
1954	1358	900	Sept. 21, 1954	0	28.5	.038	.51	35.7	.64
1955	1398	2,530	Apr. 25, 1955	0	160	.211	2.86	165	2.94
1956	1438	2,370	Feb. 26, 1956	6.5	157	.207	2.81	157	2.79
1957	1508	22,600	June 17, 1957	0	913	1.20	16.30	974	17.39
1958	1558	6,500	Aug. 7, 1958	7.5	479	.630	8.56	438	7.83
1959	1628	13,800	Feb. 14, 1959	4.2	354	.466	6.34	400	7.16
1960	1708	14,600	Apr. 4, 1960	12	565	.743	10.11	-	-

a About.

5950. Kaskaskia River at New Athens, Ill.

Location.--Lat 38°19'22", long 89°52'57", in SW $\frac{1}{4}$ sec.28, T.2 S., R.7 W., on left bank 0.5 mile downstream from bridge on State Highway 13 at New Athens and at mile 40.9.

Drainage area.--5,220 sq mi, approximately.

Records available.--October 1909 to December 1912, June 1914 to September 1921, October 1934 to September 1960. Monthly discharge only for some periods, published in WSP 1308. Records for January 1907 to September 1909, published in WSP 265, have been found to be unreliable and should not be used.

Gage.--Water-stage recorder. Datum of gage is 359.50 ft above mean sea level, datum of 1929. Oct. 1, 1909, to Dec. 31, 1912, and June 22, 1914, to Sept. 30, 1921, chain gage at site 0.66 mile upstream at same datum. Since Oct. 1, 1937, auxiliary staff gages on Mississippi River near mouth of Kaskaskia River 41 miles downstream.

Average discharge.--36 years (1909-12, 1914-21, 1934-60), 3,817 cfs.

Extremes.--1909-12, 1914-21, 1934-60: Maximum discharge, 83,000 cfs May 23, 1943 (gage height, 39.35 ft, backwater from Mississippi River); minimum, 13 cfs Oct. 5, 1941, caused by backwater from Mississippi River; minimum, unaffected by backwater, 40 cfs Sept. 19, 1954 (gage height, 1.45 ft).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	600	2,208	2,163	5,165	13,940	12,050	7,438	1,779	3,139	9,311	1,171	843	4,928
1952	1,156	3,966	2,536	5,278	7,590	10,340	12,470	1,590	2,604	1,652	300	279	4,120
1953	114	137	222	247	375	4,296	4,289	2,897	834	1,068	178	83.2	1,234
1954	60.1	52.7	66.3	83.3	122	83.5	299	250	336	147	164	706	197
1955	511	151	275	758	1,315	2,852	2,358	1,375	1,445	1,841	591	230	1,141
1956	698	1,757	538	240	2,918	2,909	1,018	1,882	3,016	2,169	1,425	260	1,562
1957	97.6	130	1,727	885	3,128	4,081	18,200	18,300	22,860	15,220	2,266	389	7,273
1958	433	1,854	4,613	6,435	2,354	6,539	3,998	5,296	4,131	6,455	10,290	750	4,466
1959	576	2,243	2,241	2,901	12,200	6,488	2,915	2,792	1,569	318	1,417	483	2,949
1960	654	1,075	2,542	2,701	4,087	3,219	7,499	3,902	4,294	7,437	478	214	3,169

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.13	0.47	0.48	1.14	2.78	2.66	1.59	0.39	0.67	2.06	0.26	0.18	12.81
1952	.26	.85	.56	1.17	1.57	2.28	2.66	.35	.56	.36	.07	.06	10.75
1953	.03	.03	.05	.05	.07	.95	.92	.64	.18	.24	.04	.02	3.22
1954	.01	.01	.01	.02	.02	.02	.06	.06	.07	.03	.04	.15	.50
1955	.11	.03	.06	.17	.26	.63	.50	.30	.31	.41	.13	.05	2.96
1956	.15	.38	.12	.05	.60	.64	.22	.42	.64	.48	.31	.06	4.07
1957	.02	.03	.38	.20	.62	.90	3.89	4.04	4.89	3.56	.50	.08	18.91
1958	.10	.40	1.02	1.42	.47	1.44	.85	1.17	.88	1.43	2.27	.16	11.61
1959	.13	.48	.49	.64	2.43	1.43	.62	.62	.34	.07	.31	.10	7.66
1960	.14	.23	.56	.60	.84	.71	1.60	.86	.92	1.64	.11	.05	8.26

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches	
		Discharge	Date							
1950	-	-	-	-	-	-	-	7,488	-	19.48
1951	1208	27,400	Feb. 26, 1951	294	4,928	0.944	12.81	5,151	13.40	
1952	1238	18,300	Apr. 16, 1952	154	4,120	.789	10.75	3,522	9.19	
1953	1278	7,150	Mar. 17, 1953	66	1,234	.236	3.22	1,210	3.14	
1954	1338	4,980	Sept. 22, 1954	42	.197	.038	.50	.260	.67	
1955	1388	6,590	Mar. 2, 1955	64	1,141	.219	2.96	1,312	3.41	
1956	1438	7,120	Feb. 28, 29	119	1,562	.299	4.07	1,479	3.85	
1957	1508	48,700	June 20, 1957	78	7,273	1.39	18.91	7,688	20.00	
1958	1558	21,900	Aug. 13, 1958	174	4,466	.856	11.61	4,308	11.19	
1959	1628	24,100	Feb. 19, 1959	153	2,949	.565	7.66	2,886	7.49	
1960	1708	19,500	July 9, 1960	144	3,169	.607	8.26	-	-	

