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

Part 12. Pacific Slope Basins in Washington
and Upper Columbia River Basin

GEOLOGICAL SURVEY WATER-SUPPLY PAPER 1736



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Prepared under the direction of E. L. HENDRICKS, Chief, Surface Water Branch

GEOLOGICAL SURVEY WATER-SUPPLY PAPER 1736



UNITED STATES DEPARTMENT OF THE INTERIOR

STEWART L. UDALL, *Secretary*

GEOLOGICAL SURVEY

Thomas B. Nolan, *Director*

PREFACE

This report contains summaries of streamflow records in the Pacific slope basins in Washington and upper Columbia River basin. 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.

The data were compiled under the supervision of district engineers, Surface Water Branch, as follows:

Frank Stermitz.....	Helena, Mont.
W. I. Travis.....	Boise, Idaho
F. M. Veatch.....	Tacoma, Wash.



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COMPILATION OF RECORDS OF SURFACE WATERS OF PACIFIC SLOPE BASINS IN WASHINGTON AND
UPPER COLUMBIA RIVER BASIN 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 Pacific slope basins in Washington and upper Columbia River basin.

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. Also 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 indention in the listing of gaging stations in the table of contents represents one rank. This downstream order and system of indention 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 discharge in acre-feet, 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 areas 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 approximates the actual hydrograph.

Under "Remarks" information is given on factors which affect the basin runoff characteristics. These include upstream regulation, diversion, and utilization--a 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 discharge in acre-feet.

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 discharge in inches or acre-feet, or both, 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.

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. 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 1316 are included in this report. For stations operated during at least part of the period 1951-60, the revisions or corrections are published with the rest of the data for the station; for stations not operated since the end of the 1950 water year, the revisions or corrections are published in a special section under the heading "Revisions and corrections to records published in WSP 1316 for stations discontinued prior to September 30, 1950."

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 in 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

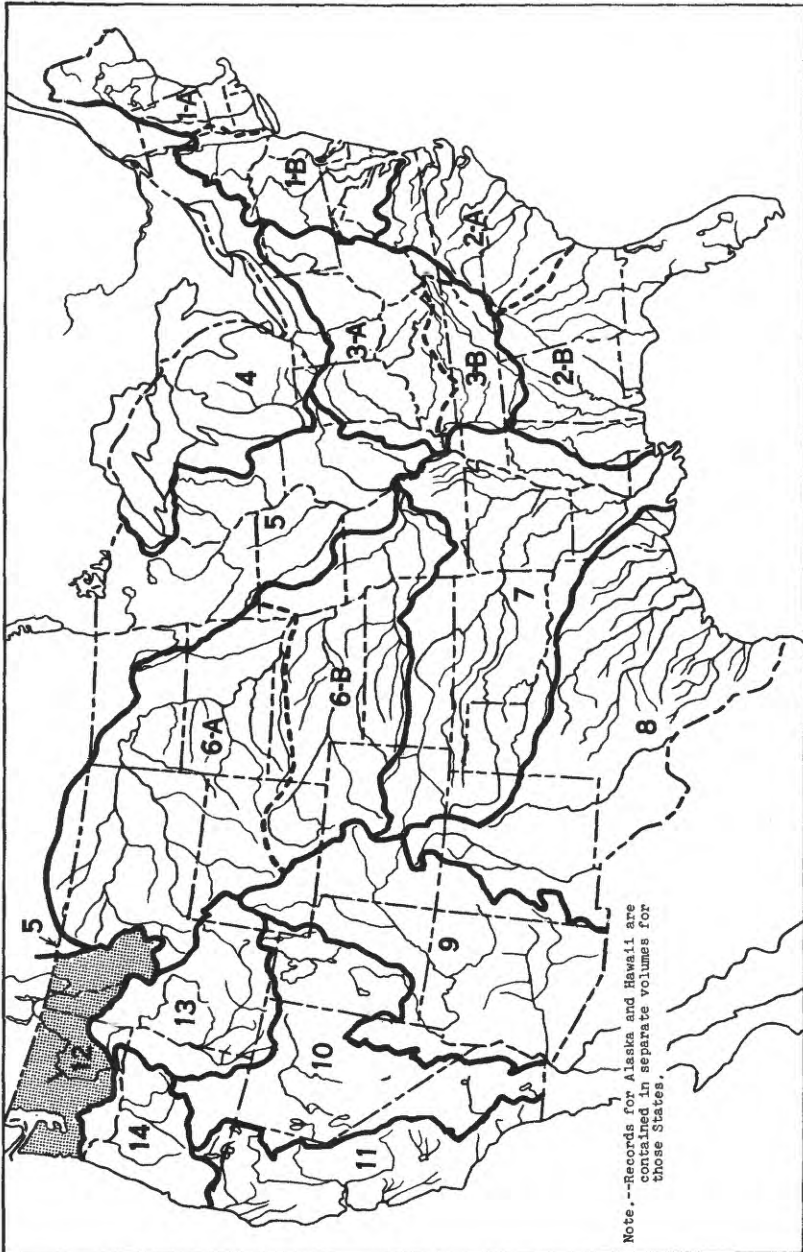


Figure 1.--Map of conterminous United States showing areas covered by 18 of the 20 volumes on surface water supply. The area covered by this report is shaded.

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 12, 1951-60

Water year	WSP	Water year	WSP
1951	1216	1956	1446
1952	1246	1957	1516
1953	1266	1958	1566
1954	1346	1959	1636
1955	1396	1960	1716

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.

Lists of flood reports and other special reports are 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 widely-separated gaging stations in the report area. The pattern of yearly runoff shown by these streams is generally representative of hydrologic conditions in their part of the report area. Several outstanding floods occurred during the 1951-60 period. During each month of the 1956 water year, streamflow was excessive in more than half the area covered by this report.

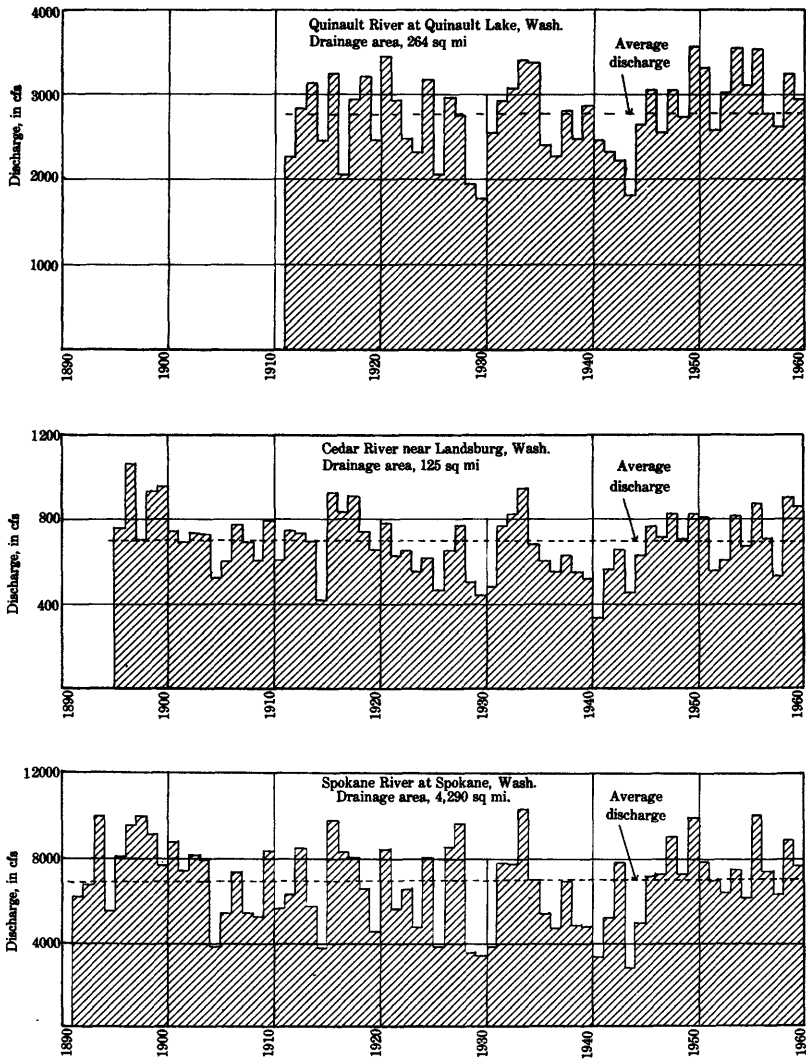


Figure 2.—Yearly discharge at three representative gaging stations.

PACIFIC SLOPE BASINS NORTH OF COLUMBIA RIVER

NASELLE RIVER BASIN

100. Naselle River near Naselle, Wash.

Location.--Lat 46°22'25", long 123°44'45", in SW $\frac{1}{4}$ sec. 1, T.10 N., R.9 W., on left bank at downstream side of highway bridge, 1 $\frac{1}{2}$ miles upstream from Salmon Creek and 3 $\frac{1}{2}$ miles east of Naselle.

Drainage area.--55.3 sq mi.

Records available.--May 1929 to September 1960.

Gage.--Wire-weight and crest-stage gage. Altitude of gage is 24 ft (by barometer). Prior to Jan. 11, 1957, staff gage and crest-stage gage at site 150 ft downstream at same datum.

Average discharge.--31 years (1929-60), 431 cfs (312,000 acre-ft per year).

Extremes.--1929-60: Maximum discharge, 11,100 cfs Jan. 22, 1935 (gage height, 15.9 ft, from floodmarks), from rating curve extended above 4,000 cfs on basis of slope-area measurement at gage height 15.2 ft; minimum observed, 19 cfs Sept. 12-14, 1949, Sept. 21-24, 1951; minimum gage height observed, 1.60 ft Sept. 8, 1956.

Remarks.--No regulation or diversion 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	458	927	1,263	1,128	1,256	503	201	116	61.0	36.5	26.0	76.0	500
1952	727	561	781	787	797	543	267	113	94.2	55.3	46.0	36.4	400
1953	38.1	9.68	738	1,969	757	471	262	287	139	71.0	56.3	66.7	413
1954	280	735	1,106	1,045	1,412	405	464	97.6	197	131	85.7	111	498
1955	242	847	640	594	559	550	770	186	96.0	124	101	71.1	396
1956	526	1,166	1,262	1,092	502	1,213	315	82.0	215	72.6	47.6	86.9	550
1957	639	478	930	309	817	743	402	107	75.1	66.3	98.2	42.9	390
1958	159	429	1,035	943	1,007	332	560	125	73.3	38.4	27.9	55.3	395
1959	245	1,095	840	1,160	550	546	560	337	211	90.0	45.7	365	503
1960	519	790	697	590	897	532	548	378	146	55.7	45.1	36.6	434

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	28,190	55,140	77,670	69,380	69,730	30,900	11,890	7,150	3,630	2,240	1,600	4,520	362,100
1952	44,730	33,390	48,040	47,180	45,840	33,370	15,900	8,190	5,600	3,400	2,830	2,170	290,600
1953	2,340	5,760	45,380	21,000	42,060	26,940	15,610	17,650	8,260	4,370	3,460	5,970	298,800
1954	15,960	43,730	68,020	64,280	78,390	24,770	27,580	6,000	11,710	8,070	5,270	6,580	360,400
1955	14,860	50,420	39,380	35,910	31,030	33,840	45,830	11,410	5,710	7,620	6,200	4,230	286,400
1956	32,340	69,400	77,610	67,160	28,860	74,600	18,750	5,040	12,800	4,460	2,930	5,170	399,100
1957	39,270	28,470	57,190	19,020	45,380	45,600	23,920	6,600	4,470	4,080	6,040	2,550	282,600
1958	9,760	25,540	65,650	59,010	55,920	20,430	33,330	7,690	4,360	2,360	1,720	3,290	286,100
1959	15,090	65,160	51,630	71,310	30,570	33,700	33,350	20,720	12,530	5,530	2,810	21,590	364,000
1960	31,890	46,980	42,840	36,270	51,620	32,740	32,610	23,260	6,900	3,420	2,770	2,180	315,400

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	Acres-foot		Inches	Acres-foot	
1950	-	-	-	-	-	-	-	-	-	-	-	-
1951	1216	6,830	Feb. 9, 1951	19	500	9.04	122.76	362,100	452	147.43	434,600	
1952	1246	5,760	Feb. 4, 1952	30	400	7.23	98.54	290,600	300	73.90	217,900	
1953	1286	6,890	(a)	29	413	7.47	101.31	298,800	515	126.48	373,000	
1954	1346	5,630	Feb. 19, 1954	60	498	9.01	122.19	360,400	466	114.37	337,300	
1955	1396	4,640	Nov. 18, 1954	49	396	7.16	97.12	286,400	499	122.44	361,100	
1956	1446	5,990	Dec. 11, 1955	29	550	9.95	135.32	399,100	475	116.87	344,700	
1957	1516	6,990	(b)	35	390	7.05	95.63	282,600	355	87.03	256,700	
1958	1566	3,560	Jan. 15, 1958	20	395	7.14	97.00	285,100	441	108.16	319,000	
1959	1636	5,310	Jan. 23, 1959	35	503	9.10	123.41	364,000	489	119.97	353,600	
1960	1716	5,950	Nov. 22, 1959	29	434	7.85	106.94	315,400	-	-	-	

a Probably Jan. 23, 1953.

b Probably Dec. 10, 1956.

105. Salmon Creek near Naselle, Wash.

Location.--Lat 46°21'20", long 123°45'00", in NE¼ sec.14, T.10 N., R.9 W., on left bank half a mile upstream from last crossing of U. S. Highway 830, 2 miles upstream from mouth, and 3 miles southeast of Naselle.

Drainage area.--16.4 sq mi.

Records available.--June 1953 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 80 ft (from topographic map). Prior to Aug. 20, 1958, at datum 0.26 ft lower.

Average discharge.--7 years (1953-60), 116 cfs (83,980 acre-ft per year).

Extremes.--1953-60: Maximum discharge (revised), 1,970 cfs Dec. 21, 1955 (gage height, 7.94 ft); maximum gage height, 8.03 ft Nov. 22, 1959; minimum discharge, 2.4 cfs Sept. 20, 1953 (gage height, 0.90 ft).

Remarks.--Slight regulation from millpond. Possibly some diversion for domestic 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	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	69.4	179	283	*297	*365	100	126	18.0	29.2	10.5	7.22	11.0	*127
1955	59.6	*235	*162	135	*140	*160	*203	39.0	18.5	24.1	17.7	15.6	*100
1956	179	317	*365	289	166	332	71.0	14.6	46.0	14.1	8.00	19.2	*152
1957	160	120	*220	81.5	203	191	93.9	24.7	13.9	9.79	17.8	5.91	*94.6
1958	29.2	106	281	*254	244	74.2	135	26.2	13.5	5.04	3.36	9.23	*97.6
1959	58.9	300	212	300	125	135	138	74.3	45.0	18.5	6.08	71.4	124
1960	128	*217	*170	*163	*254	140	157	96.5	32.2	6.92	5.55	5.00	*114

* Revised; revised daily discharge for the periods thus affected are available and will be published in a future water-supply paper.

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	4,260	10,670	17,400	*18,250	*20,260	6,170	7,510	1,110	2,380	1,560	914	1,590	*92,070
1955	3,660	*14,000	*9,960	8,280	*7,760	*9,850	*12,070	2,400	1,100	1,480	1,090	930	*72,580
1956	10,980	18,890	*22,450	17,790	9,530	20,440	4,220	895	2,740	866	492	1,150	*110,400
1957	9,840	7,130	*13,500	5,010	11,270	11,720	5,590	1,520	823	602	1,100	351	*68,460
1958	1,800	6,340	17,260	*15,630	13,550	4,560	8,040	1,610	804	510	207	553	*70,660
1959	5,620	17,850	13,040	18,470	6,950	8,290	8,210	4,570	2,680	1,140	374	4,250	89,440
1960	7,860	*12,920	*10,450	*10,050	*14,640	6,590	9,330	5,940	1,910	422	342	296	*82,760

* Revised; see footnote to table above.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year		
		Momentary maximum		Minimum day	Mean	For square mile	Runoff	Inches	Mean	Runoff	
		Discharge	Date							Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-
1953	1286	-	-	-	-	-	-	-	-	-	-
1954	1346	*1,440	Jan. 4, 1954	9.2	*127	*7.74	*205.28	*92,070	*121	*99.88	*87,360
1955	1396	*1,600	Nov. 18, 1954	6.8	*100	*6.10	*82.96	*72,580	*134	*111.21	*97,280
1956	1446	*1,970	Dec. 21, 1955	3.1	*152	*9.27	*126.29	*110,400	122	*101.30	*88,600
1957	1516	*1,650	Dec. 10, 1956	3.8	*94.6	*5.77	*78.27	*68,460	87.6	72.48	63,390
1958	1566	*1,590	Jan. 14, 1958	1.3	*97.6	*5.95	*80.79	*70,660	*110	*91.18	*79,770
1959	1636	*1,740	Nov. 12, 1958	4.6	124	7.56	102.24	89,440	*119	*98.51	*86,160
1960	1716	*1,880	Nov. 22, 1959	2.8	*114	*6.95	*94.63	*82,760	-	-	-

* Revised.

110. North Nemah River near South Bend, Wash.

Location.--Lat 46°29'25", long 123°49'55", in SE¼ sec.30, T.12 N., R.9 W., on right bank 500 ft downstream from Finn Creek, 5 miles upstream from mouth, and 12 miles south of South Bend.

Drainage area.--18.0 sq mi.

Records available.--February 1946 to September 1954, water years 1955-58, 1960 (annual maximum).

Gage.--Crest-stage gage. Altitude of gage is 60 ft (from topographic map). Prior to October 1954, water-stage recorder at same site and datum.

Average discharge.--8 years (1946-54), 122 cfs (88,320 acre-ft per year).

Extremes.--1946-58, 1960: Maximum discharge, 1,700 cfs Jan. 23, 1953 (gage height, 8.58 ft).

1946-54: Minimum discharge, 4.7 cfs Sept. 21, 22, 23, 1951; minimum gage height, 1.28 ft Nov. 8, 9, 1952.

Remarks.--No regulation or diversion 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	133	267	354	344	319	129	49.0	27.9	16.0	10.6	7.09	19.3	139
1952	149	135	212	221	207	173	82.0	40.9	29.0	16.7	13.4	10.6	107
1953	9.29	27.6	195	483	216	137	73.1	78.0	45.3	22.9	16.2	19.4	110
1954	56.5	184	329	336	368	119	118	29.2	53.7	41.0	26.7	31.5	140

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	8,180	15,910	21,770	21,170	17,710	7,960	2,920	1,720	954	652	436	1,150	100,500
1952	9,130	8,040	13,010	13,800	11,930	10,620	4,880	2,520	1,730	1,030	822	630	77,940
1953	571	1,640	12,010	29,720	12,010	8,400	4,350	4,800	2,690	1,410	995	1,180	79,760
1954	3,470	10,940	20,210	20,660	20,440	7,330	7,020	1,800	3,200	2,520	1,640	1,870	101,100

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	-	-	-	-	-	-	-	-	166	125.56	120,500
1951	1216	1,420	Feb. 9, 1951	4.7	139	7.72	104.72	100,500	117	88.39	84,850
1952	1246	1,200	Feb. 3, 1952	8.3	107	5.94	81.19	77,940	85.4	64.56	61,980
1953	1286	1,700	Jan. 23, 1953	5.8	110	6.11	83.07	79,760	138	104.33	100,200
1954	1346	1,490	Dec. 9, 1953	18	140	7.78	105.31	101,100	-	-	-
1955	1566	1,610	Nov. 18, 1954	-	-	-	-	-	-	-	-
1956	1566	1,460	Dec. 11, 1955	-	-	-	-	-	-	-	-
1957	1566	1,320	Dec. 9, 1956	-	-	-	-	-	-	-	-
1958	1566	724	Jan. 14, 1958	-	-	-	-	-	-	-	-
1959	-	-	-	-	-	-	-	-	-	-	-
1960	1716	1,130	Feb. 6, 1960	-	-	-	-	-	-	-	-

115. Willapa River at Lebam, Wash.

Location.--Lat 46°33'50", long 123°33'50", in SW $\frac{1}{4}$ sec.33, T.13 N., R.7 W., on left bank half a mile west of Lebam and 1 mile upstream from Walker Creek.

Drainage area.--41.4 sq mi.

Retords available.--June 1948 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 154.0 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.--12 years (1948-60), 196 cfs (141,900 acre-ft per year).

Extremes.--1948-60: Maximum discharge, 4,930 cfs Feb. 22, 1949 (gage height, 17.53 ft, from high-water mark in gage house), from rating curve extended above 2,200 cfs; minimum, 1.4 cfs Sept. 22, 1951; minimum gage height, 2.39 ft Aug. 22, 23, 1951, Oct. 27, 1952, Sept. 7, 1958.

Remarks.--No regulation. Some diversion for irrigation and domestic use. Records of water temperatures for the period March 1952 to September 1960 are published in reports of Geological Survey.

Correction.--In WSP 1316, the monthly mean for August 1950 is listed in error; it should be 13.3 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	154	413	513	590	631	271	95.0	41.3	15.3	9.03	5.46	8.16	227
1952	161	313	462	377	345	199	116	69.2	22.6	11.3	8.41	5.00	174
1953	6.04	18.8	279	933	327	204	107	109	47.9	18.8	11.0	17.9	174
1954	76.1	262	456	628	772	213	202	37.9	45.9	26.8	17.1	26.9	227
1955	91.5	344	294	256	246	272	345	80.8	27.4	26.1	14.5	13.4	167
1956	161	633	688	610	270	605	169	39.6	56.5	16.3	10.0	18.6	274
1957	164	180	345	145	422	341	182	52.5	24.6	13.9	11.5	4.80	156
1958	29.8	110	443	450	424	160	254	55.4	21.0	8.07	5.70	5.99	163
1959	46.7	403	322	531	231	235	214	136	51.3	19.5	11.0	58.7	188
1960	116	285	269	234	431	272	285	160	44.4	14.9	13.2	12.7	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	9,460	24,570	31,570	36,280	35,030	16,670	5,650	2,540	910	554	336	485	164,100
1952	9,900	18,610	28,410	23,180	19,840	12,240	8,950	4,260	1,350	693	517	298	126,200
1953	372	1,120	17,130	57,740	18,180	12,540	6,380	6,700	2,850	1,160	679	1,070	125,900
1954	4,680	15,590	28,060	38,610	42,880	13,080	12,040	2,330	2,730	1,650	1,050	1,600	164,300
1955	5,630	20,470	18,100	15,720	13,640	16,740	20,500	4,970	1,630	1,600	892	796	120,700
1956	9,870	37,650	42,300	37,490	15,530	37,200	10,040	2,450	3,360	1,000	618	1,110	198,600
1957	10,050	10,710	21,190	8,900	23,420	20,990	10,840	3,230	1,460	854	709	286	112,600
1958	1,830	6,560	27,220	27,660	23,540	9,850	15,130	3,410	1,250	496	350	356	117,700
1959	2,870	23,960	19,780	32,650	12,850	14,460	12,730	8,370	3,050	1,200	678	3,490	136,100
1960	7,150	16,950	16,520	14,360	24,800	16,710	16,980	9,860	2,640	913	813	756	128,500

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	-	-	-	-	-	-	-	-	260	85.21	188,200	-	-
1951	1216	3,460	Feb. 9, 1951	2.2	227	5.48	74.29	164,100	215	70.36	155,400	-	-
1952	1246	2,260	Jan. 30, 1952	3.7	174	4.20	57.16	126,200	121	39.82	87,930	-	-
1953	1286	2,780	Jan. 8, 1953	3.7	174	4.20	57.02	125,900	215	70.47	155,600	-	-
1954	1346	2,910	Feb. 18, 1954	12	227	5.48	74.42	164,300	221	72.55	160,200	-	-
1955	1396	1,890	Nov. 18, 1954	5.6	167	4.03	54.66	120,700	230	75.32	166,300	-	-
1956	1446	2,850	Dec. 21, 1955	6.3	274	6.62	89.95	198,600	208	68.27	150,700	-	-
1957	1516	3,340	Dec. 9, 1956	3.0	156	3.77	51.02	112,600	147	48.15	106,300	-	-
1958	1566	2,940	Dec. 25, 1957	3.0	163	3.94	53.28	117,700	178	58.26	128,700	-	-
1959	1656	2,240	Nov. 18, 1958	4.7	188	4.54	61.63	136,100	180	58.92	130,100	-	-
1960	1716	2,890	Nov. 21, 1959	8.5	177	4.28	58.18	128,500	-	-	-	-	-

WILLAPA RIVER BASIN

120. Fork Creek near Lebam, Wash.

Location.--Lat 46°33'20", long 123°35'00", in NW $\frac{1}{4}$ sec. 5, T.12 N., R.7 W., on right bank three-quarters of a mile upstream from mouth and $\frac{1}{2}$ miles southwest of Lebam.

Drainage area.--20.4 sq mi.

Records available.--June 1953 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 155 ft (from topographic map).

Average discharge.--7 years (1953-60), 151 cfs (109,300 acre-ft per year).

Extremes.--1953-60: Maximum discharge, 3,500 cfs Dec. 9, 1956 (gage height, 7.75 ft), from rating curve extended above 940 cfs on basis of slope-area measurement of peak flow; minimum, 3.4 cfs Sept. 6-8, 1958; minimum gage height, 1.57 ft Aug. 26, 27, Sept. 6-8, 1958.

Remarks.--Small diversion to State fish hatchery with possibly some 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	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	102	232	350	402	558	156	168	30.5	41.2	17.4	14.9	30.0	175
1955	88.3	258	212	170	185	202	250	69.6	26.0	36.2	22.1	20.9	128
1956	180	435	426	416	158	466	131	31.3	65.6	19.2	11.0	21.2	197
1957	192	133	307	98.5	287	254	127	34.8	18.9	22.0	19.9	7.34	125
1958	47.9	107	347	327	307	107	195	37.4	19.0	7.77	5.37	10.4	125
1959	68.1	357	254	398	169	189	217	105	50.7	20.0	8.03	90.8	160
1960	123	243	229	187	340	214	216	121	46.4	16.8	14.7	11.2	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	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	6,280	13,830	21,510	24,740	31,020	9,600	10,020	1,880	3,130	1,690	1,120	1,740	126,600
1955	5,430	15,340	13,050	10,430	10,270	12,440	14,870	4,280	1,540	2,230	1,360	1,250	92,490
1956	11,060	25,910	26,220	25,580	9,120	28,660	7,770	1,920	3,900	1,180	676	1,260	143,300
1957	11,820	8,190	18,850	6,060	15,910	15,620	7,580	2,150	1,130	1,350	1,220	437	90,320
1958	2,950	6,350	21,340	20,080	17,030	6,600	11,590	2,500	1,130	478	330	622	90,800
1959	4,190	21,270	15,620	24,460	9,370	11,640	12,920	6,480	3,020	1,230	494	5,400	116,100
1960	7,590	14,460	14,050	11,470	19,530	13,130	12,840	7,430	2,760	1,030	903	664	105,900

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											
1951											
1952											
1953	1286										
1954	1346	2,430	Feb. 19, 1954	13	175	8.58	116.32	126,600	164	109.16	118,800
1955	1396, 1636	1,820	Nov. 18, 1954	9.0	128	6.27	84.99	92,490	168	111.97	121,900
1956	1446	2,270	Mar. 23, 1956	6.6	197	9.66	31.66	143,300	164	109.29	118,900
1957	1516	3,500	Dec. 9, 1956	5.4	125	6.13	82.98	90,320	113	75.44	82,100
1958	1566	1,920	Dec. 25, 1957	3.4	125	6.13	83.44	90,800	140	93.04	101,200
1959	1636	2,450	Nov. 12, 1958	5.6	160	7.84	106.68	116,100	153	102.11	111,100
1960	1716	2,320	Feb. 6, 1960	6.7	146	7.16	97.31	105,900			

125. Stringer Creek near Holcomb, Wash.

Location.--Lat 46°35'15", long 123°37'50", in NW $\frac{1}{4}$ sec. 25, T.13 N., R.8 W., on left bank 30 ft upstream from road bridge, half a mile upstream from mouth, and 1 $\frac{1}{4}$ miles north-west of Holcomb.

Drainage area.--3.02 sq mi.

Records available.--May to September 1953.

Gage.--Water-stage recorder. Altitude of gage is 95 ft (from topographic map).

Extremes.--May to September 1953: Maximum discharge, 36 cfs Sept. 30 (gage height, 1.52 ft); minimum, 1.4 cfs Sept. 13, 14, 21; minimum gage height, 0.91 ft Sept. 13, 14.

Remarks.--No regulation or diversion 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
1953	-	-	-	-	-	-	-	-	5.78	3.15	2.08	2.45	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1953	-	-	-	-	-	-	-	-	344	194	128	146	-

130. Mill Creek near Willapa, Wash.

Location.--Lat 46°38'50", long 123°38'20", in NE $\frac{1}{4}$ sec. 2, T.13 N., R.8 W., on right bank a quarter of a mile upstream from mouth and 2 $\frac{1}{4}$ miles southeast of Willapa.

Drainage area.--23.7 sq mi.

Records available.--May to September 1953.

Gage.--Water-stage recorder. Altitude of gage is 35 ft (from topographic map).

Extremes.--May to September 1953: Maximum discharge, 85 cfs Sept. 30 (gage height, 1.86 ft); minimum, 1.6 cfs Sept. 22 (gage height, 0.86 ft).

Remarks.--No regulation. Small amount of diversion for domestic 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
1953	-	-	-	-	-	-	-	-	21.2	7.84	4.14	4.67	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1953	-	-	-	-	-	-	-	-	1,260	482	254	278	-

135. Willapa River near Willapa, Wash.

Location.--Lat 46°38'55", long 123°38'40", in NW¼ sec.2, T.13 N., R.8 W., on right bank 150 ft downstream from Mill Creek and 2½ miles southeast of Willapa.

Drainage area.--130 sq mi.

Records available.--August 1947 to December 1954 (fragmentary prior to August 1948), water years 1955-56, 1958-59 (annual maximum).

Gage.--Staff gage in stilling well. Datum of gage is 5.69 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Aug. 26, 1947, to July 27, 1948, water-stage recorder at site 60 ft upstream at different datum. July 28, 1948, to Dec. 2, 1954, water-stage recorder at present site and datum.

Average discharge.--6 years (1948-54), 706 cfs (511,100 acre-ft per year).

Extremes.--1947-56, 1958-59: Maximum discharge, 11,400 cfs Feb. 22, 1949 (gage height, 24.22 ft), from rating curve extended above 7,300 cfs.

1947-54: Maximum discharge, 15.5 cfs Sept. 22, 1951 (gage height, 2.93 ft).

Remarks.--Some diversion for domestic use and 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	542	1,584	1,831	2,036	2,123	951	343	153	70.7	36.6	24.6	57.8	789
1952	693	964	1,503	1,229	1,142	671	392	231	100	50.8	37.8	30.3	586
1953	31.0	92.8	954	3,115	1,163	693	369	372	178	73.6	50.4	69.7	597
1954	281	917	1,786	2,133	2,523	750	730	145	208	126	73.5	109	805
1955	316	1,141	-	-	-	-	-	-	-	-	-	-	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	33,330	82,380	112,600	125,200	117,900	58,500	20,410	9,430	4,210	2,250	1,510	3,440	571,200
1952	42,590	57,370	82,390	75,590	65,660	41,270	23,330	14,180	5,970	3,210	2,320	1,800	425,600
1953	1,916	5,520	58,600	191,500	64,580	42,530	21,960	22,890	10,580	4,530	3,100	4,150	432,000
1954	17,260	54,580	109,800	131,200	140,100	46,120	43,460	8,900	12,370	7,720	4,520	6,510	582,500
1955	19,450	67,900	-	-	-	-	-	-	-	-	-	-	-

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	-	-	-	-	-	-	-	-	912	95.19	660,000
1951	1216	10,300	Feb. 9, 1951	16	789	6.07	82.39	571,200	739	77.20	535,200
1952	1246	6,900	Feb. 4, 1952	24	586	4.51	61.37	425,600	412	43.17	299,300
1953	1286	7,690	Jan. 23, 1953	23	597	4.59	62.31	432,000	756	78.96	547,500
1954	1346	8,240	Feb. 19, 1954	50	805	6.19	84.00	582,500	-	-	-
1955	1346	6,270	Feb. 8, 1955	-	-	-	-	-	-	-	-
1956	1566	8,040	Dec. 21, 1955	-	-	-	-	-	-	-	-
1957	-	-	-	-	-	-	-	-	-	-	-
1958	1566	6,950	Dec. 25, 1957	-	-	-	-	-	-	-	-
1959	1636	7,360	Nov. 18, 1958	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-

140. Ward Creek near Willapa, Wash.

Location.--Lat 46°41'45", long 123°38'55", in SW¼ sec.14, T.14 N., R.8 W., on right bank 50 ft downstream from Fairchild Creek and 1¼ miles northeast of Willapa.

Drainage area.--19.3 sq mi.

Records available.--May to September 1953.

Gage.--Water-stage recorder. Altitude of gage is 10 ft (from topographic map).

Extremes.--May to September 1953: Maximum discharge, 202 cfs Sept. 30 (gage height, 3.61 ft), from rating curve extended above 30 cfs by logarithmic plotting; minimum, 4.1 cfs Aug. 15, 22 (gage height, 0.94 ft).

Remarks.--Slight regulation by millpond. No diversion 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
1953	-	-	-	-	-	-	-	-	29.1	10.9	7.73	9.53	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1953	-	-	-	-	-	-	-	-	1,730	672	475	567	-

145. South Fork Willapa River near Raymond, Wash.

Location.--Lat 46°37'45", long 123°42'00", in E½ sec.8, T.13 N., R.8 W., on left bank at downstream side of logging bridge, a quarter of a mile downstream from Rue Creek and ¼ miles southeast of junction of Highways 101 and 12 at Raymond.

Drainage area.--27.3 sq mi.

Records available.--May 1953 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 155 ft (from topographic map). Prior to Aug. 7, 1957, at site 40 ft upstream at same datum.

Average discharge.--7 years (1953-60), 167 cfs (120,900 acre-ft per year).

Extremes.--1953-60: Maximum discharge, 2,060 cfs Dec. 11, 1955 (gage height, 6.92 ft); minimum, 18.5 cfs Sept. 22-26, Oct. 12, 1957; minimum gage height, 1.38 ft Sept. 20-22, 1953.

Remarks.--Some slight diversion for domestic use. No 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													
1952													
1953													
1954	66.7	184	441	428	491	195	170	64.7	64.6	47.5	40.7	50.9	185
1955	63.3	202	234	250	241	249	294	92.6	53.8	49.1	42.1	30.5	149
1956	121	354	502	482	285	454	153	62.3	69.0	41.0	30.5	36.3	216
1957	171	193	345	148	251	286	156	72.4	46.1	33.1	27.0	21.1	145
1958	39.5	91.5	279	301	328	163	204	82.9	47.0	29.8	24.0	28.4	134
1959	70.0	327	250	364	209	199	225	150	90.1	52.3	34.5	93.0	172
1960	160	262	269	191	353	200	203	170	85.3	43.5	32.1	27.5	166

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	4,100	10,940	27,130	26,340	27,280	11,980	10,090	3,980	4,210	2,680	2,030	2,000	134,100
1955	3,890	12,010	14,380	15,350	13,370	15,320	17,500	5,700	3,840	2,920	2,500	3,030	108,100
1956	7,450	21,080	30,850	29,620	16,380	27,900	9,090	3,830	4,100	2,520	1,870	2,160	156,800
1957	10,520	11,500	21,210	9,100	13,940	17,600	9,310	4,450	2,740	2,040	1,660	1,260	105,300
1958	2,430	5,450	17,140	18,510	18,240	10,030	12,130	5,100	2,800	1,830	1,480	1,690	96,830
1959	4,310	19,470	15,380	22,380	11,620	12,210	13,370	9,250	5,360	3,220	2,120	5,530	124,200
1960	9,870	15,600	16,550	11,730	20,310	12,310	12,060	10,430	5,070	2,680	1,970	1,640	120,200

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	
1950											
1951											
1952											
1953	1286	-	-	-	-	-	-	-	-	-	-
1954	1346	1,960	Dec. 9, 1953	30	185	6.78	92.11	134,100	169	83.93	122,200
1955	1396	1,330	Feb. 8, 1955	26	149	5.46	74.26	108,100	190	94.26	137,200
1956	1446	2,060	Dec. 11, 1955	22	216	7.91	107.73	156,800	194	96.63	140,700
1957	1516	1,900	Dec. 9, 1956	18.5	145	5.31	72.33	105,300	120	59.82	87,120
1958	1566	956	Jan. 24, 1958	19.5	134	4.91	66.50	96,830	153	76.21	111,000
1959	1636	1,370	Nov. 12, 1958	23	172	6.30	85.31	124,200	176	87.29	127,100
1960	1716	1,390	Dec. 15, 1959	22	166	6.08	82.58	120,200	-	-	-

SMITH CREEK BASIN

150. Elkhorn Creek near Raymond, Wash.

Location.--Lat 46°46'10", long 123°44'50", in SW¼ sec.24, T.15 N., R.9 W., on left bank 20 ft upstream from bridge on U. S. Highway 101 and 5 miles north of Raymond.

Drainage area.--15.6 sq mi.

Records available.--May to September 1953.

Gage.--Water-stage recorder. Altitude of gage is 140 ft (from topographic map).

Extremes.--May to September 1953: Maximum discharge, 117 cfs Sept. 30 (gage height, 2.90 ft); minimum, 0.8 cfs Aug. 15, Sept. 21; minimum gage height, 1.12 ft Aug. 15.

Remarks.--No regulation or diversion above station.

SMITH CREEK BASIN

Monthly and yearly mean discharge, in cubic feet per second, of Elkhorn Creek near Raymond, Wash.

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1953	-	-	-	-	-	-	-	-	14.7	4.63	3.57	4.64	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1953	-	-	-	-	-	-	-	-	874	284	220	276	-

NORTH RIVER BASIN

155. North River near Brooklyn, Wash.

Location.--Lat 46°46'55", long 123°28'50", in S $\frac{1}{2}$ sec.18, T.15 N., R.6 W., on left bank $\frac{1}{4}$ miles upstream from Fall River and $\frac{1}{2}$ miles northeast of Brooklyn.

Drainage area.--29.8 sq mi.

Records available.--June 1953 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 190 ft (from topographic map).

Average discharge.--7 years (1953-60), 113 cfs (81,810 acre-ft per year).

Extremes.--1953-60: Maximum discharge, 2,640 cfs Dec. 9, 1956 (gage height, 8.69 ft); minimum, 5.4 cfs Aug. 22, 23, 1958, Aug. 8, 9, 10, 1960; minimum gage height, 0.34 ft Aug. 22, 23, 1958.

Remarks.--No regulation. Possibly some small diversion for irrigation and domestic 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	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	31.2	147	339	322	374	133	124	33.2	32.5	19.1	20.3	42.6	133
1954	49.3	157	174	165	169	175	173	53.9	25.8	20.3	11.6	12.0	98.3
1955	108	292	366	316	155	306	94.8	29.1	33.5	13.3	10.3	14.8	145
1957	110	123	256	78.4	192	194	103	39.4	20.2	12.2	9.62	6.87	95.0
1958	22.1	62.9	212	214	206	105	144	43.1	24.4	10.7	8.24	12.4	88.0
1959	48.8	284	202	279	130	123	148	94.6	40.6	17.8	11.0	43.5	118
1960	91.6	233	240	141	255	148	139	98.2	35.3	12.0	10.4	8.74	117

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	1,920	8,770	20,820	19,930	20,790	8,170	7,350	2,040	1,940	1,170	1,250	2,540	96,590
1954	3,030	9,350	10,680	10,130	9,370	10,790	10,290	3,310	1,540	1,250	712	715	71,170
1955	6,670	17,380	22,490	19,430	8,940	18,800	5,640	1,790	2,000	819	634	879	105,500
1957	6,780	7,330	15,730	4,820	10,650	11,930	6,150	2,420	1,200	751	591	409	68,760
1958	1,360	3,740	13,010	13,150	11,410	6,460	8,560	2,650	1,450	661	507	741	63,700
1959	3,000	16,920	12,430	17,150	7,210	7,580	8,780	5,820	2,420	1,090	679	2,590	85,670
1960	5,630	13,860	14,760	8,650	14,680	9,130	8,290	6,040	2,100	738	641	520	85,040

Yearly 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	1286	-	-	-	-	-	-	-	-	-	-
1954	1346	1,490	Dec. 9, 1953	12	133	4.46	60.79	96,590	122	55.47	88,140
1955	1396	1,200	Feb. 8, 1955	7.5	98.3	3.30	44.77	71,170	131	59.55	94,650
1956	1446	2,270	Dec. 11, 1955	6.2	145	4.87	66.38	105,500	122	55.86	88,770
1957	1516	2,640	Dec. 9, 1956	6.0	95.0	3.19	43.26	89,760	78.8	35.88	57,030
1958	1566	879	Dec. 25, 1957	5.4	88.0	2.95	40.09	63,700	108	49.05	77,940
1959	1636	1,950	Nov. 12, 1958	9.0	118	3.96	53.90	85,670	121	55.09	87,570
1960	1716	2,160	Dec. 15, 1959	5.8	117	3.93	53.48	85,040	-	-	-

160. Fall River at Brooklyn, Wash.

Location.--Lat 46°46'30", long 123°30'15", in NW $\frac{1}{4}$ sec.24, T.15 N., R.7 W., on right bank 40 ft upstream from bridge and a quarter of a mile upstream from mouth and east of Brooklyn.

Drainage area.--41.0 sq mi.

Records available.--June to September 1953.

Gage.--Water-stage recorder. Altitude of gage is 175 ft (from topographic map).

Extremes.--June to September 1953: Maximum discharge, 404 cfs Sept. 30 (gage height, 3.21 ft); minimum, 14.5 cfs Sept. 26; minimum gage height, 1.18 ft Sept. 16, during period of bridge construction.

Remarks.--No known regulation or diversion 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
1953	-	-	-	-	-	-	-	-	74.5	59.1	26.3	27.6	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1953	-	-	-	-	-	-	-	-	4,440	2,410	1,620	1,640	-

165. Little North River near Cosmopolis, Wash.

Location.--Lat 46°54'20", long 123°42'50", in NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.5, T.16 N., R.8 W., on right bank $1\frac{1}{2}$ miles upstream from mouth and $4\frac{1}{2}$ miles southeast of Cosmopolis.

Drainage area.--18.6 sq mi.

Records available.--November 1945 to September 1949, June to September 1953.

Gage.--Water-stage recorder. Altitude of gage is 70 ft (from topographic map).

Extremes.--1945-49, 1953: Maximum discharge, 1,250 cfs Feb. 22, 1949 (gage height, 12.82 ft); minimum, 1.0 cfs Sept. 18, 1953 (gage height, 1.69 ft).

Remarks.--Possibly some slight regulation and diversion for domestic use 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
1953	-	-	-	-	-	-	-	-	20.7	7.05	4.43	4.69	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1953	-	-	-	-	-	-	-	-	1,230	434	273	279	-

170. North River near Raymond, Wash.

Location.--Lat 46°48'30", long 123°51'00", in sec.6, T.15 N., R.8 W., on left bank $\frac{1}{4}$ miles upstream from Salmon Creek and 10 miles northwest of Raymond.

Drainage area.--219 sq mi.

Records available.--August 1927 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 7.39 ft above mean sea level (Western Washington Electric Light & Power Co. bench mark).

Average discharge.--33 years (1927-60), 954 cfs (690,700 acre-ft per year).

Extremes.--1927-60: Maximum discharge, 35,000 cfs Dec. 10, 1933 (gage height, 15.8 ft, from floodmarks), from rating curve extended above 7,500 cfs; minimum, 21 cfs Aug. 24, 1951 (gage height, 1.01 ft).

Remarks.--Some diversion for farm and domestic use above station. No regulation.

Correction.--The momentary discharge date for the water year 1936 is incomplete in WSP 1316; it should be Jan. 12 and Feb. 28, 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	804	2,052	2,838	2,960	3,370	1,650	531	241	115	54.5	31.3	77.8	1,215
1952	1,177	1,185	1,980	1,567	1,708	890	608	351	161	78.7	65.9	46.4	817
1953	42.4	120	1,292	4,649	2,289	940	622	592	314	129	90.0	79.8	926
1954	346	1,434	2,958	2,926	3,247	1,064	1,021	254	279	192	150	378	1,175
1955	494	1,682	1,436	1,479	1,419	1,522	1,827	416	191	175	131	94.1	901
1956	2,112	2,734	3,151	2,756	1,367	2,882	848	210	329	115	75.8	107	1,310
1957	1,154	1,187	2,305	811	1,771	1,899	911	318	170	99.4	79.5	52.4	893
1958	206	616	2,047	2,187	2,121	894	1,129	342	184	71.1	45.1	101	822
1959	474	2,714	1,746	2,586	1,212	1,098	1,449	876	374	150	69.3	505	1,102
1960	874	2,208	1,986	1,395	2,286	1,221	1,280	888	330	106	82.3	69.1	1,055

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	49,450	122,100	174,500	182,000	187,100	101,900	31,620	14,850	6,820	3,350	1,930	4,630	879,800
1952	72,380	70,530	121,700	96,370	98,270	54,740	36,210	21,570	9,600	4,840	3,930	2,780	592,900
1953	2,600	7,160	79,460	285,900	127,100	57,790	37,010	36,420	18,670	7,900	5,530	4,750	870,300
1954	21,280	85,320	181,900	179,900	180,300	65,400	60,740	15,600	16,800	11,800	9,230	22,490	850,600
1955	30,380	100,100	88,290	90,910	78,820	93,560	108,700	25,550	11,350	10,770	8,060	5,600	652,100
1956	68,370	162,700	193,800	169,400	78,640	177,200	50,440	12,890	19,580	7,050	4,660	6,390	951,100
1957	70,990	70,610	141,700	49,870	98,380	116,800	54,230	19,520	10,120	6,110	4,890	3,120	646,300
1958	12,670	36,660	125,900	134,500	117,800	54,950	67,200	21,040	10,950	4,370	2,770	5,980	594,800
1959	29,140	161,500	107,500	159,000	87,320	67,540	86,190	53,890	22,260	9,220	4,260	30,040	797,700
1960	53,710	131,400	122,100	85,760	131,500	75,110	76,140	54,580	19,640	6,510	5,060	4,110	765,600

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	-	-	-	-	-	-	-	-	1,358	84.15	983,000
1951	1216	14,800	Feb. 11, 1951	22	1,215	5.55	75.32	879,800	1,103	68.36	798,400
1952	1246	5,640	Feb. 5, 1952	37	817	3.73	50.77	592,900	575	35.74	417,500
1953	1286	9,040	Jan. 24, 1953	32	926	4.23	57.39	670,300	1,201	74.45	869,600
1954	1346	9,240	Jan. 6, 1954	76	1,175	5.37	72.82	850,600	1,079	66.86	780,800
1955	1396	6,710	Nov. 19, 1954	58	901	4.11	55.83	652,100	1,185	73.47	858,200
1956	1446	7,940	Dec. 13, 1955	42	1,310	5.98	81.43	951,100	1,115	69.33	809,600
1957	1516	8,840	Dec. 9, 1956	41	893	4.08	55.35	646,300	743	46.08	538,300
1958	1566	5,560	Dec. 27, 1957	32	822	3.75	50.91	594,800	991	61.41	717,500
1959	1636	8,480	Nov. 15, 1958	61	1,102	5.03	68.28	797,700	1,115	69.08	806,900
1960	1716	11,500	Nov. 22, 1959	54	1,055	4.82	65.54	765,600	-	-	-

200. Chehalis River near Doty, Wash.

Location.--Lat 46°37'00", long 123°16'40", in NW¼ sec.14, T.13 N., R.5 W., on right bank 1½ miles upstream from Elk Creek, 1½ miles south of Doty, and 3½ miles north of Pe Ell.

Drainage area.--113 sq mi.

Records available.--October 1939 to September 1960.

Gage.--Staff and crest-stage gages. Datum of gage is 302.1 ft above mean sea level (river-profile survey).

Average discharge.--21 years (1939-60), 571 cfs (413,400 acre-ft per year).

Extremes.--1939-60: Maximum discharge, 18,100 cfs Feb. 7, 1945 (gage height, 17.80 ft, water over gage, discharge based on observer's estimate of maximum gage height); minimum observed, 18 cfs Oct. 14, 1952, Aug. 25-28, 1958; minimum gage height, 0.84 ft Aug. 25-27, Sept. 21, 22, 1951, Aug. 25-28, 1958.

Revisions.--The momentary maximum discharge for the water year 1946 published in WSP 1316 has been revised to 8,170 cfs Dec. 28, 1945.