5955. Marys River near Sparta, Ill.

Location.--Lat 38°06'29", long 89°38'56", in NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.9, T.5 S., R.5 W., on left bank at downstream side of bridge on State Highway 154, 0.3 mile downstream from small tributary and 3.2 miles southeast of Sparta.

Drainage area.--17.8 sq mi.

Records available.--April 1949 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 431.60 ft above mean sea level, datum of 1929.

Average discharge.--11 years (1949-60), 14.0 cfs.

Extremes.--1949-60: Maximum discharge, 5,320 cfs Aug. 12, 1958 (gage height, 15.04 ft), from rating curve extended above 1,200 cfs on basis of contracted-opening measurement at gage height 14.17 ft; no flow for many days each year.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.14	6.38	2.94	33.2	63.6	34.7	14.5	0.60	1.71	13.0	10.4	5.71	15.3
1952	28.6	50.8	24.6	12.1	21.8	58.5	47.2	.91	.08	.50	.07	1.03	20.4
1953	0	.86	1.32	5.35	1.90	38.2	20.6	7.58	.42	.003	0	0	6.40
1954	0	0	0	0	.13	0	0	1.91	6.24	0	.17	2.94	.94
1955	6.04	.14	14.2	.82	10.2	15.9	1.85	4.39	7.85	4.15	.02	.07	5.47
1956	1.10	15.4	.05	.09	25.5	2.71	.54	10.8	10.0	5.69	7.92	0	6.55
1957	0	.55	.16	2.21	27.2	24.7	100	90.6	11.6	.73	1.32	.01	21.5
1958	.006	8.56	34.9	12.6	10.4	37.8	26.6	19.7	3.89	95.1	49.4	.33	25.2
1959	.08	13.0	7.39	25.0	25.1	21.3	12.2	5.86	.44	.33	31.5	2.49	12.0
1960	.27	1.34	43.8	12.9	6.26	20.6	3.32	13.3	2.00	2.08	.14	.85	8.99

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.009	0.40	0.19	2.15	3.72	2.25	0.91	0.04	0.11	0.84	0.68	0.36	11.66
1952	1.85	3.19	1.59	.79	1.32	3.79	2.96	.06	.005	.02	.005	.06	15.64
1953	0	.05	.09	.35	.11	2.47	1.29	.49	.03	.0002	0	0	4.88
1954	0	0	0	0	.008	0	0	.12	.39	0	.01	.18	.71
1955	.39	.009	.92	.05	.60	1.03	.12	.28	.49	.27	.001	.004	4.16
1956	.07	.97	.004	.006	1.54	.18	.03	.70	.63	.37	.51	0	5.01
1957	0	.03	.01	.14	1.59	1.60	6.30	5.87	.73	.05	.09	.0004	16.41
1958	.0004	.54	2.26	.82	.61	2.45	1.67	1.28	2.4	6.16	3.20	.02	19.25
1959	.005	.82	.48	1.62	1.47	1.38	.76	.38	.03	.02	2.04	.16	9.16
1960	.02	.08	2.83	.83	.38	1.33	.21	.86	.13	.13	.009	.05	6.86

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	0	-	-	-	22.1	16.86
1951	1208	1,160	Feb. 6, 1951	0	15.3	0.860	11.66	23.2	17.69
1952	1258	1,030	Oct. 23, 1951	0	20.4	1.15	15.64	12.0	9.15
1953	1278	860	Mar. 17, 1953	0	6.40	0.360	4.88	6.21	4.74
1954	1338	414	June 3, 1954	0	.94	.053	.71	2.67	2.03
1955	1388	990	Mar. 21, 1955	0	5.47	.307	4.16	5.10	3.89
1956	1438	810	Nov. 16, 1955	0	6.55	.368	5.01	5.25	4.01
1957	1508, 1558	3,050	May 23, 1957	0	21.5	1.21	16.41	25.1	19.17
1958	1558	5,320	Aug. 12, 1958	0	25.2	1.42	19.25	23.3	17.76
1959	1628	2,680	Aug. 17, 1959	0	12.0	.674	9.16	14.1	10.79
1960	1708	940	Dec. 18, 1959	0	8.99	.505	6.86	-	-

5960. Big Muddy River near Benton, Ill.

Location.--Lat 37°59'40", long 88°58'30", in NE¼NW¼ sec.22, T.6 S., R.2 E., on right bank at downstream side of bridge on State Highway 14, a third of a mile upstream from Illinois Central Railroad bridge, 3 miles west of Benton, 4½ miles east of Christopher, and 9 miles upstream from Middle Pork Big Muddy River.

Drainage area.--498 sq mi.

Records available.--October 1945 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 365.51 ft above mean sea level, datum of 1929. Prior to July 25, 1946, chain gage and July 25 to Aug. 12, 1946, wire-weight gage, at same site and datum. Water-stage recorder for station at Plumfield is used as an auxiliary gage for this station.

Average discharge.--15 years (1945-60), 490 cfs.

Extremes.--1945-60: Maximum discharge, 28,200 cfs Aug. 17, 1946; maximum gage height, 24.02 ft Aug. 18, 1946; minimum discharge, 0.3 cfs July 2-4, 7-9, 1954.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	6.22	949	601	1,404	2,233	1,332	553	21.0	256	441	49.7	132	656
1952	415	1,665	697	520	700	1,761	927	22.3	99.8	54.1	4.38	28.2	573
1953	3.35	10.1	32.2	777	38.3	1,274	700	668	14.0	7.91	2.25	.89	238
1954	1.54	1.73	1.80	4.60	5.68	2.89	8.98	360	59.1	6.04	36.6	101	49.5
1955	66.7	7.15	308	327	246	1,194	586	161	416	98.6	51.0	1.63	289
1956	5.50	99.7	5.90	467	839	364	222	88.2	186	817	22.9	25.7	221
1957	1.44	12.4	64.4	128	771	717	3,112	2,596	246	104	40.1	34.5	649
1958	7.85	581	2,085	850	235	1,114	574	784	56.1	774	526	46.4	643
1959	6.15	435	305	874	970	582	208	222	19.4	2.35	289	105	329
1960	90.2	148	1,223	441	312	656	446	332	186	823	43.3	1.57	394

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.01	2.13	1.39	3.25	4.67	3.13	1.24	0.05	0.57	1.02	0.12	0.30	17.88
1952	.96	3.73	1.61	1.20	1.52	4.08	2.08	.05	.22	.13	.01	.06	15.65
1953	.008	.02	.07	.18	.08	2.95	1.57	1.55	.03	.02	.005	.002	6.48
1954	.004	.004	.004	.01	.01	.007	.02	.83	.13	.01	.08	.23	1.34
1955	.15	.02	.71	.76	.51	2.76	1.31	.37	.93	.23	.12	.004	7.67
1956	.01	.22	.01	.01	1.82	.84	.50	.20	.42	1.89	.05	.06	6.03
1957	.003	.03	.15	.30	1.61	1.66	6.97	6.01	.55	.24	.09	.08	17.69
1958	.02	1.32	4.85	1.97	.45	2.58	1.29	1.82	.13	1.79	1.22	.10	17.54
1959	.01	.91	.71	2.02	2.03	1.35	.47	.51	.04	.005	.67	.24	8.96
1960	.21	.33	2.83	1.02	.68	1.52	1.00	.77	.42	1.91	.10	.004	10.79

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	862	23.49
1951	1208	7,320	Feb. 22, 1951	3.1	656	1.32	17.88	757	20.65
1952	1238	7,640	Mar. 13, 1952	1.2	573	1.15	15.65	346	9.45
1953	1278	3,940	Mar. 6, 7, 1953	.4	238	.478	6.48	235	6.40
1954	1338	2,820	May 5, 1954	.3	49.5	.099	1.34	81.5	2.21
1955	1388	4,350	Mar. 22, 1955	.9	289	.580	7.87	266	7.23
1956	1438	4,770	July 20, 1956	.9	221	.444	6.03	218	5.97
1957	1508	16,400	Apr. 6, 1957	.8	649	1.30	17.69	870	23.70
1958	1558	17,500	Dec. 21, 1957	1.6	643	1.29	17.54	476	12.98
1959	1628	2,870	Jan. 24, 1959	1.2	329	.661	8.96	393	10.70
1960	1708	6,280	July 3, 1960	.6	394	.791	10.79	-	-

5965. Tilley Creek near West Frankfort, Ill.

Location.--Lat 37°53'40", long 88°48'45", in SW¼SW¼ sec.19, T.7 S., R.4 E., on right bank 200 ft downstream from outlet of West Frankfort Reservoir and 6 miles east of West Frankfort.

Drainage area.--4.03 sq mi.

Records available.--October 1938 to September 1946, October 1948 to September 1955.

Gage.--Water-stage recorder and concrete control. Datum of gage is 420.98 ft above mean sea level, datum of 1929.

Average discharge.--14 years (1939-46, 1948-55), 834.2 million gallons per year, adjusted (equivalent to 3.53 cfs).

Extremes.--1938-46, 1948-55: Maximum discharge, 347 cfs Jan. 4, 1950 (gage height, 3.09 ft); no flow for periods in most years.

Remarks.--Flow regulated by West Frankfort Reservoir (area at crest of spillway, 183 acres). Records adjusted for pumpage and change in reservoir contents, but not for evaporation and seepage.