Remarks.--No regulation or diversion above station. Records of chemical analyses for the period July 1959 to September 1960 are published in reports of 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	601	1,234	1,563	1,545	2,021	774	466	171	65.7	33.9	23.6	57.0	705
1952	662	809	1,211	852	1,175	624	438	203	80.6	48.5	31.1	25.3	512
1953	24.5	76.9	721	2,888	1,098	605	342	344	150	67.6	50.7	60.4	535
1954	335	835	1,505	1,634	2,354	613	726	127	172	97.2	60.0	122	704
1955	290	1,084	892	810	795	805	1,065	352	119	100	68.7	82.3	535
1956	761	2,131	2,289	2,004	509	1,870	747	176	224	74.9	47.7	48.2	911
1957	536	537	1,134	412	1,330	1,144	520	165	99.1	71.1	54.1	32.9	498
1958	143	385	1,485	1,412	1,342	444	778	175	90.5	41.6	24.0	40.3	526
1959	244	1,508	954	1,695	733	758	846	412	182	79.8	39.4	357	647
1960	514	967	961	650	1,333	965	961	454	171	60.9	57.1	45.5	591

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	36,940	73,460	96,100	95,000	112,200	47,610	27,860	10,530	3,910	2,080	1,450	3,390	510,500
1952	40,720	49,150	74,430	52,390	67,610	38,370	26,090	12,500	4,800	2,980	1,910	1,510	371,500
1953	1,510	4,580	44,350	177,600	60,880	37,190	20,330	21,170	8,940	4,160	3,120	3,600	387,400
1954	20,570	49,680	92,510	100,500	130,700	37,690	43,200	7,790	10,250	5,970	3,690	7,240	509,800
1955	17,840	64,500	54,880	49,790	44,160	49,510	63,580	20,420	7,100	6,150	4,230	4,900	387,100
1956	46,810	126,800	140,800	123,200	29,300	115,000	44,450	10,950	13,340	4,610	2,930	2,870	661,100
1957	32,350	31,930	69,730	25,330	75,870	70,350	30,950	10,150	5,890	4,370	3,330	1,960	360,800
1958	8,810	22,900	81,330	86,610	74,520	27,280	46,300	10,770	5,380	2,570	1,480	2,400	380,600
1959	15,010	89,710	57,410	104,200	40,690	46,580	50,350	25,360	10,810	4,910	2,420	21,260	468,700
1960	31,600	57,540	59,110	39,940	76,660	59,350	57,160	27,690	10,150	3,740	3,510	2,710	429,400

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	-	-	-	-	-	-	-	-	-	-	-	783	94.09	567,000
1951	1216	15,700	Feb. 9, 1951	-	705	6.24	84.72	510,500	646	77.55	467,300	-	-	-
1952	1246	9,320	Feb. 4, 1952	19	512	4.53	61.64	371,500	356	42.91	258,600	-	-	-
1953	1286	7,540	Jan. 8, 1953	20	535	4.73	64.27	387,400	690	82.90	499,800	-	-	-
1954	1346	9,100	Jan. 5, 1954	44	704	6.23	84.57	509,800	669	80.34	484,200	-	-	-
1955	1396	6,400	Feb. 8, 1955	33	535	4.73	64.23	387,100	779	93.63	564,200	-	-	-
1956	1446	11,000	Dec. 11, 1955	27	911	8.06	109.69	661,100	663	79.85	481,200	-	-	-
1957	1516	12,600	(a)	26	498	4.41	59.86	360,800	482	57.94	349,200	-	-	-
1958	1566	6,540	(b)	18	526	4.65	63.13	380,600	580	69.62	419,600	-	-	-
1959	1636	67,940	Nov. 12, 1958	28	647	5.73	77.77	468,700	628	75.47	454,800	-	-	-
1960	1716	9,180	Dec. 15, 1959	32	591	5.23	71.25	429,400	-	-	-	-	-	-

a Probably Dec. 9, 1956.

b Probably Dec. 24, 1957.

c Maximum observed.

240. South Fork Newaukum River near Onalaska, Wash.
(Formerly published as Newaukum River near Onalaska)

Location.--Lat 46°34'35", long 122°41'00", on line between secs. 28 and 33, T.13 N., R.1 E., on right bank 0.9 mile upstream from Lost Creek and 1 $\frac{1}{4}$ miles east of Onalaska.

Drainage area.--42.4 sq mi (revised).

Records available.--July to October 1942, July to October 1943, July 1944 to November 1948, June 1957 to September 1960. October 1943 to September 1958, published as Newaukum River near Onalaska.

Gage.--Water-stage recorder. Altitude of gage is 540 ft (from topographic map). Prior to Sept. 28, 1944, staff gage at datum 0.93 ft higher.

Average discharge.--7 years (1944-48, 1957-60), 208 cfs (150,600 acre-ft per year).

Extremes.--1942-48, 1957-60: Maximum discharge, 3,810 cfs Dec. 11, 1946 (gage height, 8.40 ft); minimum, 17.5 cfs Sept. 6-8, 1958 (gage height, 1.26 ft).

Remarks.--No regulation or diversion 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
1957	-	-	-	-	-	-	-	-	84.7	50.4	38.1	26.3	-
1958	53.1	168	389	352	374	189	280	93.8	65.6	39.5	23.3	29.3	170
1959	60.7	429	348	458	262	257	250	187	128	60.8	37.5	119	216
1960	226	408	308	195	361	265	329	272	102	43.3	47.0	40.9	215

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957	-	-	-	-	-	-	-	-	5,040	3,100	2,340	1,570	-
1958	3,260	10,000	23,930	21,650	20,750	11,630	16,670	5,770	3,900	2,430	1,740	1,200	123,200
1959	3,730	25,530	12,410	28,180	14,560	15,790	14,900	11,510	7,620	2,740	2,300	7,080	156,400
1960	13,870	24,310	18,930	11,970	20,760	16,270	19,590	16,700	6,050	2,660	2,890	2,430	156,400

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	
1957	1566	-	-	-	-	-	-	-	-	-	-	-
1958	1566	1,060	Dec. 26, 1957	18.5	170	4.01	54.46	123,200	189	60.42	136,600	-
1959	1636	2,190	Nov. 12, 1958	21	216	5.09	69.14	156,400	225	71.99	162,800	-
1960	1716	2,190	Nov. 23, 1959	30	215	5.07	69.18	156,400	-	-	-	-

245. North Fork Newaukum River near Forest, Wash.

Location.--Lat 46°39'20", long 122°46'40", in SW $\frac{1}{4}$ sec.35, T.14 N., R.1 W., on left bank 1 $\frac{1}{4}$ miles upstream from Lucas Creek and 5 $\frac{1}{2}$ miles northeast of Forest.

Drainage area.--31.5 sq mi (revised).

Records available.--July to November 1944, July 1957 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 380 ft (from topographic map). July 25 to Nov. 6, 1944, at site 150 ft upstream at different datum.

Extremes.--1944, 1957-60: Maximum discharge, 1,720 cfs Nov. 12, 1958 (gage height, 5.17 ft); minimum, 1.2 cfs Aug. 20, probably 26, 1958 (gage height, 0.96 ft).

Remarks.--Cities of Chehalis and Centralia divert about 15 cfs above station for municipal use. No 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
1957	-	-	-	-	-	-	-	-	-	-	-	-	-
1958	16.5	75.0	210	190	215	99.1	142	44.7	26.7	15.6	13.6	4.83	-
1959	25.4	242	213	313	169	141	128	96.0	61.0	25.9	13.0	35.4	85.6
1960	82.8	208	183	117	215	174	182	131	44.2	13.9	15.3	10.4	122

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957	-	-	-	-	-	-	-	-	-	960	839	288	-
1958	1,010	4,460	12,940	11,670	11,930	6,090	8,440	2,750	1,590	482	166	432	61,960
1959	1,560	14,390	13,110	19,230	9,390	8,660	7,600	5,900	3,630	1,590	797	2,100	87,960
1960	5,090	12,360	11,270	7,180	12,360	10,670	10,630	8,070	2,630	857	939	619	82,900

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	
1957	1566	-	-	-	-	-	-	-	-	-	-	-
1958	1566	594	Dec. 25, 1957	1.3	-	-	2.72	36.91	61,960	100	43.38	72,610
1959	1636	1,720	Nov. 12, 1958	4.2	122	3.87	52.38	87,960	121	52.18	87,640	-
1960	1716	1,490	Nov. 20, 1959	5.0	114	3.62	49.35	82,900	-	-	-	-

250. Newaukum River near Chehalis, Wash.

Location.--Lat 46°37'10", long 122°56'40", on line between secs.9 and 16, T.13 N., R.2 W., on left bank at highway bridge, 2½ miles southeast of Chehalis and 3½ miles upstream from mouth.

Drainage area.--155 sq mi (revised).

Records available.--March 1929 to September 1931, July 1942 to September 1960.

Gage.--Staff and crest-stage gages. Altitude of gage is 190 ft (from topographic map). Prior to Oct. 1, 1929, at datum 1.0 ft higher.

Average discharge.--20 years (1929-31, 1942-60), 506 cfs (366,300 acre-ft per year), unadjusted.

Extremes.--1929-31, 1942-60: Maximum discharge, 7,400 cfs Dec. 9, 1953 (gage height, 13.82 ft), from rating curve extended above 3,600 cfs by logarithmic plotting; minimum observed, 12 cfs Sept. 13, 14, 1949.

Remarks.--Cities of Chehalis and Centralia divert about 15 cfs for municipal use. No 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	349	1,587	1,382	1,488	1,438	913	333	181	73.6	36.1	21.6	40.0	632
1952	371	713	1,115	784	959	636	358	183	96.7	67.5	41.5	29.1	443
1953	35.1	56.1	360	2,169	1,034	426	372	337	233	102	77.3	58.0	436
1954	200	730	1,803	1,602	1,518	499	582	157	287	148	74.7	94.0	636
1955	149	656	835	859	861	801	1,022	344	189	137	69.7	69.8	497
1956	613	1,717	1,861	1,493	753	1,444	536	170	187	76.4	49.4	48.6	748
1957	302	495	1,145	472	1,041	1,220	498	252	142	78.0	60.6	38.6	476
1958	91.5	397	1,195	1,078	1,210	491	654	192	135	63.7	30.0	46.1	461
1959	118	1,121	976	1,480	738	684	574	429	265	109	56.7	167	559
1960	468	1,043	869	555	1,101	831	943	680	185	63.0	63.7	65.4	571

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	21,440	82,560	84,970	91,470	79,890	56,140	19,820	11,120	4,380	2,220	1,330	2,380	457,700
1952	22,800	42,450	68,560	46,990	55,160	39,120	21,300	11,250	5,760	4,150	2,550	1,730	321,800
1953	2,160	3,340	22,140	33,400	57,400	26,210	22,150	20,730	13,880	6,270	4,750	3,450	315,900
1954	12,300	43,440	10,900	98,470	84,320	30,700	34,650	9,680	17,100	9,090	4,590	5,590	480,800
1955	9,160	39,040	51,310	52,790	47,840	49,250	60,790	21,140	11,270	8,440	4,280	4,150	359,500
1956	37,690	102,200	114,400	91,800	43,330	88,810	31,880	11,000	11,160	4,690	3,040	2,890	542,900
1957	18,540	29,430	70,390	29,040	57,840	75,000	29,650	15,480	8,420	4,800	3,730	2,290	344,600
1958	5,630	23,600	73,490	66,280	67,180	30,170	38,940	11,820	8,060	3,920	1,840	2,740	333,700
1959	7,270	66,710	59,990	90,980	41,010	42,070	34,160	26,400	15,800	6,710	3,480	9,950	404,500
1960	29,880	62,050	53,430	34,100	63,310	51,100	56,090	41,830	10,990	3,880	3,920	3,890	414,500

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	-	-	-	-	-	-	726	525,400
1951	1216	5,240	Feb. 9, 1951	14	632	457,700	556	402,600
1952	1246	43,980	Feb. 4, 1952	19.5	443	321,800	297	215,600
1953	1286	4,540	Jan. 23, 1953	22	436	315,900	628	454,900
1954	1348	7,400	Dec. 9, 1953	56	636	460,800	544	393,700
1955	1396	4,780	Feb. 8, 1955	34	497	359,500	710	514,200
1956	1446	6,360	Dec. 12, 1955	30	748	542,900	561	407,000
1957	1516	4,300	(b)	30	476	344,600	454	329,000
1958	1566	3,290	Dec. 26, 1957	22	461	333,700	504	364,900
1959	1636	5,410	Nov. 12, 1958	47	559	404,500	574	415,900
1960	1716	5,150	Nov. 21, 1959	33	571	414,500	-	-

a Maximum observed.

* b Probably Dec. 10, 1956.

260. Skookumchuck River near Centralia, Wash.

Location.--Lat 46°47'15", long 122°42'45", in SW 1/4 sec. 17, T. 15 N., R. 1 E., on left bank half a mile upstream from Bloody Run Creek, 4 1/2 miles upstream from Thompson Creek, and 12 miles northeast of Centralia.

Drainage area.--61.7 sq mi (revised).

Records available.--April 1929 to November 1933, October 1939 to September 1960. Monthly discharge only for some periods, published in WSP 1816.

Gage.--Water-stage recorder. Datum of gage is 300.00 ft above mean sea level (river-profile survey). Apr. 1, 1929, to Sept. 30, 1931, and Feb. 1, 1932, to Dec. 6, 1933, staff gage at site a quarter of a mile downstream at different datum. Oct. 9 to Nov. 29, 1939, staff gage at present site and datum.

Average discharge.--25 years (1929-33, 1939-60), 247 cfs (178,800 acre-ft per year).

Extremes.--1929-33, 1939-60: Maximum discharge, 6,710 cfs Dec. 9, 1953 (gage height, 48.59 ft); minimum, 15.5 cfs Nov. 28, 29, 1952 (gage height, 39.22 ft).

Remarks.--No regulation or diversion above station. Records of chemical analyses for the period July 1959 to September 1960 are published in reports of 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	220	630	598	642	713	346	199	109	49.4	27.4	22.3	28.9	296
1952	220	355	464	331	469	246	222	138	61.3	42.5	25.8	21.4	216
1953	21.4	28.5	222	1,156	492	254	185	187	131.3	59.4	39.4	35.3	234
1954	139	313	769	662	840	274	373	104	156	83.3	50.5	53.3	315
1955	96.2	349	426	406	382	333	524	246	140	88.8	49.3	53.1	257
1956	319	715	908	662	346	667	376	148	116	47.7	35.1	33.0	365
1957	146	229	481	166	523	512	271	140	77.3	47.8	39.1	27.4	220
1958	56.9	186	523	505	536	210	336	96.9	54.3	32.7	22.6	26.2	214
1959	71.8	591	398	*753	*830	*320	*290	*185	*115	*50.0	*34.0	*88.0	*266
1960	*167	*433	386	238	505	359	434	260	99.4	46.4	45.3	40.2	*252

* Revised; revised daily discharge for the periods thus affected are available and will be published in a future water-supply paper.

* Not previously published; estimated on the basis of records for Deschutes River near Rainier.

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	13,550	37,460	36,760	39,450	39,590	21,280	11,850	6,690	2,940	1,680	1,370	1,720	214,300
1952	13,500	21,130	28,550	20,330	26,970	15,130	13,610	8,460	3,680	2,620	1,580	1,500	156,900
1953	1,320	1,700	13,650	71,050	27,340	15,620	11,030	11,520	7,910	5,650	2,420	2,100	169,300
1954	8,550	18,600	47,310	40,680	46,830	16,870	22,180	6,410	9,250	5,120	3,100	3,170	227,900
1955	5,920	20,790	26,190	24,990	21,230	20,480	31,190	15,100	8,340	5,460	3,030	3,160	185,900
1956	19,580	42,550	55,820	40,730	19,870	40,990	22,360	9,070	6,880	2,940	2,160	1,960	264,900
1957	9,000	13,640	29,560	10,200	29,390	31,490	16,150	8,580	4,600	2,940	2,400	1,630	159,600
1958	3,500	11,090	32,170	31,050	29,740	12,930	20,090	5,960	3,230	2,010	1,390	1,560	154,700
1959	4,420	35,190	24,470	*46,120	*16,680	*19,680	*17,260	*11,380	*6,840	*3,070	*2,090	*5,240	*192,400
1960	*10,250	*25,780	23,720	14,680	29,070	23,920	25,830	15,980	5,910	2,850	2,800	2,390	188,200

* Revised; see footnote to table above.

* Not previously published; estimated on the basis of records for Deschutes River near Rainier.

Yearly 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	-	-	-	-	-	-	-	-	375	82.41	271,200	
1951	1216	3,980	Feb. 9, 1951	18.5	296	4.80	65.14	214,300	262	57.67	189,800	
1952	1246	2,850	Feb. 4, 1952	20	216	3.50	47.67	156,900	152	33.53	110,300	
1953	1286	2,680	Jan. 9, 1953	18.5	234	3.79	51.43	169,300	314	69.02	227,100	
1954	1346	6,710	Dec. 9, 1953	41	315	5.11	69.25	227,900	285	62.70	206,300	
1955	1396	4,010	Feb. 8, 1955	32	257	4.17	56.45	185,900	347	76.26	250,900	
1956	1446	6,230	Dec. 11, 1955	29	365	5.92	80.51	264,900	274	60.53	199,200	
1957	1516	3,390	Dec. 9, 1956	25	220	3.57	48.49	159,600	213	46.84	154,100	
1958	1566	1,950	Dec. 25, 1957	20	214	3.47	47.01	154,700	238	52.28	172,000	
1959	1566	4,260	Nov. 12, 1958	-	*266	*4.31	*58.46	*192,400	*260	*57.15	*188,100	
1960	1716	3,860	(a)	29	*252	*4.08	*55.68	*183,200	-	-	-	

* Revised.

* Not previously published.

a Nov. 22 or 23, 1959.

275. Chehalis River near Grand Mound, Wash.

Location.--Lat 46°46'35", long 123°02'05", in NE $\frac{1}{4}$ sec.22, T.15 N., R.3 W., on left bank at downstream side of highway bridge at Meadows, $1\frac{1}{2}$ miles southwest of Grand Mound and 6 miles downstream from Skookumchuck River.

Drainage area.--895 sq mi.

Records available.--October 1928 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 123.27 ft above mean sea level, datum of 1929. Prior to Oct. 3, 1934, staff gage at same site at datum 3.0 ft higher.

Average discharge.--32 years (1928-60), 2,777 cfs (2,010,000 acre-ft per year).

Extremes.--1928-60: Maximum discharge, 48,400 cfs Dec. 29, 1937 (gage height, 18.39 ft); minimum, 90 cfs Aug. 23-26, 1951; minimum gage height, 0.83 ft Aug. 27, 1958.

Remarks.--Many small diversions for irrigation and domestic use above station, including about 15 cfs for municipal water supply for Centralia and Chehalis. No regulation. Records of water temperatures for the period March 1952 to September 1960 are published in reports of 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	2,110	7,087	8,545	9,597	9,289	5,048	1,834	819	356	182	123	155	3,732
1952	2,137	3,776	6,909	4,417	6,054	3,071	1,886	955	438	257	153	135	2,507
1953	125	257	2,454	12,800	6,298	2,734	1,752	1,571	882	361	248	219	2,462
1954	1,097	3,753	9,070	9,070	11,100	3,163	3,452	1,768	1,033	538	312	481	3,662
1955	854	4,058	4,227	5,098	4,362	4,877	5,554	1,590	717	534	297	319	2,694
1956	2,630	9,697	12,400	9,791	3,829	9,060	3,343	826	803	322	228	229	4,444
1957	1,580	2,542	5,987	2,253	6,030	6,470	2,746	971	556	305	245	155	2,468
1958	399	1,488	6,595	6,465	6,911	2,645	3,806	967	589	229	129	184	2,509
1959	657	6,750	5,375	9,044	4,589	3,668	3,602	2,263	912	422	205	876	3,187
1960	1,754	5,177	4,962	3,281	6,908	4,937	5,171	2,629	857	327	298	252	3,026

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	129,800	421,700	525,400	590,100	515,900	310,400	109,100	50,350	21,180	11,170	7,540	9,230	2,702,000
1952	131,400	224,700	424,800	271,600	348,200	188,800	112,200	58,750	25,940	15,830	9,430	8,020	1,820,000
1953	7,660	15,310	150,900	787,100	349,700	168,100	104,200	96,580	52,490	22,200	15,250	12,990	1,782,000
1954	67,440	223,300	557,700	596,800	616,300	194,500	205,400	47,100	61,490	33,060	19,210	28,590	2,651,000
1955	52,530	241,500	259,900	313,500	242,200	299,800	330,500	97,760	42,670	32,820	18,290	18,980	1,951,000
1956	162,000	577,000	762,800	602,000	220,300	557,100	198,900	50,790	47,800	19,800	14,040	13,610	3,226,000
1957	97,160	151,200	362,100	158,500	534,900	597,800	163,400	59,700	33,070	18,750	15,080	9,250	1,787,000
1958	24,520	88,560	405,500	597,500	583,800	226,500	59,430	35,030	14,070	7,960	10,920	1,816,000	
1959	40,410	401,700	330,500	556,100	254,900	225,500	214,300	39,100	54,270	25,980	12,620	52,110	2,307,000
1960	107,800	308,100	305,100	201,700	397,300	303,600	307,700	161,600	51,000	20,080	17,370	14,980	2,196,000

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	-	-	-	-	-	-	-	-	4,246	64.40	3,074,000		
1951	1216	38,000	Feb. 10, 1951	90	3,732	4.17	56.59	2,702,000	3,323	50.39	2,406,000		
1952	1246	18,800	Feb. 5, 1952	111	2,507	2.80	38.13	1,820,000	1,671	25.41	1,213,000		
1953	1286	20,500	Jan. 10, 1953	104	2,462	2.75	37.33	1,782,000	3,394	51.46	2,457,000		
1954	1346	34,700	Jan. 6, 1954	230	3,662	4.09	55.52	2,651,000	3,255	49.36	2,356,000		
1955	1396	18,100	Feb. 9, 1955	160	2,694	3.01	40.86	1,951,000	4,003	60.71	2,898,000		
1956	1446	35,100	Dec. 22, 1955	142	4,444	4.97	67.57	3,226,000	3,224	49.03	2,341,000		
1957	1516	20,900	Feb. 27, 1957	135	2,468	2.76	37.43	1,787,000	2,333	35.38	1,689,000		
1958	1568	18,500	Dec. 27, 1957	99	2,509	2.80	38.06	1,816,000	2,860	43.37	2,070,000		
1959	1636	22,500	Nov. 13, 1958	137	3,187	3.56	48.33	2,307,000	3,116	47.25	2,256,000		
1960	1716	24,700	Nov. 24, 1959	173	3,026	3.38	46.01	2,196,000	-	-	-		

300. Rock Creek at Cedarville, Wash.

Location.--Lat 46°52'05", long 123°18'25", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.15, T.16 N., R.5 W., on left bank 0.2 mile downstream from Williams Creek, 1 mile west of Cedarville, and $1\frac{1}{4}$ miles upstream from mouth.

Drainage area.--24.8 sq mi.

Records available.--July to October 1942, July to October 1943, June 1944 to September 1960. Monthly discharge only for October 1942, published in WSP 1316.

Gage.--Water-stage recorder. Altitude of gage is 70 ft (from topographic map). Prior to Aug. 17, 1944, staff gage at railroad bridge three-quarters of a mile downstream at different datum.

Average discharge.--16 years (1944-60), 88.4 cfs (64,000 acre-ft per year).

Extremes.--1942-60: Maximum discharge, 1,660 cfs Feb. 9, 1951 (gage height, 13.77 ft), from rating curve extended above 850 cfs; minimum, 0.3 cfs Sept. 25, 1946.

Remarks.--No regulation. 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	47.0	174	245	274	274	164	44.0	14.7	8.21	1.66	0.95	3.28	103
1952	77.2	142	206	170	149	86.0	53.5	27.0	10.9	3.54	1.97	1.37	77.3
1953	1.81	5.20	74.2	427	205	75.5	58.4	51.9	19.6	5.79	2.88	2.60	77.1
1954	14.3	125	281	260	340	92.1	99.2	16.8	14.8	7.52	6.39	21.3	105
1955	37.0	164	155	136	141	118	137	29.6	11.7	8.49	4.52	4.14	78.4
1956	84.5	286	291	245	117	252	73.7	15.4	13.8	4.04	3.05	4.46	116
1957	81.3	102	216	70.4	175	178	82.7	22.7	9.38	4.40	3.56	1.80	78.5
1958	10.6	45.3	202	215	208	82.0	120	28.6	10.7	3.91	1.76	3.35	76.8
1959	23.3	264	199	279	126	116	121	65.4	22.4	7.81	3.10	19.3	104
1960	65.2	211	170	141	224	124	133	76.2	22.8	5.47	3.58	2.58	97.6

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2,890	10,330	15,080	16,860	15,190	10,100	2,620	905	489	102	58	195	74,820
1952	4,750	8,480	12,680	10,460	8,570	5,290	3,180	1,660	648	218	121	82	56,140
1953	111	309	4,560	26,250	11,400	4,640	3,480	3,190	1,170	356	177	155	55,800
1954	881	7,430	17,270	16,000	18,850	5,660	5,900	1,030	884	462	393	1,270	76,030
1955	2,280	9,780	9,540	8,360	7,850	7,280	8,150	1,820	694	522	278	247	56,800
1956	5,190	16,990	17,920	15,060	6,750	15,470	4,390	949	822	248	187	266	84,240
1957	5,000	6,090	13,280	4,330	9,720	10,930	4,920	1,400	558	270	207	107	56,810
1958	652	2,690	12,440	13,250	11,560	5,040	7,120	1,630	638	240	108	200	55,570
1959	1,430	15,680	12,230	17,180	7,020	7,140	7,190	4,020	1,330	480	191	1,150	75,040
1960	4,010	12,560	10,450	8,670	12,860	7,640	7,940	4,680	1,360	337	220	154	70,880

Yearly 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	-	-	-	-	-	-	-	-	111	80.81	80,420	
1951	1216	1,660	Feb. 9, 1951	0.4	103	4.15	56.57	74,820	100	54.75	72,430	
1952	1246	746	Feb. 4, 1952	1.1	77.3	3.12	42.44	56,140	48.5	26.82	35,210	
1953	1286	1,120	Jan. 23, 1953	.9	77.1	3.11	42.17	55,800	106	57.76	76,400	
1954	1346	1,020	Dec. 9, 1953	3.0	105	4.23	57.51	76,030	99.5	54.48	72,050	
1955	1396	878	Feb. 8, 1955	2.4	78.4	3.16	42.92	56,800	104	56.93	75,300	
1956	1446	1,220	Dec. 11, 1955	1.1	116	4.68	63.69	84,240	94.4	51.79	68,510	
1957	1516	1,380	Dec. 9, 1956	1.5	78.5	3.17	42.95	56,810	66.6	36.46	48,220	
1958	1566	770	Dec. 26, 1957	.9	76.8	3.10	42.01	55,570	95.5	52.25	69,130	
1959	1636	1,260	Nov. 12, 1958	1.3	104	4.19	56.74	75,040	100	54.98	72,720	
1960	1716	1,460	Nov. 21, 1959	1.6	97.6	3.94	53.59	70,880	-	-	-	

310. Chehalis River at Porter, Wash.

Location.--Lat 46°56'20", long 123°18'45", on line between secs.21 and 28, T.17 N., R.5 W., in upstream end of left bank pier of Chehalis River bridge at mouth of Porter Creek, 700 ft west of Porter.

Drainage area.--1,294 sq mi.

Records available.--January 1952 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 23.64 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.--8 years (1952-60), 4,262 cfs (3,086,000 acre-ft per year).

Extremes.--1952-60: Maximum discharge, 34,600 cfs Jan. 7, 1954 (gage height, 22.27 ft); minimum, 164 cfs Oct. 17, 1952 (gage height, 2.25 ft).

Flood in December 1933 reached a stage of 23.13 ft, from river profile by Corps of Engineers.

Remarks.--Cities of Centralia and Chehalis divert about 15 cfs from Newaukum River, a tributary, for municipal use. Other small diversions for irrigation and domestic use. No regulation. Records of water temperatures for the period July 1959 to September 1960 are published in reports of 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	-	-	-	-	9,243	4,563	3,048	1,552	677	391	228	199	-
1952	196	376	3,362	17,270	10,370	4,079	2,897	2,472	1,398	579	323	304	3,606
1953	1,355	5,079	12,880	12,780	14,650	4,985	4,852	1,293	1,451	819	487	729	5,058
1954	1,210	5,540	5,597	7,095	6,051	6,440	7,371	2,320	1,072	774	465	448	3,680
1956	3,117	12,490	16,090	13,390	5,222	12,170	4,747	1,374	1,258	549	351	344	5,942
1957	2,107	3,655	8,811	3,466	7,754	9,486	4,008	1,519	802	477	392	276	3,543
1958	547	1,906	8,396	6,689	9,655	4,198	5,299	1,525	815	371	230	277	3,457
1959	864	9,151	7,589	12,420	6,729	4,941	5,329	3,549	1,411	634	338	1,151	4,493
1960	2,261	7,347	7,652	4,893	10,160	6,376	6,929	5,718	1,428	565	432	386	4,317

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	531,600	280,500	181,400	95,430	40,280	24,060	14,030	11,860	-
1952	12,050	22,380	206,700	1,062,000	575,700	250,800	172,400	152,000	83,190	35,610	19,880	18,120	2,611,000
1953	83,290	302,200	792,000	786,000	813,800	306,500	288,700	79,510	86,330	50,330	29,960	43,360	3,662,000
1954	74,390	329,600	544,200	436,200	336,000	396,000	438,600	142,700	63,760	47,620	28,580	26,630	2,664,000
1956	181,700	743,300	989,600	823,100	300,400	748,200	282,400	84,470	74,880	33,780	21,570	20,490	4,314,000
1957	129,600	217,500	541,800	213,100	430,600	583,500	258,500	93,400	47,790	29,350	24,100	16,400	2,565,000
1958	35,650	113,400	516,200	354,300	536,200	258,100	315,300	93,780	48,490	22,810	14,170	16,450	2,503,000
1959	53,130	544,500	466,600	763,600	373,700	303,800	317,100	218,200	85,970	59,010	20,800	68,480	3,253,000
1960	139,000	437,200	470,500	300,900	584,200	592,100	412,300	228,600	84,990	34,780	26,570	22,990	3,134,000

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	Inches	Acres-foot	Runoff		
		Discharge	Date				Inches	Acres-foot				Inches	Acres-foot	
1950														
1951														
1952	1246	21,900	Feb. 6, 1952	-	-	-	-	-	-	-	-	-	-	-
1953	1286	24,800	Jan. 31, 1953	166	3,606	2.79	37.83	2,621,000	4,899	51.39	3,547,000			
1954	1346	34,600	Jan. 7, 1954	398	5,058	3.91	53.06	3,662,000	4,465	46.84	3,233,000			
1955	1396	19,200	Jan. 2, 1955	285	3,680	2.84	38.61	2,664,000	5,305	55.65	3,841,000			
1956	1446	33,700	Dec. 23, 1955	252	5,942	4.59	62.50	4,314,000	4,516	47.50	3,278,000			
1957	1516	23,600	Dec. 12, 1956	236	3,543	2.74	37.17	2,565,000	3,232	33.90	2,340,000			
1958	1566	22,000	Dec. 28, 1957	197	3,457	2.67	36.27	2,503,000	4,011	42.08	2,904,000			
1959	1636	24,300	Jan. 26, 1959	219	4,493	3.47	47.14	3,253,000	4,469	46.88	3,255,000			
1960	1716	28,300	Nov. 23, 1959	304	4,317	3.34	45.39	3,134,000	-	-	-			

325. Cloquallum River at Elma, Wash.

Location.--Lat 47°00'20", long 123°23'10", in S½NW¼ sec.36, T.18 N., R.6 W., on right bank 10 ft downstream from bridge, half a mile east of Elma, and 1.8 miles downstream from Wildcat Creek.

Drainage area.--65.8 sq mi.

Records available.--July 1942 to October 1943 (fragmentary), July 1944 to September 1960. Published as Cloquallum Creek at Elma 1942.

Gage.--Water-stage recorder. Altitude of gage is 20 ft (from topographic map). Prior to Aug. 7, 1944, staff gage at site 350 ft downstream at datum 0.42 ft lower. Aug. 7, 1944, to Sept. 1, 1953, water-stage recorder at site 200 ft upstream at same datum.

Average discharge.--16 years (1944-60), 269 cfs (194,700 acre-ft per year).

Extremes.--1942-60: Maximum discharge, 5,080 cfs (revised) Dec. 15, 1959 (gage height, 10.6 ft, from high-water mark in well); maximum gage height, 11.04 ft, Feb. 9, 1951 (site then in use); minimum discharge, 6.8 cfs Sept. 15, 1945 (gage height, 1.43 ft).

Remarks.--Several small diversions on minor tributaries above station and some regulation by logpond on Wildcat Creek.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	213	526	704	790	916	443	156	91.7	51.3	30.8	23.4	26.9	328
1952	196	296	459	396	463	255	161	96.2	59.1	33.6	31.8	23.7	205
1953	24.4	34.6	202	1,199	694	245	194	170	93.5	44.3	30.5	29.4	245
1954	91.3	343	751	714	844	355	346	92.0	75.5	57.0	40.5	56.3	311
1955	106	414	343	369	366	370	421	122	65.9	56.3	40.6	30.6	226
1956	314	798	944	739	302	739	255	88.2	98.6	47.7	33.4	36.4	367
1957	279	270	671	253	454	580	247	93.6	56.2	39.0	33.5	24.7	250
1958	64.5	155	526	582	557	263	312	97.6	55.8	33.6	24.6	27.9	223
1959	82.9	697	596	815	434	354	478	276	103	49.2	32.4	75.4	332
1960	192	660	695	533	678	333	398	230	94.6	43.0	36.1	32.3	325

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	13,070	31,330	43,260	48,570	50,900	27,270	9,300	5,640	3,050	1,900	1,440	1,600	237,300
1952	12,020	17,620	28,230	24,350	26,630	15,700	9,590	5,910	3,510	2,060	1,960	1,410	149,000
1953	1,500	2,060	12,420	73,730	38,570	15,090	11,540	10,460	5,560	2,730	1,880	1,750	177,300
1954	5,610	20,410	46,190	43,870	46,860	21,840	20,580	5,650	4,550	3,500	2,490	3,350	224,900
1955	6,500	24,610	21,090	23,900	20,330	22,750	25,070	7,490	3,920	3,460	2,500	1,820	163,400
1956	19,280	47,470	58,060	45,470	17,400	45,420	15,160	5,420	5,870	2,940	2,050	2,170	266,700
1957	17,180	16,050	41,280	15,550	25,240	35,670	14,720	5,760	3,350	2,400	2,060	1,470	180,700
1958	3,960	9,200	32,320	35,790	30,940	16,180	18,560	6,000	3,320	2,060	1,510	1,660	161,500
1959	5,100	41,460	36,650	50,110	24,110	21,780	28,450	16,970	6,130	3,020	1,990	4,490	240,300
1960	11,790	39,270	42,700	32,790	38,990	20,470	23,690	14,150	5,630	2,640	2,220	1,920	236,300

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	-	-	-	-	-	-	-	-	-	-	-
1951	1216	4,470	Feb. 9, 1951	14	328	4.98	67.64	237,300	287	68.79	243,900
1952	1246	1,800	Jan. 30, 1952	20	205	3.12	42.46	149,000	187	53.15	207,500
1953	1286	3,390	Jan. 31, 1953	18.5	245	3.72	50.54	177,300	323	66.56	233,500
1954	1346	2,620	Dec. 12, 1953	33	311	4.73	64.09	224,900	263	58.38	204,900
1955	1396	2,080	Feb. 8, 1955	21	226	3.43	46.56	163,400	326	67.25	236,000
1956	1446	3,400	Dec. 11, 1955	23	367	5.58	76.01	266,700	298	61.68	216,400
1957	1516, 1566	4,010	Dec. 19, 1956	22	250	3.80	51.48	180,700	210	43.21	151,700
1958	1566	1,800	Jan. 16, 1958	20	223	3.39	46.03	161,500	275	56.77	199,200
1959	1636	2,610	Apr. 30, 1959	21	332	5.05	68.47	240,300	346	71.49	250,900
1960	1716	4,150	Dec. 15, 1959	29	325	4.94	67.31	236,300	-	-	-

330. Chehalis River at South Elma, Wash.

Location.--Lat 46°49'00", long 123°24'40", in NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.10, T.17 N., R.6 W., on left bank 200 ft upstream from county bridge at South Elma, 1.1 miles downstream from Cloquallum River.

Drainage area.--1,417 sq mi (revised).

Records available.--July 1942 to December 1944 (fragmentary), October 1946 to March 1952.

Gage.--Water-stage recorder. Altitude of gage is 15 ft (from topographic map). Prior to Apr. 1, 1947, wire-weight gage on county bridge 200 ft downstream at same datum.

Average discharge.--5 years (1946-51), 5,057 cfs (3,661,000 acre-ft per year).

Extremes.--1942-44, 1946-52: Maximum discharge, 38,400 cfs Feb. 11, 1951 (gage height, 76.93 ft); minimum observed, 202 cfs Sept. 12, 1944 (gage height, 55.43 ft).

Remarks.--No regulation. Cities of Centralia and Chehalis divert approximately 15 cfs from Newaukum River, a tributary, for municipal use. Many minor diversions from main stream and tributaries for domestic use and 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	2,838	9,795	13,590	14,960	14,580	8,060	3,254	1,566	752	391	254	310	5,816
1952	3,257	5,178	9,713	6,602	9,717	-	-	-	-	-	-	-	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	174,500	582,800	835,800	919,600	809,700	495,600	193,600	96,280	44,750	24,040	15,630	18,420	4,211,000
1952	200,300	308,100	597,200	406,000	558,900	-	-	-	-	-	-	-	-

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		Mean	Inches
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet		
1950	-	-	-	-	-	-	-	-	-	-	-	-	-
1951	1216	38,400	Feb. 11, 1951	210	5,816	4.10	55.72	4,211,000	6,568	62.92	4,755,000	5,143	49.27
1952	1246	23,100	Feb. 6, 1952	-	-	-	-	-	-	-	-	-	-

342. East Fork Satsop River near Elma, Wash.

Location.--Lat 47°07'40", long 123°25'00", in SW $\frac{1}{4}$ sec.15, T.19 N., R.6 W., on right bank 11 miles downstream from Bingham Creek, 4 $\frac{1}{2}$ miles upstream from mouth, and 8 $\frac{1}{2}$ miles north of Elma.

Drainage area.--65.9 sq mi.

Records available.--February 1957 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 205 ft (from topographic map).

Extremes.--1957-60: Maximum discharge, 3,650 cfs Dec. 15, 1959 (gage height, 7.19 ft); minimum, 63 cfs Oct. 10, 1957; minimum gage height, 1.24 ft Sept. 28, 29, 30, 1960.

Remarks.--No regulation or diversion 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
1957	-	-	-	-	-	699	368	196	139	110	96.9	74.5	-
1958	80.9	174	559	748	701	368	388	218	148	110	86.7	79.9	303
1959	117	547	670	909	506	444	584	413	205	137	104	112	395
1960	187	742	768	617	894	485	544	355	237	146	113	95.1	429

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957	-	-	-	-	-	42,960	21,890	12,070	8,240	6,770	5,960	4,440	-
1958	4,970	10,340	34,390	45,970	38,940	22,640	23,070	13,420	8,810	6,740	5,330	4,750	219,400
1959	7,210	32,520	41,170	55,870	28,100	27,310	34,770	25,370	12,190	8,430	6,390	6,650	286,000
1960	11,490	44,160	47,250	37,940	50,830	29,840	32,370	21,810	14,110	8,960	6,980	5,660	311,400

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		Mean	Inches
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet		
1957	1516,1566	-	-	-	-	-	-	-	-	-	-	-	-
1958	1566	2,090	Jan. 17, 1958	65	303	4.60	62.41	219,400	346	71.29	250,600	425	87.62
1959	1636	3,580	Apr. 30, 1959	68	395	5.99	81.37	286,000	425	87.62	308,600	-	-
1960	1716	3,650	Dec. 15, 1959	86	429	6.51	88.60	311,400	-	-	-	-	-

350. Satsop River near Satsop, Wash.

Location.--Lat 47°00'05", long 123°29'40", in sec.36, T.18 N., R.7 W., in west pier of bridge on U. S. Highway 410, three-quarters of a mile west of Satsop and 2 miles upstream from mouth.

Drainage area.--299 sq mi (revised).

Records available.--March 1929 to September 1960.

Gage.--Water-stage recorder. Datum of gage is at mean sea level, datum of 1929. Prior to Mar. 19, 1938, staff gage at site 60 ft upstream at datum 20.9 ft higher.

Average discharge.--31 years (1929-60), 1,968 cfs (1,425,000 acre-ft per year).

Extremes.--1929-60: Maximum discharge, 46,600 cfs Jan. 22, 1935 (elevation, 38.9 ft, from floodmarks); minimum, 166 cfs Sept. 21, 1938; minimum elevation, 21.66 ft, present datum, Sept. 3-6, 1934.

Flood in November 1909 reached a stage of 37.1 ft (from high-water mark), at railroad bridge 300 ft downstream.

Remarks.--No regulation or diversion 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	1,862	3,935	6,107	5,343	6,752	2,362	1,321	742	430	287	231	314	2,449
1952	2,176	2,373	3,064	2,760	3,744	1,841	1,660	1,061	601	341	357	289	1,683
1953	244	553	3,017	9,598	4,688	1,848	1,387	1,425	737	415	291	317	2,036
1954	1,004	3,211	5,345	4,733	6,672	2,451	2,205	688	588	550	346	432	2,325
1955	1,092	4,786	3,163	2,892	2,938	2,128	3,499	1,116	575	542	508	348	1,954
1956	2,490	5,845	5,404	4,998	1,843	4,914	2,388	913	1,033	471	317	447	2,595
1957	2,541	2,162	4,575	1,632	3,544	3,710	1,987	724	464	412	419	294	1,865
1958	623	1,376	3,799	4,644	4,211	1,830	2,250	752	426	300	242	294	1,715
1959	912	3,635	3,903	5,106	2,460	2,553	3,279	1,880	849	462	297	1,001	2,192
1960	1,407	4,350	4,013	3,417	4,683	2,427	2,959	1,606	862	417	354	335	2,224

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	114,500	234,100	375,500	328,500	375,000	145,200	78,610	45,600	25,580	17,670	14,200	18,650	1,773,000
1952	133,800	141,200	188,400	169,700	225,300	113,200	98,780	65,270	35,780	20,970	21,950	17,200	1,222,000
1953	15,010	32,890	185,500	590,100	260,400	113,600	82,510	87,590	43,840	25,540	17,880	18,840	1,474,000
1954	61,740	191,000	328,600	291,000	370,500	150,700	131,200	42,330	34,980	33,850	21,250	25,710	1,683,000
1955	67,120	284,800	194,500	177,800	163,200	130,800	208,200	68,590	34,240	33,340	31,250	20,710	1,415,000
1956	153,100	347,800	332,300	300,500	106,000	302,200	142,100	56,120	61,490	28,990	19,480	26,580	1,883,000
1957	156,200	128,600	281,300	100,300	196,800	228,100	118,200	44,540	27,610	25,340	25,790	17,510	1,350,000
1958	38,280	81,880	233,600	285,500	233,900	112,500	135,900	46,240	25,370	18,450	14,880	17,460	1,242,000
1959	56,070	216,300	240,400	314,000	136,600	157,400	195,100	115,600	50,530	28,390	18,230	59,560	1,587,000
1960	86,540	258,800	246,800	210,100	269,400	149,200	176,100	98,760	51,300	25,650	21,740	19,960	1,614,000

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	-	-	-	-	-	-	-	-	2,779	126.16	2,012,000
1951	1216	36,200	Feb. 9, 1951	197	2,449	8.19	111.20	1,773,000	2,089	94.84	1,512,000
1952	1248	15,800	Jan. 30, 1952	236	1,683	5.63	76.60	1,222,000	1,366	62.18	991,600
1953	1296	26,700	Jan. 23, 1953	203	2,036	6.81	92.42	1,474,000	2,516	114.24	1,822,000
1954	1346	24,300	Dec. 12, 1953	313	2,325	7.78	105.54	1,683,000	2,276	103.34	1,648,000
1955	1396	29,300	Nov. 18, 1954	271	1,954	6.54	88.71	1,415,000	2,350	106.69	1,701,000
1956	1446	27,800	Nov. 3, 1955	236	2,595	8.68	118.11	1,883,000	2,227	101.37	1,616,000
1957	1516	32,000	Dec. 10, 1956	252	1,865	6.24	84.63	1,350,000	1,572	71.37	1,138,000
1958	1568	14,200	(a)	212	1,715	5.74	77.88	1,242,000	1,934	87.82	1,401,000
1959	1636	26,100	Apr. 30, 1959	252	2,192	7.33	99.54	1,587,000	2,303	104.54	1,667,000
1960	1716	28,700	Nov. 20, 1959	292	2,224	7.44	101.22	1,614,000	-	-	-

a Dec. 26, 1957, Jan. 17, 1958.

360. Wynoochee River above Save Creek, near Aberdeen, Wash.

Location (revised).--Lat 47°18', long 123°39', in NE¼ sec.24, T.21 N., R.8 W., on left bank 0.8 mile upstream from Save Creek, 3 miles downstream from Oxbow, and 22 miles northeast of Aberdeen.

Drainage area.--74.1 sq mi (revised).

Records available.--May 1925 to September 1960. Published as "at Oxbow, near Aberdeen" 1925-52, where drainage area was 70.7 sq mi (revised). Records published for both sites October 1951 to October 1952.

Gage.--Water-stage recorder at present site and datum since Oct. 5, 1951. Datum of gage is 401 ft above mean sea level (stadia traverse). Prior to Nov. 7, 1925, staff gage at site 1,200 ft downstream from Oxbow, 3 miles upstream from present site at different datum. Nov. 7, 1925, to Sept. 3, 1947, water-stage recorder at site 1 mile downstream from Oxbow at datum 444.0 ft above mean sea level (levels by city of Aberdeen). Sept. 4, 1947, to Oct. 13, 1952, water-stage recorder at Oxbow at datum 91 ft higher.

Average discharge.--35 years (1925-60), 801 cfs (579,900 acre-ft per year).

Extremes.--1925-60: Maximum discharge, 23,600 cfs Dec. 9, 1956 (gage height, 16.95 ft), from rating curve extended above 9,000 cfs; minimum, 64 cfs Jan. 27, 1949.

Remarks.--No regulation or diversion 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	1,129	1,456	2,143	1,501	1,966	632	705	540	238	144	107	238	894
1952	1,228	1,150	1,060	941	1,394	645	840	803	521	274	254	180	774
1953	138	407	1,358	3,953	1,536	625	794	456	304	181	270		890
1954	672	1,523	1,970	1,500	2,393	939	883	467	453	433	194	247	963
1955	700	2,542	1,274	882	1,083	613	1,061	607	575	456	311	219	856
1956	1,098	2,457	1,511	1,410	463	1,290	1,078	836	968	495	208	302	1,010
1957	1,224	883	2,335	895	1,652	1,313	834	485	274	274	269	156	880
1958	404	684	1,503	1,966	1,894	698	887	433	248	143	112	161	753
1959	559	1,598	1,739	1,979	1,869	941	1,353	838	513	243	134	713	956
1960	750	1,723	1,600	1,188	1,577	864	1,190	804	496	222	171	175	893

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	69,400	86,640	131,700	92,280	109,200	38,860	41,960	33,230	14,050	8,870	6,600	14,050	646,800
1952	75,480	68,460	65,190	57,860	80,180	39,720	50,010	49,380	31,000	16,860	15,640	10,690	560,500
1953	8,470	24,210	85,500	245,000	85,280	40,860	37,220	48,830	27,150	18,720	11,100	16,080	644,400
1954	41,310	90,640	121,200	92,240	132,900	57,720	52,520	28,710	26,930	26,610	11,930	14,710	697,400
1955	43,010	151,300	78,320	54,240	60,140	37,680	63,150	37,300	34,230	28,050	19,130	13,040	619,600
1956	67,510	146,200	92,890	86,710	26,620	79,350	64,160	51,380	57,600	30,410	12,770	17,960	733,600
1957	75,280	52,520	143,600	55,010	91,750	80,720	49,630	29,830	16,510	16,870	16,560	9,280	637,400
1958	24,870	39,520	92,390	120,900	100,200	42,920	52,770	26,620	14,730	8,780	6,900	9,600	545,200
1959	34,390	95,070	106,900	121,100	48,270	57,850	80,530	51,550	30,500	14,910	8,240	42,410	691,700
1960	46,110	102,500	98,350	73,070	90,690	53,210	70,830	49,430	29,500	13,630	10,520	10,320	648,100

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	-	-	-	-	-	-	-	-	1,043	200.30	755,200	-	-
1951	1216	14,200	Feb. 9 or 10, 1951	92	894	12.6	171.55	646,800	771	148.07	559,300	-	-
1952	1246	1346	7,590 Jan. 30, 1952	130	774	10.4	141.82	560,500	644	118.30	487,500	-	-
1953	1286	11,900	Jan. 3, 1953	106	890	12.0	163.07	644,400	1,079	197.72	781,400	-	-
1954	1346	12,350	Dec. 11, 1953	172	963	13.0	176.45	697,400	990	181.38	716,900	-	-
1955	1396	20,400	Nov. 18, 1954	168	856	11.6	156.77	619,600	903	165.37	653,500	-	-
1956	1446	22,400	Nov. 3, 1955	141	1,010	13.6	185.61	733,600	962	176.71	698,400	-	-
1957	1516	23,600	Dec. 9, 1956	132	880	11.9	161.27	637,400	722	132.27	522,700	-	-
1958	1566	9,890	Dec. 25, 1957	107	753	10.2	137.96	545,200	863	158.11	624,800	-	-
1959	1636	14,800	Apr. 29, 1959	112	956	12.9	175.94	691,700	970	177.72	702,300	-	-
1960	1716	15,800	Nov. 20, 1959	125	893	12.1	163.99	648,100	-	-	-	-	-

Yearly discharge, in cubic feet per second

Water year	Water year ending Sept. 30			Calendar year	Water year	Water year ending Sept. 30			Calendar year
	Per square mile	Runoff in inches	Runoff in inches			Per square mile	Runoff in inches	Runoff in inches	
1928	8.88	120.65	133.32	1959	9.55	129.66		147.17	
1927	12.0	162.45	154.01	1940	11.4	155.66		149.66	
1928	11.2	152.86	143.42						
1929	7.67	104.07	84.17	1941	10.2	139.39		143.26	
1930	7.24	98.32	102.24	1942	9.39	127.40		118.54	
				1943	11.0	148.77		127.27	
1931	10.4	140.50	174.59	1944	7.40	100.67		110.57	
1932	13.1	177.78	171.79	1945	11.2	152.44		167.90	
1933	12.5	170.28	203.74						
1934	14.0	189.47	172.09	1946	12.0	163.58		150.78	
1935	14.9	201.78	162.46	1947	9.87	134.03		156.40	
				1948	12.5	170.39		153.19	
1936	9.62	130.94	127.27	1949	9.94	135.00		159.35	
1937	9.26	125.69	177.12	1950	14.4	196.12		-	
1938	11.6	157.88	123.69						

Note.--Not previously published.

374. Wynoochee River above Black Creek, near Montesano, Wash.

Location.--Lat 47°00'40", long 123°39'35", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 27, T.18 N., R.8 W., 2,000 ft upstream from mouth of Black Creek and $3\frac{1}{2}$ miles northwest of Montesano.

Drainage area.--179 sq mi.

Records available.--October 1956 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 40 ft (from topographic map).

Extremes.--1956-60: Maximum discharge, 24,500 cfs Dec. 10, 1956 (gage height, 20.54 ft); minimum, 23 cfs Aug. 22, 23, 1958 (gage height, 3.11 ft).

Remarks.--City of Aberdeen diverts about 56 cfs for municipal supply at intake $2\frac{1}{2}$ miles upstream. Other small diversions for irrigation and domestic use. No 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
1957	1,914	1,437	3,301	1,083	2,396	2,272	1,277	570	262	239	229	99.3	1,253
1958	428	1,030	2,630	3,129	2,998	1,084	1,459	555	252	97.4	41.5	112	1,139
1959	688	2,605	2,625	3,136	1,276	1,486	2,011	1,179	605	225	71.7	770	1,389
1960	1,029	2,682	2,372	1,908	2,674	1,321	1,721	1,137	599	178	98.3	95.6	1,311

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957	117,700	85,530	202,900	66,590	133,000	139,700	76,010	35,050	15,600	14,690	14,070	5,910	906,800
1958	26,300	61,310	161,700	192,400	66,400	66,680	86,840	32,920	14,980	5,990	2,550	6,640	824,700
1959	42,290	155,000	161,300	192,800	70,880	91,340	119,700	72,510	35,980	13,830	4,410	45,810	1,006,000
1960	63,260	159,600	145,900	117,300	153,800	81,200	102,400	69,940	35,670	10,970	6,050	5,690	951,800

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						
1957	1516	24,500	Dec. 10, 1956	62	1,253	906,800	1,036	749,900	
1958	1566	11,100	Dec. 26, 1957	24	1,139	824,700	1,290	934,000	
1959	1636	18,400	Apr. 30, 1959	44	1,389	1,006,000	1,403	1,016,000	
1960	1716	21,900	Nov. 20, 1959	54	1,311	951,800	-	-	

390. Humptulips River near Humptulips, Wash.

Location.--Lat 47°13'45", long 123°56'25", in NE¼ sec.17, T.20 N., R.10 W., on right bank 1 mile southeast of Humptulips, 2.5 miles upstream from Stevens Creek, and 3¼ miles downstream from confluence of East and West Forks.

Drainage area.--130 sq mi.

Records available.--May 1933 to January 1935, July 1942 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 120 ft (from topographic map). Prior to Jan. 14, 1935, and Mar. 1, 1950, to Jan. 15, 1953, water-stage recorder and July 1, 1942, to Feb. 28, 1950, and Jan. 17, 1953, to Sept. 30, 1959, staff gage; all at site 400 ft downstream at different datums.

Average discharge.--19 years (1933-34, 1942-60), 1,320 cfs (955,600 acre-ft per year).

Extremes.--1933-35, 1942-60: Maximum discharge, 33,000 cfs Jan. 22, 1935 (gage height, 12.7 ft, site and datum then in use, from floodmarks), from rating curve extended above 16,500 cfs; minimum observed, 82 cfs Sept. 11, 1944.

Revisions.--The momentary maximum discharge for the water year 1946 published in WSP 1316 has been revised to 13,200 cfs.

Remarks.--No diversion above station. Slight regulation by fish hatchery on West Fork for short periods at low flow. Records of chemical analyses for the period July 1959 to September 1960 are published in reports of 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	1,700	2,189	3,386	2,771	3,623	1,253	906	546	272	151	108	318	1,423
1952	1,837	1,787	1,837	1,701	2,230	1,133	1,188	869	586	265	277	211	1,155
1953	171	599	2,056	5,750	2,584	1,258	975	1,035	464	259	185	346	1,304
1954	938	2,275	3,413	2,557	3,901	1,292	1,359	419	468	511	248	391	1,465
1955	920	3,462	1,865	1,542	1,847	1,236	1,937	716	527	524	473	246	1,267
1956	1,754	3,335	2,545	2,542	950	2,615	1,427	739	895	390	226	428	1,507
1957	1,933	1,362	3,468	843	2,125	2,263	1,175	502	335	339	341	200	1,238
1958	527	1,084	2,656	3,105	2,943	1,025	1,512	434	255	151	110	218	1,158
1959	906	2,691	2,419	3,195	1,364	1,763	2,257	1,078	576	263	157	1,134	1,483
1960	1,270	2,775	2,334	1,944	2,739	1,337	1,759	1,186	603	223	210	231	1,377

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	104,500	130,300	208,200	170,400	201,200	77,030	53,930	33,550	16,160	9,300	6,670	18,900	1,030,000
1952	113,000	105,200	112,900	104,600	128,300	69,680	70,700	53,440	34,890	16,290	17,010	12,560	838,600
1953	10,510	35,620	126,400	353,600	143,500	77,380	58,030	63,620	27,600	15,940	11,380	20,590	944,200
1954	57,680	135,400	209,900	157,200	216,700	79,440	80,880	25,740	27,640	31,430	15,260	23,260	1,061,000
1955	56,580	206,000	114,700	94,810	102,600	76,020	115,300	44,020	31,350	32,240	29,100	14,630	917,400
1956	107,900	198,400	156,500	156,300	54,630	173,100	84,920	45,430	53,260	23,960	13,870	25,440	1,094,000
1957	118,900	81,060	213,200	51,840	118,000	139,100	69,930	30,890	19,920	20,810	20,940	11,920	896,500
1958	32,380	64,490	163,300	190,900	163,400	63,030	89,990	26,700	15,190	9,270	6,790	12,970	838,400
1959	55,720	160,100	148,700	196,500	75,770	108,400	134,300	66,270	34,290	16,200	9,680	67,480	1,075,000
1960	78,060	165,100	143,500	119,500	157,600	82,240	104,700	72,920	35,880	13,710	12,940	13,720	999,900

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	-	-	-	-	-	-	-	-	1,714	178.99	1,241,000	-
1951	1216	25,500	Feb. 9, 1951	95	1,423	10.9	148.58	1,030,000	1,268	132.44	918,200	-
1952	1246	11,600	Jan. 30, 1952	137	1,155	8.88	120.94	838,600	937	98.09	680,000	-
1953	1286	20,400	Jan. 23, 1953	124	1,304	10.0	136.19	944,200	1,622	169.40	1,175,000	-
1954	1346	14,600	Dec. 11, 1953	199	1,485	11.3	153.97	1,061,000	1,430	149.27	1,035,000	-
1955	1396	23,600	Nov. 18, 1954	195	1,267	9.75	132.29	917,400	1,385	144.63	1,005,000	-
1956	1446	25,000	Nov. 3, 1955	171	1,507	11.6	157.74	1,094,000	1,438	150.57	1,044,000	-
1957	1516	32,900	Dec. 9, 1956	165	1,238	9.52	129.31	896,500	1,027	107.26	743,500	-
1958	1566	11,000	Jan. 16, 1958	94	1,158	8.91	130.94	838,400	1,302	136.00	942,800	-
1959	1638	21,100	Apr. 29, 1959	138	1,483	11.4	154.84	1,073,000	1,513	158.03	1,096,000	-
1960	1716	21,500	Nov. 20, 1959	138	1,377	10.6	144.24	999,900	-	-	-	-

395. Quinault River at Quinault Lake, Wash.

Location.--Lat 47°27'30", long 123°53'30", in sec.25, T.23 N., R.10 W., on left bank at outlet of Quinault Lake, 50 ft downstream from Olympic Highway bridge on U. S. Highway 101 and 4 miles southwest of Quinault.

Drainage area.--264 sq mi.

Records available.--October 1911 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Datum of gage is 184.60 ft above mean sea level (State Highway Department bench mark). Prior to Jan. 1, 1913, staff gage on south shore of Quinault Lake 3 miles northeast of present site and Jan. 1, 1913, to Sept. 30, 1916, staff gage at mouth of Canoe Creek 4 miles northeast of present site, at datum 1.06 ft higher. Oct. 1, 1916, to May 2, 1935, water-stage recorder at site 300 ft downstream from present site at datum 0.36 ft higher than present datum.

Average discharge.--49 years (1911-60), 2,777 cfs (2,010,000 acre-ft per year).

Extremes.--1911-22, 1926-60: Maximum discharge, 50,200 cfs Nov. 4, 1955 (gage height, 20.51 ft); minimum, 276 cfs Sept. 12, 1944 (gage height, 1.96 ft).

Flood in November 1909 reached a stage of approximately 22 ft, present datum (discharge, 52,600 cfs).

Remarks.--Natural regulation by Quinault Lake. No diversion above station. Records of chemical analyses for the period July 1959 to September 1960 are published in reports of Geological Survey.

Correction.--Some figures of discharge for the water year 1917 were corrected in WSP 1636; the resulting corrected records as summarized herewith supersede those published in WSP 1316.

Month	Mean	Per square mile	Runoff	
			Inches	Acre-feet
Calendar year 1916.....	2,710	-	-	-
April 1917.....	2,820	-	-	168,000
July.....	3,070	-	-	189,000
September.....	993	-	-	59,100
Water year 1916-17.....	2,220	8.41	113.98	1,610,000
Calendar year 1917.....	2,820	-	145.15	2,050,000

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	3,743	4,899	7,752	4,825	7,181	1,892	2,394	2,715	2,224	1,232	571	556	3,309
1952	3,755	3,549	3,241	2,114	3,905	1,835	2,550	3,681	3,007	2,140	1,142	696	2,586
1953	414	1,153	3,556	11,390	5,218	2,054	2,059	3,399	2,534	2,452	1,224	854	3,006
1954	2,754	5,858	6,743	4,500	6,694	2,774	2,717	2,458	2,723	2,999	1,618	1,247	3,561
1955	3,244	8,465	4,116	2,568	3,072	1,438	3,144	2,234	3,755	2,893	1,691	845	3,111
1956	3,735	7,592	4,389	3,809	1,695	2,983	3,034	3,888	5,116	3,396	1,370	1,242	3,523
1957	4,347	2,966	6,229	1,687	3,829	3,729	2,822	2,879	1,980	1,374	1,041	644	2,793
1958	1,189	2,327	4,682	5,985	5,962	2,344	2,771	2,612	2,071	900	453	547	2,634
1959	2,218	5,261	5,449	5,882	2,186	2,673	4,044	3,786	2,830	1,672	706	2,291	3,255
1960	2,618	5,068	4,451	3,311	4,942	2,303	3,605	3,140	2,979	1,577	850	803	2,956

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	230,200	291,500	476,600	296,700	398,800	116,300	142,400	166,900	132,400	75,740	35,120	33,070	2,396,000
1952	229,700	199,300	195,300	130,000	224,600	101,800	151,700	228,400	178,900	131,600	70,210	40,810	1,884,000
1953	25,480	68,650	206,400	700,400	402,890	700,260	22,500	209,000	160,810	50,810	25,320	50,830	2,176,000
1954	169,300	548,600	414,600	276,700	371,800	700,500	161,700	151,100	162,000	184,400	93,320	74,180	2,578,000
1955	199,500	503,700	253,100	157,900	170,600	88,410	187,100	137,400	222,300	177,900	104,000	50,300	2,252,000
1956	229,700	451,800	269,300	234,200	97,490	183,400	180,500	239,100	304,400	208,800	84,220	73,880	2,557,000
1957	267,500	176,500	358,500	105,800	212,700	229,300	167,900	177,600	117,800	84,480	63,990	38,320	2,022,000
1958	73,110	138,500	297,300	369,000	353,100	44,100	164,900	160,600	123,200	55,310	27,860	32,570	1,907,000
1959	136,300	513,000	335,600	321,800	121,400	164,400	240,700	232,800	168,400	102,800	45,410	36,300	2,356,000
1960	160,800	501,600	272,400	203,600	284,300	141,600	214,500	193,100	177,300	96,990	52,240	47,770	2,146,000

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		Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	-	-	-
1951	1216	36,700	Feb. 10, 1951	345	3,309	12.5	170.15	2,396,000	3,718	191.19	2,692,000
1952	1246	11,500	Jan. 31, 1952	410	2,596	9.83	133.83	1,884,000	2,798	143.86	2,026,000
1953	1286	20,700	Jan. 12, 1953	360	3,006	11.4	154.55	2,176,000	3,879	199.43	2,808,000
1954	1346	17,000	Dec. 12, 1953	924	3,561	13.5	183.11	2,578,000	3,594	184.80	2,602,000
1955	1396	30,500	Nov. 18, 1954	604	3,111	11.8	159.95	2,252,000	3,104	159.60	2,247,000
1956	1446	50,200	Nov. 4, 1955	578	3,523	13.3	181.64	2,557,000	3,351	172.78	2,433,000
1957	1516	32,400	Dec. 10, 1956	487	2,793	10.6	145.58	2,022,000	2,341	120.34	1,695,000
1958	1568	15,300	Jan. 17, 1958	360	2,634	9.98	135.43	1,907,000	3,028	155.68	2,192,000
1959	1636	29,700	Apr. 30, 1959	505	3,255	12.3	167.34	2,356,000	3,186	163.82	2,307,000
1960	1716	25,800	Nov. 23, 1959	603	2,956	11.2	152.43	2,146,000	-	-	-

410. Hoh River near Forks, Wash.
(Formerly published as Hoh River near Spruce)

Location.--Lat 47°48'20", long 124°06'20", in SW 1/4 sec. 34, T. 27 N., R. 11 W., on left bank 1 mile downstream from Maple Creek, 5 miles downstream from South Fork, and 1 1/2 miles southeast of Forks.

Drainage area.--208 sq mi.

Records available.--August 1926 to September 1960. Prior to October 1958, published as "near Spruce".

Gage.--Water-stage recorder. Altitude of gage is 320 ft (from river-profile map).

Average discharge.--34 years (1926-60), 2,012 cfs (1,457,000 acre-ft per year).

Extremes.--1926-60: Maximum discharge, 38,700 cfs Nov. 26, 1949 (gage height, 22.2 ft, from high-water mark), from rating curve extended above 13,000 cfs on basis of slope-area measurement of peak flow; minimum, 247 cfs Nov. 14, 15, 1929; minimum gage height, 0.66 ft Oct. 6, 18, 1957.

Maximum stage known since at least 1891, that of Nov. 26, 1949.

Revisions.--The momentary maximum discharge for water year 1945 published in WSP 131b has been revised to 31,200 cfs (estimated).

Remarks.--No artificial regulation or diversion above station. Large diurnal fluctuation during summer months caused by melting glaciers at source.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2,362	2,836	4,348	3,200	4,625	1,504	1,571	1,522	1,590	1,291	823	934	2,203
1952	2,646	2,498	2,081	1,537	2,420	1,011	1,557	2,016	1,897	1,776	1,283	802	1,791
1953	577	857	2,492	7,092	3,234	1,529	1,368	2,074	1,675	1,893	1,275	1,157	2,102
1954	2,257	3,736	4,702	3,159	4,771	1,819	1,824	1,869	1,943	2,277	1,479	1,220	2,576
1955	2,339	5,912	2,859	1,638	1,895	1,094	2,051	1,498	2,563	2,193	1,410	930	2,194
1956	2,369	4,665	2,955	2,736	1,441	2,232	2,113	2,354	3,201	2,423	1,348	1,359	2,434
1957	3,076	2,078	3,892	1,260	2,479	2,431	1,714	1,973	1,656	1,509	1,176	1,026	2,023
1958	1,270	1,546	3,077	3,726	3,524	1,460	1,647	1,744	1,767	1,293	944	1,004	1,908
1959	2,112	3,615	3,693	3,569	1,409	1,899	2,614	2,367	2,041	1,599	923	2,030	2,327
1960	2,050	2,899	2,826	2,100	2,886	1,650	2,223	2,195	2,105	1,531	1,056	821	2,024

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	145,200	168,800	267,300	196,800	256,800	92,460	93,500	93,600	94,630	79,360	50,610	55,600	1,595,000
1952	162,700	148,600	128,000	94,480	139,200	62,190	92,630	124,000	112,800	109,200	78,880	47,740	1,301,000
1953	35,500	50,980	153,200	436,100	179,600	94,020	81,390	127,500	99,670	116,400	78,400	68,870	1,522,000
1954	138,800	222,300	289,100	194,300	265,000	111,900	108,500	116,200	115,600	140,000	90,920	72,570	1,865,000
1955	143,800	351,800	175,800	100,700	105,200	67,270	122,100	92,100	152,500	134,900	86,730	55,330	1,588,000
1956	145,700	277,600	181,700	168,300	82,890	137,200	125,800	144,800	190,500	149,000	82,870	80,850	1,767,000
1957	189,100	123,600	239,300	77,500	137,700	149,500	102,000	121,300	98,540	92,790	72,340	61,030	1,465,000
1958	78,080	91,980	183,200	229,100	195,700	89,740	96,030	107,200	105,100	79,480	58,020	59,770	1,381,000
1959	129,900	215,100	227,000	19,500	78,270	116,700	155,500	145,500	121,400	98,300	56,740	20,800	1,685,000
1960	126,000	172,500	173,800	129,100	166,000	120,500	132,300	135,000	125,300	94,160	64,930	48,860	1,469,000

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	-	-	-	-	-	-	-	-	2,371	154.71	1,716,000		
1951	1216	22,400	Feb. 10, 1951	463	2,203	10.6	143.74	1,595,000	2,007	130.95	1,453,000		
1952	1246	11,400	Jan. 30, 1952	619	1,791	8.61	117.24	1,301,000	1,516	99.24	1,101,000		
1953	1286	16,900	Jan. 31, 1953	421	2,102	10.1	137.17	1,522,000	2,662	74.17	1,332,000		
1954	1346	17,600	Jan. 4, 1954	808	2,576	12.4	168.12	1,865,000	2,606	170.04	1,886,000		
1955	1396	25,800	Nov. 18, 1954	565	2,194	10.5	143.18	1,588,000	2,102	137.18	1,522,000		
1956	1446	33,600	Nov. 3, 1955	554	2,434	11.7	159.29	1,767,000	2,361	154.52	1,714,000		
1957	1516	26,400	Dec. 9, 1956	674	2,023	9.73	132.03	1,465,000	1,757	114.66	1,272,000		
1958	1566	13,800	Dec. 25, 1957	496	1,908	9.17	124.54	1,381,000	2,202	143.72	1,594,000		
1959	1636	19,000	Apr. 29, 1959	596	2,327	11.2	151.68	1,685,000	2,190	142.89	1,585,000		
1960	1716	23,200	Nov. 22, 1959	580	2,024	9.73	132.45	1,469,000	-	-	-		

415. Soleduck River near Fairholm, Wash.

Location.--Lat 48°02'40", long 123°57'35", in lot 4, SW $\frac{1}{4}$ sec.35, T.30 N., R.10 W., on right bank 300 ft downstream from South Fork, 2.5 miles southwest of Fairholm, and 17 miles east of Beaver.

Drainage area.--83.8 sq mi.

Records available.--October 1917 to September 1921, October 1933 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,060 ft (from topographic map). October 1917 to September 1921 water-stage recorder and Oct. 4 to Nov. 4, 1933, staff gage, at same site at datum 1.2 ft higher.

Average discharge.--31 years (1917-21, 1933-60), 622 cfs (450,300 acre-ft per year).

Extremes.--1917-21, 1933-60: Maximum discharge, 23,500 cfs Nov. 26, 1949 (gage height, 16.42 ft, from high-water mark in well), from rating curve extended above 13,000 cfs on basis of slope-area measurement of peak flow; minimum, 51 cfs Sept. 11, 12, 1944; minimum gage height, 0.97 ft Oct. 17-20, 1952.

Remarks.--No regulation or diversion above station.

Correction.--In WSP 1316, the mean for October 1936 is listed in error; it should be 87.6 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	743	1,085	1,601	1,167	1,668	456	603	578	460	234	112	116	729
1952	653	808	649	438	819	333	572	712	561	358	168	103	513
1953	82.8	202	768	2,582	1,016	478	457	686	539	470	219	213	643
1954	578	1,177	1,575	1,057	1,726	575	586	662	659	607	334	218	808
1955	524	1,758	1,021	571	691	305	668	623	979	624	287	135	682
1956	641	1,622	957	769	258	565	803	1,036	1,090	638	224	247	738
1957	976	753	1,442	344	946	776	596	599	367	222	150	111	606
1958	232	388	1,039	1,375	1,132	465	579	509	356	148	80.4	122	532
1959	462	1,246	1,267	1,257	469	640	967	773	572	304	123	341	703
1960	569	969	1,029	767	997	584	820	803	632	301	163	126	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	45,690	64,550	98,440	71,770	92,660	28,020	35,860	35,570	27,350	14,390	6,860	6,890	528,000
1952	40,140	48,050	39,920	26,900	47,140	20,480	34,010	43,750	33,380	22,040	10,340	8,120	372,300
1953	5,090	12,030	47,230	58,800	56,410	29,400	27,170	42,210	32,090	28,910	13,480	12,680	465,500
1954	35,520	70,030	96,830	65,000	95,840	35,360	35,430	40,710	39,220	37,310	20,520	12,950	584,700
1955	32,240	104,600	62,780	35,120	38,370	18,760	40,960	38,320	58,260	38,370	17,650	8,050	493,500
1956	39,440	96,530	58,840	47,290	14,820	34,750	47,810	63,690	64,880	39,210	13,770	14,710	535,700
1957	60,000	44,780	88,690	21,130	52,540	47,690	35,480	36,820	21,830	13,670	9,250	6,610	438,500
1958	14,250	23,100	63,880	84,530	62,870	28,620	34,460	31,320	21,160	9,070	4,940	7,280	385,500
1959	28,400	74,150	77,920	77,320	26,070	39,370	57,540	47,520	34,060	18,690	7,540	20,280	508,900
1960	35,000	57,650	63,250	47,150	57,360	35,900	46,700	49,350	37,600	18,480	10,040	7,470	468,000

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	-	-	-	-	-	-	-	-	828	133.98	599,700
1951	1216	10,800	Feb. 9, 1951	67	729	8.70	118.15	528,000	618	100.12	447,500
1952	1246	4,740	Jan. 30, 1952	76	513	6.12	83.29	372,300	425	69.03	308,500
1953	1286	8,640	Jan. 9, 1953	63	643	7.67	104.16	465,500	834	135.04	603,500
1954	1346	8,080	Jan. 5, 1954	142	808	9.64	130.82	584,700	804	130.21	582,000
1955	1396	10,800	Nov. 18, 1954	103	682	8.14	110.43	493,500	675	109.35	488,700
1956	1446	18,000	Nov. 3, 1955	98	738	8.81	119.88	535,700	736	119.57	534,400
1957	1516	16,300	Dec. 9, 1956	95	606	7.23	98.11	438,500	478	77.48	346,200
1958	1566	7,090	Dec. 25, 1957	60	532	6.35	86.24	385,500	642	103.96	464,700
1959	1636	9,260	Apr. 29, 1959	76	705	8.39	113.84	508,900	669	108.35	484,500
1960	1716	9,010	Jan. 29, 1960	90	645	7.70	104.70	468,000	-	-	-

445. Salt Creek near Port Angeles, Wash.

Location.--Lat 48°07'40", long 123°40'40", in NW $\frac{1}{4}$ sec.2, T.30 N., R.8 W., on right bank a quarter of a mile upstream from West Fork and 8 miles west of Port Angeles.

Drainage area.--8.31 sq mi.

Records available.--May to November 1952.

Gage.--Water-stage recorder. Altitude of gage is 190 ft (from topographic map).

Extremes.--May to November 1952: Maximum discharge, 4.8 cfs May 22; maximum gage height, 1.54 ft Oct. 30; minimum discharge, 0.31 cfs Oct. 7, 8 (gage height, 1.33 ft).

Remarks.--No known regulation or diversion 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
1952	-	-	-	-	-	-	-	-	1.48	0.841	0.48	1.10	-
1953	0.631	-	-	-	-	-	-	-	-	-	-	-	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1952	-	-	-	-	-	-	-	-	88	52	30	65	-
1953	39	-	-	-	-	-	-	-	-	-	-	-	-

ELWHA RIVER BASIN

450. Lake Mills at Glines Canyon, near Port Angeles, Wash.

Location.--Lat 48°00'05", long 123°36'00", on Elwha River, in SE $\frac{1}{4}$ sec.17, T.29 N., R.7 W., at Glines Canyon Dam 2 miles upstream from Griff Creek, 4 miles south of Elwha, and 11 miles southwest of Port Angeles.

Drainage area.--245 sq mi.

Records available.--April 1927 to September 1960.

Gage.--Staff gage. Datum of gage is 19.67 ft below mean sea level, datum of 1929, supplementary adjustment of 1947.

Extremes.--1927-60: Maximum contents observed, 39,940 acre-ft Dec. 22, 1936 (gage height, 613.0 ft); minimum observed since reservoir first filled in May 1927, 24,290 acre-ft Nov. 14, 1929 (gage height, 574.4 ft).

Remarks.--Reservoir is formed by concrete dam, completed in 1927; storage began Apr. 1, 1927. Total capacity, 37,790 acre-ft at gage height 608 ft (top of gates). Figures given herein represent total contents. Water is used for power by Crown Zellerbach Corp.

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

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	38,520	38,520	38,560	38,860	38,310	37,830	38,000	38,260	38,690	38,440	37,160	38,650
1952	38,220	38,740	38,180	38,990	38,350	37,750	39,080	38,350	38,480	38,860	38,310	35,110
1953	32,930	33,140	38,310	38,650	38,130	36,740	38,440	38,560	38,610	38,740	38,350	38,390
1954	38,860	38,350	38,310	37,330	38,520	36,780	35,940	38,180	38,520	39,080	38,480	36,990
1955	37,450	39,170	38,130	37,830	37,240	36,150	34,200	38,350	38,130	38,860	37,750	36,190
1956	38,610	37,540	36,320	36,360	36,700	37,160	38,910	38,910	38,390	38,820	37,540	38,690
1957	38,440	36,450	38,860	37,580	36,280	35,860	37,200	38,220	38,690	37,710	37,920	37,540
1958	38,650	37,540	38,480	38,310	39,040	36,280	35,190	37,830	38,690	37,880	37,660	35,650
1959	37,500	38,820	38,690	38,520	37,620	37,370	38,220	38,690	37,960	38,000	37,790	37,160
1960	37,880	39,040	38,820	38,440	38,310	38,740	37,830	37,920	38,000	38,520	37,120	37,330

455. Elwha River at McDonald Bridge, near Port Angeles, Wash.

Location.--Lat 48°03'20", long 123°34'55", in NE 1/4 sec. 33, T.30 N., R.7 W., on right bank 300 ft upstream from site of McDonald Bridge (now removed), half a mile upstream from Little River, 7 miles from mouth, and 8 miles southwest of Port Angeles.

Drainage area.--269 sq mi.

Records available.--October 1897 to December 1901, October 1918 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 200.00 ft above mean sea level, datum of 1929. Oct. 1, 1897, to Dec. 31, 1901, wire-weight gage at McDonald Bridge at different datum. Dec. 9, 1918, to May 1, 1936, water-stage recorder under McDonald Bridge at datum 7.4 ft higher.

Average discharge.--46 years (1897-1901, 1918-60), 1,487 cfs (1,077,000 acre-ft per year), adjusted for storage since April 1927.

Extremes.--1897-1901, 1918-60: Maximum discharge, 41,600 cfs Nov. 18, 1897 (gage height, 14.5 ft, from graph based on gage readings, site and datum then in use), from rating curve extended above 3,300 cfs on basis of two determinations of flow over dam at discharge 26,700 and 30,100 cfs, referred to 1897 datum; minimum daily, 10 cfs Oct 3, 1938.

Remarks.--Water is diverted through Glines Canyon powerhouse and returned to river above gage. Flow partly regulated by Lake Mills (see preceding page). Records of chemical analyses for the period July 1959 to September 1960 are published in reports of 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	1,379	2,276	3,617	1,976	3,106	1,074	1,617	2,208	2,305	1,484	720	488	1,846
1952	1,246	1,274	1,245	714	1,320	763	1,281	2,258	2,110	1,701	894	560	1,278
1953	587	417	988	4,035	2,215	950	891	2,200	2,000	2,203	1,133	773	1,530
1954	1,187	2,502	3,035	2,107	3,211	1,517	1,292	2,219	2,418	2,701	1,544	980	2,051
1955	1,507	3,560	2,062	1,124	1,259	654	1,218	1,452	3,126	2,110	1,142	696	1,640
1956	1,254	3,240	1,940	1,541	746	1,005	1,731	3,333	3,754	2,802	1,288	864	1,960
1957	1,634	1,574	2,592	939	1,994	1,661	1,334	3,329	1,751	1,077	654	508	1,519
1958	526	769	1,428	2,560	2,549	1,264	1,125	2,413	2,160	1,060	573	506	1,405
1959	901	2,209	2,939	2,638	1,093	1,060	1,943	2,324	2,372	1,566	703	806	1,717
1960	963	2,136	2,112	1,530	2,227	1,210	1,746	1,949	2,436	1,486	759	465	1,580

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	84,810	35,400	22,400	21,500	72,500	66,050	96,230	135,800	137,100	91,250	44,270	29,060	1,336,000
1952	76,590	75,790	76,570	43,880	75,900	46,920	76,240	137,600	125,600	104,600	54,970	33,340	928,000
1953	23,770	24,820	60,750	248,000	125,000	58,410	58,950	135,300	123,800	135,400	69,640	46,010	1,108,000
1954	71,770	146,900	166,000	129,500	178,300	93,300	76,880	136,500	143,900	166,100	94,930	58,340	1,485,000
1955	80,350	211,800	126,800	69,090	69,950	40,230	72,500	89,310	186,000	129,800	70,250	41,410	1,187,000
1956	77,080	192,800	119,300	94,770	42,890	61,780	103,000	204,900	223,400	172,300	79,220	51,410	1,423,000
1957	112,800	93,690	159,400	57,720	110,200	102,100	79,380	143,200	104,200	66,230	40,240	30,240	1,099,000
1958	32,350	45,750	87,790	57,400	141,600	77,740	66,920	148,400	128,500	65,190	35,240	30,130	1,017,000
1959	55,380	131,500	180,700	162,200	60,720	65,190	115,600	142,900	141,100	96,270	43,240	47,980	1,243,000
1960	59,210	127,100	129,800	94,090	128,100	74,370	103,900	119,800	144,900	91,400	46,700	27,680	1,147,000

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30										Calendar year					
		Observed					Adjusted					Observed			Adjusted		
		Momentary		maximum	Mini-	Mean	Runoff in acre-feet	Mean	Per square mile	Runoff in inches	Mean	Runoff in acre-feet	Mean	Runoff in inches			
		Discharge	Date	mum day													
1950	-	-	-	-	-	-	-	-	-	2,091	1,514,000	2,091	105.52				
1951	1216	14,300	Feb. 9, 1951	266	1,846	1,336,000	1,848	6.87	93.25	1,551	1,123,000	1,550	78.24				
1952	1246	5,380	Oct. 19, 1951	266	1,278	928,000	1,273	4.73	64.45	1,114	808,400	1,114	56.35				
1953	1286	11,100	Jan. 31, 1953	248	1,530	1,108,000	1,535	5.71	77.43	1,942	1,406,000	1,942	97.99				
1954	1346	9,820	Dec. 11, 1953	545	2,051	1,485,000	2,049	7.62	105.42	2,067	1,497,000	2,067	104.31				
1955	1396	14,300	Nov. 18, 1954	500	1,640	1,187,000	1,639	6.09	82.71	1,599	1,158,000	1,597	80.56				
1956	1446	21,400	Nov. 3, 1955	360	1,960	1,423,000	1,963	7.30	99.34	1,928	1,400,000	1,933	97.73				
1957	1516	22,100	Dec. 9, 1956	301	1,519	1,099,000	1,517	5.64	76.56	1,242	899,400	1,242	62.66				
1958	1566	10,500	Jan. 16, 1958	280	1,405	1,017,000	1,402	5.21	70.76	1,683	1,219,000	1,684	98.94				
1959	1636	15,400	Apr. 29, 1959	306	1,717	1,243,000	1,720	6.39	86.74	1,646	1,191,000	1,646	83.05				
1960	1716	22,900	Nov. 22, 1959	304	1,580	1,147,000	1,580	5.87	79.97	-	-	-	-				

465. Elwha River below diversion, near Port Angeles, Wash.

Location.--Lat 48°06'55", long 123°33'10". in NE $\frac{1}{4}$ sec.10, T.30 N., R.7 W., on right bank at upstream side of railroad bridge $2\frac{1}{4}$ miles upstream from mouth and $3\frac{1}{2}$ miles west of Port Angeles.

Drainage area.--318 sq mi.

Records available.--July 1951 to September 1954 (discharge measurements only December 1951 to August 1952).

Gage.--Water-stage recorder. Altitude of gage is 60 ft (from topographic map).

Extremes.--1951-54: Maximum discharge recorded, 12,600 cfs Jan. 9, 1953 (gage height, 5.88 ft); minimum recorded, 62 cfs Nov. 28, 1952 (gage height, 0.29 ft).

Remarks.--Flow affected by Lake Mills and Lake Aldwell. Flow diverted through Glines Canyon powerhouse and returned to river above gage. Port Angeles industrial canal diverts water 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	-	-	-	-	-	-	-	-	-	-	642	432	-
1952	1,124	1,329	-	-	-	-	-	-	-	-	-	-	-
1953	288	135	918	4,530	2,416	972	983	2,166	2,040	2,125	1,007	871	1,535
1954	1,081	2,485	3,118	2,358	3,649	1,644	1,321	2,227	2,429	2,735	1,499	849	2,111

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	39,470	25,680	-
1952	69,110	79,110	-	-	-	-	-	-	-	-	-	-	-
1953	17,730	18,780	56,480	278,600	134,200	59,750	58,480	133,200	121,400	130,700	61,920	39,920	1,111,000
1954	66,490	147,800	191,700	145,000	204,900	101,100	78,620	136,900	144,500	168,200	92,190	50,540	1,528,000

Yearly discharge, in cubic feet per second

Daily discharge in acre-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	1246	-	-	-	-	-	-	-
1952	1246	-	-	-	-	-	-	-
1953	1286, 1346	12,600	Jan. 9, 1953	120	1,535	1,111,000	1,967	1,424,000
1954	1346	10,800	Jan. 5, 1954	243	2,111	1,528,000	-	-

ENNIS CREEK BASIN

470. Ennis Creek near Port Angeles, Wash.

Location.--Lat 48°06'25", long 123°23'40", in SW $\frac{1}{4}$ sec.12, T.30 N., R.6 W., on right bank 1 mile upstream from mouth and 1 mile east of Port Angeles.

Drainage area.--8.32 sq mi.

Records available.--May to October 1952.

Gage.--Water-stage recorder. Altitude of gage is 85 ft (from topographic map).

Extremes.--May to October 1952: Maximum discharge, 23 cfs May 23 (gage height, 1.52 ft); minimum, 2.3 cfs Oct. 17-19 (gage height, 1.01 ft).

Remarks.--No known regulation or diversion 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
1952	-	-	-	-	-	-	-	-	14.7	11.0	4.56	3.46	-
1953	2.88	-	-	-	-	-	-	-	-	-	-	-	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1952	-	-	-	-	-	-	-	-	873	674	280	206	-
1953	177	-	-	-	-	-	-	-	-	-	-	-	-

SIEBERT CREEK BASIN

475. Siebert Creek near Port Angeles, Wash.

Location.--Lat 48°05'00", long 123°16'52", in SW 1/4 sec. 23, T.30 N., R.5 W., on right bank 300 ft downstream from Emery Creek, 3 1/2 miles upstream from mouth, and 6 1/2 miles southeast of Port Angeles.

Drainage area.--15.5 sq mi. At site prior to Apr. 22, 1960, 16.1 sq mi (revised).

Records available.--June 1952 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 280 ft (from topographic map). Prior to Apr. 22, 1960, at site within three-quarters of a mile downstream at different datums.

Average discharge.--8 years (1952-60), 20.6 cfs (14,910 acre-ft per year).

Extremes.--1952-60: Maximum discharge, 1,620 cfs Nov. 3, 1955 (gage height, 10.26 ft, former datum), from rating curve extended above 260 cfs on basis of computations of peak flow through culvert; maximum gage height, 14.49 ft Jan. 29, 1960, former site and datum (backwater from plugged culvert), 4.90 ft present site and datum, from outside high-water marks; minimum discharge, 2.0 cfs Sept. 3-5, 1952, Aug. 19-26, 1958, Aug. 25, 26, 1959.

Remarks.--No regulation or diversion 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	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	2.23	2.52	6.71	69.1	29.2	12.0	8.83	7.16	15.3	6.34	3.50	3.88	13.8
1954	5.45	11.5	31.2	141	185	20.0	8.87	7.93	7.58	6.77	4.82	8.88	35.6
1955	11.0	36.3	35.7	17.4	37.3	18.5	31.3	14.9	14.8	17.4	4.90	3.71	19.9
1956	7.14	121	78.5	54.7	25.6	47.4	27.4	11.0	12.5	5.35	3.81	3.81	33.1
1957	16.8	13.7	45.9	9.43	58.4	40.0	20.9	11.6	6.06	4.59	4.65	3.36	19.2
1958	3.45	4.51	19.7	23.3	25.8	13.8	14.0	6.38	6.57	3.22	2.51	2.93	10.4
1959	5.43	20.7	29.2	40.4	14.8	14.5	16.7	17.6	7.50	3.88	2.81	3.05	14.7
1960	4.23	12.6	29.4	42.7	54.2	28.3	14.4	14.7	6.49	3.37	3.25	2.71	17.9

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	319	217	158	134	-
1953	137	150	412	4,250	1,620	737	525	440	913	390	215	231	10,020
1954	335	685	1,920	8,650	10,260	1,230	528	487	450	416	296	527	25,780
1955	678	2,160	2,070	1,070	2,070	1,140	1,860	914	880	1,070	301	221	14,430
1956	439	7,200	4,850	3,360	1,470	2,920	1,630	679	746	329	234	227	24,060
1957	1,030	813	2,820	580	3,130	2,460	1,240	716	360	282	286	200	13,920
1958	212	268	1,210	1,430	1,430	848	830	391	391	196	154	174	7,540
1959	334	1,230	1,790	2,480	823	894	994	1,080	448	237	160	181	10,650
1960	260	751	1,810	2,620	3,120	1,740	858	901	386	207	200	161	13,010

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	Runoff	
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1950											
1951											
1952	1246										
1953	1288	303	Jan. 9, 1953	2.1	13.8	0.857	11.66	10,020	16.9	14.28	12,260
1954	1346	1,400	Jan. 5, 1954	3.6	35.6	2.21	30.02	25,780	38.3	32.31	27,750
1955	1396	480	Feb. 7, 1955	3.6	19.9	1.24	16.80	14,430	30.4	25.59	22,000
1956	1446	1,620	Nov. 3, 1955	2.9	33.1	2.06	28.01	24,060	22.4	18.94	16,260
1957	1516	1,230	Dec. 9, 1956	2.9	19.2	1.19	16.23	13,920	15.1	12.76	10,940
1958	1566	304	Dec. 25, 1957	2.0	10.4	0.648	8.80	7,540	12.7	10.74	9,200
1959	1636	137	Jan. 24, 1959	2.2	14.7	0.913	12.42	10,650	14.0	11.80	10,120
1960	1716	924	Jan. 29, 1960	2.4	17.9	1.13	15.27	13,010	-	-	-

480. Dungeness River near Sequim, Wash.

Location.--Lat 48°00'50", long 123°07'55", in NW 1/4 sec. 13, T. 29 N., R. 4 W., on right bank three-quarters of a mile upstream from Canyon Creek, 4 1/2 miles southwest of Sequim, and 11 1/2 miles upstream from mouth.

Drainage area.--156 sq mi.

Records available.--June 1923 to September 1930, June 1937 to September 1960. July 1897 to July 1898 at site below Canyon Creek, published as "near Sequim," records not equivalent.

Gage.--Water-stage recorder. Datum of gage is 569.3 ft above mean sea level (river-profile survey). June 8, 1923, to Sept. 30, 1930, staff gage just above fish-hatchery diversion half a mile downstream at different datum. June 19 to Aug. 12, 1937, staff gage at present site and datum.

Average discharge.--30 years (1923-30, 1937-60), 371 cfs (268,600 acre-ft per year).

Extremes.--1923-30, 1937-60: Maximum discharge, 6,820 cfs Nov. 27, 1949 (gage height, 7.3 ft), from rating curve extended above 2,000 cfs on basis of slope-area measurement of peak flow; minimum observed, 77 cfs Sept. 10, 1928.

Remarks.--No regulation or diversion above station. Records of chemical analyses for the water year 1960 are given in reports of 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	296	550	842	495	754	294	441	641	717	502	243	158	493
1952	242	228	234	133	250	182	377	612	602	527	271	149	317
1953	106	102	174	736	439	209	305	675	689	758	393	233	402
1954	290	581	571	493	815	384	311	638	747	840	521	364	545
1955	429	866	468	259	271	166	265	464	913	652	351	215	443
1956	259	773	460	351	181	213	509	893	1,151	837	401	235	522
1957	452	344	524	201	451	387	312	829	642	373	235	180	411
1958	174	174	246	436	583	290	254	869	894	432	223	160	393
1959	210	393	561	567	235	205	404	681	727	511	246	198	411
1960	188	387	490	388	533	282	364	566	786	456	230	139	400

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	18,190	52,760	51,750	50,450	41,880	18,070	26,250	39,430	42,680	30,840	14,960	9,390	356,600
1952	14,910	13,590	14,410	8,180	14,410	11,220	22,430	37,630	35,800	32,400	16,630	8,840	230,400
1953	6,550	6,100	10,700	45,240	24,370	12,820	18,140	41,480	40,980	46,600	24,150	13,860	291,000
1954	17,850	34,560	35,100	30,340	45,290	23,620	18,520	39,250	44,460	51,650	32,060	21,680	394,400
1955	26,370	51,550	28,800	15,910	15,060	10,190	15,760	28,560	54,330	40,090	21,570	12,800	321,000
1956	15,910	45,970	28,280	21,560	10,400	13,120	50,270	54,930	68,480	51,480	24,680	13,970	379,000
1957	27,770	20,480	32,230	12,360	25,020	23,820	18,590	50,950	38,190	22,940	14,470	10,700	297,500
1958	10,690	10,350	15,100	26,800	32,370	17,850	15,090	53,460	53,210	26,580	13,690	9,510	284,700
1959	12,890	23,370	34,490	34,850	13,050	12,590	24,020	40,660	43,280	31,440	15,110	11,770	297,500
1960	11,570	23,040	30,110	23,830	30,640	17,370	21,640	34,770	46,760	28,030	14,150	6,130	290,000

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	-	-	-	-	-	-	-	-	520	45.30	376,800	
1951	1216	4,600	Feb. 9, 1951	118	493	3.16	42.87	356,600	410	35.67	296,900	
1952	1246	1,860	Apr. 30, 1952	105	317	2.03	27.68	230,400	290	25.34	210,900	
1953	1286	2,480	Jan. 12, 1953	84	402	2.58	34.98	291,000	491	42.69	355,100	
1954	1346	3,990	Jan. 5, 1954	186	545	3.49	47.40	394,400	571	49.72	413,600	
1955	1396	3,570	Nov. 18, 1954	146	443	2.84	38.57	321,000	420	36.58	304,400	
1956	1446	6,750	Nov. 3, 1955	139	522	3.35	45.57	379,000	509	44.40	369,400	
1957	1516	4,270	Dec. 9, 1956	150	411	2.63	35.75	297,500	350	30.43	253,200	
1958	1566	2,640	Feb. 24, 1958	118	393	2.52	34.23	284,700	441	38.39	319,300	
1959	1636	3,280	Apr. 29, 1959	110	411	2.63	35.78	297,500	403	35.05	291,500	
1960	1716	6,380	Jan. 29, 1960	106	400	2.56	34.86	290,000	-	-	-	

JIMMYCOMELATELY CREEK BASIN

495. Jimmycomelately Creek near Blyn, Wash.

Location.--Lat 48°00'40", long 123°00'05", in NE $\frac{1}{4}$ sec.13, T.29 N., R.3 W., on left bank 1 mile upstream from mouth and 1 mile south of Blyn.

Drainage area.--18.3 sq mi.

Records available.--May to November 1952.

Gage.--Water-stage recorder. Altitude of gage is 80 ft (from topographic map).

Extremes.--May to November 1952: Maximum discharge, 14.1 cfs June 22 (gage height, 1.21 ft); minimum, 0.96 cfs Sept. 3-6, Oct. 15-20; minimum gage height, 0.77 ft Oct. 9-16.

Remarks.--No known regulation or diversion 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
1952	-	-	-	-	-	-	-	-	4.41	2.57	1.46	1.24	-
1953	1.30	-	-	-	-	-	-	-	-	-	-	-	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1952	-	-	-	-	-	-	-	-	262	158	90	74	-
1953	80	-	-	-	-	-	-	-	-	-	-	-	-

SALMON CREEK BASIN

500. Salmon Creek near Maynard, Wash.

Location.--Lat 47°58'50", long 122°53'40", in N $\frac{1}{2}$ sec.26, T.29 N., R.2 W., on right bank 1 mile upstream from mouth and $1\frac{1}{2}$ miles southwest of Maynard.

Drainage area.--13.0 sq mi.

Records available.--May to November 1952.

Gage.--Water-stage recorder. Altitude of gage is 75 ft (from topographic map).

Extremes.--May to November 1952: Maximum discharge, 11.5 cfs June 21 (gage height, 1.28 ft); minimum, 0.7 cfs Sept. 20, 21 (gage height, 0.81 ft).

Remarks.--No regulation. 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
1952	-	-	-	-	-	-	-	-	4.51	2.85	1.78	1.36	-
1953	1.74	-	-	-	-	-	-	-	-	-	-	-	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1952	-	-	-	-	-	-	-	-	268	176	109	81	-
1953	107	-	-	-	-	-	-	-	-	-	-	-	-

SNOW CREEK BASIN

505. Snow Creek near Maynard, Wash.

Location.--Lat 47°56'30", long 122°53'05", in SE $\frac{1}{4}$ sec.2, T.28 N., R.2 W., on left bank 600 ft upstream from Andrews Creek and $3\frac{1}{4}$ miles south of Maynard.

Drainage area.--13.2 sq mi.

Records available.--May 1952 to September 1960.

Gage.--Water-stage recorder and wooden control. Altitude of gage is 180 ft (from topographic map).

Average discharge.--8 years (1952-60), 17.4 cfs (12,600 acre-ft per year).

Extremes.--1952-60: Maximum discharge, 733 cfs about Jan. 8, 1959 (gage height, 4.07 ft, from high-water mark), from rating curve extended above 40 cfs on basis of slope-area measurement of peak flow; minimum, 1.1 cfs Aug. 7-11, 1959.

Remarks.--Some small diversion for irrigation. No regulation.

Monthly and yearly mean discharge, in cubic feet per second, of Snow Creek near Maynard, Wash.

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	2.38	4.43	19.9	53.0	19.8	12.7	16.5	18.2	26.7	8.63	6.04	4.27	16.0
1954	6.73	20.4	21.3	37.4	68.5	20.6	18.0	14.2	15.8	13.8	5.77	9.41	20.7
1955	7.45	26.3	28.0	16.6	18.6	15.1	32.1	24.2	24.0	19.9	5.99	3.89	18.5
1956	4.71	24.1	47.9	45.3	16.5	30.2	46.0	19.7	20.6	6.40	4.25	3.67	22.5
1957	11.3	8.17	16.9	6.55	21.4	33.0	27.4	13.3	7.50	8.21	4.43	2.80	13.4
1958	3.31	4.70	16.0	24.2	46.7	15.4	18.2	3.14	10.2	5.70	2.54	2.51	12.7
1959	3.45	7.41	15.7	94.7	22.8	23.0	21.9	33.6	12.7	4.65	2.13	2.79	20.5
1960	3.00	9.05	18.9	29.0	37.7	14.4	16.7	30.6	11.2	3.85	2.74	2.61	14.9

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	706	441	181	144	-
1952	-	-	-	-	-	-	-	-	706	441	181	144	-
1953	146	264	1,220	3,260	1,100	781	980	1,120	1,590	531	371	254	11,620
1954	414	1,210	1,310	2,300	3,800	1,270	1,070	875	943	851	355	560	14,960
1955	458	1,570	1,720	1,020	1,030	930	1,910	1,490	1,430	1,220	368	231	13,390
1956	290	1,440	2,940	2,780	948	1,860	2,740	1,210	1,230	394	261	218	16,310
1957	693	486	1,040	403	1,190	2,030	1,630	816	446	505	272	166	9,680
1958	204	280	984	1,490	2,600	946	1,080	500	609	228	156	149	9,230
1959	212	441	963	5,820	1,270	1,420	1,300	2,070	758	286	151	166	14,840
1960	184	539	1,160	1,780	2,170	883	996	1,880	667	237	168	155	10,820

Yearly 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	1246	-	-	-	-	-	-	-	-	-	-
1953	1286	245	Jan. 8, 1953	2.0	16.0	1.21	16.51	11,620	17.8	18.37	12,920
1954	1346	-	-	3.4	20.7	1.57	21.26	14,960	21.8	22.40	15,770
1955	1396	129	Dec. 6, 1954	3.1	18.5	1.40	19.00	15,390	19.8	20.31	14,300
1956	1446	216	Jan. 6, 1956	2.7	22.5	1.70	23.16	16,310	19.1	19.68	13,860
1957	1516	256	Feb. 24, 1957	2.2	13.4	1.02	13.75	9,680	12.3	12.69	8,930
1958	1636	179	Feb. 24, 1958	2.1	12.7	.962	13.08	9,230	12.9	13.29	9,370
1959	1636	733	(a)	1.1	20.5	1.55	21.09	14,840	20.9	21.46	15,100
1960	1716	331	Jan. 29, 1960	1.4	14.9	1.13	15.37	10,820	-	-	-

a About Jan. 8, 1959.