Monthly and yearly mean discharge, in cubic feet per second (adjusted) a/

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-1.03	4.63	2.74	11.4	13.1	8.22	3.91	-1.14	8.30	-0.18	-1.37	-0.55	3.92
1952	-.22	7.62	9.91	5.36	7.50	15.3	5.24	-.69	.25	-1.01	-1.07	-.51	3.96
1953	.544	1.30	1.46	2.76	1.23	8.99	7.54	5.00	-.729	-.584	-.584	-.584	2.21
1954	.604	.435	.899	1.46	1.41	.379	1.22	1.04	.649	.161	.137	.846	.766
1955	-	-	3.22	1.41	2.79	12.8	8.91	.798	.822	.879	-1.41	-2.89	2.42

a Adjusted for storage and pumpage.

Note.--Negative figures indicate that evaporation and seepage from reservoir exceeded inflow.

Monthly and yearly runoff, in inches (adjusted) a/

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-0.29	1.28	0.79	3.25	3.39	2.35	1.08	-0.33	2.30	-0.05	-0.39	-0.15	13.23
1952	-.06	.21	2.84	1.53	2.01	4.37	1.45	-.20	.07	-.29	-.31	-.14	11.48
1953	.16	.36	2.42	.79	.32	2.57	2.09	1.43	-.20	-.17	-.17	-.16	7.44
1954	.02	.12	.26	.42	.36	.11	.34	.30	.18	.05	.04	.23	2.43
1955	-	-	.92	.40	.72	3.65	2.47	.23	.23	.25	-.40	-.80	8.15

a Adjusted for storage and pumpage.

Note.--Negative figures indicate that evaporation and seepage from reservoir exceeded inflow.

Yearly discharge of Tilley Creek and rainfall at West Frankfort Reservoir, Ill.

		Water year ending Sept. 30							Calendar year		
Year	WSP	Discharge from spillway (millions of gallons)	Pumpage (millions of gallons)	Change in contents (millions of gallons)	Adjusted for change in reservoir contents and pumpage			Rainfall (inches)	Adjusted		Rainfall (inches)
					Runoff (millions of gallons)	Discharge per square mile			Mean in cubic feet per second	Runoff (inches)	
						Millions of gallons per day	Cubic feet per second				
1950	-	-	-	-	-	-	-	-	9.47	31.99	71.89
1951	1208	868.7	110.9	-54.4	925.2	0.629	0.973	42.07	4.83	14.44	45.37
1952	1238	789.7	223.6	-76.4	936.9	.635	.982	41.03	2.79	9.41	37.01
1953	1278	110.5	477.6	-67.6	520.5	.354	.548	28.45	2.10	6.90	25.94
1954	1338	3.0	401.3	-223.8	180.5	.123	.180	28.24	1.02	3.42	34.19
1955	1368	2.8	544.0	223.8	570.6	.388	.600	35.79	-	-	-

5970. Big Muddy River at Plumfield, Ill.

Location.--Lat 37°54'05", long 89°00'50", in NW $\frac{1}{4}$ sec.20, T.7 S., R.2 E., on left bank three-quarters of a mile upstream from bridge on State Highway 149 at Plumfield and 1.9 miles downstream from Middle Fork Big Muddy River.

Drainage area.--753 sq mi.

Records available.--June 1908 to September 1910 and December 1910 to December 1912 (published as "near Cambon"), August 1914 to September 1960.

Gage.--Water-stage recorder and concrete control. Datum of gage is 358.24 ft above mean sea level, datum of 1929. June 16, 1908, to Dec. 31, 1912, chain gage at site 1.7 miles upstream at different datum. Aug. 14, 1914, to July 12, 1937, chain gage at site a quarter of a mile downstream at different datum. July 13, 1932, to Nov. 12, 1938, chain gage at bridge three-quarters of a mile downstream at datum 4.14 ft lower. Since Feb. 14, 1937, auxiliary wire-weight gage at pumping plant at Zeigler, 4 miles downstream.

Average discharge.--48 years (1908-9, 1911-12, 1914-60), 711 cfs.

Extremes.--1908-12, 1914-60: Maximum discharge, 26,100 cfs Aug. 19, 1946; maximum gage height, 28.22 ft Aug. 19, 1946; no flow at times in 1908-9, 1911, 1914, 1936, 1940-41.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	11.1	1,008	865	2,245	3,177	2,041	753	74.8	420	628	52.8	148	938
1952	463	2,183	1,837	1,043	1,209	2,833	1,538	44.5	198	82.6	11.5	24.4	954
1953	7.23	250	60.6	224	144	1,833	989	988	17.7	131	3.37	.261	362
1954	2.75	3.15	4.08	305	15.3	4.95	21.0	341	71.4	7.00	40.0	128	54.1
1955	70.8	9.68	266	522	325	1,853	766	196	552	148	57.1	2.71	399
1956	17.3	116	830	6.19	1,131	822	438	129	226	728	84.8	33.6	308
1957	2.12	17.9	804	218	1,057	982	4,237	2,918	1,103	133	77.9	38.1	899
1958	8.36	828	2,965	1,584	444	1,661	825	1,682	128	1,712	801	74.1	1,079
1959	9.79	577	474	1,403	1,500	1,061	314	410	38.8	3.80	894	166	567
1960	207	206	1,696	894	734	967	742	515	277	1,095	91.6	3.64	622