51.0. Andrews Creek near Maynard, Wash.

Location.--Lat 47°56'35", long 122°53'00", in SW $\frac{1}{4}$ sec. 1, T.28 N., R.2 W., on left bank 250 ft upstream from mouth and 3 $\frac{1}{4}$ miles south of Maynard.

Drainage area.--10.2 sq mi.

Records available.--May to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 175 ft (from topographic map).

Extremes.--May to September 1952: Maximum discharge, 6.0 cfs July 2 (gage height, 1.34 ft); no flow Aug. 26 to Sept. 30.

Remarks.--Flow regulated by natural flow from Crocker Lake. No known 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
1952	-	-	-	-	-	-	-	-	2.22	1.91	0.155	-	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1952	-	-	-	-	-	-	-	-	132	118	9.5	-	-

CHIMACUM CREEK BASIN

515. Chimacum Creek near Chimacum, Wash.

Location.--Lat 47°58'25", long 122°46'35", in SW $\frac{1}{4}$ sec.26, T.29 N., R.1 W., on right bank 100 ft downstream from culvert, 3 miles south of Chimacum, and 3 $\frac{1}{4}$ miles upstream from mouth of East Fork.

Drainage area.--12.6 sq mi.

Records available.--June 1952 to December 1957.

Average discharge.--5 years (1952-57), 15.3 cfs (11,080 acre-ft per year).

Gage.--Water-stage recorder. Altitude of gage is 140 ft (from topographic map).

Extremes.--1952-57: Maximum discharge, 222 cfs Jan. 6, 1956 (gage height, 5.69 ft); minimum, 0.2 cfs Aug. 2, 1953, July 7, 1956, June 9, 1957; minimum gage height, 1.11 ft Aug. 2, 1953.

Remarks.--Some regulation and diversions during summer months for irrigation.

Monthly and yearly mean discharge, in cubic feet per second

[illegible]

Monthly and yearly discharge, in acre-feet

[illegible]

Yearly discharge, in cubic feet per second

[illegible]

BIG QUILCENE RIVER BASIN

525. Big Quilcene River at Quilcene, Wash.
(Formerly published as Big Quilcene River near Quilcene)

Location.--Lat 47°49'10", long 122°52'30", in NW¼ sec.24, T.27 N., R.2 W., on right bank a quarter of a mile south of Quilcene and half a mile upstream from mouth.

Drainage area.--68.7 sq mi.

Records available.--August 1926 to September 1927, June to September 1951. Published as "near Quilcene" 1926-27.

Gage.--Water-stage recorder. Altitude of gage is 20 ft (from topographic map). Aug. 24, 1926, to Sept. 30, 1927, staff gage on right bank at highway bridge 2 miles upstream at different datum.

Extremes.--1926-27, 1951: Maximum discharge observed, 1,620 cfs Dec. 2, 1926 (gage height, 4.10 ft, site and datum then in use), from rating curve extended above 700 cfs; minimum, 17 cfs Sept. 27, 1951 (gage height, 1.05 ft).

Remarks.--A maximum of 26.2 cfs can be diverted at Port Townsend Dam, 9 miles upstream from station, for municipal water supply of that city. Possible slight regulation by fish hatchery above station.

Monthly 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	93.1	42.3	23.1	-

Monthly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	9,030	5,730	2,600	1,370	-

DOSEWALLIPS RIVER BASIN

530. Dosewallips River near Brinnon, Wash.

Location.--Lat 47°43'35", long 123°00'30", in SW¼ sec.24, T.26 N., R.3 W., on left bank half a mile upstream from Corrigenda ranger station, 5½ miles northwest of Brinnon, and 7½ miles upstream from mouth.

Drainage area.--93.7 sq mi.

Records available.--October 1930 to October 1949, May to September 1951, water years 1950 and 1951-60 (annual maximum).

Gage.--Crest-stage gage. Altitude of gage is 250 ft (from topographic map). Oct. 10, 1930, to Oct.31, 1949, and May 23 to Sept. 30, 1951, water-stage recorder at same site and datum. Nov. 1, 1949, to May 22, 1951, and Oct. 1, 1951, to June 30, 1953, staff gage in stilling well at same site and datum.

Average discharge.--19 years (1930-49), 445 cfs (322,200 acre-ft per year).

Extremes.--1930-60: Maximum discharge, 13,200 cfs Nov. 26, 1949 (gage height, 9.92 ft, from high-water mark in well), from rating curve extended above 4,500 cfs on basis of slope-area measurement of peak flow.

1930-49, 1951: Minimum discharge, 65 cfs Dec. 4, 1936 (gage height, 1.71 ft).

Remarks.--No regulation or diversion above station.

Monthly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	883	524	233	172	-

Monthly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	52,910	32,240	14,320	10,240	-

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	1566	3,990	Feb. 9, 1951	-	-	-	-	-	-
1952	1566	2,230	Apr. 30, 1952	-	-	-	-	-	-
1953	1566	3,200	Jan. 9, 1953	-	-	-	-	-	-
1954	1566	3,230	Nov. 13, 1953	-	-	-	-	-	-
1955	1566	5,330	Nov. 19, 1954	-	-	-	-	-	-
1956	1566	8,050	Nov. 3, 1955	-	-	-	-	-	-
1957	1566	5,430	Dec. 9, 1956	-	-	-	-	-	-
1958	1566	5,180	Feb. 24, 1958	-	-	-	-	-	-
1959	1636	4,300	Jan. 8, 1959	-	-	-	-	-	-
1960	1716	6,600	Jan. 29, 1960	-	-	-	-	-	-

540. Duckabush River near Brinnon, Wash.

Location--Lat 47°41'00", long 123°00'40", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.1, T.25 N., R.3 W., on left bank $\frac{1}{2}$ miles upstream from mouth and 5 miles west of Brinnon.

Drainage area--66.5 sq mi.

Records available--August to December 1910 (gage heights and discharge measurements only), December 1910 to December 1911, June 1938 to September 1960. Published as "near Duckabush" 1910-11.

Gage--Water-stage recorder. Datum of gage is 241.49 ft above mean sea level, datum of 1929. Aug. 19, 1910, to Dec. 31, 1911, staff gage at same site at different datum.

Average discharge--22 years (1938-60), 409 cfs (296,100 acre-ft per year).

Extremes--1910-11, 1938-60: Maximum discharge, 8,960 cfs Nov. 26, 1949 (gage height, 10.06 ft), from rating curve extended above 1,800 cfs on basis of slope-area measurement of peak flow; minimum, 45 cfs Oct. 26, 28, 29, 1942; minimum gage height, 1.32 ft Sept. 30, 1939.

Remarks--No regulation or diversion 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	477	631	1,059	470	698	239	484	576	548	287	112	90.5	471
1952	428	479	349	214	434	240	560	772	626	484	206	96.8	407
1953	65.8	155	477	1,180	486	283	408	669	584	598	280	183	448
1954	392	967	662	448	868	382	362	546	544	585	303	188	518
1955	400	1,254	625	266	330	162	323	412	737	512	234	143	449
1956	329	714	500	451	148	297	626	1,043	1,088	766	294	182	537
1957	455	348	540	170	541	480	459	742	452	290	163	109	396
1958	266	284	482	711	1,015	357	396	720	608	240	102	81.7	435
1959	242	531	690	919	262	265	516	609	625	369	137	293	456
1960	235	525	565	516	621	327	479	516	573	341	147	86.1	410

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	29,310	37,560	65,110	28,920	38,770	14,700	28,820	35,390	32,600	17,620	6,910	5,390	341,100
1952	26,330	28,520	21,470	13,180	24,980	14,760	33,350	47,470	37,280	29,790	12,690	5,760	295,600
1953	4,050	9,210	29,340	72,560	27,000	17,420	24,250	41,160	34,750	36,740	17,230	10,910	324,600
1954	24,070	56,540	40,710	27,570	48,330	23,470	21,560	33,560	32,360	35,980	18,630	11,200	374,900
1955	24,800	74,620	38,410	16,360	18,340	9,970	19,210	25,320	45,830	31,470	14,590	8,490	325,000
1956	20,260	42,480	30,720	27,700	8,490	18,260	37,240	64,150	64,730	47,120	18,100	10,840	390,100
1957	28,000	20,730	33,190	10,430	30,060	30,120	27,320	45,640	26,890	17,840	10,050	6,500	286,800
1958	16,350	16,890	29,620	43,700	56,360	21,960	23,540	44,280	36,150	14,780	6,300	4,860	314,800
1959	14,870	13,580	42,420	56,520	14,560	16,310	30,700	37,440	37,180	22,690	8,410	17,430	330,100
1960	14,470	31,250	34,730	31,750	35,710	20,140	28,480	31,700	34,070	20,970	9,060	5,130	297,500

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		Mean	Runoff	
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet		Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	533	108.77	385,800	-	-	-
1951	1216	4,190	Feb. 9, 1951	52	471	7.08	96.18	341,100	394	80.49	385,400	394	80.49	385,400
1952	1246	2,940	Apr. 30, 1952	74	407	6.12	83.34	295,600	361	73.83	261,900	361	73.83	261,900
1953	1286	3,240	Jan. 9, 1953	55	448	6.74	91.54	324,600	558	114.02	404,300	558	114.02	404,300
1954	1346	3,580	Nov. 13, 1953	116	518	7.79	105.63	374,900	539	110.01	390,200	539	110.01	390,200
1955	1396	5,260	Nov. 19, 1954	91	449	6.75	91.64	325,000	388	79.18	280,800	388	79.18	280,800
1956	1446	5,800	Nov. 3, 1955	87	537	8.08	109.99	390,100	521	106.74	378,600	521	106.74	378,600
1957	1516	4,290	Dec. 9, 1956	79	395	5.95	80.85	286,800	370	75.47	267,700	370	75.47	267,700
1958	1566	4,910	Feb. 24, 1958	70	435	6.54	88.75	314,800	471	96.08	340,800	471	96.08	340,800
1959	1636	4,750	Jan. 8, 1959	63	456	6.86	93.08	330,100	444	90.71	321,700	444	90.71	321,700
1960	1716	6,500	Jan. 29, 1960	68	410	6.17	83.88	297,500	-	-	-	-	-	-

HAMMA HAMMA RIVER BASIN

545. Hamma Hamma River near Eldon, Wash.

Location.--Lat 47°35'20", long 123°07'00", in NW $\frac{1}{4}$ sec.7, T.24 N., R.3 W., on left bank a quarter of a mile downstream from Watson Creek, $4\frac{1}{2}$ miles northwest of Eldon, and 6 miles upstream from mouth.

Drainage area.--51.3 sq mi.

Records available.--June 1951 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 510 ft (from topographic map).

Average discharge.--9 years (1951-60), 370 cfs (267,900 acre-ft per year).

Extremes.--1951-60: Maximum discharge, 5,810 cfs Nov. 3, 1955 (gage height, 6.58 ft), from rating curve extended above 1,100 cfs; minimum, 42 cfs Oct. 21-23, Nov. 9, 1952; minimum gage height, 0.33 ft Sept. 15, 16, 1958.

Remarks.--No regulation or diversion 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	-	-	-	-	-	-	-	-	-	174	74.2	68.2	-
1952	404	433	310	181	405	212	470	664	476	333	146	76.1	342
1953	47.5	122	446	1,068	438	242	325	537	415	360	162	114	357
1954	287	720	560	392	728	360	319	413	384	374	180	139	402
1955	343	1,038	502	233	281	141	288	332	528	346	165	106	358
1956	285	633	433	391	115	260	591	903	900	612	245	137	459
1957	393	330	495	150	449	468	407	548	286	175	119	77.9	324
1958	226	296	448	685	1,011	326	354	559	391	146	70.0	52.8	376
1959	177	434	617	795	247	233	409	497	428	225	92.5	224	366
1960	201	476	488	463	595	316	430	420	422	218	96.8	63.9	348

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	-	10,710	4,560	4,060	-
1952	24,860	25,780	19,070	11,150	23,290	13,030	27,980	40,850	28,300	20,500	9,000	4,530	248,300
1953	2,920	7,230	27,390	65,680	24,350	14,870	19,340	33,040	24,710	22,110	9,980	6,780	258,400
1954	17,660	42,840	34,450	24,090	40,440	22,170	18,970	25,400	22,830	23,020	11,070	8,250	291,200
1955	21,090	61,770	30,880	14,340	15,600	8,680	17,120	20,410	31,440	21,280	10,130	6,320	259,000
1956	17,530	37,670	26,600	24,040	6,630	15,990	35,180	55,490	53,560	37,610	15,030	8,150	333,500
1957	24,140	19,650	30,460	9,220	24,930	28,780	24,190	33,710	17,040	10,750	7,320	4,630	234,800
1958	13,870	17,600	27,540	42,140	56,130	20,040	21,090	34,370	23,280	9,000	4,310	3,140	272,500
1959	10,880	25,800	37,910	48,870	13,680	14,340	24,360	30,570	25,460	13,860	5,690	13,360	264,800
1960	12,330	28,300	29,990	28,460	34,200	19,420	25,570	25,850	25,100	13,400	5,950	3,800	252,400

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	1216	-	-	-	-	-	-	-	-	-	-	-
1952	1246	1,940	Nov. 30, 1951	56	342	6.67	90.77	248,300	298	79.01	216,200	
1953	1286	2,780	Jan. 9, 1953	42	357	6.96	94.44	258,400	436	115.42	315,800	
1954	1346	2,320	Nov. 13, 1953	108	402	7.84	106.43	291,200	426	113.31	310,000	
1955	1396	4,280	Nov. 19, 1954	77	358	6.98	94.68	259,000	314	83.00	227,100	
1956	1446	5,810	Nov. 3, 1955	75	459	8.95	121.90	333,500	449	119.13	325,900	
1957	1516	3,340	Feb. 24, 1957	64	324	6.32	85.81	234,800	303	80.25	219,600	
1958	1566	4,440	Feb. 24, 1958	48	376	7.33	99.60	272,500	398	105.30	288,100	
1959	1636	4,030	Jan. 8, 1959	53	366	7.13	96.77	264,800	360	95.31	260,800	
1960	1716	5,410	Jan. 29, 1960	55	348	6.78	92.25	252,400	-	-	-	

546. Jefferson Creek near Eldon, Wash.

Location.--Lat 47°35'00", long 123°06'15", in SE $\frac{1}{4}$ sec.7, T.24 N., R.3 W., on right bank a quarter of a mile upstream from mouth and 4 miles northwest of Eldon.

Drainage area.--21.6 sq mi.

Records available.--October 1957 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 500 ft (from topographic map).

Extremes.--1957-60: Maximum discharge, 2,660 cfs Jan. 8, 1959 (gage height, 8.32 ft), from rating curve extended above 1,600 cfs on basis of slope-area measurement at gage height 7.84 ft; minimum, 9.7 cfs Sept. 27-30, 1960 (gage height, 2.78 ft).

Remarks.--No regulation or diversion 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	116	132	197	426	478	142	158	101	80.5	34.6	17.5	14.0	156
1959	57.3	186	287	457	129	145	180	156	92.9	47.8	22.7	102	156
1960	69.9	206	257	248	328	153	197	120	82.0	42.4	22.6	14.1	144

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1958	7,150	7,880	12,110	26,160	26,550	8,720	9,380	6,210	4,790	2,130	1,080	832	113,000
1959	3,520	11,060	17,660	28,090	7,170	8,940	10,710	9,580	5,530	2,940	1,400	6,080	112,700
1960	4,300	12,280	15,790	15,260	18,870	9,400	11,710	7,390	4,880	2,610	1,390	836	104,700

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
1958	1566	2,270	Feb. 18, 1958	13	156	7.22	98.08	113,000	163	102.51	118,100
1959	1636	2,660	Jan. 8, 1959	12.5	156	7.22	97.82	112,700	156	97.93	112,800
1960	1716	2,190	Jan. 29, 1960	9.7	144	6.67	90.90	104,700	-	-	-

EAGLE CREEK BASIN

555. Eagle Creek near Lilliwaup, Wash.

Location.--Lat 47°29'10", long 123°04'40", in NW $\frac{1}{4}$ sec.16, T.23 N., R.3 W., on left bank 750 ft upstream from mouth and 2 $\frac{1}{2}$ miles northeast of Lilliwaup.

Drainage area.--7.06 sq mi.

Records available.--June to September 1951.

Gage.--Water-stage recorder. Altitude of gage is 10 ft (from topographic map).

Extremes.--June to September 1951: Maximum discharge, 25 cfs Sept. 29 (gage height, 1.85 ft), from rating curve extended above 11 cfs; minimum, 6.9 cfs Sept. 20 (gage height, 1.42 ft).

Remarks.--No known regulation or diversion above station.

Monthly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	10.5	8.60	8.08	8.19	-

Monthly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	625	529	497	488	-

FINCH CREEK BASIN

560. Finch Creek at Hoodsport, Wash.

Location.--Lat 47°24'20", long 123°08'50", in SE $\frac{1}{4}$ sec.11, T.22 N., R.4 W., on right bank in Hoodsport a quarter of a mile upstream from mouth.

Drainage area.--3.45 sq mi.

Records available.--June to September 1951.

Gage.--Water-stage recorder. Altitude of gage is 20 ft (from topographic map).

Extremes.--June to September 1951: Maximum discharge, 27 cfs Sept. 29; maximum gage height, 1.40 ft June 13-14; minimum discharge, 11 cfs Aug. 31.

Remarks.--No regulation or diversion above station.

Monthly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	17.2	14.4	12.2	12.8	-

Monthly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	1,030	888	753	765	-

565. North Fork Skokomish River below Staircase Rapids, near Hoodsport, Wash.

Location.--Lat 47°30'55", long 123°19'45", in NW $\frac{1}{4}$ sec. 4, T.23 N., R.5 W., on left bank $1\frac{1}{2}$ miles upstream from Lake Cushman, 2 miles upstream from Dry Creek, and $11\frac{1}{2}$ miles northwest of Hoodsport.

Drainage area.--58.1 sq mi.

Records available.--July 1924 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 762.26 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Nov. 1, 1934, water-stage recorder and Nov. 1, 1934, to Nov. 10, 1941, staff gages, on right bank at same datum.

Average discharge.--36 years (1924-60), 489 cfs (354,000 acre-ft per year).

Extremes.--1924-60: Maximum discharge, 27,000 cfs Nov. 5, 1934 (gage height, 14.4 ft, from high-water mark), from rating curve extended above 9,800 cfs on basis of slope-area measurement at gage height 12.2 ft; minimum recorded, 16 cfs Sept. 23, 1930 (gage height, 1.12 ft).

Note.--The maximum discharge for the water year 1940, not previously determined, is estimated to be 9,000 cfs Dec. 15, 1939.

Remarks.--No regulation or diversion above station.

Correction.--In WSP 1316, the acre-feet for September 1927 is listed in error; it should be 12,500 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	726	914	1,464	617	1,087	303	642	663	534	234	100	134	615
1952	599	614	465	290	602	253	639	939	719	497	229	115	496
1953	68.7	201	576	1,915	719	332	472	812	647	589	230	198	564
1954	441	1,134	928	571	1,016	515	494	674	625	616	250	173	617
1955	519	1,655	808	360	430	190	412	525	886	524	224	143	555
1956	564	1,131	677	558	182	314	738	1,304	1,332	915	321	206	688
1957	630	500	826	235	713	632	611	737	369	224	159	104	477
1958	297	398	693	1,027	1,381	480	525	772	508	178	83.9	81.1	530
1959	310	737	987	1,047	338	342	684	703	552	304	114	341	548
1960	337	730	767	758	838	438	625	654	665	312	140	87.5	528

Monthly and yearly mean discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	44,630	54,410	90,050	37,940	60,360	18,660	38,190	40,740	31,800	14,360	6,150	7,980	445,200
1952	36,850	36,530	28,580	17,830	34,630	15,580	38,020	57,770	42,780	30,560	14,090	6,820	360,000
1953	4,220	11,960	35,390	117,700	39,940	20,430	28,060	49,950	38,480	36,200	14,170	11,790	408,300
1954	27,130	67,480	57,040	35,110	56,450	31,680	39,390	41,460	37,170	37,860	15,370	10,300	446,400
1955	31,890	98,470	49,670	22,120	23,890	11,690	24,530	32,250	52,740	32,200	13,780	8,520	401,800
1956	34,690	67,290	41,620	34,300	10,490	19,330	43,940	80,160	79,240	56,240	19,710	12,270	499,300
1957	38,720	29,780	50,810	14,360	39,610	38,880	36,330	45,290	21,940	13,780	9,750	6,170	345,400
1958	18,250	23,710	42,600	63,130	76,710	29,530	31,270	47,470	30,090	10,930	5,160	4,820	383,700
1959	19,080	43,880	60,700	64,360	18,790	21,010	40,680	43,250	38,810	18,680	6,980	20,280	396,500
1960	20,690	43,450	47,150	46,620	48,170	26,940	37,170	40,210	39,590	19,170	8,630	5,200	383,000

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	-	-	-	-	-	-	-	695	156.62	-	502,800
1951	1216	7,030	Feb. 10, 1951	53	615	10.22	138.68	445,200	495	115.56	358,100
1952	1246	3,810	Nov. 30, 1951	82	496	8.54	116.18	360,000	427	99.92	309,600
1953	1286	6,730	Jan. 9, 1953	47	564	9.71	131.77	408,300	702	164.07	508,400
1954	1346	4,510	Mar. 9, 1954	118	617	10.6	144.07	446,400	656	153.23	474,800
1955	1396	9,400	Nov. 18, 1954	94	555	9.55	129.65	401,800	505	117.89	365,300
1956	1446	13,600	Nov. 3, 1955	90	688	11.8	161.12	499,300	654	153.29	475,000
1957	1516	9,430	Dec. 9, 1956	80	477	8.21	111.48	345,400	429	100.26	310,700
1958	1566	6,890	Feb. 24, 1958	63	530	9.12	123.83	383,700	584	136.45	422,800
1959	1636	7,210	Dec. 1, 1958	58	548	9.43	127.96	396,500	531	123.97	384,100
1960	1716	8,850	Jan. 29, 1960	65	528	9.09	123.63	383,000	-	-	-

570. Lake Cushman near Hoodsport, Wash.

Location.--Lat 47°25'05", long 123°13'20", in SW $\frac{1}{4}$ sec.5, T.22 N., R.4 W., on upstream face of Cushman Dam No. 1, 4 miles northwest of Hoodsport.

Drainage area.--93.7 sq mi.

Records available.--October 1925 to September 1960.

Gage.--Staff gage. Datum of gage is 2.99 ft below sea level (levels by city of Tacoma). Since May 28, 1931, auxiliary staff gage at spillway.

Extremes.--1925-60: Maximum contents observed, 459,200 acre-ft Dec. 22, 1933, and Nov. 19, 1954 (gage height, 739.38 ft); minimum observed (since reservoir first filled), 164,560 acre-ft Dec. 13, 1929 (gage height, 650.8 ft).

Remarks.--Reservoir is formed by concrete arch dam; dam was completed and storage began Oct. 21, 1925. Capacity, 281,300 acre-ft between gage heights 649.0 (lower limit of operation) and 735.0 ft (spillway crest). Water used by city of Tacoma for power development. Records of month-end contents not previously published for 1951-60. Change in contents are published in annual water-supply papers in connection with North Fork Skokomish River near Hoodsport.

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

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	435,460	436,380	437,970	411,340	419,280	377,820	388,520	416,880	446,290	452,140	447,400	440,920
1952	420,720	413,100	362,520	355,250	357,060	362,880	408,730	440,260	449,080	451,430	448,710	427,180
1953	397,980	372,080	377,210	447,720	428,920	413,800	431,960	443,870	449,830	452,270	444,530	434,480
1954	407,710	417,200	422,600	412,430	432,000	432,480	436,700	445,100	451,930	452,980	448,790	434,850
1955	418,160	436,240	429,440	402,860	401,640	369,610	387,480	426,280	452,270	453,270	443,970	417,600
1956	431,600	424,160	424,960	425,200	392,440	380,970	417,440	450,630	451,130	452,220	448,790	417,040
1957	410,170	394,840	398,640	361,840	409,940	438,620	444,850	452,310	451,550	449,580	434,850	390,590
1958	378,320	356,510	380,820	429,200	440,800	438,130	441,980	451,130	451,970	451,930	435,300	412,860
1959	370,400	379,570	435,550	436,450	416,880	430,800	454,910	453,480	451,130	451,050	432,240	432,780
1960	431,040	431,040	425,840	410,010	405,880	406,150	435,180	447,560	449,910	453,320	441,570	429,200

575. North Fork Skokomish River near Hoodsport, Wash.

Location.--Lat 47°25'20", long 123°13'10", in SW $\frac{1}{4}$ sec.5, T.22 N., R.4 W., at city of Tacoma dam, 4 miles northwest of Hoodsport.

Drainage area.--93.7 sq mi.

Records available.--August 1910 to September 1911 (fragmentary), February 1913 to September 1960 (monthly discharge only) in reports of Geological Survey. October 1911 to September 1953 (monthly discharge only) in State Water-Supply Bulletin 6.

Gage.--Discharge determined from record of power output and Lake Cushman elevations, plus spillway discharge when crest is exceeded. Prior to Sept. 23, 1911, staff gage and February 1913 to September 1923 water-stage recorder, at approximately same site. At datum 486.4 ft above mean sea level (levels by city of Tacoma) prior to Sept. 2, 1918, and at datum 5.00 ft higher Sept. 2, 1918, to September 1923. October 1923 to September 1930 water-stage recorder 1 mile downstream at different datum.

Average discharge.--49 years (1911-60), 741 cfs (536,500 acre-ft per year), adjusted for storage.

Extremes.--Notdetermined since regulation began in Lake Cushman.

Remarks.--No diversion of consequence. Flow regulated in Lake Cushman since October 1925 for power by city of Tacoma.

Cooperation.--Records of power output and elevation of Lake Cushman furnished by city of Tacoma.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,167	1,402	2,268	1,498	1,598	1,166	633	340	100	160	184	315	900
1952	1,266	1,154	1,498	781	790	578	159	639	634	458	305	485	730
1953	573	750	993	1,889	1,373	783	325	810	590	555	367	448	786
1954	1,024	1,409	1,317	1,231	1,507	797	705	649	592	693	385	434	891
1955	990	2,151	1,353	995	721	910	427	55.7	524	578	422	616	811
1956	611	1,879	1,149	1,114	924	936	426	997	1,551	951	396	789	975
1957	1,070	896	1,175	970	505	645	789	747	443	310	429	871	739
1958	652	946	807	981	1,980	766	754	732	539	205	365	490	759
1959	1,130	1,004	708	1,798	958	435	635	868	794	368	442	503	802
1960	497	1,137	1,277	1,438	1,438	799	544	668	716	295	355	334	789

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	71,780	83,440	139,500	92,140	88,650	71,700	37,680	20,910	5,960	9,870	11,320	18,720	651,700
1952	77,850	68,650	92,100	48,000	45,450	35,520	9,480	39,310	37,770	28,050	19,770	28,680	529,800
1953	35,210	44,600	61,070	116,200	76,280	48,130	19,310	49,780	35,130	34,130	22,550	26,640	569,000
1954	62,960	85,860	80,960	75,710	85,680	48,980	41,940	39,910	35,240	42,630	23,670	25,800	645,300
1955	60,840	128,000	83,180	61,160	40,050	55,970	25,400	3,420	31,190	35,550	25,950	36,650	587,400
1956	37,540	111,800	70,670	68,510	53,130	57,650	25,320	61,290	92,290	58,460	24,370	46,960	708,000
1957	65,810	53,350	72,250	59,640	28,030	39,640	46,980	45,900	26,380	19,090	26,370	51,800	535,200
1958	40,070	56,280	49,600	80,350	110,000	47,080	44,850	44,980	32,100	12,580	22,450	29,140	549,500
1959	69,470	59,770	43,520	109,900	53,190	26,740	37,800	53,550	47,280	22,650	27,150	29,920	580,700
1960	30,570	67,660	78,550	88,290	82,720	49,150	32,350	41,100	42,580	18,140	21,630	19,860	572,800

Yearly discharge, in cubic feet per second

Year	W. S. P. no.	Water year ending Sept. 30						Calendar year					
		Observed			Adjusted			Observed			Adjusted		
		Momentary maximum Discharge	Minimum Date	Runoff in acre-feet	Mean	Per square mile	Runoff in inches	Mean	Runoff in acre-feet	Mean	Runoff in inches	Mean	Runoff in inches
1950	-	-	-	-	-	-	-	-	-	1,005	727,900	1,015	147.02
1951	1216	-	-	0	900	651,700	907	9,680	31.36	823	595,600	718	104.09
1952	1246	-	-	0	730	529,800	711	7,590	23.26	595	432,000	615	89.39
1953	1286	-	-	0	786	569,000	796	8,500	15.32	906	655,900	969	140.33
1954	1346	-	-	0	891	645,300	892	9,520	29.20	953	689,600	962	139.35
1955	1396	-	-	0	811	587,400	788	8,410	14.08	740	535,400	733	106.23
1956	1346	-	-	0	975	708,000	975	10,4	141.57	936	679,400	900	130.69
1957	1396	-	-	0	759	535,200	703	7,500	101.82	677	489,800	652	94.45
1958	1446	-	-	0	759	549,500	790	8,430	114.40	796	576,300	872	126.26
1959	1636	-	-	0	802	580,700	830	8,860	120.20	808	584,800	794	115.08
1960	1716	-	-	0	789	572,800	784	8,370	113.91	-	-	-	-

580. Deer Meadow Creek near Hoodsport, Wash.

Location.--Lat 47°25'00", long 123°13'30", in NW $\frac{1}{4}$ sec.8, T.22 N., R.4 W., on left bank a quarter of a mile upstream from mouth and 4 miles west of Hoodsport.

Records available.--August 1950 to August 1951, October 1952 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 688.28 ft above mean sea level, datum of 1929, supplementary adjustment of 1947 (levels by city of Tacoma). Prior to Oct. 1, 1952, at datum 0.48 ft higher.

Average discharge.--8 years (1950-51, 1952-60), 7.28 cfs (5,270 acre-ft per year).

Extremes.--1950-51, 1952-60: Maximum discharge, 355 cfs Nov. 3, 1955 (gage height, 2.98 ft); minimum, 0.2 cfs Oct. 8-11, 1952, Oct. 2, 4, 6, 7, 1958.

Remarks.--Since October 1953, records include large part of flow of McTaggart Creek, from which water is diverted at city of Tacoma diversion dam in N $\frac{1}{2}$ sec.7, T.22 N., R.4 W. When flow of McTaggart Creek exceeds about 80 cfs, there is undiverted spill over dam. For discharges less than about 80 cfs the city allows up to 2 cfs to flow through pipe in dam and continue in McTaggart Creek, not to exceed the natural flow of stream. No 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
1950	-	-	-	-	-	-	-	-	-	-	-	0.73	-
1951	3.40	6.84	9.62	8.15	9.99	3.77	2.48	1.78	1.19	0.91	0.81	-	-
1952	3.33	4.49	4.65	14.3	6.86	3.74	2.58	2.29	1.81	1.33	.97	.89	3.34
1953	1.60	8.16	13.2	15.9	33.3	7.55	5.12	2.22	1.86	1.48	1.16	1.07	7.56
1954	1.81	20.8	9.65	8.05	11.8	4.85	11.9	2.55	1.84	1.40	.92	.84	6.29
1955	3.29	34.2	26.7	26.4	8.87	23.9	11.7	2.45	2.22	1.66	1.22	.80	12.0
1956	4.35	5.81	11.9	5.29	19.3	18.8	6.55	2.89	2.18	1.33	1.00	.58	6.42
1957	.98	3.25	14.8	27.7	27.8	7.50	6.20	3.21	1.75	1.27	.56	.45	7.86
1958	.46	4.99	15.3	26.3	7.51	6.09	9.81	6.04	2.55	1.84	1.00	1.08	6.93
1959	1.49	12.8	14.8	15.9	22.3	7.83	12.2	4.79	2.00	1.34	.57	.85	7.86
1960													

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1950	-	-	-	-	-	-	-	-	-	-	-	44	-
1951	209	407	592	501	555	232	148	110	71	56	50	-	-
1952	20	29	286	878	381	230	154	141	108	82	60	53	2,420
1953	98	485	814	980	1,850	464	304	136	111	91	71	64	5,470
1954	111	1,240	593	495	654	298	709	157	109	86	57	50	4,560
1955	202	2,040	1,640	1,630	510	1,470	694	151	132	102	75	47	8,690
1956	267	346	732	202	1,070	1,160	390	177	130	82	61	35	4,650
1957	60	194	912	1,710	1,550	461	369	197	104	78	34	27	5,700
1958	28	297	939	1,620	417	375	584	372	152	113	61	64	5,020
1959	91	764	908	852	1,280	481	724	294	119	82	60	50	5,700
1960													

Yearly discharge, in cubic feet per second

Year	MSP	Water year ending Sept. 30					Calendar year		
		Nomenary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet	
		Discharge	Date						
1950	1216	-	-	-	-	-	-	-	-
1951	1216	60	Feb. 9, 1951	-	-	-	-	-	-
1952									
1953	1286	26	Jan. 2, 1953	0.2	3.34	4,420	4.81		3,480
1954	1346	167	Jan 5, 1954	.5	7.56	5,470	8.30		6,020
1955	1396	244	Nov. 19, 1954	.7	6.29	4,560	8.97		6,500
1956	1446	355	Nov. 3, 1955	.6	12.0	8,690	8.47		6,160
1957	1516	150	Feb. 26, 1957	.4	6.42	4,650	6.17		4,470
1958	1566	111	Dec. 25, 1957	.3	7.86	5,700	7.99		5,790
1959	1636	78	Apr. 29, 1959	.2	6.93	5,020	7.62		5,520
1960	1716	108	(a)	.4	7.86	5,700	-		-

a Nov. 20, 1959, Jan. 29, 1960.

585. Dow Creek near Hoodsport, Wash.

Location.--Lat 47°24'40", long 123°11'15", in E $\frac{1}{2}$ sec.9, T.22 N., R.4 W., on right bank 1 mile upstream from mouth and 2 $\frac{1}{4}$ miles west of Hoodsport.

Drainage area.--1.67 sq mi.

Records available.--August 1950 to October 1954.

Gage.--Water-stage recorder. Altitude of gage is 600 ft (from topographic map).

Extremes.--1950-54: Maximum discharge, 543 cfs Feb. 9, 1951 (gage height, 2.72 ft); minimum, 0.02 cfs Sept. 14, 15, 16, 20, 21, 1951; minimum gage height, 0.52 ft Oct. 1, 2, 1951.

Remarks.--City of Tacoma diverts about a third of a cubic foot per second for domestic use of Cushman powerplant village. No 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
1950	-	-	-	-	-	-	-	-	-	-	-	0.21	-
1951	4.54	18.6	22.0	15.1	40.5	8.55	4.57	1.67	0.82	0.24	0.11	.20	9.53
1952	7.75	13.2	15.4	13.7	22.6	10.6	5.89	2.84	1.04	.49	.20	.23	7.79
1953	.20	.47	15.6	50.5	18.6	8.47	4.69	3.70	1.96	.84	.47	.39	8.82
1954	1.86	13.5	21.5	25.2	53.7	13.3	9.16	1.81	1.01	.66	.38	.41	11.6

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1950	-	-	-	-	-	-	-	-	-	-	-	12	-
1951	279	1,110	1,350	926	2,250	526	272	103	49	15	6.7	12	6,900
1952	477	785	949	840	1,300	652	351	175	62	30	19	14	5,650
1953	12	28	961	3,100	1,030	521	279	228	116	52	29	23	6,380
1954	115	805	1,320	1,550	2,980	819	545	111	60	41	24	25	8,400

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	1216	-	-	-	-	-	-	-	-	-	-	
1951	1216	543	Feb. 9, 1951	0.1	9.53	5.71	77.45	6,900	8.80	71.52	6,370	
1952	1246	145	Jan. 30, 1952	.2	7.79	4.66	65.47	5,650	6.12	49.89	4,440	
1953	1286	157	Jan. 2, 1953	.1	8.82	5.28	71.71	6,380	10.5	85.61	7,620	
1954	1346	225	Jan. 5, 1954	.3	11.6	6.95	94.28	8,400	-	-	-	

590. McTaggart Creek near Hoodsport, Wash.

Location.--Lat 47°24'50", long 123°14'25", in N $\frac{1}{4}$ sec.7, T.22 N., R.4 W., on left bank three-quarters of a mile upstream from mouth and 4 $\frac{3}{4}$ miles west of Hoodsport.

Drainage area.--1.30 sq mi.

Records available.--August 1950 to September 1953.

Gage.--Water-stage recorder. Altitude of gage is 770 ft (from topographic map).

Extremes.--1950-53: Maximum discharge, 170 cfs Feb. 9, 1951 (gage height, 4.04 ft); no flow at times in each year.

Remarks.--No known diversion or regulation above station. Beginning September 1953 entire flow of this stream diverted into Deer Meadow Creek (see preceding page) and Lake Cushman 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
1950	-	-	-	-	-	-	-	-	-	-	-	0	-
1951	2.17	10.4	20.2	15.2	24.2	4.76	2.40	0.91	0.08	0	0	.04	6.58
1952	2.29	5.49	9.41	5.97	15.3	4.94	3.87	1.88	.35	0	.02	0	4.08
1953	0	.12	8.21	33.7	12.3	4.03	2.65	1.35	.79	.05	0	-	-

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	-
1951	134	619	1,240	935	1,340	293	143	50	4.6	0	0	2.4	4,760
1952	141	327	579	367	878	303	230	116	21	0	1.0	0	2,960
1953	0	7.3	505	2,070	685	248	158	83	47	3.4	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		Mean	Runoff	
		Discharge	Date					Inches	Acre-feet		Inches	Acre-feet
1950	1216	-	-	-	0	-	-	-	-	-	-	-
1951	1216	170	Feb. 9, 1951	0	6.58	5.06	68.72	4,760	5.27	55.86	3,815	
1952	1246	59	Jan. 30, 1952	0	4.08	3.14	42.71	2,960	3.34	35.02	2,430	
1953	1286	81	Jan. 2, 1953	0	-	-	-	-	-	-	-	-

595. North Fork Skokomish River near Potlatch, Wash.

Location.--Lat 47°19'40", long 123°14'30", in NE¼NW¼ sec.7, T.21 N., R.4 W., on left bank 1 mile upstream from mouth, 6 miles southwest of Potlatch, and 7 miles downstream from city of Tacoma's Cushman Dam No. 2.

Drainage area.--117 sq mi, includes 99 sq mi above Cushman Dam No. 2 which is normally non-contributing.

Records available.--March 1944 to December 1949, February 1950 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 63.49 ft above mean sea level (levels by city of Tacoma). Prior to Nov. 27, 1949 (destroyed by flood of Nov. 27, 1949), and Mar. 18 to May 9, 1950, water-stage recorder at site 200 ft downstream at present datum.

Extremes.--1944-60: Maximum discharge, 7,740 cfs Nov. 4, 1955 (gage height, 10.45 ft); minimum recorded, 1.3 cfs Sept. 5, 14, 16, 1951 (gage height, 2.02 ft).

Remarks.--Entire flow of river normally diverted at Cushman Dam No. 2 to supply powerplant which discharges directly into sea (Hood Canal). Main portion of McTaggart Creek is diverted into Cushman Reservoir No. 2 and may bypass this station. Flow regulated by Lake Cushman (see p. 50) and by pondage in Cushman Reservoir No. 2, from which spill releases are infrequent.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	234	306	1,262	732	982	162	44.7	25.9	10.1	5.30	2.83	4.98	311
1952	943	133	422	158	232	78.8	47.9	28.1	13.6	7.64	11.9	4.93	174
1953	5.38	12.9	186	697	399	85.6	48.8	37.5	21.2	10.1	6.20	6.15	125
1954	25.9	141	235	279	496	106	83.3	24.0	14.7	22.2	8.86	7.32	118
1955	29.1	852	229	122	121	83.7	147	43.6	23.1	26.1	10.9	10.2	140
1956	87.1	936	250	257	89.0	227	88.2	31.9	39.0	18.9	14.8	11.8	170
1957	82.7	77.2	189	68.9	185	140	75.2	37.0	23.2	16.8	10.2	6.06	75.4
1958	22.2	60.4	154	224	508	85.3	103	41.5	21.0	14.3	6.45	7.59	121
1959	15.7	109	174	509	106	83.0	240	136	32.9	18.7	9.26	22.4	122
1960	41.7	256	225	192	226	117	148	59.5	29.7	17.6	13.8	10.6	111

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	14,390	18,190	77,610	45,040	54,550	9,930	2,660	1,590	600	326	174	296	225,400
1952	57,970	7,900	25,930	9,730	13,340	4,850	2,850	1,730	810	469	733	293	126,600
1953	331	768	11,410	42,850	22,190	5,270	2,910	2,300	1,260	618	381	366	90,650
1954	1,590	8,420	14,460	17,150	27,540	6,510	4,950	1,470	876	1,360	545	435	85,310
1955	1,790	50,720	14,050	7,490	6,720	5,150	9,730	2,680	1,370	1,610	670	608	101,600
1956	5,350	55,670	15,370	15,800	5,120	13,970	5,250	1,960	2,320	1,160	908	705	123,600
1957	5,090	4,590	11,600	4,240	10,260	8,630	4,470	2,280	1,380	1,030	627	360	54,560
1958	1,360	3,590	9,440	13,800	28,190	5,240	6,120	2,550	1,250	878	396	452	73,270
1959	963	6,460	10,680	31,290	5,910	5,100	14,300	8,390	1,960	1,150	569	1,330	88,100
1960	2,570	15,260	13,810	11,830	12,990	7,190	8,820	3,680	1,770	1,080	849	630	80,460

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	1216	3,280	Feb. 10, 1951	1.4	311	225,400	286	207,000
1952	1248	2,920	Oct. 19, 1951	4.4	174	126,600	65.2	47,310
1953	1286	2,580	Jan. 23, 1953	3.2	125	90,650	142	102,600
1954	1348	2,770	Feb. 23, 1954	5.8	118	85,310	176	127,400
1955	1396	6,100	Nov. 19, 1954	5.8	140	101,600	154	111,400
1956	1446	7,740	Nov. 4, 1955	7.4	170	123,600	94.3	68,470
1957	1516	3,060	Dec. 9, 1956	4.6	75.4	54,560	65.8	47,670
1958	1566	2,300	Feb. 25, 1958	4.6	101	73,270	106	76,980
1959	1636	3,980	Apr. 29, 1959	7.0	122	88,100	140	101,600
1960	1716	2,680	Nov. 20, 1959	7.0	111	80,460	-	-

600. South Fork Skokomish River near Potlatch, Wash.

Location.--Lat 47°23'10", long 123°18'30", in NW $\frac{1}{4}$ sec.22, T.22 N., R 5 W., on right bank at head of canyon, 1 mile upstream from Rock Creek, 3 miles downstream from Brown Creek, and 7 $\frac{1}{2}$ miles west of Potlatch.

Drainage area.--65.6 sq mi.

Records available.--October 1923 to September 1932, September 1946 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 456 ft (by barometer).

Average discharge.--23 years (1923-32, 1946-60), 597 cfs (432,200 acre-ft per year).

Extremes.--1923-32, 1946-60: Maximum discharge, 19,300 cfs Nov. 26, 1949 (gage height, 17.75 ft), from rating curve extended above 5,600 cfs on basis of logarithmic plotting; minimum, 38 cfs Sept. 15, 1926; minimum gage height, 0.51 ft Sept. 2, 3, 1959.

Remarks.--No regulation or diversion above station. Records of water temperatures for the period May 1955 to September 1960 are published in reports of 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	942	1,206	1,835	1,197	1,717	481	656	478	258	134	85.0	156	756
1952	850	883	757	584	1,107	502	789	761	419	211	176	117	594
1953	93.0	299	1,077	2,954	1,077	535	507	631	332	217	119	176	668
1954	497	1,291	1,321	995	1,796	768	758	470	352	308	141	147	729
1955	554	1,932	1,004	588	782	364	773	563	486	293	183	150	636
1956	782	1,831	1,314	1,223	353	828	992	981	867	427	181	200	833
1957	756	519	1,109	306	1,077	937	705	405	208	185	163	108	537
1958	322	485	1,094	1,583	1,704	588	764	379	194	111	77.4	80.3	610
1959	362	1,077	1,279	1,489	554	642	941	587	351	157	98.9	400	662
1960	433	1,019	986	958	1,195	688	909	624	372	160	111	102	627

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	57,920	71,780	112,800	73,590	95,380	29,550	39,040	29,360	15,350	8,240	5,220	9,310	547,500
1952	52,270	52,550	46,570	35,920	63,680	30,880	46,960	46,780	24,960	12,950	10,820	6,960	431,300
1953	5,720	17,790	66,200	181,600	59,840	32,900	30,180	38,790	19,790	13,320	7,350	10,440	483,900
1954	30,550	76,840	81,240	16,150	99,770	47,230	45,090	28,900	20,950	18,950	8,860	8,750	528,100
1955	34,040	115,000	61,750	36,130	43,430	22,370	46,020	34,590	28,920	18,010	11,260	8,940	460,500
1956	48,110	109,000	80,760	75,200	20,320	50,880	59,030	60,330	51,610	26,230	11,150	11,900	604,500
1957	46,500	30,880	68,190	18,910	59,800	57,600	41,970	24,880	12,370	11,400	10,020	6,410	388,900
1958	19,780	28,850	67,290	97,130	94,620	36,130	45,480	23,270	11,540	6,850	4,760	5,370	441,200
1959	22,270	84,080	78,630	91,570	30,790	39,450	55,970	36,120	20,890	9,670	6,080	23,800	497,300
1960	26,610	60,640	60,660	58,930	68,750	42,280	54,110	38,350	22,160	9,840	6,850	6,090	455,300

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	-	-	-	-	-	-	-	-	-	-	-
1951	1216	11,500	Feb. 9, 1951	64	756	11.5	156.49	547,500	630	130.44	456,400
1952	1246, 1346	6,120	Jan. 30, 1952	93	594	9.05	123.27	431,300	509	105.64	369,600
1953	1286	10,000	Jan. 2, 1953	78	668	10.2	138.32	483,900	805	166.59	582,800
1954	1346	8,470	Jan. 5, 1954	116	729	11.1	150.95	528,100	760	157.28	550,200
1955	1396	14,800	Nov. 18, 1954	99	636	9.70	131.60	460,500	673	139.33	487,500
1956	1446	17,800	Nov. 3, 1955	108	833	12.7	172.76	604,500	706	146.40	512,200
1957	1516	16,700	Dec. 9, 1956	92	537	8.19	111.17	388,900	496	102.69	359,300
1958	1566	9,060	Dec. 25, 1957	68	610	9.30	126.13	441,200	677	140.14	490,300
1959	1636	8,880	Apr. 29, 1959	84	662	10.1	136.98	497,300	639	132.12	462,200
1960	1716	11,300	Nov. 20, 1959	83	627	9.56	130.13	455,300	-	-	-

605. South Fork Skokomish River near Union, Wash.

Location.--Lat 47°20'30", long 123°16'30", in NE $\frac{1}{4}$ sec.2, T.21 N., R.5 W., on right bank $\frac{3}{4}$ miles upstream from confluence with North Fork and Vance Creek and 8 miles west of Union.

Drainage area.--79.6 sq mi.

Records available.--August 1931 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 110 ft (by barometer). Prior to Sept. 19, 1931, staff gage at same site at datum 2.32 ft higher.

Average discharge.--29 years (1931-60), 712 cfs (515,500 acre-ft per year).

Extremes.--1931-60: Maximum discharge, 21,600 cfs Jan. 22, 1935, Nov. 26, 1949 (gage height, 11.0 ft), from rating curve extended above 11,000 cfs; minimum, 62 cfs Sept. 18, 1938; minimum gage height, 1.38 ft Sept. 29-30, 1960.

Remarks.--No regulation or diversion 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	977	1,413	2,129	1,323	1,899	546	661	490	270	137	87.6	159	835
1952	1,009	1,028	918	724	1,466	593	888	844	474	252	199	132	707
1953	98.7	372	1,339	4,030	1,464	662	576	663	371	240	142	192	849
1954	522	1,470	1,855	1,526	2,248	894	831	480	369	322	418	158	874
1955	598	2,357	1,284	752	954	463	914	598	505	309	195	167	752
1956	885	2,162	1,569	1,472	414	1,075	1,146	1,012	909	442	185	197	957
1957	898	597	1,291	350	1,299	1,122	788	470	233	201	180	115	625
1958	360	574	1,309	1,805	1,939	659	815	405	210	117	84.0	97.9	691
1959	369	1,294	1,600	1,949	667	761	1,185	621	337	173	91.5	455	794
1960	493	1,395	1,292	1,288	1,583	780	1,045	652	378	173	124	105	772

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	60,080	84,060	130,900	81,330	105,500	33,550	39,310	30,150	16,050	5,390	9,480	604,200	604,200
1952	62,010	61,200	56,480	44,520	84,510	36,470	52,850	51,920	28,200	15,480	12,230	7,850	513,500
1953	6,070	22,150	82,320	247,800	82,420	40,720	34,270	42,000	22,080	14,760	8,740	11,450	614,800
1954	32,100	87,490	112,800	81,520	24,800	55,000	49,470	29,520	21,962	19,790	9,100	9,410	633,000
1955	36,740	139,100	78,920	46,220	52,960	28,490	54,410	36,750	30,050	19,010	11,970	9,940	544,600
1956	54,430	128,600	96,500	90,500	23,820	66,090	68,220	62,220	54,080	27,150	11,400	11,730	694,700
1957	55,190	35,540	79,370	21,550	72,160	69,010	46,900	28,880	13,860	12,350	11,060	6,870	452,700
1958	22,150	34,170	80,500	111,000	107,700	40,500	48,480	24,880	12,500	7,170	5,180	5,850	500,000
1959	22,700	77,000	98,380	119,800	38,180	46,760	70,480	38,190	20,040	10,630	5,630	27,060	574,800
1960	30,340	82,980	79,430	79,200	91,030	47,940	62,150	40,110	22,510	10,660	7,590	6,270	560,200

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	-	-	-	-	-	-	-	-	956	162.99	-	-
1951	1216	12,500	Feb. 9, 1951	70	835	10.5	142.32	604,200	703	119.85	508,900	-
1952	1246	8,080	Jan. 30, 1952	104	707	8.88	120.96	513,500	612	104.68	444,400	-
1953	1286	13,600	(a)	94	849	10.7	144.81	614,800	1,016	173.51	746,600	-
1954	1346	10,600	Jan. 5, 1954	121	874	11.0	149.08	633,000	905	154.34	655,300	-
1955	1396	15,500	Nov. 18, 1954	112	752	9.45	128.28	544,600	786	134.13	569,300	-
1956	1446	17,900	Nov. 3, 1955	114	957	12.0	163.67	694,700	806	137.89	585,300	-
1957	1516	14,700	Dec. 9, 1956	101	625	7.85	106.66	452,700	579	98.82	419,500	-
1958	1566	9,490	Dec. 25, 1957	69	691	8.68	117.78	500,000	775	132.21	561,300	-
1959	1636	13,500	Apr. 29, 1959	82	794	9.97	135.41	574,800	787	134.16	569,500	-
1960	1716	16,100	Nov. 20, 1959	86	772	9.70	131.97	560,200	-	-	-	-

a Jan. 2 or 3, 1953.

610. Vance Creek near Potlatch, Wash.

Location.--Lat 47°19'45", long 123°18'48", in NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 9, T.21 N., R.5 W., 1 mile downstream from Aristine Creek and 8 $\frac{1}{2}$ miles southwest of Potlatch.

Drainage area.--15.6 sq mi.

Records available.--March 1955 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 200 ft (from topographic map).

Extremes.--1955-56: Maximum discharge, 1,500 cfs Nov. 4, 1955 (gage height, 7.00 ft); minimum, 12 cfs Sept. 4-9, 17-23, 1956; minimum gage height, 2.86 ft Sept. 12, 13, 1955. High water of Nov. 18, 1954, reached a stage of 8.1 ft, from floodmarks (discharge, 3,840 cfs), by slope-area measurement.

Remarks.--No regulation or diversion above station. Records of water temperatures for the period July 1955 to September 1957 are published in reports of 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
1955	-	-	-	-	-	-	307	70.5	26.0	27.4	28.5	24.9	-
1956	307	599	182	156	71.4	297	309	56.5	58.0	24.6	15.5	24.4	175

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1955	-	-	-	-	-	-	18,250	4,340	1,550	1,680	1,750	1,480	-
1956	18,900	35,660	11,180	9,610	4,110	18,260	18,390	3,480	3,450	1,520	956	1,450	127,000

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
1955	1396	-	-	-	-	-	-	-	-	-	-
1956	1446	1,500	Nov. 4, 1955	12	175	11.2	152.58	127,000	-	-	-

615. Skokomish River near Potlatch, Wash.

Location.--Lat 47°19'00", long 123°11'05", in NW¼NW¼ sec.15, T.21 N., R.4 W., on right bank half a mile upstream from U. S. Highway 101, 2.8 miles downstream from confluence of North and South Forks, 4.7 miles southwest of Potlatch, and 5.5 miles upstream from mouth.

Drainage area.--230 sq mi.

Records available.--July 1943 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 16.47 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Mar. 24, 1956, water-stage recorders or staff gages at about present site at datum 2.88 ft higher except Oct. 1, 1947, to Apr. 18, 1951, at present datum. Mar. 24, 1956, to July 21, 1958, at site 200 ft downstream at datum 2.88 ft higher.

Extremes.--1943-60: Maximum discharge, 27,000 cfs Nov. 3, 1955 (gage height, 15.5 ft, present datum); minimum, 125 cfs Sept. 14-17, 1944 (gage height, -0.01 ft, datum then in use).

Flood in December 1933 reached a stage of 14.3 ft, present datum (discharge, 18,600 cfs).

Revisions.--The momentary maximum discharge for the water year 1950 published in WSP 1316 has been revised to 21,400 cfs.

Remarks.--Flow partly regulated by Lake Cushman and Cushman Reservoir No. 2. In normal years practically entire flow of North Fork is diverted at dam No. 2 and returned to sea through Cushman powerplant No. 2. Records of water temperatures for the period May 1955 to September 1960 are published in reports of 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	1,574	2,273	4,330	2,834	4,002	1,076	1,019	751	421	274	198	261	1,571
1952	2,162	1,485	1,728	1,219	2,143	1,002	1,221	1,040	573	342	291	225	1,116
1953	169	453	1,863	5,540	2,399	1,041	868	970	533	347	210	304	1,223
1954	772	2,255	2,752	2,256	3,760	1,340	1,237	675	543	470	261	266	1,366
1955	883	3,710	1,754	1,190	1,511	815	1,230	812	618	436	305	244	1,143
1956	1,332	3,788	2,341	2,419	780	1,958	1,762	1,309	1,213	557	224	327	1,502
1957	1,956	1,564	2,433	729	2,167	1,948	1,201	642	367	314	283	196	1,129
1958	482	773	2,061	2,980	3,373	1,033	1,424	683	322	225	186	174	1,130
1959	508	1,698	2,356	3,176	1,126	1,181	1,976	1,182	616	351	229	620	1,268
1960	711	2,151	2,009	1,774	2,262	1,359	1,659	1,015	608	320	250	221	1,169

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	96,770	35,300	266,200	174,200	222,200	66,190	60,660	46,180	25,080	16,850	12,180	15,520	1,137,000
1952	133,000	88,360	106,200	74,980	23,300	61,620	72,660	63,940	34,090	21,020	17,870	13,390	810,400
1953	10,410	26,930	114,600	340,700	133,200	64,030	51,680	59,640	31,700	21,330	12,890	18,080	885,200
1954	47,450	34,200	169,200	158,700	208,600	82,370	73,620	41,470	32,310	28,690	18,060	15,840	988,900
1955	54,310	220,800	107,900	73,160	83,940	50,140	90,450	49,960	36,800	26,780	18,770	14,530	827,600
1956	81,890	225,400	143,900	148,700	44,890	120,400	104,900	80,470	72,180	34,240	13,800	19,430	1,090,000
1957	120,300	81,170	149,600	44,830	120,400	119,800	71,480	39,470	21,860	19,330	17,380	11,640	817,300
1958	29,650	45,990	126,700	183,200	187,300	63,860	84,750	42,000	19,160	13,860	11,440	10,330	818,200
1959	31,220	12,900	144,800	195,300	62,520	72,640	117,600	71,430	36,630	21,580	14,090	36,920	917,600
1960	43,690	128,000	123,600	109,100	130,100	83,570	98,720	62,390	36,160	19,660	15,370	13,150	863,500

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	-	-	-	-	-	-	1,704	1,233,000	
1951	1216	19,200	Feb. 10, 1951	156	1,571	1,137,000	1,335	966,600	
1952	1246	11,300	Jan. 30, 1952	180	1,116	810,400	874	634,800	
1953	1286	15,500	Jan. 3, 1953	152	1,223	885,200	1,497	1,084,000	
1954	1346	15,000	Jan. 5, 1954	227	1,366	988,900	1,410	1,021,000	
1955	1396	20,000	Nov. 18, 1954	159	1,143	827,600	1,237	895,700	
1956	1446	27,000	Nov. 3, 1955	196	1,502	1,090,000	1,364	990,100	
1957	1516	17,200	Dec. 9, 1956	175	1,129	817,300	923	668,500	
1958	1566	12,400	Dec. 25, 1957	131	1,130	818,200	1,250	904,800	
1959	1636	23,600	Apr. 30, 1959	128	1,268	917,600	1,276	924,000	
1960	1716	22,100	Nov. 20, 1959	180	1,189	863,500	-	-	

625. Purdy Creek near Union, Wash.

Location.--Lat 47°18'05", long 123°10'50", in NW¼ sec.22, T.21 N., R.4 W., on left bank immediately downstream from county road bridge, 1 mile upstream from Weaver Creek and 5½ miles southwest of Union.

Drainage area.--1.43 sq mi.

Records available.--September 1954 to July 1960.

Gage.--Water-stage recorder. Datum of gage is 28.76 ft above mean sea level (State Fisheries Department reference mark).

Average discharge.--5 years (1954-59), 23.5 cfs (17,010 acre-ft per year).

Extremes.--1954-60: Maximum discharge, 111 cfs Dec. 15, 1959; maximum gage height, 2.21 ft Apr. 22, 1960; minimum daily discharge, 5.9 cfs Dec. 9, 1959.

Remarks.--Flow affected by springs. Regulation resulting from construction of fish hatchery began October 1959. Records of water temperatures for the period May 1955 to September 1960 are published in reports of 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	-	-	-	-	-	-	-	-	-	-	-	15.7	-
1955	12.4	21.8	22.1	24.5	31.4	27.3	30.2	25.7	22.9	20.0	16.1	14.8	22.4
1956	17.0	29.2	41.4	49.8	36.3	43.8	37.2	26.4	22.0	18.6	18.2	15.5	29.6
1957	17.2	16.1	30.4	20.9	25.6	34.9	26.5	22.5	19.8	18.3	16.4	15.0	22.0
1958	15.2	15.4	16.9	28.4	32.7	28.6	26.4	22.9	20.6	18.4	15.2	13.0	20.7
1959	11.8	13.8	19.6	35.4	28.8	26.4	31.2	31.3	22.0	19.5	16.5	15.5	22.6
1960	14.8	20.2	22.3	25.1	41.2	33.2	38.5	36.7	25.2	19.4	-	-	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951													
1952													
1953													
1954	-	-	-	-	-	-	-	-	-	-	-	936	-
1955	762	1,300	1,360	1,500	1,750	1,680	1,800	1,580	1,360	1,230	988	880	16,190
1956	1,040	1,740	2,540	3,060	2,090	2,700	2,210	1,620	1,310	1,150	1,120	922	21,500
1957	1,080	960	1,870	1,290	1,420	2,150	1,570	1,390	1,180	1,130	1,010	892	15,920
1958	810	797	1,040	1,740	1,810	1,760	1,570	1,410	1,220	1,130	932	771	14,990
1959	727	824	1,210	2,170	1,600	1,620	1,850	1,930	1,310	1,200	1,020	922	16,380
1960	909	1,200	1,370	1,540	2,370	2,040	2,290	2,260	1,500	1,190	-	-	-

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	1396	-		-		-	-	-
1955	1396	70	Feb. 7, 1955	11	22.4	16,190	25.0	18,090
1956	1446	81	Dec. 22, 1955	13.5	29.6	21,500	27.7	20,070
1957	1516	106	Dec. 10, 1956	11.5	22.0	15,920	20.3	14,680
1958	1566	60	Jan. 16, 1958	11	20.7	14,990	20.9	15,100
1959	1636	99	Apr. 30, 1959	10	22.6	16,380	23.6	17,100
1960	1716	111	Dec. 15, 1959	-	-	-	-	-

630. Union River near Bremerton, Wash.

Location.--Lat 47°31'45", long 122°47'05", in SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.34, T.24 N., R.1 W., on right bank 400 ft upstream from highway bridge, $\frac{1}{4}$ miles upstream from Hazel Creek, and 7 miles west of Bremerton.

Drainage area.--3.16 sq mi.

Records available.--October 1945 to September 1959.

Gage.--Water-stage recorder. Altitude of gage is 395 ft (from topographic map). Prior to Jan. 30, 1952, at site 100 ft upstream at datum 398.0 ft above mean sea level (closed stadia traverse).

Average discharge.--14 years (1945-59), 12.2 cfs (8,830 acre-ft per year).

Extremes.--1945-59: Maximum discharge, 476 cfs Feb. 22, 1949 (gage height, 3.85 ft, site and datum then in use), from rating curve extended above 160 cfs by logarithmic plotting; minimum daily, 0.2 cfs June 2, 1955.

Remarks.--Regulation by Casad Dam 1 mile upstream since sometime in 1956. No diversion 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	8.54	31.1	42.6	38.1	44.8	13.0	4.77	2.14	1.17	0.64	0.46	0.64	15.5
1952	12.9	18.4	23.0	30.7	26.6	9.04	4.87	3.10	1.72	.83	.61	.51	11.0
1953	.58	.97	14.6	78.5	23.7	13.8	7.23	3.37	2.37	1.35	.89	.90	12.4
1954	6.85	24.3	27.5	32.5	52.3	12.6	10.5	3.16	1.95	1.29	.88	.98	14.3
1955	1.18	30.9	22.7	14.9	14.6	10.0	15.9	3.55	2.23	2.08	1.49	1.14	9.99
1956	9.45	47.1	36.3	50.8	14.1	29.4	8.48	1.70	3.44	1.79	1.24	.96	17.1
1957	3.71	14.3	8.89	8.42	5.24	8.96	8.74	9.22	10.5	10.6	12.0	18.3	9.96
1958	6.84	4.86	5.01	5.87	17.0	10.7	7.75	10.7	11.1	14.9	9.08	6.05	9.11
1959	7.06	20.1	12.5	7.75	7.70	8.81	14.5	16.3	9.62	12.8	10.6	10.6	11.5
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	525	1,850	2,620	2,340	2,490	801	284	132	70	39	28	38	11,220
1952	794	1,090	1,420	1,890	1,530	556	290	191	102	51	37	30	7,980
1953	36	58	899	4,830	1,310	846	430	207	141	83	55	53	8,950
1954	421	1,450	1,690	2,000	2,910	776	627	195	116	79	54	58	10,380
1955	72	1,840	1,390	916	810	616	946	218	132	128	91	68	7,230
1956	581	2,800	2,230	3,130	810	1,810	505	105	204	110	76	57	12,420
1957	228	849	546	518	291	551	520	567	626	654	736	1,120	7,210
1958	420	289	308	361	945	659	461	658	680	914	558	360	6,590
1959	434	1,200	766	476	428	541	861	1,000	572	790	651	628	8,350
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 Inches	Acre-feet	Mean	Runoff	
		Discharge	Date							Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	17.4	74.87	12,610
1951	1216	378	Feb. 9, 1951	0.3	15.5	4.91	66.55	11,220	13.2	56.50	9,530
1952	1248	-	-	.4	11.0	3.48	47.35	7,980	7.81	33.62	5,670
1953	1286	212	Jan. 3, 1953	.4	12.4	3.92	53.08	8,950	15.9	68.33	11,520
1954	1346	254	Jan. 5, 1954	.7	14.3	4.53	61.53	10,380	14.0	60.01	10,120
1955	1396	348	Nov. 19, 1954	.2	9.99	3.16	42.91	7,230	13.2	56.61	9,540
1956	1446	386	Nov. 3, 1955	.7	17.1	5.41	73.67	12,420	11.6	49.99	8,430
1957	1516	52	(a)	.6	9.96	3.15	42.77	7,210	9.12	39.18	6,600
1958	1566	26	(b)	.7	9.11	2.88	39.12	6,590	11.0	47.31	7,980
1959	1636	46	May 23, 1959	4.5	11.5	3.64	49.56	8,350	-	-	-
1960											

a Oct. 31 to Nov. 1, 1956.

b Feb. 25 to Mar. 1, 1958.

635. Union River near Belfair, Wash.

Location.--Lat 47°28'20", long 122°49'40", in NE $\frac{1}{4}$ sec.20, T.23 N., R.1 W., on left bank at highway bridge, $\frac{1}{2}$ miles north of Belfair, 2 miles upstream from mouth, and 6 miles downstream from Casad Dam.

Drainage area.--19.2 sq mi.

Records available.--July 1947 to September 1959.

Gage.--Water-stage recorder. Datum of gage is 45.6 ft above mean sea level (closed stadia traverse).

Average discharge.--12 years (1947-59), 54.7 cfs (39,600 acre-ft per year).

Extremes.--1947-59: Maximum discharge, 1,610 cfs Feb. 22, 1949 (gage height, 7.81 ft), from rating curve extended above 700 cfs; minimum, 11 cfs Aug. 15, 1959; minimum gage height, 1.06 ft Sept. 5, 6, 1949.

Remarks.--City of Bremerton diverts annually about 4,000 acre-ft from a point about 5 miles above station for municipal use. The diversion varies from almost no flow in August and September to as much as 10 cfs during winter months. Regulation by dam 6 miles upstream since sometime in 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	35.7	91.2	151	149	194	77.3	49.2	38.1	30.6	25.1	23.2	24.7	73.4
1952	46.5	62.2	80.2	95.1	90.2	42.5	33.9	27.4	22.4	18.9	16.5	15.5	45.7
1953	26.9	17.4	49.6	250	97.2	51.6	36.7	29.4	24.6	19.6	17.0	17.2	53.3
1954	25.8	61.2	87.5	123	179	61.7	53.6	34.8	28.1	26.1	22.4	21.5	59.7
1955	21.2	92.9	69.9	47.6	55.0	45.3	66.9	33.8	24.7	23.3	20.5	19.0	43.2
1956	50.2	145	141	156	73.3	134	59.7	37.9	37.7	26.0	22.8	21.7	75.6
1957	39.9	37.6	78.1	43.2	76.9	85.4	43.5	34.5	29.1	25.1	24.1	22.8	44.9
1958	24.3	29.7	66.1	92.9	94.2	49.4	48.2	33.3	26.4	19.6	16.2	15.9	42.7
1959	22.7	51.1	73.4	112	63.2	45.8	64.9	56.3	30.8	22.2	19.1	25.3	48.7

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2,200	5,430	9,310	9,140	10,770	4,750	2,930	2,340	1,820	1,540	1,420	1,470	53,120
1952	2,860	3,700	4,930	5,720	5,190	2,610	2,020	1,680	1,330	1,160	1,010	924	33,130
1953	1,650	1,040	3,050	15,400	5,400	3,180	2,300	1,810	1,460	1,210	1,050	1,030	38,580
1954	1,590	3,640	5,380	7,540	9,920	3,600	3,190	2,140	1,730	1,610	1,380	1,280	43,200
1955	1,310	5,530	4,300	2,930	3,050	2,790	3,980	2,080	1,470	1,440	1,260	1,130	31,270
1956	3,090	8,650	8,670	9,610	4,220	8,230	3,550	2,330	2,240	1,600	1,400	1,290	54,880
1957	2,450	2,240	4,800	2,660	4,270	5,250	2,590	2,120	1,730	1,540	1,480	1,360	32,490
1958	1,490	1,770	4,070	5,710	5,230	3,040	2,870	2,040	1,570	1,210	995	947	30,940
1959	1,400	3,040	4,510	6,880	3,510	2,690	3,860	3,460	1,830	1,370	1,170	1,510	35,230

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	-	-	-	-	-	-	72.5	52,520	
1951	1216	1,230	Feb. 9, 1951	17.5	73.4	53,120	65.9	47,670	
1952	1246	616	Jan. 30, 1952	14.5	45.7	33,130	37.7	27,380	
1953	1286	702	Jan. 3, 1953	14.5	53.3	38,580	60.0	43,450	
1954	1346	834	Jan. 5, 1954	17	59.7	43,200	60.4	43,730	
1955	1396	665	Nov. 19, 1954	16.5	43.2	31,270	56.0	40,540	
1956	1446	1,040	Nov. 3, 1955	19	75.6	54,880	60.6	43,960	
1957	1516	768	Dec. 9, 1956	20	44.9	32,490	41.9	30,330	
1958	1566	340	Dec. 25, 1957	14	42.7	30,940	45.0	32,560	
1959	1636	499	Apr. 30, 1959	17.5	48.7	35,230	-	-	

645. Mission Creek near Bremerton, Wash.

Location.--Lat 47°32'00", long 122°50'05", in NE¼NW¼ sec.32, T.24 N., R.1 W., on west shore of Mission Lake, 300 ft upstream from lake outlet and 9½ miles southwest of Bremerton.
Drainage area.--1.91 sq mi.
Records available.--June 1945 to September 1953.
Gage.--Water-stage recorder. Datum of gage is 513.0 ft above mean sea level (by closed stadia traverse).
Average discharge.--8 years (1945-53), 6.63 cfs (4,800 acre-ft per year).
Extremes.--1945-53: Maximum discharge, 96 cfs Feb. 22, 1949 (gage height, 6.36 ft); no flow at times in each year.
Remarks.--Fish screen at lake outlet may have slight regulating effect since November 1949. No 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	2.70	18.2	24.6	21.9	22.9	7.57	3.34	0.67	0.01	0	0	0	8.40
1952	2.63	9.00	16.9	14.6	17.6	4.38	4.63	2.24	.46	.20	0	0	6.02
1953	0	0	8.06	37.6	15.3	8.99	3.80	2.33	.27	.32	0	.01	6.38

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	166	1,080	1,520	1,340	1,270	466	199	41	0.8	0	0	0	6,080
1952	162	536	1,040	896	1,010	269	276	138	27	12	0	0	4,370
1953	0	0	496	2,310	848	553	226	143	16	19	0	.6	4,610

Yearly 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	-	-	-	-	-	-	-	-	9.59	68.15	6,950
1951	1216	90	Feb. 9, 1951	0	8.40	4.40	59.73	6,080	6.99	49.67	5,050
1952	1246	69	Jan. 31, 1952	0	6.02	3.15	42.88	4,370	4.31	30.68	3,120
1953	1286	67	Jan. 9, 1953	0	6.38	3.34	45.33	4,610	-	-	-

650. Mission Creek near Belfair, Wash.

Location.--Lat 47°29'20", long 122°51'45", in NW¼ sec.18, T.23 N., R.1 W., on left bank 3 miles northwest of Belfair and 5 miles upstream from mouth.
Drainage area.--4.37 sq mi.
Records available.--October 1945 to April 1953.
Gage.--Water-stage recorder. Datum of gage is 330.0 ft above mean sea level (closed stadia traverse).
Average discharge.--7 years (1945-52), 12.4 cfs (8,980 acre-ft per year).
Extremes.--1945-53: Maximum discharge, 403 cfs Feb. 22, 1949 (gage height, 6.10 ft, from graph based on gage readings); no flow Sept. 16, 21, 22, Oct. 1, 1951.
Remarks.--No regulation or diversion 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	0.88	29.9	50.3	43.8	55.8	13.2	3.94	1.33	0.68	0.45	0.22	0.10	16.5
1952	6.37	17.8	28.8	25.9	31.6	9.88	4.70	1.52	.62	.53	.45	.30	10.6
1953	.21	.36	20.2	91.7	31.3	13.4	-	-	-	-	-	-	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	54	1,780	3,090	2,690	3,100	811	235	82	40	28	13	6.1	11,930
1952	392	1,060	1,770	1,590	1,820	608	280	94	37	33	28	18	7,730
1953	15	22	1,240	5,640	1,740	827	-	-	-	-	-	-	-

Yearly 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	-	-	-	-	-	-	-	-	17.3	53.72	12,520
1951	1216	278	Feb. 9, 1951	0	16.5	3.78	51.19	11,930	14.1	43.90	10,230
1952	1246	120	Feb. 1, 1952	.1	10.6	2.43	33.16	7,730	7.96	24.79	5,780
1953	1286	159	Jan. 9, 1953	-	-	-	-	-	-	-	-

655. Gold Creek near Bremerton, Wash.

Location.--Lat 47°33'20", long 122°48'35" in NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.21, T.24 N., R.1 W., on right bank $1\frac{1}{2}$ miles upstream from mouth and 8 miles west of Bremerton.

Drainage area.--1.54 sq mi.

Records available.--October 1945 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 750.9 ft above mean sea level (closed stadia traverse).

Average discharge.--15 years (1945-60), 5.39 cfs (3,900 acre-ft per year).

Extremes.--1945-60: Maximum discharge, 203 cfs Feb. 22, 1949 (gage height, 3.27 ft); minimum, 0.1 cfs July 29, Sept. 9, 1958; minimum gage height, 0.72 ft Sept. 9, 1958.

Remarks.--No regulation or diversion 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	5.52	13.4	18.2	16.6	19.2	6.47	2.84	1.40	0.79	0.56	0.44	0.49	6.92
1952	4.97	7.75	10.1	12.3	10.2	5.18	2.91	1.80	1.07	.82	.55	.38	4.79
1953	.50	.94	7.65	29.3	11.9	7.03	3.79	2.15	1.52	.97	.71	.91	5.60
1954	2.73	9.83	12.1	16.2	25.4	8.13	5.67	2.14	1.47	1.00	.65	.69	7.05
1955	.80	12.1	10.6	7.95	7.35	5.68	8.84	2.74	1.45	1.24	.78	.82	5.00
1956	5.00	22.7	17.8	18.5	7.11	19.1	6.31	2.46	2.75	1.36	.85	.82	8.74
1957	4.76	6.83	15.0	6.47	13.0	12.0	5.38	2.55	1.42	.77	.65	.44	5.74
1958	.97	3.94	9.97	14.5	14.7	5.24	7.22	2.46	1.19	.72	.43	.61	5.10
1959	1.34	6.57	10.7	15.9	7.88	5.85	6.98	4.37	1.78	.96	.57	1.03	5.32
1960	1.59	10.1	11.5	12.6	13.8	8.89	9.77	4.54	1.92	.83	.75	.66	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	217	796	1,120	1,020	1,060	398	169	86	47	34	27	29	5,000
1952	305	461	620	755	586	318	173	111	64	38	27	23	3,480
1953	31	56	471	1,800	660	432	226	132	90	60	44	54	4,060
1954	168	585	747	996	1,410	500	337	131	88	61	40	41	5,100
1955	49	721	650	489	408	349	526	169	86	76	48	49	3,620
1956	307	1,350	1,090	1,140	409	1,180	376	151	164	84	52	49	6,350
1957	293	407	924	398	724	736	320	156	84	47	40	26	4,160
1958	60	235	613	890	815	322	429	152	71	44	26	36	3,690
1959	83	391	656	979	438	360	415	269	106	59	35	61	3,850
1960	98	602	709	777	793	547	582	279	114	51	46	39	4,640

Yearly 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	-	-	-	-	-	-	-	7.93	69.88	5,740	
1951	1216	153	Feb. 9, 1951	0.3	6.92	4.49	60.97	5,000	5.89	51.90	4,260
1952	1246	97	Jan. 30, 1952	.3	4.79	3.11	42.40	3,480	3.65	32.31	2,650
1953	1286	106	Jan. 2, 1953	.3	5.60	3.64	49.39	4,060	6.90	60.86	5,000
1954	1346	149	Jan. 5, 1954	.6	7.05	4.58	62.17	5,100	6.94	61.21	5,020
1955	1396	97	Nov. 19, 1954	.5	5.00	3.25	44.07	3,620	6.84	60.23	4,950
1956	1446	175	Nov. 3, 1955	.5	8.74	5.68	77.24	6,350	7.19	63.54	5,230
1957	1516	157	Dec. 10, 1956	.3	5.74	3.73	50.62	4,160	4.75	41.90	3,440
1958	1566	77	Dec. 25, 1957	.3	5.10	3.31	44.95	3,690	5.41	47.66	3,920
1959	1636	77	Jan. 24, 1959	.4	5.32	3.45	46.89	3,850	5.71	50.29	4,130
1960	1716	138	Nov. 20, 1959	.5	6.39	4.15	56.45	4,640	-	-	-

670. Panther Creek near Bremerton, Wash.

Location.--Lat 47°31'50", long 122°51'30", in NW $\frac{1}{4}$ sec.31, T.24 N., R.1 W., on left bank half a mile downstream from Panther Lake and 11 miles southwest of Bremerton.

Drainage area.--1.00 sq mi.

Records available.--June 1945 to September 1953.

Gage.--Water-stage recorder. Datum of gage is 486 ft above mean sea level (closed stadia traverse).

Average discharge.--8 years (1945-53), 3.04 cfs (2,200 acre-ft per year).

Extremes.--1945-53: Maximum discharge, 88 cfs Feb. 22, 1949 (gage height, 3.02 ft); no flow at times in each year.

Remarks.--No regulation or diversion 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	0.32	7.11	11.8	9.94	11.7	2.72	0.74	0.18	0	0	0	0	3.66
1952	.70	4.21	7.74	7.42	6.94	2.43	1.00	.37	.02	0	0	0	2.56
1953	0	0	2.66	19.5	7.06	3.12	1.34	.45	.10	.02	0	0	2.85

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	19	423	724	611	65	167	44	11	0	0	0	0	2,650
1952	43	251	476	456	399	149	60	23	1.2	0	0	0	1,870
1953	0	0	163	1,200	392	192	80	27	6.1	1.4	0	0	2,060

Yearly 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	-	-	-	-	-	-	-	-	4.13	56.08	2,990
1951	1216	63	Feb. 9, 1951	0	3.66	3.66	49.67	2,650	3.11	42.25	2,250
1952	1246	31	Jan. 30, 1952	0	2.56	2.56	34.84	1,870	1.72	23.46	1,250
1953	1286	36	Jan. 15, 1953	0	2.85	2.85	38.67	2,060	-	-	-

685. Dewatto Creek near Dewatto, Wash.

Location.--Lat 47°28'10", long 123°01'30", in SE¼ sec.23, T.23 N., R.3 W., on right bank at county road bridge, 1½ miles upstream from mouth and 2 miles northeast of Dewatto.

Drainage area.--17.5 sq mi.

Records available.--July 1947 to October 1954, water years 1955-57 (annual maximum), May 1958 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 55 ft (from topographic map). July 1947 to October 1954 water-stage recorder and Aug. 1, 1955, to May 21, 1958, crest-stage gage only, at same site and datum. May to September 1958 water-stage recorder at datum 0.92 ft higher.

Average discharge.--9 years (1947-54, 1956-60), 69.6 cfs (50,390 acre-ft per year).

Extremes.--1947-60: Maximum discharge, 2,110 cfs Nov. 3, 1955 (gage height, 7.42 ft).

1947-54, 1958-60: Minimum discharge, 9.6 cfs Sept. 22, 1950, Sept. 11, 12, 14, 15, 1959; minimum gage height, 1.57 ft Sept. 20, 21, 22, 1951.

Remarks.--No regulation or diversion 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	44.0	133	188	170	213	76.4	42.9	32.9	21.2	16.2	12.9	13.8	79.6
1952	61.5	92.6	120	141	127	60.2	39.2	29.5	20.9	16.5	14.8	11.9	61.1
1953	12.2	15.8	95.0	295	123	75.9	43.4	29.3	21.5	16.4	14.2	14.1	63.0
1954	20.1	88.0	124	185	263	80.4	66.7	30.9	23.9	19.4	16.7	16.5	76.7
1955													
1956													
1957													
1958									23.4	17.0	13.9	13.6	-
1959	17.4	59.0	126	188	94.4	69.7	81.0	54.1	26.6	18.1	17.2	15.7	63.9
1960	20.2	116	119	138	160	91.9	101	48.8	28.7	18.9	17.5	15.9	72.6

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2,710	7,940	11,540	10,450	11,850	4,690	2,550	2,000	1,260	994	794	823	57,600
1952	3,770	5,510	7,370	8,670	7,320	3,700	2,330	1,810	1,240	1,010	911	710	44,350
1953	752	939	5,840	18,170	6,840	4,670	2,580	1,800	1,280	1,010	873	838	45,590
1954	1,240	5,240	7,650	11,370	14,600	4,940	3,970	1,900	1,420	1,190	1,030	981	55,530
1955													
1956													
1957													
1958									1,400	1,050	854	809	-
1959	1,070	3,510	7,730	11,550	5,240	4,290	4,820	3,330	1,580	1,110	1,060	933	46,220
1960	1,240	6,930	7,290	8,470	9,200	5,650	6,020	3,000	1,710	1,160	1,070	945	52,680

Yearly 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	-	-	-	-	-	-	-	88.6	68.37	64,190	-	
1951	1216	1,180	Feb. 9, 1951	11	79.6	4.52	61.37	57,600	71.9	55.77	52,060	
1952	1246	968	Jan. 30, 1952	11	61.1	3.49	47.53	44,350	48.6	37.77	35,230	
1953	1286	880	Jan. 3, 1953	11	63.0	3.60	48.85	45,590	72.1	55.90	52,190	
1954	1346	1,280	Jan. 5, 1954	13.5	76.7	4.38	59.48	55,530	-	-	-	
1955	1566	1,170	Nov. 19, 1954	-	-	-	-	-	-	-	-	
1956	1566	2,110	Nov. 3, 1955	-	-	-	-	-	-	-	-	
1957	1566	1,750	Dec. 9, 1956	-	-	-	-	-	-	-	-	
1958	1566	-	-	-	-	-	-	-	-	-	-	
1959	1636, 1716	650	Jan. 24, 1959	9.6	63.9	3.65	49.52	46,220	68.2	52.90	49,370	
1960	1716	1,060	Nov. 20, 1959	15	72.6	4.15	56.46	52,680	-	-	-	

700. Dogfish Creek near Poulsbo, Wash.

Location.--Lat 47°45'10", long 122°38'30", in SW 1/4 sec. 11, T.26 N., R.1 E., on left bank half a mile upstream from mouth and 1 mile north of Poulsbo.

Drainage area.--6.77 sq mi.

Records available.--July 1947 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 20 ft (from topographic map). Prior to Nov. 2, 1950, at site 200 ft downstream at datum 1.75 ft lower.

Average discharge.--13 years (1947-60), 8.85 cfs (6,410 acre-ft per year).

Extremes.--1947-60: Maximum discharge, 333 cfs Feb. 22, 1949 (gage height, 8.07 ft, present datum, from high-water mark on gage house), from rating curve extended above 50 cfs on basis of contracted-opening measurement of peak flow; minimum, 0.7 cfs Aug. 6, 1959.

Revisions.--The momentary maximum discharges for the water years 1948-50 published in WSP 1316 have been revised to 108 cfs, 333 cfs, and 127 cfs respectively.

Remarks.--Slight regulation at times from unknown source. 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	5.54	13.4	16.0	15.3	20.5	9.03	5.71	5.09	3.76	3.12	3.20	3.63	8.63
1952	7.06	11.9	16.7	18.1	11.6	6.89	5.36	4.65	3.75	3.22	3.57	2.99	7.98
1953	4.05	6.08	11.5	27.5	8.89	9.18	6.06	5.11	4.99	3.14	2.85	3.48	7.75
1954	6.10	10.1	9.50	25.1	37.4	10.2	8.52	5.15	5.30	3.94	4.02	5.17	10.7
1955	4.87	12.5	13.0	8.88	7.72	7.94	7.76	5.20	4.63	4.38	3.23	3.47	6.95
1956	6.52	16.0	28.6	29.5	11.4	17.5	7.97	5.30	7.05	4.12	4.15	4.88	12.0
1957	8.03	7.08	8.56	8.69	19.6	17.3	11.6	5.87	4.80	3.91	3.48	3.92	8.55
1958	7.27	7.66	13.4	24.4	23.9	10.1	10.1	5.18	4.12	3.20	3.18	4.34	9.65
1959	7.17	9.34	11.3	14.4	12.3	11.5	9.28	8.89	4.25	2.48	2.97	5.10	8.23
1960	6.12	9.67	13.4	17.0	17.0	11.2	10.8	7.35	4.86	3.46	4.86	4.96	9.20

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	341	798	984	939	1,140	555	340	313	224	192	197	228	6,250
1952	434	708	1,030	1,110	668	424	319	286	223	198	220	178	5,800
1953	249	362	706	1,690	494	565	360	314	297	193	175	207	5,610
1954	375	602	584	1,540	2,070	627	507	317	315	242	247	307	7,730
1955	300	742	797	546	429	488	462	320	275	269	199	207	5,030
1956	401	951	1,760	1,820	658	1,080	474	326	420	253	255	290	8,690
1957	493	421	527	535	1,090	1,100	687	361	286	240	213	233	6,190
1958	447	456	822	1,500	1,330	621	599	319	245	197	196	258	6,990
1959	441	556	693	886	685	708	552	547	253	153	183	303	5,960
1960	376	575	822	1,050	978	688	644	452	289	213	299	295	6,680

Yearly 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
1950											
1951	1216,1636	104	Feb. 9, 1951	2.6	8.63	1.27	17.29	6,250	9.72	19.50	7,040
1952	1246,1636	77	Nov. 30, 1951	2.6	7.98	1.18	16.04	5,800	8.69	17.42	6,300
1953	1286,1636	128	Jan. 8, 1953	2.4	7.75	1.14	15.53	5,610	6.81	13.68	4,940
1954	1346,1636	159	Feb. 21, 1954	2.7	10.7	1.58	21.45	7,730	8.09	16.22	5,860
1955	1396,1636	102	Nov. 19, 1954	2.7	6.95	1.03	13.93	5,030	11.1	22.21	8,010
									8.71	17.47	6,310
1956	1446,1636	269	Dec. 20, 1955	3.5	12.0	1.77	24.04	8,690	9.65	19.41	7,020
1957	1516,1636	130	Feb. 25, 1957	3.0	8.55	1.26	17.15	6,190	9.64	17.93	6,470
1958	1566,1636	109	Dec. 25, 1957	2.8	9.65	1.43	19.35	6,990	9.80	19.25	6,960
1959	1636	124	Jan. 24, 1959	1.2	8.23	1.22	16.50	5,960	8.35	16.73	6,040
1960	1716	193	Jan. 29, 1960	3.0	9.20	1.36	18.50	6,680	-	-	-

728. Purdy Creek at Purdy, Wash.

Location.--Lat 47°23'18", long 122°37'30", in NW $\frac{1}{4}$ sec.24, T.22 N., R.1 E., on left bank at downstream side of culvert, 400 ft upstream from mouth at Purdy and 2 miles south of Burley.

Drainage area.--3.44 sq mi.

Records available.--November 1959 to September 1960.

Gage.--Staff gage. Altitude of gage is about 10 ft above mean sea level.

Extremes.--1959-60: Maximum discharge, 113 cfs Dec. 15, 1959 (gage height, 1.6 ft, from graph based on gage readings); minimum observed, 1.5 cfs Aug. 10, 1960 (gage height, 0.20 ft).

Remarks.--No regulation or diversion above station.

Monthly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1960	-	-	12.9	14.5	11.9	8.11	8.96	7.61	4.02	2.43	2.43	2.61	-

Monthly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1960	-	-	796	889	684	499	533	468	239	149	156	156	-

BURLEY CREEK BASIN

730. Burley Creek at Burley, Wash.

Location.--Lat 47°24'55" (revised), long 122°37'50", in NE $\frac{1}{4}$ sec.11, T.22 N., R.1 E., on left bank at county road bridge, 0.1 mile west of Burley and 0.3 mile upstream from mouth.

Drainage area.--10.0 sq mi.

Records available.--July 1947 to September 1950, November 1959 to September 1960.

Gage.--Staff gage. Altitude of gage is 10 ft (from topographic map). July 1947 to September 1950 water-stage recorder at same site at different datum.

Extremes.--1947-50, 1959-60: Maximum discharge, 291 cfs Mar. 3, 1950 (gage height, 4.53 ft, datum then in use); minimum, 11 cfs July 19-21, 1947.

Remarks.--Several small diversions for domestic use above station. No regulation.

Monthly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1960	-	-	42.0	37.6	38.9	39.4	37.7	31.0	21.2	16.3	17.7	17.9	-

Monthly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1960	-	-	2,580	2,310	2,240	2,420	2,250	1,910	1,260	1,000	1,090	1,060	-

735. Huge Creek near Wauna, Wash.

Location.--Lat 47°23'20", long 122°41'50", at north line of sec.20, T.22 N., R.1 E., on right bank at downstream side of bridge, an eighth of a mile upstream from mouth and 2½ miles west of Wauna.

Drainage area.--5.51 sq mi.

Records available.--July 1947 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 100 ft (from topographic map). Prior to June 26, 1951, at same site at datum 0.86 ft higher.

Average discharge.--13 years (1947-60), 11.8 cfs (8,540 acre-ft per year).

Extremes.--1947-60: Maximum discharge, 391 cfs Feb. 9, 1951 (gage height, 3.64 ft); minimum, 3.2 cfs Sept. 1, 1950; minimum gage height, 0.49 ft May 18, 20, 21, 1956.

Remarks.--No regulation or diversion 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	6.50	15.1	34.1	34.5	51.8	17.7	9.30	7.55	6.71	5.79	4.82	5.09	16.4
1952	6.47	7.80	12.2	13.1	18.7	8.93	6.17	4.77	4.62	4.45	4.32	4.21	7.95
1953	4.09	4.13	4.97	42.8	25.9	10.8	8.16	6.10	5.15	4.50	4.44	4.72	10.4
1954	6.00	10.1	24.4	37.0	36.7	13.4	10.3	7.08	6.03	5.20	4.65	4.59	13.7
1955	4.55	13.8	11.8	10.9	12.9	9.74	10.7	6.15	4.90	4.67	4.35	4.49	8.20
1956	5.91	23.0	36.9	43.4	13.5	32.2	13.8	8.89	8.25	5.94	5.48	5.37	16.9
1957	8.91	10.0	20.9	10.5	17.1	21.4	10.4	7.25	6.45	6.03	5.64	5.30	10.8
1958	5.57	5.74	9.76	23.8	23.2	10.3	9.65	6.34	4.59	4.44	4.56	4.57	9.30
1959	5.36	9.52	15.3	37.2	15.6	10.2	16.5	12.4	7.27	5.76	4.83	5.39	12.1
1960	5.69	12.1	22.2	21.8	25.3	16.0	15.6	9.76	7.25	5.73	5.33	5.00	12.6

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	399	901	2,090	2,120	2,870	1,090	553	464	399	356	296	303	11,840
1952	398	484	750	807	1,080	549	367	294	275	273	265	250	5,770
1953	252	246	306	2,630	1,440	661	486	375	307	276	273	281	7,530
1954	369	602	1,500	2,270	2,040	824	613	436	359	320	286	273	9,890
1955	279	819	728	672	718	599	634	378	292	287	267	267	5,940
1956	364	1,370	2,270	2,670	776	1,980	823	546	491	365	337	320	12,310
1957	548	597	1,280	843	949	1,320	820	446	394	371	347	315	7,820
1958	343	342	600	1,460	1,290	631	574	390	273	273	280	272	6,730
1959	330	566	941	2,290	867	826	982	761	432	354	297	321	8,770
1960	350	723	1,360	1,340	1,450	984	925	600	431	352	327	298	9,140

Yearly 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	-	-	-	-	-	-	-	16.9	41.52	12,190	
1951	1216	391	Feb. 9, 1951	3.9	16.4	2.98	40.34	11,840	13.9	34.28	10,080
1952	1246	89	Feb. 4, 1952	3.6	7.95	1.44	19.63	5,770	6.83	16.88	4,980
1953	1286, 1636	128	Jan. 31, 1953	3.8	10.4	1.89	25.63	7,530	12.7	31.31	9,200
1954	1346, 1636	138	Feb. 21, 1954	4.0	13.7	2.49	33.67	9,890	12.8	31.47	9,250
1955	1396	87	Feb. 8, 1955	4.0	8.20	1.49	20.23	5,940	11.2	27.61	8,120
1956	1446, 1636	154	Dec. 21, 1955	4.1	16.9	3.07	41.87	12,310	14.8	36.53	10,730
1957	1516	106	Dec. 10, 1956	4.8	10.8	1.96	26.62	7,820	9.22	22.73	6,680
1958	1566	85	Jan. 16, 1958	4.0	9.30	1.69	22.91	6,730	10.1	24.79	7,280
1959	1636	205	Apr. 30, 1959	4.3	12.1	2.20	29.82	8,770	12.9	31.86	9,560
1960	1716	212	Dec. 15, 1959	4.8	12.6	2.29	31.12	9,140	-	-	-

740. Shumocher Creek near Union, Wash.

Location.--Lat 47°19'10", long 122°59'20", in SW $\frac{1}{4}$ sec.7, T.21 N., R.2 W., on right bank a quarter of a mile upstream from mouth and 6 miles southeast of Union.

Drainage area.--12.2 sq mi.

Records available.--June to October 1951.

Gage.--Water-stage recorder. Altitude of gage is 190 ft (from topographic map).

Extremes.--June to October 1951: Maximum discharge, 19.5 cfs Oct. 2 (gage height, 1.04 ft); minimum, 4.0 cfs Sept. 27 (gage height, 0.69 ft).

Remarks.--No regulation or diversion above station.

Monthly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	13.3	10.5	7.91	6.89	-

Monthly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	792	643	791	410	-

DEER CREEK BASIN

750. Deer Creek near Shelton, Wash.

Location.--Lat 47°16'00", long 123°00'15" (revised), in NW $\frac{1}{4}$ sec.36, T.21 N., R.3 W., on left bank three-quarters of a mile upstream from mouth and 6 miles northeast of Shelton.

Drainage area.--13.6 sq mi.

Records available.--December 1942 to September 1943, August 1948 to September 1950, May to September 1951.

Gage.--Water-stage recorder. Altitude of gage is 20 ft (from topographic map). Dec. 29, 1942, to Sept. 30, 1943, staff gage at same site at different datum.

Extremes.--1942-43, 1948-51: Maximum discharge, 386 cfs Feb. 22, 1949 (gage height, 5.13 ft); minimum observed, 16 cfs Sept. 24, 25, 27-29, 1943.

Remarks.--No known regulation or diversion above station.

Monthly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	24.7	21.2	19.3	22.5	-

Monthly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	1,470	1,300	1,180	1,340	-

755. Cranberry Creek near Shelton, Wash.

Location.--Lat 47°16'00", long 123°00'30", in NW¼ sec.36, T.21 N., R.3 W., on left bank half a mile upstream from mouth and 6 miles northeast of Shelton.

Drainage area.--15.2 sq mi.

Records available.--December 1942 to September 1943, August 1948 to September 1951.

Gage.--Water-stage recorder. Altitude of gage is 25 ft (from topographic map). Dec. 30, 1942, to Sept. 30, 1943, staff gage at same site and datum.

Extremes.--1942-43, 1948-51: Maximum discharge, 860 cfs Feb. 9, 1951 (gage height, 7.12 ft); minimum, 4.7 cfs Sept. 3, 11, 13, 1949 (gage height, 1.87 ft); minimum gage height, 0.74 ft Sept. 23-25, 1943.

Remarks.--No regulation. Minor 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	22.8	77.4	115	134	200	61.7	29.5	21.0	13.6	8.79	7.64	8.92	57.5

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,400	4,600	7,070	8,230	11,100	3,790	1,760	1,290	808	541	470	531	41,590

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year		
		Momentary maximum		Minimum		Mean	Per square mile	Runoff		Runoff	
		Discharge	Date	day	day			Inches	Acre-feet	Mean	Inches
1950	-	-	-	-	-	-	-	-	-	64.1	57.25
1951	1216	860	Feb. 9, 1951	6.5	57.5	3.78	51.31	41,590	-	-	46,400

JOHNS CREEK BASIN

760. Johns Creek near Shelton, Wash.

Location.--Lat 47°15'00", long 123°05'15", in NE¼ sec.5, T.20 N., R.3 W., on left bank 3 miles upstream from mouth and 3 miles north of Shelton.

Drainage area.--17.7 sq mi.

Records available.--December 1942 to September 1943, August 1948 to October 1950, May to September 1951.

Gage.--Water-stage recorder. Altitude of gage is 200 ft (from topographic map). Prior to Oct. 1, 1943, staff gage at same site at different datum.

Extremes.--1942-43, 1948-51: Maximum discharge recorded, 211 cfs Mar. 5, 1950; maximum gage height, 3.49 ft Feb. 23, 1949; minimum discharge, 3.9 cfs Sept. 22, 1951 (gage height, 0.29 ft).

Remarks.--No regulation or diversion above station.

Monthly 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	8.42	6.54	6.34	-

Monthly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	734	517	402	377	-

765. Goldsborough Creek near Shelton, Wash.

Location--Lat 47°12'50", long 123°10'50", in SW $\frac{1}{4}$ sec.15, T.20 N., R.4 W., on right bank $\frac{3}{4}$ miles west of Shelton and $\frac{5}{8}$ miles upstream from mouth.

Drainage area--42 sq mi, approximately.

Records available--June 1951 to September 1960.

Gage--Water-stage recorder. Altitude of gage is 205 ft (from topographic map).

Average discharge--9 years (1951-60), 117 cfs (84,700 acre-ft per year).

Extremes--1951-60: Maximum discharge, 1,390 cfs Dec. 15, 1959; maximum gage height, 8.51 ft Dec. 10, 1956; minimum discharge, 16 cfs Sept. 23, 1951, Sept. 22-25, 1952, Aug. 25, 27, Sept. 8, 9, 12-14, 1958.