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.02	1.49	1.33	3.44	4.39	3.12	1.12	0.11	0.62	0.96	0.08	0.22	16.90
1952	.71	3.23	2.81	1.60	1.73	4.34	2.28	.07	.29	.13	.02	.04	17.25
1953	.01	.04	.09	.34	.20	2.81	1.47	1.51	.03	.02	.005	.0004	6.53
1954	.004	.005	.006	.01	.02	.008	.03	.52	.11	.01	.06	.19	.97
1955	.11	.01	.41	.80	.45	2.84	1.14	.30	.82	.23	.09	.004	7.20
1956	.03	.17	.01	.009	1.62	1.26	.65	.20	.33	1.11	.13	.05	5.57
1957	.003	.03	.12	.33	1.46	1.50	6.28	4.47	1.63	.20	.12	.06	16.20
1958	.01	1.23	4.39	2.42	.61	2.85	1.22	2.57	.19	2.62	1.23	.11	19.45
1959	.01	.86	.73	2.15	2.07	1.62	.47	.63	.06	.006	1.37	.25	10.23
1960	.32	.30	2.60	1.37	1.05	1.48	1.10	.79	.41	1.68	.14	.005	11.25

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	1,641	29.60
1951	1208	8,320	Feb. 23, 1951	6.3	938	1.25	16.90	1,155	20.81
1952	1238	7,980	Mar. 14, 1952	3.9	954	1.27	17.25	588	10.64
1953	1278	4,850	Mar. 7, 1953	.13	362	.481	6.53	355	6.40
1954	1358	1,760	May 7, 1954	.06	54.1	.072	.97	82.7	1.49
1955	1368	5,770	Mar. 24, 1955	1.2	399	.530	7.20	381	6.98
1956	1438	2,940	Feb. 21, 1956	1.3	308	.409	5.57	305	5.51
1957	1508	13,700	Apr. 6, 1957	.9	899	1.19	16.20	1,203	21.68
1958	1558	12,200	Dec. 22, 1957	1.6	1,079	1.43	19.45	856	15.42
1959	1628	4,450	Aug. 19, 1959	2.1	567	.753	10.23	657	11.85
1960	1708	5,440	July 4, 1960	2.5	622	.826	11.25	-	-

5975. Crab Orchard Creek near Marion. Ill.

Location.--Lat 37°43'50", long 88°53'21", in NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.21, T.9 S., R.3 E., near center of span on downstream side of bridge on State Highway 12, 2 miles downstream from Buckley Creek and 2 miles east of Marion.

Drainage area.--31.9 sq mi.

Records available.--October 1951 to September 1960.

Gage.--Wire-weight gage. Datum of gage is 415.82 ft above mean sea level, datum of 1929.

Average discharge.--9 years (1951-60), 18.0 cfs.

Extremes.--1951-60: Maximum discharge, 3,380 cfs May 22, 1957 (gage height, 11.55 ft, from graph based on gage readings), from rating curve extended above 1,300 cfs; no flow for many days each year.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	0.30	48.0	52.4	46.3	80.1	113	98.6	2.54	3.19	0.95	6.15	0	37.4
1953	0	1.03	1.04	2.04	1.13	29.1	28.8	18.0	0	.01	0	0	6.81
1954	0	0	0	.63	7.17	0	5.44	13.9	1.71	.003	0	.28	2.39
1955	.27	0	19.3	.53	21.2	108	20.8	1.04	.54	1.17	.10	0	14.4
1956	.99	.52	.02	1.59	65.7	18.8	3.20	2.00	.15	2.00	.81	5.25	8.17
1957	0	.74	1.63	17.1	61.1	23.4	125	185	12.7	4.44	.02	0	35.6
1958	0	28.5	68.9	32.8	13.6	48.6	41.0	21.6	.83	61.0	.44	.02	26.6
1959	1.48	2.16	1.10	28.6	34.5	28.2	12.8	15.8	.07	0	37.4	10.4	14.3
1960	12.7	2.99	26.3	25.7	23.7	54.1	9.78	28.2	10.7	1.36	2.12	.38	16.6

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	0.01	1.68	1.89	1.67	2.71	4.08	3.45	0.09	0.11	0.03	0.22	0	15.94
1953	0	.04	.04	.07	.04	1.05	1.01	.65	0	.0003	0	0	2.90
1954	0	0	0	.02	.23	0	.19	.50	.06	.0001	0	.01	1.01
1955	.01	0	.70	.02	.69	3.90	.73	.04	.02	.04	.004	0	6.15
1956	.04	.02	.0006	.06	2.22	.68	.11	.07	.005	.07	.03	.18	3.49
1957	0	.03	.06	.62	2.00	.85	4.39	6.60	.44	.16	.0008	0	15.15
1958	0	1.00	2.49	1.18	.44	1.75	1.45	.78	.03	2.21	.02	.0007	11.33
1959	.05	.08	.04	1.04	1.13	1.02	.45	.57	.002	0	1.35	.36	6.08
1960	.46	.10	.95	.93	.80	1.95	.34	1.02	.37	.05	.08	.01	7.06

Yearly discharge, in cubic feet per second

Year	WSF	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-
1952	1238, 1388	1,850	Apr. 13, 1952	0	37.4	1.17	15.94	29.1	12.44
1953	1278, 1388	670	Mar. 22, 1953	0	6.81	.213	2.90	6.63	2.82
1954	1338, 1388	450	May 2, 1954	0	2.39	.075	1.01	4.05	1.72
1955	1388	3,300	Mar. 20, 1955	0	14.4	.451	6.15	12.9	5.50
1956	1438	960	Feb. 18, 1956	0	8.17	.256	3.49	8.24	3.52
1957	1508	3,580	May 22, 1957	0	35.6	1.12	15.15	43.6	18.55
1958	1558	2,550	July 18, 1958	0	26.6	.834	11.33	18.6	8.01
1959	1628	1,400	Aug. 17, 1959	0	14.3	.448	6.08	17.5	7.43
1960	1708	735	Jan. 15, 1960	0	16.6	.520	7.06	-	-

5990. Beaucoup Creek near Matthews, Ill.

Location--Lat 37°58'00", long 89°21'00", in SW $\frac{1}{4}$ sec. 29, T.6 S., R.2 W., on right bank at downstream side of bridge on State Highway 13, 1 $\frac{1}{2}$ miles east of Matthews, 3 $\frac{1}{2}$ miles upstream from Galum Creek, and 7 miles southwest of Du Quoin.

Drainage area--291 sq mi.

Records available--October 1945 to September 1960.

Gage--Water-stage recorder. Datum of gage is 368.15 ft above mean sea level, datum of 1929. Prior to July 25, 1946, wire-weight gage at same site and datum.

Average discharge--15 years (1945-60), 245 cfs.

Extremes--1945-60: Maximum discharge, 18,100 cfs Aug. 17, 1946 (gage height, 23.24 ft); no flow at times each year 1953-59.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	7.41	255	160	647	1,302	572	251	24.6	69.4	311	46.8	121	307
1952	323	884	445	254	364	320	609	34.5	40.0	21.7	3.08	4.64	324
1953	.74	12.8	28.4	83.6	96.7	495	359	219	8.00	10.6	1.64	12	110
1954	.07	.21	.65	4.45	5.12	1.09	13.5	116	70.5	5.98	11.1	23.2	21.0
1955	26.7	3.63	222	40.2	167	370	117	84.7	182	50.3	5.92	1.96	106
1956	7.45	105	1.99	2.13	364	145	89.8	45.1	38.4	8.48	18.7	10.3	68.2
1957	1.62	9.14	17.7	33.2	279	209	1,506	1,074	202	37.8	27.2	17.6	285
1958	2.18	219	999	280	129	653	414	434	70.6	631	395	19.1	358
1959	10.1	153	126	410	408	308	115	79.2	11.3	.52	238	62.9	159
1960	35.1	39.0	655	164	104	323	147	241	60.5	162	63.5	2.97	168

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.03	0.98	0.63	2.56	4.66	2.27	0.96	0.10	0.27	1.23	0.19	0.46	14.34
1952	1.28	3.39	1.76	1.01	1.35	3.65	2.33	.14	.15	.09	.01	.02	15.18
1953	.0003	.05	.11	.35	.35	1.96	1.38	.87	.03	.04	.007	.0005	5.13
1954	.0003	.0008	.003	.02	.02	.004	.05	.46	.27	.02	.04	.09	.98
1955	.11	.01	.88	.16	.60	1.46	.45	.34	.70	.20	.02	.008	4.94
1956	.03	.40	.008	.008	1.35	.57	.34	.18	.15	.03	.07	.04	3.18
1957	.006	.04	.07	.13	1.00	.83	5.78	4.25	.78	.15	.11	.07	13.22
1958	.009	.84	3.96	1.11	.46	2.59	1.59	1.72	.27	2.50	1.57	.07	16.69
1959	.04	.58	.50	1.62	1.46	1.22	.44	.31	.04	.002	.94	.24	7.39
1960	.14	.15	2.60	.65	.39	1.28	.56	.95	.23	.64	.25	.01	7.65

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches
		Discharge	Date						
1950	-	-	-	-	-	-	-	463	21.63
1951	1208	3,360	Feb. 22, 1951	1.2	307	1.05	14.34	410	19.13
1952	1238	5,250	Mar. 12, 1952	.7	324	1.11	15.18	190	8.91
1953	1278	2,060	Mar. 6, 1953	0	110	1.378	5.13	106	4.97
1954	1338	1,420	May 2, 1954	0	21.0	.072	.98	42.3	1.97
1955	1388	2,060	Mar. 23, 1955	.4	106	.364	4.94	93.7	4.38
1956	1438	1,320	Feb. 27, 1956	0	68.2	.254	3.18	61.2	2.85
1957	1508	11,200	Apr. 5, 1957	0	285	1.973	13.22	384	17.91
1958	1558	10,500	Dec. 21, 1957	0	358	1.23	16.69	279	13.00
1959	1628	2,530	Aug. 19, 1959	0	159	.546	7.39	197	9.16
1960	1708	3,480	Dec. 20, 1959	.2	168	.577	7.85	-	-

5995. Big Muddy River at Murphysboro, Ill.

Location.--Lat 37°44'55", long 89°20'45", in SE $\frac{1}{4}$ sec. 8, T.9 S., R.2 W., on left bank just upstream from Lewis Creek, 0.1 mile upstream from Gulf, Mobile and Ohio Railroad bridge, at Murphysboro.