Remarks--No regulation or diversion 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	-	-	-	-	-	-	-	-	-	24.4	20.2	23.2	-
1952	69.5	108	172	155	186	104	71.5	51.3	35.5	24.3	22.7	17.3	84.4
1953	18.6	25.0	100	376	324	122	91.7	77.4	47.2	29.3	23.4	23.6	104
1954	44.9	144	265	283	396	205	175	58.7	46.1	34.5	27.0	27.9	141
1955	48.7	217	156	159	162	156	175	66.9	39.8	34.9	27.1	24.0	105
1956	110	290	351	367	167	321	150	62.6	54.1	32.5	26.3	23.1	163
1957	87.1	91.9	196	96.2	171	227	116	63.5	40.9	29.6	25.5	20.9	96.8
1958	34.3	70.4	180	223	245	120	124	57.6	35.0	23.2	19.5	20.3	95.2
1959	36.0	177	218	313	174	135	184	152	59.4	34.1	24.0	30.8	128
1960	46.8	211	238	212	326	174	188	108	60.1	32.7	29.5	26.3	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	-	-	-	-	-	-	-	-	-	1,500	1,240	1,380	-
1952	4,270	6,420	10,570	9,510	10,710	6,380	4,250	3,160	2,110	1,500	1,390	1,030	61,300
1953	1,140	1,480	6,160	23,130	18,010	7,510	5,450	4,760	2,810	1,800	1,440	1,410	75,100
1954	2,760	8,570	16,270	17,380	22,000	12,620	10,440	3,610	2,750	2,120	1,660	1,660	101,800
1955	3,000	12,930	9,560	9,800	9,010	9,570	10,410	4,110	2,370	2,150	1,660	1,430	76,000
1956	6,740	17,270	21,600	22,560	9,630	19,730	8,900	3,850	3,220	2,000	1,610	1,370	118,500
1957	5,350	5,470	12,080	5,920	9,490	13,930	6,920	3,900	2,410	1,820	1,570	1,240	70,100
1958	2,100	4,190	11,060	13,720	13,610	7,570	7,390	3,540	2,140	1,420	1,200	1,210	68,960
1959	2,210	10,530	13,390	19,220	9,680	8,490	10,930	9,350	3,540	2,090	1,480	1,840	92,750
1960	2,880	12,530	14,600	13,050	18,770	10,700	11,160	6,670	3,580	2,010	1,810	1,560	99,320

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		Mean	Runoff	
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1950											
1951	1216	-	-	-	-	-	-	-	-	-	-
1952	1246	468	Jan. 31, 1952	16	84.4	2.01	27.38	61,300	67.3	21.80	48,820
1953	1286	1,090	Jan. 31, 1953	16.5	104	2.48	33.52	75,100	130	41.92	93,920
1954	1346	972	Feb. 22, 1954	24	141	3.36	45.46	101,800	138	44.52	99,730
1955	1396	775	Nov. 19, 1954	21	105	2.50	33.94	76,000	133	42.92	96,120
1956	1446	712	Nov. 3, 1955	21	163	3.88	52.89	118,500	132	42.75	95,770
1957	1516	977	Dec. 10, 1956	20	96.8	2.30	31.30	70,100	89.2	28.83	64,560
1958	1566	552	Jan. 17, 1958	16	95.2	2.27	30.80	68,960	107	34.72	77,730
1959	1636	871	Apr. 30, 1959	18	128	3.05	41.42	92,750	133	43.15	96,630
1960	1716	1,390	Dec. 15, 1959	24	157	3.26	44.36	99,320	-	-	-

GOLDSBOROUGH CREEK BASIN

770. Goldsborough Creek at Shelton, Wash.

Location.--Lat 47°12'40", long 123°06'30", in NE $\frac{1}{4}$ sec.19, T.20 N., R.3 W., on right bank at upstream side of railroad bridge in Shelton, 1 mile upstream from mouth.

Drainage area.--55 sq mi, approximately.

Records available.--December 1942 to September 1943, June to September 1951.

Gage.--Water-stage recorder. Altitude of gage is 20 ft (from topographic map). Prior to Oct. 1, 1943, staff gage on downstream side of same bridge at different datum.

Extremes.--1942-43, 1951: Maximum discharge observed, 950 cfs Feb. 6, 1943 (gage height, 3.96 ft); minimum, 4.9 cfs Aug. 22, 23, 1951 (gage height, 1.00 ft).

Remarks.--Diversion above station of as much as 29 cfs for use in lumber and pulp industry below station. No regulation.

Monthly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	22.3	14.1	7.13	8.35	-

Monthly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	1,320	866	438	497	-

MILL CREEK BASIN

775. Mill Creek at Shelton, Wash.

Location.--Lat 47°11'45", long 123°05'45", in NW $\frac{1}{4}$ sec.29, T.20 N., R.3 W., on right bank a quarter of a mile south of Shelton and 2 $\frac{1}{4}$ miles downstream from Lake Isabella.

Drainage area.--19.5 sq mi.

Records available.--December 1942 to September 1943, May to September 1951.

Gage.--Water-stage recorder. Altitude of gage is 110 ft (from topographic map). Prior to Oct. 1, 1943, staff gage at same site at different datum.

Extremes.--1942-43, 1951: Maximum discharge observed, 474 cfs Feb. 7, 1943 (gage height, 3.40 ft, datum then in use); minimum observed, 11 cfs Sept. 15, 1943 (gage height, 0.59 ft, datum then in use).

Remarks.--No known regulation or diversion above station.

Monthly 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	15.6	12.5	13.6	-

Monthly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	1,360	958	769	821	-

75

Location.--Lat 47°03'30", long 123°06'50", in NW $\frac{1}{4}$ sec.19, T.19 N., R.3 W., on right bank three-quarters of a mile southwest of Kamilche and 3 miles upstream from mouth.

Remarks.--No regulation. Probably some diversion for irrigation and farm use.

[illegible][illegible][illegible]

784. Kennedy Creek near Kamilche, Wash.

Location.--Lat 47°04'40", long 123°07'35", in SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.1, T.18 N., R.4 W., on left bank 100 ft upstream from Kennedy Falls, 0.4 mile (revised) upstream from mouth at Oyster Bay, and 4 miles south of Kamilche.

Drainage area.--15.3 sq mi.

Records available.--February to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 110 ft (from topographic map).

Extremes.--February to September 1960: Maximum discharge not determined; minimum, 2.8 cfs Aug. 10, 13 (gage height, 0.32 ft).

Remarks.--No regulation or diversion above station.

Monthly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1960	-	-	-	-	185	87.6	104	41.8	17.1	6.34	3.76	3.28	-

Monthly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1960	-	-	-	-	10,650	5,390	6,170	2,570	1,020	390	231	195	-

785. Kennedy Creek near New Kamilche, Wash.

Location.--Lat 47°05'30", long 123°05'45", in NE $\frac{1}{4}$ sec.31, T.19 N., R.3 W., on left bank 1 mile south of New Kamilche and 2 miles upstream from mouth.

Drainage area.--18.7 sq mi.

Records available.--May to September 1951.

Gage.--Water-stage recorder. Altitude of gage is 30 ft (from topographic map).

Extremes.--May to September 1951: Maximum discharge, 14 cfs Sept. 30 (gage height, 1.88 ft); minimum, 2.8 cfs Aug. 23-27 (gage height, 1.53 ft).

Remarks.--No regulation. Small amount of diversion for irrigation.

Monthly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	8.71	5.19	3.60	3.96	-

Monthly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	518	319	221	235	-

790. Deschutes River near Rainier, Wash.

Location.--Lat 46°51'10", long 122°40'00", in SW $\frac{1}{4}$ sec.22, T.16 N., R.1 E., on right bank 75 ft upstream from county road crossing, half a mile downstream from outlet of Reichel Lake, and 2 $\frac{1}{2}$ miles southeast of Rainier.

Drainage area.--89.8 sq mi.

Records available.--June 1949 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 350 ft (from topographic map).

Average discharge.--11 years (1949-60), 275 cfs (199,100 acre-ft per year).

Extremes.--1949-60: Maximum discharge, 5,620 cfs Dec. 12, 1955 (gage height, 13.06 ft); minimum, 21 cfs Sept. 20, 1952; minimum gage height, 2.64 ft Sept. 20, Oct. 17, 1952.

Remarks.--Probably some small diversion for irrigation and domestic use. No 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	191	570	639	672	809	585	226	122	57.1	40.8	33.2	33.2	312
1952	175	353	480	353	510	248	232	166	70.8	45.5	30.6	25.1	223
1953	25.4	35.9	189	1,071	478	273	182	173	119	63.6	44.5	41.0	224
1954	135	280	709	738	943	335	405	125	137	77.6	50.4	51.3	328
1955	90.9	332	373	327	381	355	517	248	141	79.6	46.8	52.3	244
1956	274	719	1,063	784	303	735	366	129	118	53.6	42.3	35.4	387
1957	138	188	461	162	614	576	267	139	80.3	47.3	40.2	32.4	226
1958	58.1	149	522	552	566	232	345	106	66.9	39.9	30.3	31.0	223
1959	68.9	536	435	752	306	328	297	191	116	53.4	39.2	88.7	267
1960	172	391	351	246	551	415	455	287	103	53.5	50.2	43.5	258

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	11,720	33,940	39,270	41,310	44,960	23,660	13,440	7,520	3,400	2,510	2,040	1,980	225,800
1952	10,760	21,020	29,510	21,720	29,330	15,240	13,800	10,210	4,210	2,800	1,880	1,490	162,000
1953	1,580	2,130	11,630	65,860	26,560	16,810	10,840	10,620	7,100	3,910	2,740	2,440	162,200
1954	8,270	16,650	43,570	45,350	52,350	20,570	24,100	7,690	8,180	4,770	3,100	3,050	237,600
1955	5,590	19,730	22,920	20,120	21,150	21,850	30,760	15,270	8,380	4,890	2,880	3,110	176,600
1956	16,860	42,770	65,370	48,220	17,400	45,220	21,770	7,960	7,040	3,300	2,600	2,110	280,600
1957	8,470	11,190	28,320	9,960	34,070	35,430	15,880	8,520	4,780	2,910	2,470	1,930	163,900
1958	3,570	8,850	32,110	33,920	31,440	14,280	20,520	6,550	3,980	2,450	1,860	1,850	161,400
1959	4,230	31,920	26,760	46,230	17,010	20,150	17,700	11,720	6,880	3,280	2,410	5,280	193,600
1960	10,580	23,250	21,590	15,150	31,690	25,500	27,050	17,670	6,150	3,290	3,090	2,590	187,600

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	-	-	-	-	-	-	-	-	375	57.27	271,500	
1951	1216	3,570	Feb. 9, 1951	26	312	3.52	47.71	225,800	279	42.21	202,100	
1952	1246	3,160	Jan. 30, 1952	22	223	2.48	33.81	162,000	160	24.22	116,000	
1953	1286	2,770	Jan. 9, 1953	24	224	2.49	33.88	162,200	297	44.98	215,400	
1954	1346	4,740	Dec. 9, 1953	40	328	3.65	49.64	237,600	300	45.41	217,400	
1955	1396	3,260	Feb. 8, 1955	36	244	2.72	36.89	176,600	350	52.91	253,400	
1956	1446	5,620	Dec. 12, 1955	33	387	4.31	58.59	280,600	280	42.51	203,600	
1957	1516	3,760	Feb. 24, 1957	29	226	2.52	34.24	163,900	222	33.53	160,500	
1958	1566	2,620	Dec. 26, 1957	28	223	2.48	33.70	161,400	248	37.52	179,800	
1959	1636	3,050	Nov. 12, 1958	28	267	2.97	40.42	193,600	257	38.86	186,100	
1960	1716	3,360	Nov. 21, 1959	33	258	2.87	39.17	187,600	-	-	-	

DESCHUTES RIVER BASIN

800. Deschutes River near Olympia, Wash.

Location.--Lat 47°00'05", long 122°53'40", in NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.35, T.18 N., R.2 W., on left bank $\frac{1}{2}$ miles upstream from mouth and 2 $\frac{1}{2}$ miles south of Olympia.

Drainage area.--160 sq mi.

Records available.--April 1945 to November 1954, water years 1955-57 (annual maximum), June 1957 to September 1960.

Gage.--Water-stage recorder and crest-stage gage. Altitude of gage is 95 ft (from topographic map). Prior to Oct. 14, 1947, water-stage recorder on right bank at same datum. Nov. 3, 1954, to June 13, 1957, crest-stage gage only, at same site and datum.

Average discharge.--12 years (1945-54, 1957-60), 409 cfs (296,100 acre-ft per year).

Extremes.--1945-60: Maximum discharge, 6,080 cfs Dec. 13, 1955 (gage height, 8.46 ft). 1945-54, 1957-60: Minimum discharge, 66 cfs Oct. 11, 1945; minimum gage height, 1.90 ft Oct. 18, Nov. 11, 1952.

Remarks.--No regulation. Small diversions for irrigation above station.

Revisions.--Some periods for the water years 1946-47, and 1949 were revised in WSP 1716; resulting revised records as summarized herewith supersede those published in WSP 1316.

Month	Mean	Per square mile	Runoff		Momentary maximum	
			Inches	Acres-foot	Discharge	Date
November 1945.....	489	-	-	29,120	-	-
December.....	636	-	-	39,090	-	-
January 1946.....	855	-	-	62,590	-	-
Water year 1945-46.....	393	2.46	33.36	284,800	3,270	Dec. 29, 1945
December 1946.....	963	-	-	59,220	-	-
Calendar year 1946.....	428	-	36.31	309,900	-	-
January 1947.....	639	-	-	39,290	-	-
Water year 1946-47.....	355	2.22	30.07	256,700	4,750	Jan. 26, 1947
Calendar year 1947.....	329	-	27.90	238,200	-	-
Water year 1948-49.....	-	-	-	-	4,750	Feb. 18, 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	263	742	934	1,021	1,344	717	413	260	164	127	111	104	512
1952	247	419	620	466	713	376	328	244	146	115	91.7	81.3	319
1953	76.8	85.6	242	1,308	794	424	304	277	211	136	106	94.4	336
1954	196	357	893	1,015	1,246	583	604	262	246	162	118	115	478
1955	156	-	-	-	-	-	-	-	-	-	-	-	-
1956	-	-	-	-	-	-	-	-	193	130	115	96.1	-
1957	-	-	-	-	-	-	-	-	-	-	-	-	-
1958	129	226	658	732	780	408	497	217	155	109	86.6	84.2	338
1959	130	709	630	990	579	517	489	346	207	137	106	152	415
1960	238	554	581	419	799	626	676	423	212	148	127	116	408

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	16,170	44,130	57,420	62,790	74,650	44,070	24,600	15,980	9,780	7,790	6,850	6,220	370,400
1952	15,210	24,960	38,130	28,640	41,000	23,130	19,540	15,000	8,700	7,090	5,640	4,840	231,900
1953	4,720	5,090	14,880	80,410	44,100	26,050	18,120	17,050	12,560	8,350	6,510	5,620	243,500
1954	12,040	21,260	54,900	62,420	69,220	35,880	35,940	16,090	14,620	9,960	7,240	6,830	346,400
1955	9,610	-	-	-	-	-	-	-	-	-	-	-	-
1956	-	-	-	-	-	-	-	-	-	-	-	-	-
1957	-	-	-	-	-	-	-	-	11,470	8,000	7,050	5,720	-
1958	7,930	13,430	40,490	45,010	43,320	25,060	29,600	13,320	9,220	6,720	5,320	5,010	244,400
1959	8,000	42,210	38,760	60,850	32,150	31,800	29,070	21,270	12,310	8,430	6,520	9,030	300,400
1960	14,620	32,990	35,730	25,780	45,980	38,510	40,200	26,000	12,610	9,090	7,810	6,930	296,200

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	Acres-foot		Inches	Acres-foot
1950	-	-	-	-	-	-	-	-	-	-	-
1951	1216	4,600	Feb. 10, 1951	96	512	3.12	42.35	370,400	576	47.67	416,800
1952	1246	2,990	Jan. 31, 1952	77	319	1.99	27.17	231,900	457	38.78	331,000
1953	1286	2,870	Jan. 10, 1953	74	336	2.10	28.52	243,500	424	35.96	307,000
1954	1346	4,780	Dec. 10, 1953	95	478	2.99	40.58	346,400	-	-	-
1955	1566	3,540	Feb. 9, 1955	-	-	-	-	-	-	-	-
1956	1566	6,080	Dec. 13, 1955	-	-	-	-	-	-	-	-
1957	1566	4,210	Feb. 25, 1957	-	-	-	-	-	-	-	-
1958	1566	2,720	Dec. 26, 1957	77	338	2.11	28.64	244,400	375	31.83	271,600
1959	1636	3,040	Nov. 13, 1958	90	415	2.59	35.21	300,400	407	34.55	294,800
1960	1716	3,340	Nov. 21, 1959	107	408	2.55	34.72	296,200	-	-	-

810. Woodland Creek near Olympia, Wash.

Location.--Lat 47°04'20", long 122°49'00", in SW $\frac{1}{4}$ sec.4, T.18 N., R.1 W., on left bank $\frac{1}{2}$ miles upstream from mouth and 4.4 miles northeast of Olympia.

Drainage area.--24.3 sq mi.

Records available.--June 1949 to April 1959, May to October 1959 (monthly discharge only), November 1959 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 25 ft (from topographic map). June 29, 1949, to Apr. 28, 1959, at site 15 ft upstream at datum 0.75 ft higher.

Average discharge.--11 years (1949-60), 27.7 cfs (20,050 acre-ft per year).

Extremes.--1949-60: Maximum discharge, 204 cfs Feb. 9, 1951 (gage height, 4.46 ft, datum then in use); minimum recorded, 8.0 cfs Dec. 17-21, 1952, Sept. 29, Oct. 4, 5, 1958; minimum gage height recorded, 1.07 ft, datum then in use, Sept. 29, Oct. 4, 5, 1958.

Remarks.--Some diversion for irrigation and domestic use above station. No 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	17.5	23.6	44.6	67.3	102	77.1	51.3	38.4	30.3	21.4	16.6	14.4	41.7
1952	17.0	18.6	26.6	26.8	30.5	24.2	20.0	17.9	15.9	12.8	10.2	9.41	19.1
1953	9.25	9.36	9.60	26.2	40.9	26.4	21.7	18.2	15.8	12.5	11.1	10.9	17.5
1954	11.3	18.6	51.4	52.0	58.9	50.3	39.4	30.3	25.6	21.4	18.3	15.6	30.9
1955	14.6	20.7	24.6	24.0	27.8	26.2	27.7	22.6	18.0	14.8	14.1	12.2	20.7
1956	14.9	29.5	68.4	92.5	62.9	68.2	52.2	38.7	32.4	26.5	21.6	18.9	43.9
1957	19.7	20.6	30.0	26.2	31.2	44.7	35.0	26.0	20.1	18.2	15.7	13.7	25.1
1958	13.4	12.9	16.6	25.5	31.5	30.1	26.5	20.4	15.6	11.6	9.05	9.18	18.5
1959	9.74	18.2	25.9	37.9	41.4	34.9	30.6	24	20	16	14	13	23.7
1960	21	15.5	26.8	27.3	44.2	38.8	39.5	32.0	24.1	18.7	17.1	15.3	26.6

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,080	1,400	2,740	4,140	5,870	4,740	3,050	2,360	1,800	1,320	1,020	855	30,180
1952	1,050	1,110	1,640	1,650	1,760	1,490	1,190	1,100	945	787	626	560	13,910
1953	569	557	590	1,610	2,270	1,620	1,290	1,120	937	770	684	647	12,660
1954	692	1,120	1,930	3,200	3,270	3,090	2,340	1,860	1,520	1,320	1,130	928	22,400
1955	896	1,230	1,510	1,480	1,550	1,730	1,650	1,390	1,070	912	870	725	15,010
1956	916	1,760	4,210	5,690	3,620	4,200	3,110	2,380	1,930	1,630	1,330	1,120	31,900
1957	1,210	1,230	1,840	1,610	1,730	2,750	2,080	1,600	1,200	1,120	968	814	18,150
1958	824	768	1,020	1,570	1,750	1,850	1,580	1,250	929	716	557	546	13,360
1959	599	1,080	1,590	2,330	2,300	2,150	1,820	1,480	1,190	984	861	774	17,180
1960	1,290	925	1,650	1,680	2,540	2,380	2,350	1,970	1,440	1,150	1,050	907	19,330

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		Inches	Acre-feet	
1950	-	-	-	-	-	-	-	-	39.5	22.05	-	28,570
1951	1216	204	Feb. 9, 1951	12.5	41.7	1.72	23.30	30,180	39.7	22.19	-	28,760
1952	1246	59	Feb. 4, 1952	9.0	19.1	.786	10.71	13,910	16.3	9.12	-	11,820
1953	1266	68	Jan. 31, 1953	8.0	17.5	.720	9.76	12,660	20.3	11.51	-	14,690
1954	1346	105	Feb. 21, 1954	10.5	30.9	1.27	17.29	22,400	30.8	17.22	-	22,290
1955	1396	64	Feb. 8, 1955	11.5	20.7	.852	11.58	15,010	25.2	14.09	-	16,260
1956	1446	150	Dec. 21, 1955	12	43.9	1.81	24.62	31,900	40.3	22.60	-	29,290
1957	1516	91	Dec. 9, 1956	12.5	25.1	1.03	14.01	18,150	22.8	12.73	-	16,480
1958	1566	54	Mar. 21, 1958	8.7	18.5	.761	10.32	13,360	19.4	10.82	-	14,020
1959	1636	152	Nov. 18, 1958	-	23.7	.975	13.23	17,180	24.5	13.69	-	17,750
1960	1716	101	Dec. 15, 1959	8.3	26.6	1.09	14.92	19,330	-	-	-	-

815. McAllister Springs near Olympia, Wash.

Location.--Lat 47°01'45", long 122°43'25", in SE¹ sec.19, T.18 N., R.1 E., on right side of stilling pool just above city of Olympia control gates, 8 miles east of Olympia.

Records available.--March 1951 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is about mean sea level. Auxiliary water-stage recorder 30 ft downstream from base gage.

Average discharge.--9 years (1951-60), 24.0 cfs (17,380 acre-ft per year), unadjusted.

Extremes.--1951-60: Maximum daily discharge, 46 cfs Jan. 26, 1956; minimum daily, 12.5 cfs Aug. 9, 1960.

Remarks.--City of Olympia diverts an average of about 4 cfs per day just above station. Gage pool regulated by low dam and flashboards. Backwater from tides occurs daily.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	34.0	32.4	30.1	26.9	25.6	25.8	-
1952	25.3	26.5	27.2	28.5	28.5	25.8	24.1	23.3	22.9	20.6	21.2	20.1	24.5
1953	20.3	21.0	22.0	25.4	27.1	27.5	25.3	23.4	22.3	19.9	19.5	19.5	22.5
1954	20.0	21.2	22.7	29.9	33.6	31.3	30.4	28.1	27.3	25.5	24.3	23.6	26.4
1955	23.0	23.8	24.3	24.9	26.6	27.2	25.2	25.1	23.6	23.3	21.2	20.7	24.1
1956	22.5	24.9	30.7	40.8	39.9	37.4	35.2	31.9	30.6	27.1	26.6	23.7	30.9
1957	22.5	22.9	28.1	28.2	28.2	30.6	30.4	28.7	26.2	24.0	23.4	22.2	26.3
1958	23.0	22.0	18.2	19.2	19.1	21.6	21.7	20.6	19.1	16.5	15.8	16.4	19.4
1959	17.9	19.8	20.8	21.4	22.9	25.3	24.8	24.2	20.6	18.0	16.8	16.9	20.8
1960	16.3	19.4	20.1	21.2	23.0	25.1	24.6	23.9	21.5	18.2	17.4	17.2	20.8

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	2,020	1,990	1,790	1,650	1,590	1,530	-
1952	1,560	1,580	1,670	1,750	1,640	1,590	1,430	1,430	1,360	1,270	1,300	1,200	17,780
1953	1,250	1,250	1,350	1,440	1,510	1,690	1,490	1,440	1,320	1,220	1,200	1,160	16,320
1954	1,230	1,260	1,400	1,840	1,860	1,920	1,810	1,730	1,620	1,570	1,490	1,410	19,140
1955	1,410	1,420	1,490	1,530	1,480	1,670	1,500	1,540	1,400	1,440	1,300	1,230	17,410
1956	1,380	1,480	1,890	2,510	2,290	2,300	2,100	1,960	1,820	1,660	1,640	1,410	22,440
1957	1,380	1,360	1,730	1,740	1,570	1,880	1,610	1,770	1,560	1,480	1,440	1,320	19,040
1958	1,410	1,310	1,120	1,180	1,060	1,340	1,290	1,270	1,140	1,010	969	979	14,080
1959	1,090	1,180	1,280	1,320	1,270	1,560	1,470	1,490	1,230	1,110	1,030	1,000	15,030
1960	1,120	1,150	1,240	1,310	1,320	1,550	1,460	1,470	1,280	1,120	1,070	1,020	15,110

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year			
		Observed					Adjusted		Observed		Adjusted	
		Maximum day		Min-imum day	Mean	Runoff in acre-feet	Mean	Mean	Mean	Runoff in acre-feet	Mean	Mean
		Discharge	Date									
1951	1216	a44	Mar. 25, 1951	-	-	-	-	-	-	-	-	-
1952	1246	33	Jan. 25, 1952	17.5	24.5	17,780	-	23.2	-	16,820	-	-
1953	1286	35	Feb. 17, 1953	17.5	22.5	16,320	-	22.6	-	16,360	-	-
1954	1346	36	(b)	19	26.4	19,140	-	27.0	-	19,570	-	-
1955	1396	30	(c)	18.5	24.1	17,410	-	24.7	-	17,840	-	-
1956	1446	46	Jan. 26, 1956	21	30.9	22,440	-	30.5	-	22,160	-	-
1957	1516	37	Dec. 10, 1956	20	26.3	19,040	-	25.4	-	19,410	-	-
1958	1566	25	Feb. 28, 1958	13.5	19.4	14,080	23.2	19.0	-	13,790	23.1	-
1959	1636	28	(d)	14	20.8	15,030	24.7	20.7	-	14,990	24.7	-
1960	1718	29	Mar. 16, 1960	12.5	20.8	15,110	25.1	-	-	-	-	-

a Maximum during period March to June.

b Feb. 5, 13, 21, 1954.

c Feb. 8, 28, Mar. 29, 1955.

d Mar. 15-20, Apr. 15, 16, 1959.

825. Nisqually River near National, Wash.

Location.--Lat 46°45'10", long 122°05'00", in SW¹/₄ sec. 29, T. 15 N., R. 6 E., on right bank 100 ft downstream from railroad bridge, 1 mile west of National, 2½ miles west of Ashford, and 3 miles upstream from Mineral Creek.

Drainage area.--133 sq mi.

Records available.--May 1942 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,450 ft (from river-profile map).

Average discharge.--18 years (1942-60), 775 cfs (561,100 acre-ft per year).

Extremes.--1942-60: Maximum discharge, 10,900 cfs Nov. 23, 1959 (gage height, 11.77 ft), from rating curve extended above 5,900 cfs on basis of slope-area measurement at gage height 11.86 ft; minimum, 108 cfs Dec. 1, 3, 1952 (gage height, 2.76 ft).

Remarks.--Small diversion for domestic use. Slight regulation at low water by powerplant of Mount Rainier National Park on Paradise River. Records of water temperatures for the period October 1951 to September 1960 are published in reports of Geological Survey.

Revisions.--Some periods for the water years 1943, 1947 and 1950 were revised in WSP 1716; the resulting records as summarized herewith supersede those published in WSP 1316.

Mean	Mean	Per square mile	Runoff		Momentary maximum	
			Inches	Acre-feet	Discharge	Date
Water year 1942-43.....	-	-	-	-	7,500	Nov. 23, 1942
Water year 1946-47.....	-	-	-	-	8,100	Dec. 11, 1946
November 1949.....	979	-	-	58,250	-	-
Calendar year 1949.....	788	-	80.41	570,400	-	-
Water year 1949-50.....	913	6.86	93.19	661,000	7,310	Nov. 27, 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	708	1,263	1,452	745	1,354	475	883	1,024	867	649	468	395	853
1952	714	630	584	334	722	418	930	1,051	821	789	533	412	661
1953	311	140	246	1,535	991	432	627	949	1,052	1,165	598	474	709
1954	389	645	1,436	761	1,080	617	764	1,128	1,179	1,092	666	464	851
1955	388	752	540	520	656	296	608	949	1,695	1,217	726	467	733
1956	1,034	1,522	1,372	763	331	537	1,111	1,594	1,410	1,140	627	429	991
1957	541	707	1,211	351	599	878	863	1,164	862	551	405	440	715
1958	301	399	765	903	1,072	504	857	1,101	1,041	828	669	437	738
1959	483	1,440	1,243	1,209	495	526	806	914	1,026	741	488	739	844
1960	1,155	1,634	821	435	772	619	909	1,179	1,092	804	532	470	867

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	43,520	75,170	89,270	45,800	75,190	29,230	52,510	62,940	51,590	39,930	28,770	23,530	617,400
1952	43,920	37,470	35,930	20,540	41,540	25,670	55,320	64,620	48,870	46,480	32,790	24,520	479,700
1953	19,110	8,330	15,140	94,360	55,020	26,580	37,300	58,360	62,570	71,600	36,760	28,200	513,300
1954	23,920	38,370	88,270	46,780	59,960	37,940	45,480	69,380	70,170	67,150	40,960	27,600	616,000
1955	23,860	44,770	33,180	31,990	36,420	18,170	36,180	58,340	100,800	74,810	44,630	27,790	530,900
1956	63,550	90,540	84,390	46,890	19,010	33,040	68,090	98,030	83,920	70,070	38,530	25,540	719,600
1957	33,290	42,060	74,440	21,590	33,270	53,970	51,350	71,570	51,310	33,890	24,900	26,190	517,800
1958	18,500	23,750	47,040	55,520	59,510	30,970	50,980	67,700	61,920	50,910	41,150	25,990	533,900
1959	29,700	85,690	76,440	74,370	27,510	32,330	47,980	56,210	61,060	45,570	29,980	43,980	610,800
1960	70,990	97,210	50,460	26,740	44,420	38,050	54,080	72,490	64,960	49,410	32,720	27,990	629,500

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		Mean	Inches	Acre-feet
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet			
1950	-	-	-	-	-	-	-	-	-	1,017	103.76	736,000	-	-
1951	1216	1,716	6,050	Feb. 11, 1951	255	853	6.41	87.05	617,400	728	74.27	526,800	-	-
1952	1246	2,700	2,000	Feb. 4, 1952	220	661	4.97	67.64	479,700	558	57.09	404,900	-	-
1953	1286	4,760	Jan. 31, 1953	110	709	5.33	72.36	513,300	858	87.59	621,300	-	-	-
1954	1346	6,640	Dec. 9, 1953	283	851	6.40	86.82	616,000	784	79.95	567,200	-	-	-
1955	1396	3,740	June 10, 1955	231	733	5.51	74.85	530,900	922	94.12	667,600	-	-	-
1956	1446	7,470	Dec. 12, 1955	257	991	7.45	101.45	719,600	869	88.94	630,900	-	-	-
1957	1516	3,680	Feb. 26, 1957	198	715	5.38	72.99	517,800	632	64.47	457,500	-	-	-
1958	1586	2,790	Apr. 20, 1958	179	738	5.55	75.29	533,900	879	89.74	636,500	-	-	-
1959	1636	5,450	Nov. 12, 1958	293	844	6.35	86.11	610,800	891	89.68	637,600	-	-	-
1960	1716	10,900	Nov. 23, 1959	266	867	6.52	88.74	629,500	-	-	-	-	-	-

830. Mineral Creek near Mineral, Wash.

Location.--Lat 46°44'20", long 122°08'40", in SW $\frac{1}{4}$ sec.35, T.15 N., R.5 E., on right bank three-eighths of a mile downstream from railroad bridge, 1 mile upstream from mouth, and 2 $\frac{1}{2}$ miles northeast of Mineral.

Drainage area.--74.3 sq mi.

Records available.--June 1942 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,340 ft (from topographic map).

Average discharge.--18 years (1942-60), 378 cfs (273,700 acre-ft per year).

Extremes.--1942-60: Maximum discharge, 7,600 cfs Dec. 9, 1953 (gage height, 9.02 ft), from rating curve extended above 3,400 cfs; minimum, 19.5 cfs Sept. 22, 23, Oct. 6-10, 13, 14, 1952; minimum gage height, 1.40 ft Sept. 22, 23, 1950.

Remarks.--No regulation or diversion above station. Records of water temperatures for the period August 1951 to September 1957 are published in reports of 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	312	768	860	624	1,067	357	509	332	90.3	39.5	29.0	39.3	414
1952	390	442	531	346	626	292	590	388	128	63.8	33.2	23.7	319
1953	23.1	35.9	195	1,568	698	319	361	404	249	96.5	55.2	46.9	337
1954	148	423	1,006	624	1,065	390	675	468	382	154	89.6	91.0	455
1955	194	633	474	390	600	257	562	656	552	187	62.6	65.0	384
1956	527	1,219	1,122	730	192	590	814	647	266	94.1	46.3	40.9	525
1957	252	350	922	202	577	773	522	291	129	58.9	40.7	32.1	345
1958	79.1	242	689	768	796	285	671	205	115	60.0	34.6	40.8	329
1959	90.6	946	681	981	320	416	587	405	235	69.7	37.0	192	413
1960	421	763	530	308	621	450	559	560	214	67.1	76.1	76.7	386

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	19,150	45,730	52,880	38,380	59,270	21,940	30,300	20,380	5,380	2,430	1,790	2,340	300,000
1952	23,980	28,310	32,670	21,260	36,030	17,950	34,520	23,860	7,590	3,920	2,040	1,410	231,500
1953	1,420	2,140	12,020	96,410	38,770	19,630	21,500	24,850	14,800	5,930	3,400	2,790	243,700
1954	9,110	25,190	61,830	38,340	59,040	23,980	40,060	28,800	22,720	9,450	5,520	5,410	329,400
1955	11,920	37,680	29,160	23,990	33,320	15,820	33,410	40,340	32,680	11,490	3,850	3,870	277,700
1956	32,410	72,550	69,010	44,900	11,080	36,270	48,420	39,800	15,840	5,790	2,970	2,440	381,500
1957	15,510	20,840	56,700	12,430	32,040	47,530	31,060	17,890	7,870	3,620	2,500	1,910	249,700
1958	4,870	14,400	42,340	47,240	44,210	17,520	39,960	12,610	6,860	3,690	2,130	2,430	238,300
1959	5,570	56,270	41,870	60,290	17,770	25,580	34,940	24,880	13,970	4,290	2,280	11,440	299,200
1960	25,870	45,390	32,600	18,920	35,740	27,670	33,290	34,430	12,720	4,130	4,680	4,570	280,000

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	-	-	-	-	-	-	-	-	497	90.02	360,000
1951	1216	5,390	Feb. 9, 1951	24	414	5.52	75.00	300,000	366	66.92	265,200
1952	1246	3,420	Feb. 4, 1952	20	319	4.29	58.43	231,500	228	41.43	164,200
1953	1286	4,070	Jan. 31, 1953	20	337	4.54	61.49	243,700	448	81.82	324,200
1954	1346	7,600	Dec. 9, 1953	65	455	6.12	83.13	329,400	431	78.75	312,100
1955	1396	5,000	Feb. 8, 1955	43	384	5.17	70.09	277,700	515	94.12	372,900
1956	1446	7,400	Dec. 11, 1955	34	525	7.07	96.26	381,500	414	75.83	300,500
1957	1516	5,360	Dec. 10, 1956	29	345	4.64	63.01	249,700	301	55.07	218,300
1958	1566	2,400	Dec. 25, 1957	25	329	4.43	60.11	238,300	387	70.74	280,400
1959	1636	4,860	Jan. 24, 1959	30	413	5.56	75.49	299,200	413	75.53	299,300
1960	1716	4,880	Nov. 20, 1959	24	386	5.20	70.66	280,000	-	-	-

850. Alder Reservoir at Alder, Wash.

Location.--Lat 46°48'05", long 122°18'30", in NW¼ sec.9, T.15 N., R.4 E., near left end of Alder Dam on Nisqually River, 1 mile west of Alder and 4½ miles upstream from Mashel River.

Drainage area.--286 sq mi.

Records available.--November 1944 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 7.61 ft below mean sea level, datum of 1929 (levels by city of Tacoma). Prior to July 8, 1946, staff gage at same site and datum.

Extremes.--1944-60: Maximum contents, 232,700 acre-ft Aug. 1, 2, 1960; minimum observed since reservoir first filled, 93,990 acre-ft Feb. 16, 1949 (gage height, 1,147.61 ft).

Remarks.--Reservoir is formed by concrete arch dam; storage began Nov. 7, 1944; dam completed in 1945. Capacity, 99,170 acre-ft between gage heights 1,114 (lower limit of operating range) and 1,177 ft (gage height of spillway). Water can be controlled by spillway gates to gage height 1,207 ft, usable capacity, 179,600 acre-ft. Dead storage, 52,100 acre-ft. Figures given herein represent total contents. Water is used by city of Tacoma for power production.

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

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	191,350	182,480	180,380	182,790	185,360	160,020	167,310	178,060	192,910	208,580	212,380	196,250
1952	202,130	187,100	158,960	114,740	142,190	106,250	167,960	197,780	208,810	223,240	209,680	196,050
1953	141,750	120,400	104,510	222,340	213,450	185,820	169,740	200,390	211,710	228,950	218,440	203,580
1954	163,990	181,740	217,540	208,520	216,350	210,840	225,640	220,840	229,260	228,950	226,540	217,240
1955	190,000	211,400	220,500	187,900	175,900	135,200	147,200	172,300	225,900	231,700	220,800	207,100
1956	222,300	219,600	220,800	216,600	162,800	177,400	205,600	228,600	230,500	229,600	225,000	198,600
1957	185,100	170,000	208,500	131,700	155,100	196,900	202,400	218,400	219,900	230,900	224,100	210,600
1958	159,000	133,500	172,800	213,200	222,600	193,900	223,500	218,700	225,600	230,800	216,600	159,900
1959	130,000	227,700	228,600	221,100	188,700	170,800	193,100	222,000	229,900	231,100	217,200	214,900
1960	222,300	217,500	203,000	159,900	171,300	167,500	192,100	226,800	223,800	232,400	210,300	191,300

855. La Grande Reservoir at La Grande, Wash.

Location.--Lat 46°49'20", long 122°18'10", in SE¼ sec.33, T.16 N., R.4 E., at left end of gate control structure, 1 mile southeast of La Grande and 1½ miles downstream from Alder Dam.

Drainage area.--289 sq mi.

Records available.--January 1945 to September 1960. Month-end contents February 1945 to September 1950, published in WSP 1316.

Gage.--Water-stage recorder. Datum of gage is 7.61 ft below mean sea level, datum of 1929 (levels by city of Tacoma). Prior to June 12, 1947, month-end gage heights furnished by city of Tacoma from temporary gages in pool above dam.

Extremes.--1947-60: Maximum contents, 2,760 acre-ft May 14, 1950 (gage height, 936.4 ft); minimum observed (since reservoir first filled), 1,370 acre-ft Aug. 24, 1956 (gage height, 900.0 ft).

Remarks.--Reservoir is formed by concrete arch dam completed in 1944; storage began February 1945. Usable storage, 1,050 acre-ft between gage heights 910 (minimum practical head) and 935 ft (normal reservoir level). Dead storage, 1,630 acre-ft. Figures given herein represent total contents. Water used by city of Tacoma for power production. Records for water year 1951, not previously published 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	2,392	2,328	2,313	2,367	2,232	2,187	2,210	2,261	2,160	1,956	1,884	2,265
1952	2,223	2,323	2,333	2,223	2,551	2,333	2,318	2,362	2,280	2,284	2,557	2,280
1953	2,270	2,397	2,328	2,294	2,246	2,382	2,338	2,328	2,147	1,960	2,313	2,338
1954	2,308	2,372	2,347	2,323	2,246	2,270	2,323	2,323	2,333	2,232	2,362	2,494
1955	2,313	2,342	2,458	2,318	2,352	2,294	2,407	2,422	2,299	2,407	2,333	2,284
1956	2,367	2,280	2,382	2,328	2,045	2,362	2,228	2,237	2,504	2,280	2,484	2,347
1957	2,442	2,256	2,453	2,432	2,463	2,328	2,473	2,417	2,265	2,412	2,422	2,478
1958	2,525	2,323	2,515	2,357	2,382	2,453	2,494	2,448	2,437	2,289	2,318	2,557
1959	2,494	2,499	2,223	2,412	2,478	2,484	2,143	2,362	2,442	2,432	2,504	2,478
1960	2,546	2,333	2,504	2,338	2,589	2,478	2,367	2,382	2,478	2,644	2,412	2,568

865. Nisqually River at La Grande, Wash.

Location.--Lat 46°50'30", long 122°19'35", in SE $\frac{1}{4}$ sec.29, T.16 N., R.4 E., on right bank half a mile downstream from city of Tacoma powerplant, half a mile northwest of La Grande, and three-quarters of a mile upstream from Mashel River.

Drainage area.--292 sq mi.

Records available.--September 1906 to October 1911, November and December 1911 (gage heights only), October 1919 to September 1931, October 1943 to September 1960. Monthly discharge only for some periods, published in WSP 1316. Published as "below Little Nisqually River, near La Grande" 1906-10 and as "near La Grande" 1912, 1919-31.

Gage.--Water-stage recorder. Altitude of gage is 490 ft (from river-profile map). Sept. 5, 1906, to Sept. 8, 1910, staff gage just below site of diversion dam 4 miles upstream at different datum. January 1910 to December 1911, staff gage at La Grande powerhouse site; datum at mean sea level (levels by city of Tacoma). January 1920 to September 1931 water-stage recorder at approximately same site as that of first staff gage at datum 921.17 ft above mean sea level (levels by city of Tacoma). Dec. 7, 1943, to Feb. 8, 1945, water-stage recorder 600 ft downstream from La Grande powerhouse at different datum.

Average discharge.--34 years (1906-11, 1919-31, 1943-60), 1,395 cfs (1,010,000 acre-ft per year), adjusted for storage.

Extremes.--1906-11, 1919-31, 1943-60: Maximum discharge, 20,700 cfs Nov. 23, 1959 (gage height, 9.63 ft); practically no flow on many occasions at site near La Grande as result of regulation.

Remarks.--Flow regulated by city of Tacoma powerplant at La Grande since December 1943, by Alder Reservoir (see p. 83) since November 1944, and by La Grande Reservoir (see p. 83) since February 1945. All diversions returned to river 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	1,262	2,974	3,235	2,253	3,543	1,621	1,661	1,475	853	490	452	710	1,697
1952	1,364	1,774	2,033	1,715	1,577	1,573	893	1,214	874	662	804	688	1,265
1953	1,240	593	925	2,702	2,351	1,475	1,484	1,124	1,205	687	880	805	1,299
1954	1,355	1,182	2,939	2,320	3,209	1,511	1,758	2,020	1,716	1,394	883	788	1,749
1955	1,161	1,533	1,281	1,783	1,908	1,523	1,658	1,682	1,748	1,535	1,104	928	1,484
1956	1,831	4,000	3,964	2,537	1,693	1,702	2,024	2,383	2,000	1,360	828	903	2,103
1957	1,215	1,620	2,159	1,976	1,613	1,790	1,751	1,473	1,163	587	663	784	1,398
1958	1,374	1,316	1,497	1,835	2,555	1,497	1,473	1,570	1,110	780	976	1,448	1,445
1959	1,170	1,741	2,813	3,779	1,785	1,793	1,665	1,306	1,471	1,047	907	1,233	1,728
1960	1,798	3,047	2,104	1,698	1,780	1,611	1,563	1,841	1,490	840	1,077	970	1,633

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	77,590	177,000	98,900	38,500	96,800	99,850	98,820	90,720	50,780	30,120	27,780	42,270	1,229,000
1952	83,890	105,500	125,000	105,500	90,720	96,710	53,120	74,680	52,040	40,710	49,420	40,930	918,200
1953	76,250	35,270	56,870	166,100	130,500	90,690	88,300	69,090	71,710	54,570	52,910	47,900	940,200
1954	83,330	70,330	180,700	142,700	78,200	92,900	104,600	124,200	102,100	85,710	54,310	46,920	1,266,000
1955	71,360	91,230	78,750	109,600	105,900	93,830	98,850	103,400	104,000	94,380	67,890	55,200	1,074,000
1956	112,600	338,000	243,700	156,000	97,410	104,700	120,500	146,500	119,000	83,620	50,890	53,760	1,527,000
1957	74,700	98,390	132,800	121,500	89,570	110,100	104,200	90,580	89,200	36,070	40,770	46,630	1,012,000
1958	84,480	78,330	92,030	112,800	141,900	92,040	87,640	98,530	66,060	47,940	60,000	86,180	1,046,000
1959	71,970	105,600	175,000	232,300	99,130	110,200	99,060	80,000	87,530	64,370	55,790	73,370	1,251,000
1960	110,500	181,300	129,400	104,400	102,400	99,070	93,000	100,900	88,870	51,660	66,210	57,700	1,185,000

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30										Calendar year			
		Observed					Adjusted					Observed		Adjusted	
		Momentary		Maximum		Mean	Runoff		Mean	Per square		Mean	Runoff		Mean
		Discharge	Date	day	in		in	acre-feet		in	inches		in	in	
1950		-	-	-	-	-	-	-	-	-	-	-	-	-	-
1951	1216	15,400	Feb. 10, 1951	414	1,697	1,229,000	1,705	5.84	79.26	1,505	1,406,000	2,015	93.67		
1952	1248	9,350	Dec. 28, 1951	462	1,265	918,200	1,265	4.33	58.95	1,084	772,200	989	46.09		
1953	1288	10,600	Feb. 1, 1953	204	1,299	940,200	1,309	4.48	60.86	1,528	1,108,000	1,684	78.29		
1954	1348	14,500	Dec. 12, 1953	480	1,748	1,266,000	1,768	5.05	82.19	1,650	1,173,000	1,625	75.53		
1955	1396	6,740	(a)	497	1,484	1,074,000	1,468	5.03	68.29	1,971	1,427,000	1,971	91.82		
1956	1446	19,200	Dec. 12, 1955	455	2,103	1,527,000	2,092	7.16	97.49	1,703	1,236,000	1,686	78.61		
1957	1516	5,180	Mar. 4, 1957	392	1,398	1,012,000	1,414	4.84	65.81	1,331	963,500	1,282	59.58		
1958	1566	6,900	Feb. 17, 1958	432	1,445	1,046,000	1,375	4.71	63.89	1,574	1,140,000	1,652	76.74		
1959	1636	14,500	Jan. 24, 1959	524	1,728	1,251,000	1,804	6.18	83.83	1,828	1,323,000	1,793	83.34		
1960	1716	20,700	Nov. 23, 1959	540	1,633	1,185,000	1,599	5.48	74.61	-	-	-	-		

a Nov. 21, 1954, Jan. 2, 1955.

870. Mashel River near La Grande, Wash.

Location.--Lat 46°51'25", long 122°18'05", in NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.21, T.16 N., R.4 E., on right bank 50 ft below bridge, $\frac{1}{2}$ miles northeast of La Grande, and $\frac{3}{4}$ miles upstream from mouth.

Drainage area.--80.7 sq mi.

Records available.--October 1940 to September 1957.

Gage.--Water-stage recorder. Datum of gage is 619.53 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.--17 years (1940-57), 232 cfs (168,000 acre-ft per year).

Extremes.--1940-57: Maximum discharge, 7,980 cfs Dec. 11, 1946 (gage height, 9.30 ft), from rating curve extended above 3,200 cfs; minimum, 4.5 cfs Sept. 24, 1952 (gage height, 1.72 ft).

Remarks.--Small diversion for city of Eatonville water supply. Some regulation at low water by millpond in Eatonville.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	188	518	519	529	567	295	253	166	52.7	14.7	12.7	23.1	259
1952	229	335	353	198	409	245	264	139	66.3	44.4	13.3	11.3	191
1953	10.0	12.9	83.2	694	368	266	245	255	246	71.5	40.3	40.3	194
1954	137	293	697	612	703	228	356	172	294	111	70.6	115	313
1955	121	254	235	231	356	233	475	340	255	173	39.5	49.9	229
1956	307	688	832	489	195	551	440	216	224	45.8	27.8	24.5	337
1957	176	241	411	113	530	544	295	220	89.7	35.2	21.5	16.9	223
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	11,550	30,800	33,890	32,540	31,500	18,110	15,030	10,220	3,140	901	778	1,370	187,800
1952	14,100	19,920	21,710	12,150	23,510	15,070	15,730	8,580	3,950	2,730	818	671	138,900
1953	616	768	5,120	42,680	20,440	16,330	14,590	15,680	14,640	4,400	2,480	2,400	140,100
1954	8,440	17,420	42,870	37,640	39,030	14,020	21,160	10,600	17,520	6,840	4,340	6,860	226,700
1955	7,430	15,110	14,470	14,170	19,780	14,320	28,270	20,910	15,150	10,630	2,430	2,970	165,600
1956	18,860	40,920	51,160	30,050	11,240	33,890	26,170	13,270	13,330	2,810	1,710	1,460	244,900
1957	10,830	14,360	25,300	6,950	29,430	33,480	17,540	13,540	5,340	2,170	1,320	1,000	161,300
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	-	-	-	-	-	-	-	308	51.52	221,800	
1951	1216	2,880	Feb. 11, 1951	6.6	259	3.21	43.64	187,800	234	39.34	169,300
1952	1246	2,070	Jan. 30, 1952	7.2	191	2.37	32.27	138,900	124	20.83	89,710
1953	1286	1,890	Jan. 31, 1953	6.8	194	2.40	32.57	140,100	280	47.03	202,400
1954	1346	4,640	Dec. 9, 1953	40	313	3.88	52.68	226,700	269	45.31	195,000
1955	1396	2,960	Feb. 8, 1955	29	229	2.84	38.48	165,600	331	55.66	239,600
1956	1446	3,760	Dec. 21, 1955	17	337	4.18	56.89	244,900	254	42.85	184,400
1957	1516	3,110	Mar. 7, 1957	6.9	223	2.76	37.47	161,300	-	-	-
1958											
1959											
1960											

880. Ohop Creek near Eatonville, Wash.

Location.--Lat 46°52'50", long 122°16'45", in SE¼ sec.10, T.16 N., R.4 E., on left bank 400 ft downstream from Lynch Creek, 600 ft downstream from outlet of Ohop Lake, and 1 mile northwest of Eatonville.

Drainage area.--35.5 sq mi.

Records available.--June 1927 to September 1932, September 1941 to September 1960.

Gage.--Water-stage recorder and concrete control. Datum of gage is 519.8 ft above mean sea level (stadia traverse). June 1, 1927, to Sept. 30, 1932, water-stage recorder at same site at datum 2.79 ft higher. Sept. 6, 1941, to Mar. 17, 1942, staff gage at present site and datum.

Average discharge.--24 years (1927-32, 1941-60), 67.3 cfs (48,720 acre-ft per year).

Extremes.--1927-32, 1941-60: Maximum discharge, 1,740 cfs Dec. 9, 1953; maximum gage height, 5.97 ft Dec. 11, 1946; minimum discharge, 2.3 cfs Aug. 22, 23, 1944; minimum gage height observed, 1.12 ft Sept. 26, 1947.