Drainage area.--2,170 sq mi, approximately.

Records available.--December 1916 to September 1960 (fragmentary prior to 1931).

Gage.--Water-stage recorder. Datum of gage is 335.5 ft above mean sea level, datum of 1929. Prior to June 20, 1931, chain gage at South Twentieth Street Bridge, 1,300 ft downstream, at datum 5 ft lower. June 20, 1931, to July 11, 1933, chain gage at upstream side of Illinois Central Railroad bridge across mouth of Lewis Creek at present datum. Since Oct. 6, 1931, auxiliary wire-weight gage 7,700 ft upstream.

Average discharge.--30 years (1930-60), 1,840 cfs.

Extremes.--1917-60: Maximum discharge, 28,000 cfs Jan. 28, 1949 (gage height, 36.01 ft); maximum daily reverse flow, 4,400 cfs July 3, 1947, caused by backwater from Mississippi River; no flow Aug. 13 to Sept. 1, 1936 (unaffected by backwater).

Flood of Feb. 2, 1916, reached a stage of 34.9 ft, present datum (discharge, 28,000 cfs).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	172	1,606	2,183	5,688	7,179	6,374	1,156	149	693	2,574	542	681	2,391
1952	1,178	4,977	4,935	2,432	3,247	7,473	4,599	468	557	213	59.4	90.9	2,490
1953	43.1	79.9	176	415	399	3,629	2,347	2,558	88.8	68.1	18.8	2.69	824
1954	9.94	21.8	39.8	48.0	106	21.9	50.2	770	356	31.9	79.0	233	147
1955	159	30.3	850	1,133	718	4,786	1,533	599	1,368	679	95.0	10.7	1,002
1956	634	306	291	17.7	2,243	2,039	754	481	383	902	286	130	631
1957	231	101	182	618	2,260	2,383	12,670	7,323	5,017	483	167	100	2,593
1958	37.5	1,985	6,293	4,659	1,614	4,727	3,053	5,519	472	6,167	3,106	155	3,181
1959	94.2	1,513	1,178	2,958	4,157	3,428	1,020	850	296	53.4	3,106	615	1,593
1960	885	614	4,984	2,584	1,808	2,372	2,166	1,606	780	2,042	353	207	1,708

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.09	0.83	1.16	3.01	3.45	3.39	0.59	0.08	0.36	1.37	0.29	0.35	14.97
1952	.63	2.51	2.62	1.29	1.61	3.97	2.36	.25	.18	.11	.03	.05	15.61
1953	.02	.04	.09	.22	.19	1.93	1.21	1.36	.05	.04	.01	.001	5.16
1954	.005	.01	.02	.03	.05	.01	.03	.41	.18	.02	.04	.12	.92
1955	.08	.02	.45	.60	.34	2.54	.79	.32	.70	.36	.05	.006	6.26
1956	.04	.16	.02	.009	1.11	1.08	.39	.26	.20	.48	.15	.07	3.97
1957	.01	.05	.10	.33	1.08	1.27	6.52	3.89	2.58	.26	.09	.05	16.23
1958	.02	1.02	3.34	2.48	.77	2.51	1.57	2.93	.24	3.28	1.65	.03	19.89
1959	.05	.78	.63	1.57	1.99	1.82	.52	.45	.15	.03	1.65	.32	9.96
1960	.47	.32	2.65	1.37	.90	1.26	1.11	.85	.40	1.09	.19	.11	10.72

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean
		Discharge	Date					
1950	-	-	-	-	-	-	-	4,609
1951	1208	15,200	Feb. 24, 25	-651	2,591	1.10	14.97	2,979
1952	1238	15,000	Mar. 16, 1952	38	2,490	1.15	15.61	1,598
1953	1278	6,810	Mar. 8, 1953	1.2	824	.380	5.16	904
1954	1338	3,580	May 5, 1954	-220	147	.068	.92	230
1955	1388	11,500	Mar. 25, 1955	6.0	1,002	.462	6.26	947
1956	1438	4,670	Feb. 28, 1956	13	631	.291	3.97	623
1957	1508	23,700	Apr. 8, 1957	8.3	2,593	1.19	16.23	3,268
1958	1558	17,800	Dec. 24, 1957	16	3,181	1.47	19.89	2,712
1959	1628	10,200	Aug. 22, 1959	16	1,595	.734	9.96	1,909
1960	1708	12,500	Dec. 22, 1959	34	1,708	.787	10.72	-

Note.--Negative figure indicates reverse flow.

CACHE RIVER BASIN

6000. Big Creek near Wetaug, Ill.

Location.--Lat 37°19'00", long 89°07'55", in SW $\frac{1}{4}$ sec.5, T.14 S., R.1 E., or left bank 300 ft upstream from highway bridge, 1 mile upstream from Little Creek, and 2 miles southeast of Wetaug.