Remarks.--No regulation. Possible small diversions for domestic use 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	58.1	145	162	183	202	102	43.8	30.8	15.6	8.49	5.30	12.4	80.0
1952	59.6	77.5	102	49.5	92.0	78.1	62.4	42.7	18.7	13.9	6.20	4.44	50.5
1953	9.83	8.81	24.5	142	122	75.5	71.3	70.5	90.8	27.6	12.0	14.7	55.4
1954	33.8	82.1	224	191	160	84.5	88.4	31.7	80.8	36.6	23.6	49.4	90.1
1955	38.1	59.4	70.5	101	97.6	87.8	141	65.4	42.4	47.7	13.2	19.7	64.8
1956	86.7	185	267	169	90.6	170	88.6	33.9	48.0	16.2	11.0	13.3	98.4
1957	54.6	60.9	134	44.2	135	175	76.9	62.8	31.8	14.2	12.9	8.22	67.2
1958	20.3	56.4	113	112	143	69.7	114	34.4	33.0	14.7	6.25	9.52	59.9
1959	25.9	151	143	160	87.8	88.6	71.1	76.7	69.2	18.4	10.8	25.5	77.1
1960	76.0	156	115	62.3	103	78.0	96.9	138	44.0	14.1	14.8	17.6	76.1

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	3,570	8,630	9,950	11,270	11,210	6,260	2,610	1,900	928	522	326	738	57,910
1952	3,660	4,610	6,270	3,040	5,290	4,800	3,710	2,620	1,110	854	381	284	36,610
1953	604	524	1,510	8,740	6,800	4,840	4,240	4,350	5,400	1,700	737	874	40,100
1954	2,080	4,890	13,800	11,760	8,860	5,200	5,260	1,950	4,810	2,250	1,450	2,940	65,250
1955	2,340	3,530	4,330	6,200	5,420	5,400	8,380	3,900	2,520	2,930	810	1,170	46,930
1956	5,330	10,990	16,410	10,390	5,210	10,440	5,270	2,090	2,850	995	678	791	71,440
1957	3,360	3,620	8,220	2,720	7,470	10,790	4,570	3,860	1,890	875	791	489	48,660
1958	1,250	3,350	6,970	6,860	7,940	4,290	6,750	2,120	1,960	901	384	566	43,340
1959	1,590	8,960	8,770	9,810	4,880	5,450	4,230	4,710	4,120	1,130	662	1,520	55,830
1960	4,670	9,290	7,050	3,830	5,910	4,800	5,770	8,480	2,620	869	909	1,040	55,240

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	Acres-feet	Mean	Inches	Acres-feet	Mean	Inches	Acres-feet
1950	-	-	-	-	-	-	-	-	-	-	-	91.9	35.62	66,500
1951	1216	1,020	Feb. 11, 1951	4.0	80.0	2.29	31.05	57,910	69.5	26.58	50,300	69.5	26.58	50,300
1952	1246	350	Oct. 23, 1951	3.6	50.5	1.42	19.37	36,610	34.1	13.08	24,710	34.1	13.08	24,710
1953	1286	458	Jan. 31, 1953	4.5	55.4	1.56	21.38	40,100	80.4	30.75	55,230	80.4	30.75	55,230
1954	1348	1,740	Dec. 9, 1953	10.5	90.1	2.54	34.47	65,250	75.5	28.90	54,680	75.5	28.90	54,680
1955	1396	480	Feb. 8, 1955	4.8	64.8	1.83	24.81	46,930	95.9	36.68	69,460	95.9	36.68	69,460
1956	1446	824	Dec. 12, 1955	7.9	98.4	2.77	37.73	71,440	74.3	28.48	53,910	74.3	28.48	53,910
1957	1516	605	Mar. 7, 1957	5.9	67.2	1.89	25.70	48,660	62.2	23.79	45,030	62.2	23.79	45,030
1958	1566	339	Dec. 26, 1957	5.2	59.9	1.69	22.89	43,340	70.6	26.98	51,090	70.6	26.98	51,090
1959	1636	720	Nov. 12, 1958	7.5	77.1	2.17	29.48	55,830	79.4	30.37	57,520	79.4	30.37	57,520
1960	1716	805	Nov. 22, 1959	6.0	76.1	2.14	29.16	55,240	-	-	-	-	-	-

885. Nisqually River near McKenna, Wash.

Location.--Lat 46°51'20", long 122°27'10", in SE $\frac{1}{4}$ sec.20, T.16 N., R.3 E., on right bank 800 ft downstream from Elbow Creek, three-quarters of a mile upstream from Tanwax Creek, and 7.4 miles southeast of McKenna.

Drainage area.--445 sq mi.

Records available.--August 1941 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 373.6 ft above mean sea level (stadia traverse). Prior to Sept. 30, 1941, staff gage at same site and datum.

Average discharge.--19 years (1941-60), 1,798 cfs (1,302,000 acre-ft per year).

Extremes.--1941-60: Maximum discharge, 20,800 cfs Dec. 12, 1955 (gage height, 12.06 ft); minimum, 85 cfs Oct. 19, 1945 (gage height, 2.57 ft); minimum daily, 176 cfs Jan. 30, 1945.

Remarks.--No diversion above station. Yelm Irrigation District Canal, abandoned in 1950, diverted water 3.6 miles above station. Major portion of flow regulated by Alder Reservoir and city of Tacoma powerplant at La Grande (see elsewhere in this report).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,576	3,450	4,002	2,943	4,284	2,133	1,953	1,650	891	498	479	766	2,037
1952	1,645	2,241	2,482	1,976	2,120	1,929	1,248	1,409	951	708	845	692	1,520
1953	1,281	578	1,038	3,416	2,991	1,928	1,920	1,511	1,594	1,021	945	910	1,587
1954	1,557	1,607	3,877	3,239	3,932	1,852	2,160	2,121	2,033	1,500	908	913	2,132
1955	1,318	1,856	1,646	2,267	2,486	1,969	2,426	2,126	2,059	1,780	1,142	968	1,832
1956	2,238	4,586	4,938	3,197	2,128	2,588	2,620	2,564	2,267	1,441	886	1,006	2,540
1957	1,444	1,849	2,714	2,119	2,254	2,574	2,124	1,725	1,249	575	635	755	1,665
1958	1,420	1,552	2,094	2,396	3,120	1,750	2,022	1,707	1,245	797	954	1,422	1,697
1959	1,259	2,483	3,263	4,193	2,088	2,135	1,942	1,585	1,675	997	858	1,275	1,980
1960	2,075	3,529	2,600	1,993	2,327	2,086	2,205	2,248	1,697	883	1,142	1,005	1,980

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	96,910	205,300	246,100	180,900	237,900	131,200	116,200	101,400	53,000	30,610	29,480	45,570	1,475,000
1952	101,100	133,400	152,600	121,500	121,900	118,600	74,240	86,610	56,590	43,410	51,950	41,170	1,103,000
1953	78,760	34,380	63,810	210,100	166,100	118,600	114,200	92,930	94,840	62,790	58,100	54,130	1,149,000
1954	95,720	95,600	238,400	199,100	218,900	113,900	128,500	130,300	140,121	100,926	55,840	54,300	1,543,000
1955	81,040	110,500	101,200	139,400	138,100	121,100	144,300	130,800	122,500	109,400	70,210	57,590	1,326,000
1956	137,600	272,900	303,600	196,600	122,400	159,100	155,900	157,600	134,900	88,590	54,500	59,870	1,844,000
1957	88,800	110,000	166,800	130,300	125,200	158,300	128,400	106,000	74,310	35,370	39,020	44,900	1,205,000
1958	87,530	92,370	128,800	147,300	173,300	107,600	120,300	104,900	74,090	49,000	58,630	84,620	1,228,000
1959	77,590	147,700	200,600	257,800	116,000	131,300	115,500	97,470	99,680	61,300	52,740	75,880	1,433,000
1960	127,800	210,000	159,900	122,500	133,800	128,300	131,200	138,200	101,000	54,270	70,230	59,800	1,437,000

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	-	-	-	-	-	-	2,329	1,686,000	
1951	1216	17,700	Feb. 11, 1951	416	2,037	1,475,000	1,814	1,313,000	
1952	1246	6,520	Dec. 18, 1951	419	1,520	1,103,000	1,230	892,900	
1953	1286	10,700	Feb. 1, 1953	197	1,587	1,149,000	1,936	1,402,000	
1954	1346	16,700	Dec. 9, 1953	498	2,132	1,543,000	1,943	1,406,000	
1955	1396	6,620	Jan. 1, 1955	526	1,832	1,326,000	2,414	1,748,000	
1956	1446	20,800	Dec. 12, 1955	520	2,540	1,844,000	2,060	1,495,000	
1957	1516	5,890	Mar. 7, 1957	348	1,665	1,205,000	1,586	1,148,000	
1958	1566	5,820	Feb. 26, 1958	424	1,697	1,228,000	1,859	1,345,000	
1959	1636	14,100	Jan. 24, 1959	438	1,980	1,453,000	2,079	1,505,000	
1960	1716	19,300	Nov. 23, 1959	529	1,980	1,437,000	-	-	

895. Nisqually River at McKenna, Wash.

Location.--Lat 46°56'00", long 122°33'35", in SE¹/₄ NW¹/₄ sec. 28, T.17 N., R.2 E., on left bank 100 ft downstream from highway bridge at McKenna and 9.0 miles downstream from Tanwax Creek.

Drainage area.--517 sq mi.

Records available.--October 1947 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 275 ft (from topographic map).

Extremes.--1947-60: Maximum discharge, 20,500 cfs Nov. 23, 1959, from rating curve extended above 11,000 cfs by logarithmic plotting; maximum gage height, 12.38 ft Dec. 12, 1955; minimum discharge, 37 cfs July 14, 15, Sept. 19, 1960; minimum gage height, 0.98 ft Sept. 19, 1948.

Remarks.--Major portion of flow regulated by Alder Reservoir and city of Tacoma power-plants at Alder Dam and at La Grande. Centralia power canal diverts 4.4 miles above station; water is returned to river at powerplant 4.5 miles below station. Minor amount of 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	1,220	3,012	3,561	2,656	4,091	1,827	1,591	1,293	586	161	148	380	1,696
1952	1,228	1,785	2,183	1,647	1,772	1,552	910	1,128	597	364	477	354	1,165
1953	872	272	655	2,983	2,659	1,568	1,534	1,124	1,252	817	685	518	1,237
1954	1,194	1,258	3,595	3,070	3,618	1,646	1,879	1,765	1,717	1,302	743	988	1,904
1955	1,299	1,797	1,611	1,963	2,105	1,611	2,028	1,845	1,652	1,308	646	503	1,526
1956	1,693	4,071	4,675	2,902	1,730	2,177	2,119	2,001	1,684	843	391	453	2,063
1957	910	1,290	2,142	1,521	1,737	2,089	1,550	1,129	669	248	249	328	1,153
1958	858	1,023	1,671	1,910	2,611	1,284	1,575	1,219	762	333	498	884	1,209
1959	744	1,875	2,717	3,708	1,593	1,578	1,396	1,096	1,125	479	340	715	1,448
1960	1,459	3,068	2,072	1,445	1,855	1,558	1,630	1,754	1,170	295	751	521	1,459

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	75,000	179,200	219,000	163,300	227,000	112,300	94,670	79,530	34,880	11,100	9,070	22,610	1,228,000
1952	75,490	106,800	134,200	101,300	102,000	95,410	54,170	69,390	35,550	22,400	29,320	19,880	845,900
1953	53,600	16,200	40,270	183,400	147,600	96,390	91,290	69,110	74,490	50,210	42,130	30,820	895,500
1954	73,430	74,840	221,000	188,700	211,900	101,200	111,800	108,500	102,100	80,050	45,670	58,790	1,378,000
1955	79,860	106,900	99,030	120,700	116,900	99,040	120,700	113,500	98,320	80,430	39,700	29,920	1,105,000
1956	104,100	242,200	287,500	178,500	99,510	133,800	126,100	123,000	100,200	51,860	24,060	26,940	1,498,000
1957	55,940	76,760	131,700	95,500	96,470	128,500	92,200	69,430	39,600	15,260	15,320	19,520	834,400
1958	52,820	60,900	102,700	117,400	145,000	78,920	93,700	74,950	45,360	20,490	30,610	52,610	875,500
1959	45,760	111,600	167,100	228,000	88,460	96,930	83,070	67,380	66,940	29,470	20,920	42,540	1,048,000
1960	89,690	182,600	127,400	88,880	106,700	95,670	96,990	107,900	69,600	18,120	44,950	30,990	1,059,000

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	-	-	-	-	-	-	2,091	1,514,000		
1951	1216	16,900	Feb. 11, 1951	97	1,696	1,228,000	1,480	1,071,000		
1952	1246	5,280	Dec. 5, 1951	120	1,165	845,900	881	639,500		
1953	1286	9,990	Feb. 1, 1953	58	1,237	895,500	1,595	1,155,000		
1954	1346	16,200	Dec. 10, 1953	362	1,904	1,378,000	1,788	1,294,000		
1955	1396	6,020	(a)	116	1,526	1,105,000	2,007	1,453,000		
1956	1446	20,200	Dec. 12, 1955	75	2,063	1,498,000	1,554	1,128,000		
1957	1516	5,190	Mar. 7, 1957	64	1,153	834,400	1,086	786,400		
1958	1566	4,980	Feb. 26, 1958	99	1,208	875,500	1,356	983,500		
1959	1636	13,900	Jan. 24, 1959	51	1,448	1,048,000	1,552	1,123,000		
1960	1716	20,500	Nov. 23, 1959	46	1,459	1,059,000	-	-		

a Probably Jan. 1, 1955.

902. Muck Creek at Roy, Wash.

Location.--Lat 47°00'20", long 122°32'30", in SW 1/4 sec.34, T.18 N., R.2 E., on right bank 0.3 mile downstream from Muck Lake at north edge of Roy.

Drainage area.--87.8 sq mi.

Records available.--May 1956 to September 1960.

Gage.--Staff gage. Altitude of gage is 310 ft (from topographic map).

Extremes.--1956-60: Maximum discharge observed, 351 cfs Jan. 25, 1959 (gage height, 4.16 ft); no flow for many days in each year.

Remarks.--Some regulation in lakes above station. Small amount of diversion above station for domestic 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	-	-	-	-	-	-	-	-	6.55	1.10	0	0	-
1957	0	0	26.7	49.0	65.4	191	75.1	21.2	5.74	1.00	.06	0	36.2
1958	.5	1.60	29.1	107	213	108	77.9	38.6	16.5	3.28	1.71	0	48.7
1959	0	25.0	143	204	170	78.8	55.4	36.4	13.8	6.64	3.62	2.74	61.2
1960	1.05	39.7	130	101	182	124	85.5	86.6	52.6	17.9	12.4	7.37	69.7

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	-	-	-	-	-	-	-	-	390	67	0	0	-
1957	0	0	1,640	3,010	3,630	11,770	4,470	1,300	342	61	3.8	0	26,230
1958	3.0	95	1,790	6,570	11,840	6,660	4,640	2,370	983	202	105	0	35,260
1959	0	1,490	8,810	12,570	9,450	4,850	3,290	2,240	821	408	223	163	44,320
1960	65	2,360	8,010	6,220	10,450	7,640	5,090	5,330	3,130	1,100	765	439	50,600

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					
1956	1516	-	-	-	-	-	-	-
1957	1516	332	Mar. 11, 1957	0	36.2	26,230	36.6	26,470
1958	1566	308	Feb. 27, 1958	0	48.7	35,260	60.3	43,670
1959	1636	351	Jan. 25, 1959	0	61.2	44,320	61.4	44,450
1960	1716	226	Feb. 16, 1960	0	69.7	50,600	-	-

905. Clover Creek near Tillicum, Wash.

Location.--Lat 47°08'40", long 122°30'10", on west line of sec.12, T.19 N., R.2 E., on right bank 1½ miles upstream from mouth and 2½ miles northeast of Tillicum.

Drainage area.--70.3 sq mi.

Records available.--June 1949 to October 1954.

Gage.--Water-stage recorder. Altitude of gage is 270 ft (from topographic map).

Average discharge.--5 years (1949-54), 47.3 cfs (34,240 acre-ft per year).

Extremes.--1949-54: Maximum discharge, 568 cfs Feb. 12, 1951 (gage height, 4.64 ft); no flow for many days in 1949, 1952-53.

Remarks.--Some diversion for domestic use and by Army air base. Probably some 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	10.4	25.0	119	158	279	173	88.0	46.9	26.2	12.5	3.79	1.40	77.4
1952	3.99	8.27	19.5	25.2	47.1	40.6	29.8	20.8	12.0	4.47	.56	.077	17.4
1953	0	0	0	30.1	103	47.8	40.7	31.5	21.4	10.7	3.65	2.40	23.7
1954	4.00	14.5	88.1	155	158	103	73.5	44.2	29.5	18.0	8.42	9.55	56.7

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	639	1,480	7,310	9,710	15,510	10,630	5,240	2,890	1,560	770	233	84	56,060
1952	245	373	1,200	1,550	2,710	2,500	1,780	1,280	716	275	35	4.6	12,670
1953	0	0	0	1,850	5,720	2,940	2,420	1,940	1,280	656	225	143	17,170
1954	246	860	5,420	9,520	7,670	6,340	4,380	2,720	1,750	1,110	518	556	41,090

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	-	-	-	-	-	-	-	-	71.4	13.79	51,690
1951	1216	568	Feb. 12, 1951	0.8	77.4	1.10	14.96	56,060	66.9	12.93	48,440
1952	1246	66	Feb. 4, 1952	0	17.4	.248	3.37	12,670	14.9	2.88	10,850
1953	1286	164	(a)	0	23.7	.337	4.58	17,170	32.7	6.32	23,700
1954	1346	263	Jan. 7, 1954	2.6	56.7	.807	10.97	41,090	-	-	-

a Feb. 5 or 6, 1953.

910.5. Flett Creek at 74th Street, at Tacoma, Wash.

Location.--Lat 47°11'26", long 122°29'08", in SE $\frac{1}{4}$ sec.25, T.20 N., R.2 E., on right bank just downstream from South 74th Street crossing in Tacoma and 3 miles upstream from mouth.

Drainage area.--5 sq mi, approximately.

Records available.--May 1959 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 235 ft (from topographic map).

Extremes.--1959-60: Maximum discharge, 6.5 cfs Nov. 21, 1959 (gage height, 2.34 ft); no flow for long periods in each year.

Remarks.--No regulation or diversion 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
1959	-	-	-	-	-	-	-	-	0.17	0.03	0	0	-
1960	0.003	0.96	0.61	0.67	1.38	0.46	0.23	0.14	0	0	0	0	0.37

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1959	-	-	-	-	-	-	-	-	10	1.8	0	0	-
1960	0.2	57	37	41	79	29	14	8.7	0	0	0	0	266

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	1636	-	-	-	-	-	-	-
1960	1716	6.5	Nov. 21, 1959	0	0.37	266	-	-

910.7. Flett Creek below Flett Springs, at Tacoma, Wash.

Location.--Lat 47°10'50", long 122°30'10", in NW $\frac{1}{4}$ sec.36, T.20 N., R.2 E., on left bank 20 ft downstream from Flett Springs, a quarter of a mile south of city limits of Tacoma, and $\frac{1}{2}$ miles upstream from mouth.

Drainage area.--8 sq mi, approximately.

Records available.--July 1959 to September 1960.

Gage.--Water-stage recorder. Datum of gage is about 230 ft (from topographic map).

Extremes.--1959-60: Maximum discharge, 30 cfs Nov. 21, 1959; maximum gage height, 2.14 ft Nov. 20, 1959 (backwater caused by work on control); no flow for part of Aug. 12, 1960.

Remarks.--Storm sewer drainage above station. Several diversions for irrigation and industrial 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
1959	-	-	-	-	-	-	-	-	-	2.97	2.02	2.78	-
1960	2.23	6.22	12.1	11.3	19.5	12.7	10.4	8.57	5.72	2.93	1.98	2.47	7.97

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1959	-	-	-	-	-	-	-	-	-	183	124	166	-
1960	137	370	745	698	1,120	782	616	527	341	180	122	147	5,780

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	1636	-	-	-	-	-	-	-
1960	1716	30	Nov. 21, 1959	0.7	7.97	5,780	-	-

911. Flett Creek at Tacoma, Wash.

Location.--Lat 47°11'23", long 122°31'08", in SW $\frac{1}{4}$ sec.26, T.20 N., R.2 E., on right bank at 75th Street half a mile west of city limits of Tacoma and 0.6 mile upstream from mouth.

Drainage area.--10 sq mi, approximately.

Records available.--June 1959 to September 1960.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 200 ft (from topographic map).

Extremes.--1959-60: Maximum discharge, 36 cfs Feb. 6, 1960 (gage height, 2.48 ft); maximum gage height, 2.64 ft June 19, 1959 (backwater from debris); minimum discharge, 1.3 cfs Aug. 12, 1960 (gage height, 1.47 ft).

Remarks.--Storm sewer drainage above station. Several diversions for irrigation and industrial use. At times during winter months, 1,000 gpm is pumped into creek for short intervals from Mountain View Memorial Park.

Monthly and 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	-	-	-	-	-	-	-	-	6.02	3.80	2.95	3.73	-
1960	3.31	7.49	14.6	13.9	23.1	15.3	12.6	10.8	6.78	3.80	2.65	2.95	9.73

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1959	-	-	-	-	-	-	-	-	358	233	181	222	-
1960	203	445	898	857	1,330	942	752	665	404	233	163	175	7,070

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	1636	-	-	-	-	-	-	-	-	-
1960	1716	36	Feb. 6, 1960	1.6	9.73	7,070	-	-	-	-

912. Leach Creek near Fircrest, Wash.

Location.--Lat 47°13'15", long 122°30'30", in lot 24, block 14, SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.14, T.20 N., R.2 E., on right bank $\frac{1}{4}$ miles south of Fircrest and 2 miles upstream from mouth.

Drainage area.--6.01 sq mi, of which 2.53 sq mi is noncontributing.

Records available.--March 1957 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 190 ft (from topographic map).

Extremes.--1957-60: Maximum discharge, 66 cfs Nov. 20, 1959 (gage height, 2.43 ft); minimum, 1.8 cfs Aug. 12, 14, 17, 18, 19, 20, 1960; minimum gage height, 0.75 ft Aug. 2, 5, 13, 14, Sept. 5, 6, 1957.

Remarks.--Drainage into upper end of basin influenced by urbanizing of area. No regulation or diversion 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
1957	-	-	-	-	-	5.54	4.19	4.08	3.52	3.39	3.80	3.27	-
1958	4.03	4.47	4.79	5.91	5.12	4.03	3.58	3.63	3.68	3.45	3.26	3.29	4.10
1959	3.85	5.41	6.04	7.48	4.76	4.54	4.28	3.49	3.30	2.87	2.99	3.60	4.38
1960	3.66	5.82	5.52	5.18	5.80	4.42	4.82	3.25	3.02	2.61	2.57	2.56	4.09

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957	-	-	-	-	-	340	250	251	210	208	234	195	-
1958	248	266	295	363	284	248	215	223	219	212	200	196	2,970
1959	237	322	372	480	264	279	254	214	196	176	184	214	3,170
1960	225	346	340	319	334	272	287	200	180	160	158	152	2,970

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	1516	-	-	-	-	-	-	-	-	-
1958	1566	28	Jan. 16, 1958	2.8	4.10	2,970	4.27	3,090	-	-
1959	1836	41	Jan. 24, 1959	2.6	4.38	3,170	4.36	3,150	-	-
1960	1716	66	Nov. 20, 1959	2.0	4.09	2,970	-	-	-	-

913. Leach Creek near Steilacoom, Wash.

Location--Lat 47°11'55", long 122°31'15", in NW¹/₄ NW¹/₄ sec. 26, T.20 N., R.2 E., on left bank a third of a mile upstream from mouth and 4 miles northeast of Steilacoom.

Drainage area--7.63 sq mi, of which 2.53 sq mi is noncontributing.

Records available--February 1957 to September 1960.

Gage--Water-stage recorder. Altitude of gage is 140 ft (from topographic map).

Extremes--1957-60: Maximum discharge, 94 cfs Nov. 21, 1959 (gage height, 3.59 ft); minimum, 4.5 cfs July 13, 1958; minimum gage height, 1.36 ft Sept. 19, 1957.

Remarks--Drainage into upper end of basin influenced by urbanizing of area. Some pumping for domestic use above gage. No 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
1957	-	-	-	-	11.1	13.0	11.4	10.5	9.97	9.79	9.93	9.62	-
1958	10.6	9.78	10.1	14.6	14.3	10.0	10.4	10.3	9.88	7.28	7.06	7.61	10.1
1959	8.41	11.4	12.1	17.6	11.3	10.2	9.94	8.60	7.61	6.85	7.32	8.68	10.0
1960	8.88	12.8	13.0	11.4	12.4	10.2	11.4	8.43	7.91	6.81	7.63	7.38	9.87

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957	-	-	-	-	615	801	675	645	593	602	611	572	-
1958	651	582	619	900	796	618	620	632	588	448	434	453	7,340
1959	517	681	743	1,080	628	626	591	529	453	421	450	517	7,240
1960	546	763	801	703	715	629	677	518	471	419	481	439	7,160

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30				Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean
		Discharge	Date				
1957	1516	-	-	-	-	-	-
1958	1566	44	Jan. 16, 1958	6.2	10.1	7,340	10.3
1959	1636	66	Jan. 24, 1959	6.4	10.0	7,240	10.2
1960	1716	94	Nov. 21, 1959	6.2	9.87	7,160	-

915. Chambers Creek below Leach Creek, near Steilacoom, Wash.

Location.--Lat 47°11'55", long 122°31'45", in NE 1/4 sec. 27, T.20 N., R.2 E., on left bank an eighth of a mile (revised) downstream from Leach Creek, 1 1/2 miles downstream from outlet of Steilacoom Lake, and 4 miles northeast of Steilacoom.

Drainage area.--104 sq mi.

Records available.--December 1937 to September 1940, July 1943 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 100 ft (from topographic map). Prior to Jan. 13, 1960, at sites 100 and 150 ft upstream at datum 0.95 ft higher.

Average discharge.--19 years (1938-40, 1943-60), 113 cfs (81,810 acre-ft per year).

Extremes.--1937-40, 1943-60: Maximum discharge, 792 cfs Jan. 5, 1956 (gage height, 3.58 ft, site and datum then in use); minimum, 28 cfs Oct. 17, 18, 19, 1959.

Remarks.--Some regulation by gates at outlet of Steilacoom Lake. Some diversions from tributaries for domestic 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	78.5	98.0	238	310	499	391	225	129	86.1	67.9	54.1	50.5	184
1952	76.6	72.7	86.1	87.2	130	116	84.7	72.0	61.1	44.9	42.7	40.7	76.1
1953	36.0	37.6	42.7	81.3	234	135	111	89.5	79.3	71.8	41.6	47.1	82.8
1954	53.5	69.2	172	305	275	232	165	114	97.7	77.1	51.2	61.7	139
1955	54.8	63.9	96.0	126	144	137	164	126	80.1	62.9	51.5	44.6	95.5
1956	57.3	89.0	357	496	242	233	194	123	103	72.1	58.5	46.7	173
1957	62.7	69.5	99.1	115	121	233	156	110	77.9	65.3	56.0	45.3	101
1958	50.1	46.4	59.0	110	203	172	120	109	81.3	55.9	38.0	38.1	89.6
1959	42.0	65.0	141	249	241	164	146	115	87.0	59.5	45.0	42.7	117
1960	39.6	57.1	132	137	236	175	162	149	103	68.9	56.9	51.0	113

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	4,820	5,830	14,660	19,070	27,710	24,020	13,370	7,960	5,120	4,180	3,330	3,000	133,100
1952	4,710	4,330	5,300	5,360	7,480	7,150	5,040	4,430	3,640	2,760	2,620	2,420	55,240
1953	2,210	2,240	2,630	5,000	12,970	8,320	6,620	5,500	4,720	4,410	2,560	2,800	59,980
1954	3,290	4,120	10,580	18,780	15,280	14,240	9,830	7,040	5,820	4,740	3,150	3,670	100,500
1955	3,370	3,800	5,900	7,720	8,010	8,430	9,750	7,740	4,770	3,870	3,160	2,650	69,170
1956	3,520	5,300	21,970	30,510	13,940	14,330	11,560	7,570	6,140	4,430	3,590	2,780	125,600
1957	3,860	4,140	6,090	7,080	6,710	14,310	9,290	6,730	4,640	4,010	3,440	2,690	72,990
1958	3,080	2,760	3,650	6,790	11,300	10,590	7,160	6,670	4,840	3,440	2,330	2,270	64,860
1959	2,580	5,060	8,700	15,330	13,370	10,080	8,700	7,050	5,170	3,660	2,770	2,540	85,010
1960	2,430	3,400	8,130	8,420	13,590	10,750	9,640	9,130	6,120	4,050	3,500	3,030	82,190

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	-	-	-	-	-	-	181	130,700
1951	1216	661	Feb. 11, 1951	48	184	133,100	169	122,100
1952	1246	152	Feb. 4, 1952	37	76.1	55,240	66.1	47,980
1953	1286	347	Feb. 8, 1953	31	82.8	59,980	97.9	70,890
1954	1346	418	Jan. 27, 1954	45	139	100,500	132	95,620
1955	1396	245	Feb. 8, 1955	39	95.5	69,170	120	86,890
1956	1446	792	Jan. 5, 1956	40	173	125,600	150	108,900
1957	1516	320	Mar. 12, 1957	41	101	72,990	94.5	68,370
1958	1566	253	Feb. 24, 1958	33	89.6	64,860	99.1	71,730
1959	1636	368	Jan. 24, 1959	37	117	85,010	114	82,630
1960	1716	313	Feb. 6, 1960	28	113	82,190	-	-

920. Puyallup River near Electron, Wash.

Location --Lat 46°54'15", long 122°02'05", in N½ sec.3, T.16 N., R.6 E., on left bank 1,000 ft upstream from Puget Sound Power & Light Co.'s flume headworks, a third of a mile downstream from Mowich River, and 10 miles southeast of Electron.

Drainage area --92.8 sq mi.

Records available --October 1908 to September 1926, October 1944 to September 1949, and October 1957 to September 1960 in reports of Geological Survey. October 1908 to September 1933 and October 1944 to September 1949 (monthly discharge only) in State Water-Supply Bulletin No. 6.

Gage --Water-stage recorder. Altitude of gage is 1,640 ft (from river-profile map). Prior to Jan. 1, 1913, staff gage and Jan. 1, 1913, to Sept. 30, 1926, Oct. 1, 1944, to Sept. 30, 1949, and Oct. 1, 1957, to Oct. 31, 1959, water-stage recorder, all at sites within 125 ft upstream at different datums. Gage washed out Nov. 22, 1959, reestablished Aug. 19, 1960, at site 100 ft upstream at different datum.

Average discharge --33 years (1908-33, 1944-49, 1957-60), 529 cfs (383,000 acre-ft per year).

Extremes --1908-26, 1944-49, 1957-60: Maximum discharge, 10,800 cfs Nov. 22, 1959 (gage height, 11.9 ft, from floodmarks, site and datum in use Oct. 1, 1957, to Oct. 31, 1959), result of slope-area measurement; minimum not determined, probably occurred during period of ice effect in December 1914 or December 1922.

Remarks --No regulation or diversion above station.

Correction --In WSP 1316, the momentary maximum discharge for the water year 1945 is listed in error; it should be 5,060 cfs Jan. 7, 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
1958	333	343	556	560	632	290	467	729	718	610	516	327	504
1959	434	1,083	881	797	329	368	569	652	806	580	371	709	632
1960	1,015	1,178	656	312	480	384	510	817	739	563	435	382	622

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1958	20,500	20,400	32,950	34,420	35,080	17,800	27,790	44,820	42,730	37,520	31,740	19,460	365,200
1959	26,690	64,420	54,190	49,000	18,250	22,610	33,890	40,070	47,970	35,690	22,790	42,220	457,800
1960	62,400	70,080	40,340	19,190	27,590	23,640	30,340	50,250	43,980	34,610	26,740	22,710	451,900

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	
1958	1566	1,870	Dec. 6, 1957	184	504	5.43	73.79	365,200	603	88.23	436,700	
1959	1636	4,840	Nov. 12, 1958	206	632	6.81	92.50	457,800	670	98.06	485,300	
1960	1716	10,800	Nov. 22, 1959	185	622	6.70	91.30	451,900	-	-	-	

930. Kapowsin Creek near Kapowsin, Wash.

Location.--Lat 46°59'30", long 122°11'30", in NE $\frac{1}{4}$ sec.5, T.17 N., R.5 E., on right bank half a mile downstream from Kapowsin Lake and $\frac{1}{2}$ miles east of Kapowsin.

Drainage area.--23 sq mi, approximately.

Records available.--June 1927 to October 1932, October 1941 to September 1957, water years 1958-60 (annual maximum).

Gage.--Water-stage recorder and crest-stage gage; log control. Datum of gage is 561 ft above mean sea level (from stadia traverse). Prior to Oct. 8, 1932, water-stage recorder at same site at datum 3.23 ft higher. Oct. 1, 1941, to Mar. 31, 1942, staff gage, Oct. 1, 1957, to Sept. 30, 1960, stilling well, and since Sept. 24, 1958, crest-stage gage, at present site and datum.

Average discharge.--21 years (1927-32, 1941-57), 49.7 cfs (35,980 acre-ft per year).

Extremes.--1927-32, 1941-60: Maximum discharge, 610 cfs Dec. 12, 1955 (gage height, 5.37 ft); maximum gage height, 5.83 ft Dec. 12, 1946 (backwater from debris).
1927-32, 1941-57: Minimum discharge, 0.9 cfs Aug. 23-27, 1951 (gage height, 1.72 ft).

Remarks.--No known regulation or diversion 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	34.2	108	138	139	176	81.5	33.6	20.7	10.1	2.86	1.42	2.53	61.6
1952	24.9	42.3	76.8	37.5	74.6	54.9	47.2	36.9	13.3	6.35	2.41	2.11	34.8
1953	2.65	4.90	13.2	99.9	102	50.1	53.9	46.7	56.3	19.9	6.76	6.64	38.2
1954	21.5	50.9	164	129	115	62.7	77.2	23.1	53.6	23.5	12.8	29.7	63.4
1955	28.5	50.1	51.0	79.9	79.5	66.1	118	48.9	22.8	24.9	11.1	9.77	48.9
1956	69.9	133	198	154	62.8	130	62.4	24.2	27.5	14.5	3.33	4.47	72.3
1957	29.0	44.1	107	38.9	86.6	148	57.0	36.5	24.2	8.11	6.85	3.60	49.0
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	2,100	6,410	8,470	8,570	9,760	5,010	2,000	1,280	600	176	87	151	44,610
1952	1,530	2,520	4,720	2,300	4,290	3,370	2,810	2,270	791	390	148	125	25,260
1953	163	292	815	6,140	5,660	3,080	3,210	2,870	3,350	1,230	416	395	27,620
1954	1,320	3,030	10,110	7,940	6,410	3,850	4,600	1,420	3,190	1,440	784	1,770	45,860
1955	1,750	2,980	3,140	4,920	4,420	4,070	7,000	3,010	1,360	1,530	683	581	35,440
1956	4,300	7,920	12,180	8,260	3,610	7,990	3,710	1,490	1,640	890	204	266	52,460
1957	1,790	2,620	6,590	2,390	4,810	9,070	3,390	2,240	1,440	498	421	214	35,470
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	
1950	-	-	-	-	-	-	-	73.1	43.12	52,920	
1951	1216	582	Feb. 12, 1951	0.9	61.6	2.68	36.36	44,610	50.3	29.67	36,400
1952	1246	176	Feb. 5, 1952	1.8	34.8	1.51	20.61	25,260	24.5	14.49	17,760
1953	1286	285	Feb. 1, 1953	1.9	38.2	1.66	22.51	27,620	56.4	33.27	40,810
1954	1345	574	Dec. 10, 1953	3.8	63.4	2.76	37.40	45,860	54.2	32.03	39,270
1955	1395	293	Feb. 8, 1955	5.8	48.9	2.13	28.89	35,440	71.8	42.37	51,970
1956	1446	610	Dec. 12, 1955	1.9	72.3	3.14	42.80	52,460	53.8	31.87	39,060
1957	1516	364	Mar. 7, 1957	2.9	49.0	2.13	28.92	35,470	-	-	-
1958	1566	218	Feb. 24, 1958	-	-	-	-	-	-	-	-
1959	1636	440	Nov. 12, 1958	-	-	-	-	-	-	-	-
1960	1716	377	Nov. 22, 1959	-	-	-	-	-	-	-	-

935. Puyallup River near Orting, Wash.

Location.--Lat 47°02'20", long 122°12'25", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.17, T.18 N., R.5 E., on right bank 600 ft downstream from highway bridge, 4 miles south of Orting, and 9 miles upstream from Carbon River.

Drainage area.--172 sq mi.

Records available.--September 1931 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 357.5 ft above mean sea level, unadjusted. Prior to Feb. 6, 1946, at site 600 ft upstream at datum 3.93 ft higher. Supplementary water-stage recorder 200 ft upstream at datum 2.1 ft higher than present gage datum used at times during periods in 1942-46.

Average discharge.--29 years (1931-60), 710 cfs (514,000 acre-ft per year).

Extremes.--1931-60: Maximum discharge, 12,900 cfs Nov. 22, 1959 (gage height, 7.25 ft, in gage well, 8.47 ft, from outside gage), from rating curve extended above 8,600 cfs on basis of slope-area measurement of peak flow; minimum, 25 cfs Nov. 28, 1952; minimum gage height, 1.22 ft Jan. 6, 7, 8, 9, 20, 1960; minimum daily discharge, 59 cfs Nov. 29, 1952.

Remarks.--Water diverted for Electron powerplant of Puget Sound Power & Light Co., returned to river above gage. Some regulation by Electron powerplant. Records of chemical analyses for the water year 1960 are given in reports of 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	708	1,167	1,374	939	1,340	631	594	725	651	566	454	391	791
1952	801	692	662	356	668	403	647	747	578	626	455	311	577
1953	210	928	205	1,555	847	419	569	801	889	841	531	397	612
1954	417	616	1,526	895	1,018	565	649	681	994	843	561	500	771
1955	416	694	577	639	663	404	700	697	1,244	1,034	544	415	669
1956	950	1,324	1,520	1,003	469	826	851	1,036	1,156	842	512	386	905
1957	553	658	1,369	373	759	937	664	936	738	488	373	377	685
1958	366	459	887	847	975	422	737	851	786	649	577	385	658
1959	495	1,457	1,260	1,164	546	611	733	780	878	645	429	700	809
1960	1,291	1,702	937	456	766	586	695	1,099	827	603	491	426	823

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	43,520	69,420	84,460	57,710	74,390	38,770	35,320	44,610	38,720	34,790	27,940	23,260	572,900
1952	49,270	41,150	40,680	20,670	38,440	24,750	38,490	45,960	34,370	38,470	27,870	18,530	418,600
1953	12,930	5,520	12,600	85,610	47,050	25,790	33,850	49,260	52,880	51,700	32,630	23,600	443,400
1954	25,620	36,680	93,850	55,050	56,530	34,720	38,610	41,850	59,170	51,840	34,510	29,770	558,200
1955	25,590	41,280	35,460	39,260	37,920	24,820	41,660	42,860	74,020	63,560	33,470	24,710	484,600
1956	58,430	78,810	93,450	61,680	26,960	50,810	49,460	63,720	67,570	51,800	31,490	22,940	657,100
1957	34,000	39,120	84,210	22,910	42,150	57,590	39,510	57,530	45,920	30,010	22,920	22,420	496,300
1958	22,530	27,290	54,520	52,080	54,170	25,940	43,870	51,120	46,760	39,930	35,500	22,880	478,600
1959	30,430	86,690	77,500	71,580	30,310	37,540	43,620	47,960	52,230	39,670	26,380	41,650	585,600
1960	79,400	101,300	57,600	28,060	44,040	36,050	41,370	67,560	49,230	37,060	30,200	25,360	597,200

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	-	-	-	-	-	-	-	-	918	73.31	664,600
1951	1216	6,250	Feb. 11, 1951	239	791	4.65	63.22	572,900	700	55.23	506,600
1952	1246	3,060	Oct. 3, 1951	190	577	3.35	45.64	418,600	439	34.73	318,600
1953	1286	4,730	Jan. 31, 1953	59	612	3.56	48.33	445,400	785	61.97	568,500
1954	1346	10,100	Dec. 9, 1953	243	771	4.48	60.85	558,200	697	54.99	504,500
1955	1396	4,420	Feb. 8, 1955	251	669	3.89	52.83	484,500	847	66.82	613,000
1956	1446	12,100	Dec. 11, 1955	243	905	5.26	71.64	657,100	804	63.64	583,800
1957	1516	4,360	Dec. 9, 11, 1956	200	685	3.98	54.10	496,300	612	48.32	443,300
1958	1566	2,740	Dec. 25, 1957	239	658	3.83	51.95	476,600	783	61.80	566,900
1959	1636	5,460	Nov. 12, 1958	223	809	4.70	63.83	585,600	869	68.59	629,200
1960	1716	12,900	Nov. 22, 1959	237	823	4.78	65.10	597,200	-	-	-

940. Carbon River near Fairfax, Wash.

Location.--Lat 47°01'40", long 122°01'50", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.22, T.18 N., R.6 E., on left bank $\frac{1}{4}$ miles upstream from highway bridge, $\frac{1}{4}$ miles northwest of Fairfax, and $2\frac{1}{4}$ miles downstream from Evans Creek.

Drainage area.--78.9 sq mi. At site prior to August 1912, 76.2 sq mi.

Records available.--November 1910 to July 1912, March 1929 to September 1960. Published as "at Fairfax" 1910-12.

Gage.--Water-stage recorder. Datum of gage is 1,212.6 ft above mean sea level (river-profile survey). Prior to July 13, 1912, staff gage at railroad crossing 1.7 miles upstream at different datum.

Average discharge.--31 years (1929-60), 422 cfs (305,500 acre-ft per year).

Extremes.--1910-12, 1929-60: Maximum discharge, 11,000 cfs Dec. 9, 1933 (gage height, 10.2 ft), from rating curve extended above 4,200 cfs; minimum, 36 cfs Nov. 28, 29, 1952; minimum gage height recorded, 0.75 ft Nov. 20, 1944.

Remarks.--No regulation or diversion 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	480	746	785	505	781	368	419	564	519	351	249	208	496
1952	503	373	285	137	324	211	415	538	440	457	265	167	343
1953	111	62.5	110	790	492	189	356	462	585	645	297	209	359
1954	215	412	883	371	461	239	375	517	706	656	400	273	459
1955	264	143	316	299	354	168	336	511	1,007	763	381	217	419
1956	596	920	733	437	181	269	506	774	750	637	311	218	529
1957	387	515	878	170	226	428	402	618	544	339	240	207	420
1958	204	296	487	466	466	204	401	567	571	408	299	241	383
1959	361	981	844	659	270	313	454	518	636	472	291	538	529
1960	830	1,014	540	224	326	308	413	709	684	443	326	257	506

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	29,510	44,370	48,260	31,030	43,390	22,650	24,910	34,690	30,900	21,570	15,280	12,370	358,900
1952	30,910	22,190	17,530	8,430	18,610	12,960	24,700	33,080	26,200	28,120	16,300	9,950	249,000
1953	6,820	5,720	6,770	48,550	27,320	11,600	21,180	28,420	34,850	39,690	18,280	12,450	259,600
1954	13,250	24,500	54,320	22,790	25,610	14,690	22,290	31,770	42,010	40,310	24,620	16,270	332,400
1955	16,230	24,600	19,450	18,400	19,680	10,340	20,010	31,450	59,930	46,940	23,450	12,690	303,400
1956	36,660	54,760	45,040	26,880	10,420	16,570	30,120	47,610	44,640	39,150	19,130	12,950	383,900
1957	23,800	30,660	53,990	10,430	15,860	26,330	23,910	38,000	32,340	21,480	14,780	12,330	303,900
1958	12,560	17,620	29,950	28,620	25,880	12,530	23,880	34,840	33,960	24,970	18,410	14,340	277,600
1959	22,220	58,390	51,880	40,520	15,000	19,220	27,030	31,850	37,810	29,000	17,910	32,020	382,800
1960	51,020	60,360	33,200	13,780	18,780	18,930	24,600	43,570	40,720	27,210	20,020	15,320	367,500

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	-	-	-	-	-	-	-	-	567	95.94	410,600
1951	1216	4,770	Feb. 9, 1951	138	496	6.12	82.98	358,900	425	73.05	307,400
1952	1246	2,610	Oct. 3, 1951	94	343	4.35	59.16	249,000	289	46.48	195,600
1953	1286	4,580	Jan. 31, 1953	40	359	4.58	61.69	259,600	462	79.46	334,400
1954	1349	6,880	Dec. 9, 1953	106	458	5.82	79.01	332,400	415	71.46	300,600
1955	1396	2,490	Feb. 8, 1955	112	419	5.31	72.09	303,400	524	90.18	379,500
1956	1446	6,320	Dec. 11, 1955	136	529	6.70	91.24	383,900	490	84.60	355,900
1957	1516	5,280	Dec. 10, 1956	110	420	5.32	72.23	303,900	353	60.75	255,600
1958	1566	1,610	Dec. 6, 1957	116	383	4.85	65.97	277,600	483	83.16	349,900
1959	1636	4,310	Nov. 12, 1958	156	529	6.70	90.99	382,800	546	93.85	394,900
1960	1716	9,970	Nov. 23, 1959	133	506	6.41	87.33	367,500	-	-	-

950. South Prairie Creek at South Prairie, Wash.

Location.--Lat 47°08'30", long 122°05'30", in NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.18, T.19 N., R.6 E., on right bank 0.3 mile northeast of South Prairie and 5 miles upstream from mouth.

Drainage area.--78.6 sq mi.

Records available.--June 1949 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 430 ft (from topographic map).

Average discharge.--11 years (1949-60), 251 cfs (181,700 acre-ft per year).

Extremes.--1949-60: Maximum discharge, 6,850 cfs Dec. 11, 1955 (gage height, 9.78 ft), from rating curve extended above 3,000 cfs; minimum, 22 cfs Nov. 29, 1952 (gage height, 1.25 ft).

Remarks.--Small amount of diversion for domestic use above station. No 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	220	468	537	451	656	352	195	199	112	51.3	38.4	45.3	275
1952	220	226	268	154	291	206	244	251	142	84.9	38.0	35.2	180
1953	34.0	35.2	61.5	51.0	401	186	281	252	320	156	65.4	56.9	195
1954	129	293	678	388	434	212	318	215	350	197	131	165	292
1955	126	221	235	258	340	209	361	324	356	246	64.7	50.5	233
1956	316	566	728	490	168	424	362	279	282	110	52.2	54.4	320
1957	203	250	569	126	301	461	295	272	147	71.3	57.1	56.4	234
1958	105	163	342	386	399	163	332	150	119	58.9	36.8	56.6	191
1959	101	613	467	495	228	259	282	267	273	96.1	46.2	188	276
1960	349	566	384	207	300	212	296	463	203	70.7	68.2	61.6	268

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	13,550	27,870	33,020	27,720	36,400	21,650	11,580	12,260	6,650	3,150	2,360	2,700	198,900
1952	13,520	13,440	16,470	9,450	16,720	12,700	14,540	15,460	8,440	5,220	2,330	2,090	130,400
1953	2,090	2,090	3,780	31,330	22,300	11,440	16,720	15,500	19,030	9,610	4,020	3,380	141,300
1954	7,920	17,410	41,700	23,840	24,120	13,060	18,920	13,210	20,850	12,130	8,080	9,830	211,100
1955	7,720	13,170	14,430	15,850	18,900	12,840	21,460	19,920	21,170	15,120	5,210	3,010	168,800
1956	19,420	33,690	44,750	30,130	9,690	26,080	21,550	17,160	16,810	6,750	3,210	3,240	232,500
1957	12,460	14,850	35,000	7,780	16,710	28,360	17,570	16,720	8,760	4,380	3,510	3,360	189,500
1958	6,480	9,710	21,030	23,750	22,160	10,140	19,750	9,220	7,100	3,620	2,260	3,370	138,600
1959	6,190	36,490	28,690	30,440	12,670	15,930	16,780	16,420	16,250	5,910	2,840	11,180	199,800
1960	21,470	33,650	23,620	12,720	17,230	13,030	17,630	28,440	12,090	4,350	5,420	4,850	194,500

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	-	-	-	-	-	-	-	-	-	-	-
1951	1216	3,550	Feb. 11, 1951	24	275	2.75	47.44	198,900	314	54.17	227,100
1952	1246	1,460	Feb. 4, 1952	31	180	3.29	31.13	130,400	252	40.05	167,900
1953	1286	2,680	Jan. 31, 1953	26	195	2.48	33.71	141,300	131	22.64	94,310
1954	1346	5,470	Dec. 9, 1953	69	292	3.72	50.35	211,100	277	47.80	200,400
1955	1396	3,440	Feb. 8, 1955	43	233	2.96	40.26	168,800	248	42.78	179,400
1956	1446	6,850	Dec. 11, 1955	39	320	4.07	55.46	232,500	320	55.19	231,500
1957	1516	2,750	Dec. 9, 1956	38	234	2.96	40.44	169,500	271	46.97	196,900
1958	1566	1,710	Jan. 17, 1958	27	131	2.43	33.06	138,600	199	34.46	144,400
1959	1636	3,160	Nov. 12, 1958	34	276	3.51	47.68	199,800	239	41.22	172,700
1960	1716	3,900	Nov. 20, 1959	42	268	3.41	46.41	194,500	286	49.43	207,200

PUYALLUP RIVER BASIN

965. Puyallup River at Alderton, Wash.

Location.--Lat 47°11'05", long 122°13'45", on line between sec.25, T.20 N., R.4 E., and sec.30, T.20 N., R.5 E., on right bank at downstream side of bridge on State Highway 5E, 1 mile north of Alderton, 1 mile south of Sumner, and 2 miles upstream from Stuck River.

Drainage area.--438 sq mi.

Records available.--October 1914 to February 1927, October 1943 to April 1957.

Gage.--Water-stage recorder. Datum of gage is at mean sea level, datum of 1929. Prior to Feb. 2, 1927, staff or chain gages at practically same site. Prior to Aug. 5, 1918, at datum 49.77 ft higher; Aug. 5, 1918, to Feb. 1, 1927, at datum 48.77 ft higher; Oct. 1, 1943, to Sept. 30, 1955, at datum 0.23 ft lower.