Drainage area.--32.2 sq mi.

Records available.--October 1940 to September 1960. Records prior to October 1950, published with those for streams in the Ohio River basin. Monthly discharge only for some periods, published in WSP 1305.

Gage.--Water-stage recorder and concrete control. Datum of gage is 336.86 ft above mean sea level, datum of 1929.

Average discharge.--20 years (1940-60), 38.5 cfs.

Extremes.--1940-60: Maximum discharge, 7,200 cfs Mar. 19, 1943, from rating curve extended above 2,500 cfs on basis of slope-area measurement of flow in main channel and computed flow through breaks in levees; maximum gage height, 16.32 ft Mar. 6, 1945; no flow Sept. 15-19, 1954.

Remarks.--Flow of lower part of Cache River basin was diverted from Ohio River to Mississippi River beginning Oct. 31, 1950, through diversion channel of Mound-Mound City flood-protection project.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	10.2	68.4	48.3	119	123	57.7	33.8	9.21	26.5	7.30	14.4	17.0	43.8
1952	7.68	120	100	65.4	107	175	47.0	18.8	24.0	7.57	8.41	8.52	57.3
1953	1.42	7.14	9.27	23.8	12.0	62.4	45.8	27.6	5.03	3.05	1.27	1.14	16.6
1954	.42	.61	2.68	16.6	17.0	4.73	22.8	17.2	49.6	.51	1.45	17.8	12.5
1955	3.41	1.54	49.4	5.67	13.0	79.4	55.3	92.0	14.8	16.9	.74	1.34	28.0
1956	7.34	2.09	.76	5.05	101	29.5	49.6	10.1	10.6	5.27	.70	7.49	18.7
1957	1.03	12.9	6.88	48.4	47.5	30.2	164	218	46.8	8.24	4.20	.35	48.7
1958	14.1	155	122	64.7	22.8	119	62.6	64.9	55.5	155	30.7	4.50	73.0
1959	2.67	16.3	6.25	73.2	59.4	37.9	10.3	8.14	3.81	2.42	49.6	11.1	23.3
1960	4.92	4.48	37.9	30.1	21.6	37.0	19.6	35.3	7.99	3.57	11.8	1.34	18.1

Monthly and yearly runoff, in inches

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0.37	2.30	1.73	4.27	3.97	2.07	1.17	0.33	0.92	0.26	0.52	0.59	18.50
1952	.27	4.16	3.58	2.34	3.58	6.28	1.63	.67	.85	.27	.30	.30	24.21
1953	.05	.25	.33	.85	.39	2.24	1.59	.99	.17	.11	.01	.005	5.98
1954	.02	.02	.10	.60	.55	.17	.79	.61	1.72	.02	.05	.62	5.27
1955	.12	.05	1.77	.20	.42	2.84	1.92	3.29	.51	.60	.03	.05	11.60
1956	.26	.07	.03	.18	3.38	1.06	1.72	.36	.37	.19	.02	.26	7.90
1957	.04	.45	.25	1.73	1.54	1.08	5.67	7.72	1.62	.29	1.15	.01	20.55
1958	.50	5.36	4.37	2.32	.74	4.26	2.17	2.32	1.92	5.56	1.10	.16	30.78
1959	.10	.57	.22	2.62	1.92	1.36	.36	.29	.13	.09	1.17	.38	9.81
1960	.18	.16	1.36	1.08	.72	1.32	.68	1.26	.28	.13	.42	.05	7.64

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year			
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff in inches	Mean	Runoff in inches	
		Discharge	Date							
1950	-	-	-	-	-	-	-	-	-	-
1951	1208	2,160	Feb. 20, 1951	1.0	43.8	1.36	18.50	101	42.58	
1952	1238	2,340	Mar. 10, 1952	.4	57.3	1.78	24.21	39.4	22.11	
1953	1278	1,240	Apr. 18, 1953	.1	16.6	.516	6.98	39.8	16.83	
1954	1338	2,030	June 3, 1954	0	12.5	.388	5.27	15.4	6.50	
1955	1388	2,830	May 13, 1955	.2	28.0	.870	11.80	16.8	7.07	
1956	1438	1,560	Feb. 15, 1956	.1	18.7	.581	7.90	24.3	10.22	
1957	1508	2,680	May 23, 1957	.1	48.7	1.51	20.55	19.6	8.28	
1958	1558	2,630	July 18, 1958	.2	73.0	2.27	30.78	71.3	30.04	
1959	1628	1,540	Jan. 21, 1959	1.0	23.3	.724	9.81	50.8	21.44	
1960	1708	1,280	Jan. 14, 1960	.7	18.1	.562	7.64	25.2	10.62	

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Base compiled, with some modification, from River Basin Maps, IACWR, Subcommittee on Hydrology

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C.—1964—W-8428

MAP OF HUDSON BAY AND UPPER MISSISSIPPI RIVER BASINS, SHOWING LOCATION OF GAGING STATIONS FOR WHICH RECORDS ARE INCLUDED IN THIS REPORT