Average discharge.--25 years (1914-26, 1943-56), 1,614 cfs (1,168,000 acre-ft per year).

Extremes.--1914-27, 1943-57: Maximum discharge, 23,300 cfs Dec. 12, 1955 (elevation, 56.84 ft); minimum daily, 150 cfs Nov. 29, Dec. 1, 1952.
Flood in 1906 reached a stage of 66.3 ft, from floodmarks (discharge not determined).

Remarks.--Minor diversions for farm and domestic use. Some regulation by Electron power-plant of Puget Sound Power & Light Co. Since 1912, the city of Tacoma pipeline diversion from Green River has spilled up to 110 cfs daily (an average of 40 cfs, or 2,380 acre-ft per month) into Puyallup River at south line of sec. 7, T.19 N., R.5 E., half a mile east of McMillin.

Monthly and yearly mean discharge, in cubic feet per second

[illegible]

Monthly and yearly discharge, in acre-feet

[illegible]

Yearly discharge, in cubic feet per second

[illegible]

970. White River at Greenwater, Wash.

Location.--Lat 47°08'50", long 121°38'50", in SE $\frac{1}{4}$ sec.10, T.19 N., R.9 E., on right bank three-quarters of a mile southeast of Greenwater, three-quarters of a mile upstream from Greenwater River, and 18 $\frac{1}{2}$ miles east of and 25 miles upstream from Buckley.

Drainage area.--216 sq mi.

Records available.--December 1911 to May 1912 (fragmentary), March 1929 to September 1960. Published as "near Enumclaw" 1911-12.

Gage.--Water-stage recorder. Altitude of gage is 1,725 ft (from river-profile map). Prior to May 6, 1912, staff gage at site 2 miles upstream at different datum.

Average discharge.--31 years (1929-60), 855 cfs (619,000 acre-ft per year).

Extremes.--1911-12, 1929-60: Maximum discharge, 18,100 cfs Dec. 21, 1933 (gage height, 9.38 ft), from rating curve extended above 3,600 cfs by logarithmic plotting; minimum, 120 cfs Nov. 2, 1935 (gage height, 1.69 ft).

Note.--The momentary maximum discharge for the water year 1930 not published in WSP 1916, has been estimated as 2,000 cfs Feb. 19, 1930.

Remarks.--No regulation or diversion 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	818	1,448	1,536	727	1,313	624	1,169	1,504	1,484	1,129	638	422	1,065
1952	556	544	501	330	642	428	970	1,407	1,249	1,004	625	433	724
1953	341	227	243	1,043	978	416	665	1,149	1,302	1,404	715	500	747
1954	490	598	1,372	647	843	552	690	1,352	1,416	1,531	758	529	900
1955	432	624	514	525	668	320	572	985	2,395	1,573	846	591	838
1956	863	1,592	1,490	726	400	457	1,260	2,225	2,200	1,791	898	569	1,208
1957	520	690	1,515	605	535	854	917	1,753	1,395	817	609	520	897
1958	377	416	648	776	852	504	734	1,744	1,562	950	720	449	811
1959	559	1,579	1,569	1,422	677	597	961	1,216	1,806	1,598	749	731	1,107
1960	1,196	1,847	1,210	557	799	630	912	1,245	1,630	1,078	655	462	1,017

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	50,310	86,150	94,430	44,690	72,900	38,350	69,540	32,470	88,280	69,410	39,220	25,120	770,900
1952	34,210	32,360	30,780	20,220	56,940	26,340	57,690	86,490	74,290	61,720	38,420	25,750	525,300
1953	20,980	13,530	14,950	64,110	54,290	25,550	39,550	70,670	77,450	86,340	43,990	29,750	541,100
1954	30,110	35,570	84,370	39,760	46,830	33,930	41,090	83,150	84,290	96,150	46,590	31,450	651,300
1955	26,590	37,150	31,590	32,260	38,220	19,690	34,010	60,580	142,500	96,710	51,990	35,190	606,500
1956	53,040	94,720	91,600	44,660	22,990	28,080	75,000	136,800	130,900	110,100	55,210	33,830	876,900
1957	31,940	41,050	93,160	57,190	29,740	52,500	54,580	107,800	83,010	50,220	37,440	30,940	649,600
1958	23,190	24,770	39,850	47,710	47,340	30,960	43,680	107,300	92,970	58,430	44,250	26,730	587,200
1959	34,360	93,940	96,500	87,420	37,600	36,700	57,160	74,780	107,500	85,940	46,060	43,480	801,400
1960	73,560	109,300	74,410	34,230	45,960	38,730	54,240	76,540	97,010	66,280	40,250	27,480	738,600

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	-	-	-	-	-	-	-	-	1,209	76.01	875,400		
1951	1216	5,550	Feb. 9, 1951	355	1,065	4.93	66.93	770,900	880	55.33	637,300		
1952	1246	2,190	May 20, 1952	250	724	3.35	45.61	525,300	658	41.45	477,400		
1953	1286	4,020	Jan. 31, 1953	167	747	3.46	46.95	541,100	886	55.68	641,800		
1954	1346	5,560	Dec. 9, 1953	340	900	4.17	56.54	651,300	824	51.79	596,600		
1955	1396	5,160	June 11, 1955	268	838	3.88	52.64	606,500	1,037	65.14	750,500		
1956	1446	10,100	Dec. 12, 1955	314	1,208	5.59	76.14	876,900	1,107	69.79	803,700		
1957	1516	6,860	Dec. 10, 1956	327	89	4.15	56.40	649,600	789	49.60	571,200		
1958	1566	3,580	May 25, 1958	249	811	3.75	50.96	587,200	1,000	62.85	724,200		
1959	1636	5,230	Nov. 12, 1958	345	1,107	5.12	69.56	801,400	1,153	72.43	834,500		
1960	1716	14,300	Nov. 23, 1959	368	1,017	4.71	64.10	738,600	-	-	-		

PUYALLUP RIVER BASIN

975. Greenwater River at Greenwater, Wash.

Location.--Lat 47°09'15", long 121°38'00", in NW 1/4 sec. 11, T. 19 N., R. 9 E., on left bank 1 mile upstream from mouth, 1 mile east of Greenwater, and 19 miles east of Buckley.

Drainage area.--73.9 sq mi.

Records available.--September 1911 to August 1912 (fragmentary), May 1929 to September 1960. Published as "near Enumclaw" 1911-12.

Gage.--Water-stage recorder. Altitude of gage is 1,725 ft (from topographic map). Prior to Aug. 10, 1912, staff gages at approximately same site at different datums. May 1, 1929, to Aug. 14, 1934, water-stage recorder at site 900 ft upstream at different datum.

Average discharge.--31 years (1929-60), 209 cfs (151,300 acre-ft per year).

Extremes.--1911-12, 1929-60: Maximum discharge, 5,360 cfs Nov. 22, 1959 (gage height, 7.67 ft), from rating curve extended above 1,200 cfs on basis of slope-area measurement of peak flow; minimum, 23 cfs Oct. 7, 1934; minimum gage height, 2.00 ft Nov. 28 to Dec. 2, 1952.

Revisions.--The momentary maximum discharge for the water year 1947 published in WSP 1316 has been revised to 5,000 cfs.

Remarks.--No regulation or diversion 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	94.0	328	400	235	327	175	411	528	319	114	57.5	43.1	252
1952	69.5	97.2	118	64.4	158	118	323	391	218	119	55.5	38.3	147
1953	32.1	32.9	35.0	275	297	124	206	364	357	191	71.9	47.7	169
1954	48.0	89.4	483	228	290	153	227	517	452	283	97.4	64.4	244
1955	70.8	93.2	116	155	235	90.6	182	363	736	301	102	67.3	208
1956	172	457	406	211	113	149	457	764	544	241	88.9	61.0	306
1957	80.1	167	427	145	124	221	322	511	231	89.1	53.9	38.1	202
1958	41.2	58.7	172	219	222	147	263	429	198	77.0	45.5	42.3	159
1959	104	436	484	441	205	182	292	381	397	151	65.6	129	272
1960	347	567	345	129	193	189	300	368	312	120	72.4	61.9	249

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	5,780	19,540	24,580	14,480	18,150	10,760	24,480	32,490	18,980	6,990	3,530	2,560	182,300
1952	4,270	5,780	7,260	3,960	9,080	7,290	19,250	24,040	12,970	7,330	3,410	2,280	106,900
1953	1,970	1,960	2,150	16,990	16,480	7,650	12,240	22,380	21,250	11,730	4,420	2,840	122,100
1954	2,950	5,320	29,690	14,020	16,130	9,440	13,490	31,790	26,930	17,420	5,990	3,830	177,000
1955	4,350	5,550	7,150	9,540	13,050	5,570	10,810	22,320	43,770	18,510	6,250	4,000	150,900
1956	10,590	27,220	24,990	12,990	6,500	9,190	27,170	46,990	32,360	14,810	5,460	3,630	221,900
1957	4,930	9,950	26,230	8,940	6,900	13,570	19,160	31,450	13,730	5,480	3,310	2,270	145,900
1958	2,530	3,490	10,580	13,470	12,300	9,050	15,650	26,380	11,810	4,740	2,800	2,520	115,300
1959	6,410	25,930	29,740	27,120	11,400	11,160	17,380	23,420	23,610	9,310	4,030	7,650	197,200
1960	21,360	33,730	21,200	7,920	10,530	11,650	17,850	22,620	18,570	7,410	4,450	3,680	181,000

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	-	-	-	-	-	-	-	-	320	58.85	232,000	-	-	-
1951	1216	1,130	(a)	35	252	3.41	46.26	182,300	207	37.99	149,700	-	-	-
1952	1246	576	May 20, 1952	32	147	1.99	27.12	106,900	132	24.28	95,690	-	-	-
1953	1286	1,370	Feb. 1, 1953	28	169	2.29	30.98	122,100	213	39.06	153,900	-	-	-
1954	1346	2,000	Dec. 9, 1953	40	244	3.30	44.90	177,000	216	39.59	156,100	-	-	-
1955	1396	1,580	June 11, 1955	49	208	2.81	38.28	150,900	272	49.90	196,600	-	-	-
1956	1446	2,230	Dec. 12, 1955	52	308	4.14	56.31	221,900	276	50.80	200,200	-	-	-
1957	1516	1,000	Dec. 13, 1956	34	202	2.73	37.02	145,900	168	30.80	121,400	-	-	-
1958	1566	816	Apr. 21, 1958	34	159	2.15	29.26	115,300	222	40.81	160,800	-	-	-
1959	1636	1,610	Jan. 24, 1959	32	272	3.68	50.02	197,200	292	53.62	211,400	-	-	-
1960	1716	5,360	Nov. 22, 1959	44	249	3.37	45.92	181,000	-	-	-	-	-	-

a Feb. 11, May 11, 1951.

980. Mud Mountain Reservoir near Buckley, Wash.

Location.--Lat 47°08'30", long 121°55'50", in NE $\frac{1}{4}$ sec.17, T.19 N., R.7 E., on left bank of reservoir just upstream from Mud Mountain Dam on White River, 5 miles southeast of Buckley and 6 miles downstream from Clearwater River.

Drainage area.--400 sq mi.

Records available.--October 1943 to September 1960.

Gage.--Staff gage. Datum of gage is at mean sea level (levels by Corps of Engineers).

Extremes.--1943-60: Maximum contents observed since dam was completed, 37,300 acre-ft June 20, 1956 (elevation, 1,117.1 ft); no pool at times in some years.

Remarks.--Reservoir, for flood control, is formed by earth-fill dam. Embankment completed and storage began on small scale in 1942. Capacity, 106,000 acre-ft between elevations 895 (invert of outlet tunnel) and 1,215 ft (spillway crest). Storage is not retained but is dissipated as soon after a flood as is possible without creating damaging flows downstream in order to have the maximum capacity available for any following flood which might develop.

Cooperation.--Records of reservoir elevations and capacity table 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	127	14,540	1,620	113	179	191	135	142	224	130	0	80
1952	0	92	43	84	43	62	373	252	77	43	43	43
1953	43	43	43	8,710	52	52	667	20,880	168	454	1,780	1,900
1954	1,930	72	107	107	191	95	62	160	4,880	89	77	72
1955	43	43	3,160	62	107	127	107	17,540	11,440	5,160	83	43
1956	7,070	1,610	451	698	107	62	3,960	31,400	8,690	667	107	1,900
1957	2,090	2,080	168	2,060	11,490	3,540	3,190	10,150	28,370	116	43	43
1958	43	43	141	141	12,870	9,000	134	9,280	2,890	11,830	3,570	138
1959	107	587	11,040	464	572	235	2,470	22,380	120	120	1,880	2,510
1960	3,060	18,900	12,840	1,260	508	519	519	1,000	609	609	168	168

985. White River near Buckley, Wash.

Location.--Lat 47°09'05", long 121°57'00", in SW¼NW¼ sec.8, T.19 N., R.7 E., on right bank 0.7 mile upstream from Red Creek, 1 mile downstream from Mud Mountain Dam, 4 miles east of Buckley, and 8 miles downstream from Clearwater River.

Drainage area.--401 sq mi.

Records available.--October 1928 to November 1933, October 1938 to September 1960.

Gage.--Water-stage recorder. Datum of gage is at mean sea level, datum of 1929 (Corps of Engineers bench mark). Oct. 26 to Dec. 9, 1928, staff gage and Dec. 9, 1928, to Nov. 30, 1933, water-stage recorder, at site 3 miles upstream at different datum. Nov. 26, 1938, to Feb. 14, 1939, staff gage at present site and datum.

Average discharge.--27 years (1928-33, 1938-60), 1,434 cfs (1,038,000 acre-ft per year), adjusted for storage since December 1943.

Extremes.--1928-33, 1938-60: Maximum discharge, 17,000 cfs Feb. 26, 1932 (gage height, 17.5 ft, site and datum then in use), from rating curve extended above 4,000 cfs; probably no flow part of each day Oct. 1, 2, 7, 8, Nov. 14, Dec. 1, 5, 15, 1958, Jan. 3, Mar. 24, June 8, Aug. 19, 1959; minimum daily, 59 cfs June 25, 1957, Mar. 26, 1958. Maximum stage known, 23.4 ft in December 1933, from floodmarks, at former site (discharge, 28,000 cfs from rating curve extended above 3,000 cfs).

Remarks.--Diversion for some community use within basin. Flow regulated by Mud Mountain Reservoir for flood control (see preceding page). Storage is not retained and observed annual runoff closely represents natural runoff of 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	1,282	2,647	3,067	1,858	2,623	1,299	1,961	2,401	2,100	1,318	760	577	1,818
1952	1,075	1,199	1,158	650	1,354	870	1,591	2,203	1,674	1,301	810	541	1,199
1953	373	267	343	2,243	2,127	848	1,432	1,771	2,430	1,875	971	666	1,273
1954	630	1,018	2,996	1,491	1,840	1,066	1,511	2,406	2,335	2,244	1,116	790	1,621
1955	736	1,108	976	1,136	1,846	735	1,287	1,738	3,704	2,347	1,161	749	1,427
1956	1,477	3,119	2,963	1,620	779	1,210	2,664	3,553	3,573	2,390	1,029	642	2,088
1957	937	1,374	2,888	757	875	1,767	2,519	1,544	1,362	734	592	1,435	1,435
1958	515	681	1,410	1,634	1,469	1,016	1,754	2,396	2,094	1,063	946	726	1,307
1959	841	2,915	2,635	2,799	1,115	1,169	1,753	1,702	2,817	1,602	809	1,277	1,767
1960	2,159	2,937	2,175	1,043	1,403	1,145	1,569	2,179	2,137	1,222	889	637	1,624

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	78,840	157,500	188,600	114,200	145,700	79,870	116,700	147,600	125,000	80,900	46,740	34,350	1,316,000
1952	66,100	71,370	71,220	38,780	77,870	53,500	94,650	135,500	99,610	79,980	49,790	32,170	870,500
1953	22,910	15,910	21,070	37,900	118,200	52,110	85,200	108,900	144,600	115,300	59,690	39,610	921,400
1954	36,720	60,570	184,200	91,680	102,200	65,550	89,890	147,900	138,300	138,000	58,820	46,990	1,173,000
1955	45,280	65,940	60,040	69,830	82,550	45,210	76,560	106,080	220,400	144,300	71,390	44,580	1,033,000
1956	90,810	185,600	182,200	99,590	44,820	74,430	158,500	212,600	147,000	83,290	38,210	1,516,000	1,516,000
1957	57,630	81,730	177,600	46,530	48,570	108,600	106,900	154,900	91,900	83,740	45,160	35,210	1,038,000
1958	31,670	40,520	86,710	100,500	81,570	62,500	104,400	147,300	24,600	65,380	58,200	43,170	946,500
1959	51,700	173,400	162,000	72,100	61,910	71,870	104,300	104,600	167,600	98,500	49,720	75,970	1,294,000
1960	132,700	174,800	133,700	64,150	80,710	70,420	93,360	134,000	127,100	75,160	54,690	37,920	1,179,000

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30												Calendar year			
		Observed						Adjusted						Observed			
		Momentary		maximum	Minimum	Mean	Runoff in acre-feet	Mean		Per square mile	Runoff in inches	Mean	Runoff in acre-feet	Mean	Runoff in inches	Mean	Runoff in inches
		Discharge	Date	day	day												
1950	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1951	1216	9,650	Feb. 12, 1951	458	1,818	1,316,000	1,818	4.53	61.55	2,098	1,519,000	2,098	71.01	1,519,000	71.01	1,519,000	71.01
1952	1246	5,550	Feb. 4, 1952	436	1,199	870,500	1,199	2.99	40.70	994	721,700	994	35.74	721,700	35.74	721,700	35.74
1953	1286	9,000	Feb. 3, 1953	175	1,273	921,400	1,273	3.18	43.17	1,582	1,145,000	1,582	53.54	1,145,000	53.54	1,145,000	53.54
1954	1346	10,100	Dec. 9, 1953	480	1,621	1,173,000	1,621	4.03	54.77	1,465	1,061,000	1,470	49.74	1,061,000	49.74	1,061,000	49.74
1955	1396	7,210	June 10, 1955	60	1,427	1,033,000	1,427	3.56	48.27	1,824	1,320,000	1,820	61.58	1,320,000	61.58	1,320,000	61.58
1956	1446	13,700	Dec. 12, 1955	169	2,088	1,516,000	2,088	5.21	70.94	1,893	1,374,000	1,893	63.23	1,374,000	63.23	1,374,000	63.23
1957	1516	6,910	Dec. 10, 1956	59	1,435	1,038,000	1,435	3.57	48.46	1,218	880,400	1,218	41.15	880,400	41.15	880,400	41.15
1958	1566	3,820	May 26, 1958	59	1,507	946,500	1,507	3.26	44.27	1,623	1,175,000	1,623	55.45	1,175,000	55.45	1,175,000	55.45
1959	1636	10,700	Jan. 25, 1959	167	1,787	1,294,000	1,787	4.46	60.58	1,862	1,348,000	1,865	63.09	1,348,000	63.09	1,348,000	63.09
1960	1716	13,000	Nov. 23, 1959	313	1,624	1,179,000	1,624	4.04	55.01	-	-	-	-	-	-	-	-

1005. White River near Sumner, Wash.
(Formerly published as Stuck River near Sumner)

Location.--Lat 47°14'55", long 122°14'35", in NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.1, T.20 N., R.4 E., on right bank 300 ft downstream from county bridge, 3 miles north of Sumner, and $\frac{1}{2}$ miles upstream from mouth.

Drainage area.--470 sq mi, excludes that of Lake Tapps.

Records available.--January 1945 to September 1960. Prior to October 1959, published as Stuck River near Sumner.

Gage.--Water-stage recorder. Datum of gage is at mean sea level (Intercounty River Improvement Commission bench mark).

Average discharge.--15 years (1945-60), 623 cfs (451,000 acre-ft per year).

Extremes.--1945-60: Maximum discharge, 15,100 cfs Dec. 12, 1955 (elevation, 61.40 ft); minimum, 28 cfs Nov. 1, 1958; minimum elevation, 48.48 ft Feb. 1, 1945 (channel affected by dredging).

Remarks.--White River flume diverts an average of from 1,000 to 1,200 cfs annually, 22 miles upstream, for storage in Lake Tapps (see p. 106) and for power development at Dieringer powerplant below this station. Flood flow regulated by Mud Mountain Reservoir (see p. 103).

Monthly and yearly 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	1,025	2,325	811	1,928	296	653	751	315	164	85.1	87.0	712
1952	111	107	154	142	303	135	346	764	325	93.6	65.4	88.7	219
1953	54.0	49.9	61.1	993	1,404	174	245	352	710	356	252	84.0	388
1954	114	258	2,051	430	406	200	265	759	868	729	110	100	525
1955	106	142	166	228	550	147	256	653	2,204	603	174	60.0	437
1956	475	1,772	2,182	616	260	546	1,173	2,101	1,853	827	216	156	1,000
1957	123	259	2,092	134	200	423	432	946	368	126	216	60.9	452
1958	98.7	89.8	253	505	371	159	412	865	438	148	85.8	140	297
1959	278	2,018	1,953	2,229	578	425	815	894	1,869	101	61.2	321	962
1960	792	2,177	1,188	275	314	233	255	1,459	831	59.9	72.0	110	647

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	12,180	61,010	43,000	49,880	107,100	18,220	38,850	46,160	17,730	10,070	5,230	5,180	515,600
1952	6,610	6,360	9,480	8,740	17,400	8,280	20,600	47,000	19,340	5,760	4,020	5,280	159,100
1953	3,320	2,970	3,750	61,030	77,960	10,720	14,550	21,640	42,260	21,880	15,490	5,000	280,600
1954	6,980	14,150	26,100	26,410	22,570	12,300	15,650	46,690	51,630	44,800	6,740	5,950	380,000
1955	6,520	8,420	10,180	14,000	30,540	9,050	15,230	40,170	31,100	37,080	10,670	3,570	316,500
1956	29,180	105,400	134,200	37,890	14,980	21,270	69,790	129,200	110,200	50,880	13,300	9,290	725,600
1957	7,550	15,430	28,600	8,260	11,130	26,010	25,730	58,140	21,910	7,770	13,270	3,620	327,400
1958	6,070	5,350	15,570	31,070	20,630	9,750	24,490	53,160	26,070	9,100	5,270	8,360	214,900
1959	17,090	120,100	120,100	37,000	52,120	26,120	48,520	54,990	11,200	6,180	3,760	19,130	696,300
1960	48,690	129,500	73,040	16,880	18,040	14,310	15,180	89,730	49,450	3,680	4,430	6,550	469,500

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	-	-	-	-	-	-	1,024	741,000
1951	1216	12,200	Feb. 11, 1951	68	712	515,600	445	322,100
1952	1246	2,660	May 1, 1952	52	219	159,100	202	146,500
1953	1296	6,700	Feb. 4, 1953	36	388	280,600	577	417,700
1954	1346	11,700	Dec. 9, 1953	89	525	380,000	356	257,900
1955	1396	7,380	June 12, 1955	40	437	316,500	774	560,200
1956	1446	15,100	Dec. 12, 1955	37	1,000	725,600	838	608,400
1957	1516	6,460	Dec. 18, 1956	53	452	327,400	280	202,800
1958	1566	2,900	Feb. 27, 1958	56	297	214,900	615	445,200
1959	1636, 1716	11,900	Jan. 25, 1959	32	962	696,300	954	690,200
1960	1716	14,700	Nov. 24, 1959	41	647	469,500	-	-

1010. Lake Tapps near Sumner, Wash.

Location.--Lat 47°14'30", long 122°11'30", in NE $\frac{1}{4}$ sec.8, T.20 N., R.5 E., $\frac{1}{2}$ miles east of Dieringer and 3 miles northeast of Sumner.

Drainage area.--12.5 sq mi.

Records available.--November 1911 to September 1960. October 1934 to October 1950, change in contents published with records for Puyallup River at Puyallup. Month-end contents only November 1911 to September 1950, published in WSP 1316.

Gage.--Staff gage. Datum of gage is 0.70 ft above mean sea level (levels by Puget Sound Power & Light Co.).

Extremes.--1911-60: Maximum contents observed, 51,710 acre-ft June 30, 1958 (gage height, 541.57 ft); maximum gage height, 543.00 ft Oct. 17, 1959; minimum contents observed, 458 acre-ft June 24, 1912 (gage height, 505.70 ft).

Remarks.--Reservoir is formed by diking of a natural lake into which a great part of the low-water flow of White River is diverted. Usable capacity, 46,660 acre-ft between elevations 515 and 543 ft (from capacity table dated July 28, 1959). Storage used for power.

Cooperation.--Gage-height record and contents curve furnished by Puget Sound Power & Light Co.

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

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	46,380	47,420	42,930	44,100	40,550	30,440	36,180	44,890	47,220	47,220	44,580	46,850
1952	42,530	44,250	40,400	27,970	29,140	27,720	48,100	47,090	42,600	45,940	47,770	46,980
1953	46,960	44,930	44,360	45,390	16,040	9,920	22,920	31,840	43,480	45,060	45,000	44,840
1954	44,320	46,800	45,260	35,320	39,610	21,940	25,200	39,850	47,920	45,830	42,620	46,120
1955	42,600	46,320	42,340	26,870	15,300	12,620	15,070	32,220	43,790	46,980	45,480	42,490
1956	50,220	49,710	49,300	42,950	17,840	24,930	44,620	45,570	47,040	44,430	45,170	45,860
1957	45,680	42,910	39,810	21,780	21,320	37,670	37,650	47,260	30,600	48,080	46,870	45,130
1958	48,560	42,200	47,220	46,010	49,320	18,740	39,320	47,150	51,460	44,670	49,360	44,140
1959	36,580	42,160	42,820	43,800	33,340	41,580	43,530	41,720	43,670	40,760	45,140	45,670
1960	45,600	39,640	34,440	37,320	23,680	24,580	37,530	43,400	44,670	45,650	45,400	43,110

1011. Lake Tapps diversion at Dieringer, Wash.

Location.--Lat 47°14'20", long 122°13'40", in NW $\frac{1}{4}$ sec.7, T.20 N., R.5 E., on right bank 900 ft downstream from Dieringer powerplant, 1,200 ft upstream from mouth, and $2\frac{1}{2}$ miles north of Sumner.

Records available.--April 1958 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 60 ft (from topographic map).

Extremes.--1958-60: Maximum discharge, 2,310 cfs Nov. 23, 1959 (gage height, 6.00 ft); minimum daily, 19.5 cfs Aug. 22, 23, 1959.

Remarks.--Regulation by White River powerplant.

Monthly and 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	-	-	1,273	1,520	1,112	899	1,277	1,534	1,605	1,057	779	609	-
1959	560	1,516	1,273	1,520	1,112	899	1,277	1,118	1,576	1,625	693	1,065	1,185
1960	1,443	1,341	1,459	909	1,604	1,007	1,344	1,183	1,704	1,228	783	560	1,211

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1958	-	-	-	-	-	-	-	94,330	95,480	64,980	47,890	36,220	-
1959	34,440	90,180	78,270	93,490	61,740	55,270	76,010	68,770	93,780	99,910	42,600	63,390	857,800
1960	88,750	79,770	89,690	55,890	92,270	61,930	79,950	72,720	101,400	75,500	48,120	33,320	879,300

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1958	1566	2,050	May 27-29, 1958	-	-	-	-	-
1959	1636	2,230	May 28, 1959	19.5	1,185	857,800	1,261	913,200
1960	1716	2,310	Nov. 23, 1959	32	1,211	879,300	-	-

a Maximum daily during period April to September.

1015. Puyallup River at Puyallup, Wash.

Location.--Lat 47°12'30", long 122°19'35", in NW¼ sec.20, T.20 N., R.4 E., on left bank 0.8 mile upstream from bridge at Clark Creek, 1 mile northwest of Puyallup, and 7 miles upstream from mouth.

Drainage area.--948 sq mi.

Records available.--May 1914 to September 1960.

Gage.--Water-stage recorder. Datum of gage is at mean sea level, datum of 1929. Prior to Dec. 3, 1919, at sites 1¼ miles and 900 ft upstream at different datums. Dec. 3, 1919, to Nov. 9, 1935, at site 500 ft upstream at datum 9.61 ft higher than present datum.

Average discharge.--46 years (1914-60), 3,350 cfs (2,425,000 acre-ft per year), adjusted for storage in Lake Tapps since October 1934 and Mud Mountain Reservoir October 1944 to September 1947.

Extremes.--1914-60: Maximum discharge, 57,000 cfs Dec. 10, 1933 (elevation, 31.0 ft, present datum); minimum, 306 cfs Sept. 25, 1955 (elevation, 8.23 ft); minimum daily, 400 cfs Nov. 30, 1952.

Remarks.--All diverted water returned to river above gage. Large part of flow of White River, a tributary, is diverted into Lake Tapps (see preceding page) and thence returned via White River (formerly Stuck River) above station. Flood flow regulated by Mud Mountain Reservoir on White River (see p. 103). Some pondage on tributaries and upper Puyallup River. Diurnal fluctuations caused by powerplants and glacial melt above station. Since 1912, spill from the city of Tacoma pipeline diversion from Green River into Puyallup River at south line of sec.7, T.19 N., R.5 E., half a mile east of McMillin has been as much as 110 cfs but averages only about 40 cfs per month (2,380 acre-ft). Records of water temperatures for the period July 1959 to September 1960 are published in reports of 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	3,123	5,504	6,577	4,812	7,187	3,529	3,494	4,153	3,665	2,583	1,777	1,364	3,980
1952	2,916	2,682	2,910	1,874	3,289	2,277	3,267	4,291	3,505	2,808	1,744	1,192	2,727
1953	846	656	964	6,248	5,490	2,297	2,981	3,600	4,551	3,924	2,026	1,483	2,907
1954	1,714	2,987	7,465	4,363	4,397	3,068	3,458	3,957	4,934	4,513	2,574	1,995	3,785
1955	1,837	2,906	2,730	3,355	3,948	2,146	3,740	3,700	6,830	4,850	2,493	1,621	3,337
1956	3,663	6,925	7,646	4,708	2,588	3,673	4,634	5,905	6,369	4,593	2,244	1,498	4,544
1957	2,523	3,288	6,887	2,121	2,960	4,456	3,820	4,855	3,868	2,340	1,687	1,457	5,341
1958	1,401	2,068	3,697	4,355	4,354	2,782	3,567	4,250	3,934	2,620	1,960	1,598	3,040
1959	2,068	7,153	6,423	6,708	3,042	3,718	3,712	4,017	5,266	3,319	1,682	3,340	4,131
1960	6,689	8,796	6,613	3,937	5,318	3,896	4,878	6,102	6,159	4,032	3,158	2,706	5,185

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	192,000	327,500	404,400	256,900	399,200	217,000	207,900	255,300	218,100	158,800	109,300	81,190	2,867,000
1952	179,300	159,600	178,900	115,300	189,200	140,000	194,400	263,800	208,500	172,700	107,200	70,900	1,980,000
1953	52,050	39,060	59,300	384,200	304,900	141,200	177,400	221,400	270,800	241,200	124,600	88,260	2,104,000
1954	105,400	177,700	459,000	266,200	244,200	188,600	205,800	243,300	293,300	277,500	158,200	118,700	2,740,000
1955	115,000	172,900	167,900	206,300	219,300	131,900	222,600	227,500	406,400	298,200	153,300	96,440	2,416,000
1956	225,200	412,000	470,100	289,500	148,900	225,800	275,800	563,100	379,000	282,400	158,000	89,150	3,299,000
1957	155,100	195,600	409,900	130,400	164,400	272,700	227,300	298,500	230,200	143,900	103,700	86,690	2,418,000
1958	86,150	123,100	227,400	266,600	241,800	71,100	122,300	261,900	334,100	161,100	120,500	94,930	2,201,000
1959	127,200	425,600	394,900	412,300	169,000	70,900	224,500	247,000	513,300	304,100	103,400	98,800	2,991,000
1960	411,300	523,400	406,600	242,100	305,900	239,600	290,300	375,200	566,500	247,900	194,200	161,000	3,764,000

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30										Calendar year					
		Observed					Adjusted					Observed			Adjusted		
		Momentary maximum		Min- imum day	Mean	Runoff in acre-feet	Mean	Per square mile	Runoff in inches	Mean	Runoff in acre-feet	Mean	Runoff in inches				
		Discharge	Date														
1950	-	-	-	-	-	-	-	-	-	4,664	3,376,000	4,658	-	-	-		
1951	1216	29,800	Feb. 11, 1951	868	3,960	2,867,000	3,961	4.18	56.72	3,399	2,460,000	3,395	-	-	-		
1952	1246	9,110	Feb. 4, 1952	629	2,727	1,980,000	2,727	2.88	39.16	2,221	1,612,000	2,227	-	-	-		
1953	1286	16,900	Feb. 1, 1953	400	2,907	2,104,000	2,904	3.06	41.58	3,724	2,696,000	3,725	-	-	-		
1954	1346	34,500	Dec. 9, 1953	801	3,785	2,740,000	3,787	3.99	54.23	3,387	2,452,000	3,383	-	-	-		
1955	1396	15,000	Feb. 8, 1955	432	3,337	2,416,000	3,332	3.51	47.70	4,240	3,069,000	4,249	-	-	-		
1956	1446	37,600	Dec. 12, 1955	609	4,544	3,299,000	4,549	4.80	65.32	4,067	2,952,000	4,054	-	-	-		
1957	1516	17,300	Dec. 11, 1956	657	3,541	2,418,000	3,539	3.52	47.80	2,893	2,094,000	2,902	-	-	-		
1958	1566	10,700	Jan. 17, 1958	677	5,040	2,201,000	3,039	3.21	43.51	3,746	2,712,000	3,752	-	-	-		
1959	1636	22,600	Jan. 24, 1959	772	4,131	2,991,000	4,147	4.37	59.37	4,675	3,385,000	4,665	-	-	-		
1960	1716	35,600	Nov. 23, 1959	1,950	5,185	3,764,000	5,181	5.47	74.39	-	-	-	-	-	-		

1035. Snow Creek near Lester, Wash.

Location.--Lat 47°15'00", long 121°24'00", in NW¼ sec.3, T.20 N., R.11 E., on right bank 60 ft upstream from bridge, a quarter of a mile upstream from mouth, and 5½ miles northeast of Lester.

Drainage area.--11.9 sq mi.

Records available.--October 1945 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,950 ft (from topographic map). Prior to Apr. 17, 1957, at site 140 ft upstream at datum 3.84 ft higher. Apr. 17, 1957, to Jan. 5, 1960, at site 60 ft downstream at present datum.

Average discharge.--15 years (1945-60), 69.1 cfs (50,030 acre-ft per year).

Extremes.--1945-60: Maximum discharge, 3,400 cfs Nov. 23, 1959 (gage height, 8.0 ft), from rating curve extended above 1,300 cfs; minimum, 3.0 cfs Nov. 29, 30, 1952; minimum gage height, 1.00 ft Sept. 12, 13, 1958.

Remarks.--No regulation or diversion 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	53.4	129	116	56.9	124	39.5	131	163	75.9	16.0	6.93	6.93	76.1
1952	53.2	63.8	36.1	20.8	56.0	33.2	127	152	67.7	27.8	7.90	5.48	54.1
1953	4.16	4.23	7.75	158	107	42.8	85.2	118	85.2	32.3	9.26	6.68	54.6
1954	13.2	57.5	173	52.0	64.1	38.7	89.3	179	165	79.1	17.5	11.1	78.4
1955	25.2	67.5	31.7	42.5	79.2	18.3	48.1	141	226	107	23.4	10.0	68.0
1956	93.9	125	89.4	24.5	17.3	27.6	153	262	148	58.2	11.5	9.19	85.1
1957	60.3	69.7	237	23.3	20.4	36.1	120	135	41.7	12.9	7.17	5.09	64.5
1958	8.01	31.2	80.3	56.9	94.1	46.4	104	116	27.0	10.0	5.40	11.6	48.9
1959	53.4	187	149	127	41.0	62.5	126	121	78.0	24.5	9.34	88.5	89.0
1960	104	166	119	15.6	45.4	67.4	116	132	75.9	15.4	9.32	11.0	73.1

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	3,280	7,690	7,150	3,500	6,890	2,430	7,820	10,010	4,510	982	426	412	55,100
1952	3,270	3,790	2,220	1,280	3,220	2,040	7,550	9,350	4,030	1,710	486	326	39,270
1953	256	252	477	9,720	5,920	2,630	5,070	7,160	5,070	1,990	569	397	39,510
1954	814	3,420	10,610	3,200	3,560	2,380	5,320	11,030	9,820	4,860	1,070	660	56,740
1955	1,550	4,020	1,950	2,610	4,400	1,130	2,860	8,660	13,450	6,600	1,440	597	49,270
1956	5,770	7,430	5,490	1,500	997	1,700	9,130	16,100	8,820	3,580	708	547	61,770
1957	3,710	4,150	14,590	1,430	1,130	2,220	7,150	8,270	2,480	792	441	303	46,670
1958	492	1,850	4,940	3,500	5,220	2,850	6,190	7,130	1,600	615	332	688	35,410
1959	3,290	11,130	9,190	7,780	2,280	3,840	7,480	7,460	4,640	1,510	574	5,270	64,440
1960	6,580	9,890	7,300	962	2,610	4,150	6,930	8,140	4,510	947	573	655	53,050

Yearly 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	-	-	-	-	-	-	-	-	87.3	99.57	63,180
1951	1216	842	Feb. 9, 1951	4.1	76.1	6.39	86.84	55,100	35.9	72.81	46,260
1952	1246	298	May 13, 1952	4.7	54.1	4.55	61.89	39,270	42.7	45.81	30,980
1953	1286	1,210	Jan. 31, 1953	3.0	54.6	4.59	62.26	39,510	73.7	84.10	53,370
1954	1346	1,130	Dec. 9, 1953	7.8	78.4	6.59	89.42	56,740	68.3	77.87	49,420
1955	1396	950	Feb. 8, 1955	7.8	68.0	5.71	77.62	49,270	83.5	95.25	60,440
1956	1446	1,210	Dec. 11, 1955	6.4	85.1	7.15	97.33	61,770	90.3	103.22	65,530
1957	1516	1,730	Dec. 9, 1956	4.4	64.5	5.42	73.55	46,670	43.5	49.67	31,500
1958	1566,1636	449	Apr. 20, 1958	4.0	48.9	4.11	55.81	35,410	71.5	81.52	51,740
1959	1636	716	Nov. 12, 1958	7.4	89.0	7.48	101.50	64,440	88.9	101.45	64,400
1960	1716	3,400	Nov. 23, 1959	6.5	73.1	6.14	83.59	53,050	-	-	-

1040. Friday Creek near Lester, Wash.

Location.--Lat 47°13'10", long 121°27'10", in SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.18, T.20 N., R.11 E., on left bank 0.4 mile upstream from mouth and 2 miles northeast of Lester.

Drainage area.--4.55 sq mi.

Records available.--October 1945 to September 1960.

Gage.--Water-stage recorder. Concrete control Aug. 9, 1951, to Nov. 22, 1959. Altitude of gage is 1,760 ft (from topographic map).

Average discharge.--15 years (1945-60), 28.1 cfs (20,340 acre-ft per year).

Extremes.--1945-60: Maximum discharge, 1,370 cfs Nov. 22, 1959 (gage height, 6.04 ft, from high-water mark in well), from rating curve extended above 230 cfs on basis of slope-area measurement of peak flow; minimum, 1.2 cfs Sept. 6, 1958; minimum gage height, 1.64 ft Aug. 14, 20, 21, 22, Sept. 30, 1960.

Revisions.--The momentary maximum discharges for the water years 1957 and 1959 have been revised to 424 and 590 cfs, respectively.

Remarks.--Small diversion above gage of about 1,000 gallons per day for domestic use. No 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	20.2	51.2	45.7	21.4	46.0	16.0	41.6	63.7	32.1	6.39	3.34	3.08	29.0
1952	16.7	22.9	14.2	8.60	22.6	16.0	45.5	61.8	26.8	10.7	3.79	2.66	21.0
1953	2.15	1.96	3.23	63.9	38.6	15.7	29.2	49.8	38.0	11.9	4.19	3.18	21.7
1954	4.92	23.4	75.1	23.8	26.8	16.8	32.1	60.8	71.4	30.9	7.83	6.00	31.7
1955	9.03	22.3	14.6	19.1	34.4	9.89	19.3	41.8	85.0	47.8	11.0	5.97	26.5
1956	37.2	55.2	37.3	12.2	7.43	13.1	52.9	86.6	70.5	28.8	6.08	4.20	34.3
1957	17.7	25.5	90.4	13.0	12.4	17.8	43.4	86.1	17.8	5.93	3.25	2.21	26.4
1958	3.68	11.0	22.8	28.7	31.7	14.5	39.9	43.6	9.59	3.65	2.40	3.65	17.8
1959	22.6	82.8	62.3	53.6	17.2	22.8	40.9	50.8	32.5	9.66	3.73	37.8	36.4
1960	45.7	66.5	36.4	9.08	19.4	21.7	39.0	54.3	35.1	7.36	4.77	4.35	28.6

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,240	3,040	2,810	1,320	2,550	982	2,470	3,920	1,910	393	205	183	21,020
1952	1,030	1,360	873	529	1,300	982	2,710	3,800	1,600	656	233	158	15,230
1953	132	117	199	5,930	2,140	967	1,740	3,060	2,260	731	258	189	15,720
1954	302	1,390	4,820	1,460	1,490	1,030	1,910	3,740	4,250	1,900	481	357	22,930
1955	555	1,330	898	1,170	1,910	808	1,150	2,570	5,060	2,940	676	355	19,220
1956	2,290	3,290	2,290	750	427	803	3,140	5,330	4,200	1,770	374	250	24,910
1957	1,090	1,510	5,560	801	691	1,100	2,580	4,060	1,060	364	200	131	19,150
1958	226	656	1,770	1,400	1,760	891	2,370	2,680	570	225	147	217	12,910
1959	1,390	4,930	3,830	3,300	955	1,400	2,440	3,120	1,930	594	229	2,250	26,370
1960	2,810	3,960	2,240	558	1,120	1,330	2,320	3,340	2,090	453	293	259	20,770

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	
1950	-	-	-	-	-	-	-	-	-	-	-
1951	1216	262	Feb. 11, 1951	2.1	29.0	6.37	86.67	21,020	34.1	101.75	24,680
1952	1246	125	May 20, 1952	2.2	21.0	4.62	62.73	15,230	23.8	70.87	17,200
1953	1286	300	Jan. 31, 1953	1.3	21.7	4.77	64.81	15,720	17.1	51.14	12,420
1954	1346	412	Dec. 9, 1953	3.0	31.7	6.97	94.49	22,930	29.8	88.98	21,590
1955	1396	424	Feb. 8, 1955	4.8	26.5	5.82	79.18	19,220	26.8	79.93	19,401
									33.6	100.15	24,310
1956	1446	406	Dec. 11, 1955	3.5	34.3	7.54	106.65	24,910	34.7	103.84	25,200
1957	1516	*424	Dec. 10, 1956	2.0	26.4	5.80	78.89	19,150	18.8	56.20	13,640
1958	1566	181	Apr. 20, 1958	1.6	17.8	3.91	53.21	12,910	28.2	84.10	20,410
1959	1636	*590	Nov. 12, 1958	2.8	36.4	8.00	108.67	26,370	34.8	103.96	25,230
1960	1716	1,370	Nov. 22, 1959	3.6	28.6	6.29	85.61	20,770	-	-	-

* Revised.

1045. Green River near Lester, Wash.

Location.--Lat 47°12'25", long 121°33'15", in NE¼SE¼ sec.20, T.20 N., R.10 E., on left bank 0.3 mile upstream from Champion Creek, ¼ miles downstream from McCain Creek, and 3 miles west of Lester.

Drainage area.--104 sq mi.

Records available.--October 1945 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,480 ft (from river-profile map). Prior to Nov. 22, 1959, at site 300 ft upstream at different datum (gage destroyed by flood of Nov. 22, 1959). Dec. 28, 1959, to Sept. 21, 1960, staff gage at site 400 ft downstream at different datum.

Average discharge.--15 years (1945-60), 436 cfs (315,700 acre-ft per year).

Extremes.--1945-60: Maximum discharge, 22,000 cfs Nov. 22, 1959 (gage height, about 16.0 ft, from floodmarks, site and datum then in use), result of slope-area measurement of peak flow; minimum, 22 cfs Nov. 30, 1952.

Remarks.--No regulation or diversion 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	268	798	795	452	787	293	805	899	349	89.0	43.7	38.4	465
1952	186	307	255	126	369	268	832	838	313	145	49.7	34.5	309
1953	26.0	27.9	44.9	943	688	286	515	688	481	191	61.0	40.7	331
1954	57.3	270	1,133	410	443	305	61.6	1,009	839	326	91.3	64.9	464
1955	109	298	227	316	539	176	428	875	1,201	458	122	69.0	399
1956	510	811	686	226	130	299	1,169	1,596	789	257	67.8	49.5	550
1957	214	399	1,343	167	179	361	782	804	203	76.7	46.9	31.8	386
1958	42.0	127	447	405	569	264	667	676	167	68.5	38.8	49.6	291
1959	294	1,345	1,002	945	291	377	717	688	423	132	57.9	412	557
1960	750	1,683	811	185	403	382	573	709	379	114	65.8	80.4	510

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	16,450	47,500	48,890	27,760	7,740	27,760	18,040	47,890	55,290	20,760	5,470	2,690	336,700
1952	11,420	18,270	15,700	7,740	21,250	16,490	49,540	51,510	18,650	8,920	3,060	2,050	224,600
1953	1,600	1,660	2,760	58,010	38,220	17,600	30,660	42,280	28,620	11,750	3,750	2,420	239,300
1954	3,520	16,090	69,680	25,220	24,580	18,780	36,640	62,060	49,940	20,060	5,610	3,860	336,000
1955	6,710	17,640	13,930	19,410	29,910	10,940	25,450	53,800	71,480	28,180	7,520	4,110	289,100
1956	31,360	48,250	42,170	13,890	7,480	18,380	69,580	98,140	46,930	15,790	4,170	2,950	399,100
1957	13,150	23,750	82,570	10,290	9,950	22,210	45,520	49,430	12,080	4,720	2,880	1,890	279,400
1958	2,580	7,570	27,470	24,880	13,590	16,220	39,670	41,550	9,910	4,210	2,390	2,950	211,000
1959	18,080	80,030	61,630	58,130	16,170	23,160	42,660	42,300	25,140	8,090	3,560	24,530	403,500
1960	46,100	100,100	49,870	11,390	23,170	23,480	34,100	43,590	22,540	7,030	4,040	4,780	370,200

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	-	-	-	-	-	-	-	-	559	73.00	405,000
1951	1216	4,790	Feb. 9, 1951	28	465	4.47	60.70	336,700	372	48.54	269,300
1952	1246	1,680	Apr. 19, 1952	29	309	2.97	40.49	224,600	255	33.40	185,200
1953	2886	4,990	Jan. 31, 1953	22	331	3.18	43.16	239,300	446	58.16	322,600
1954	1346	6,020	Dec. 9, 1953	42	464	4.46	60.59	336,000	394	51.40	285,000
1955	1396	5,280	Feb. 8, 1955	48	399	3.84	52.12	289,100	515	67.17	372,600
1956	1446	7,630	Dec. 12, 1955	41	550	5.29	71.94	399,100	547	71.53	396,800
1957	1516	7,400	Dec. 9, 1956	28	386	3.71	50.37	279,400	273	35.62	197,600
1958	1566	2,860	Apr. 20, 1958	28	291	2.80	38.05	211,000	480	60.06	333,100
1959	1636	6,840	Nov. 12, 1958	37	557	5.36	72.74	403,500	608	79.29	439,800
1960	1716	22,000	Nov. 22, 1959	46	510	4.90	66.74	370,200	-	-	-

1047. Green Canyon Creek near Lester, Wash.

Location.--Lat 47°13'10", long 121°34'30", in SE¼ sec.18, T.20 N., R.10 E., on left bank a quarter of a mile upstream from mouth and 4 miles west of Lester.

Drainage area.--3.23 sq mi.

Records available.--April to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,480 ft (from topographic map).

Extremes.--April to September 1960: Maximum discharge, 52 cfs May 20 (gage height, 1.71 ft, from recorded range in stage); minimum daily, 2.4 cfs Sept. 15-20, 22.

Maximum stage known, 3.36 ft Nov. 22, 1959, from floodmarks (discharge, 359 cfs, result of culvert measurement of peak flow).

Remarks.--No regulation or diversion above station.

DUWAMISH RIVER BASIN

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Monthly mean discharge, in cubic feet per second, of Green Canyon Creek near Lester, Wash.

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1960	-	-	-	-	-	-	18.2	17.8	9.55	4.52	4.10	2.97	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1960	-	-	-	-	-	-	1,080	1,090	568	278	252	177	-

1050. Smay Creek near Lester, Wash.

Location.--Lat 47°15'40", long 121°33'50", in SW¹/₄ sec.32, T.21 N., R.10 E., on right bank ³/₄ miles upstream from mouth and ⁴/₂ miles northwest of Lester.

Drainage area.--8.71 sq mi.

Records available.--September 1946 to September 1960.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 1,900 ft (from topographic map). Prior to Dec. 11, 1946, water-stage recorder at site 200 ft upstream at datum 4.28 ft higher (destroyed by high water of Dec. 11, 1946).

Average discharge.--14 years (1946-60), 53.0 cfs (38,370 acre-ft per year).

Extremes.--1946-60: Maximum discharge, 2,380 cfs Nov. 23, 1959 (gage height, 8.14 ft), from rating curve extended above 310 cfs on basis of slope-area measurement of peak flow; minimum, 4.2 cfs Nov. 21 to Dec. 1, 1952.

Remarks.--No regulation or diversion 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	36.8	97.9	100	61.1	99.9	32.8	82.1	98.7	46.7	16.5	9.55	8.57	57.2
1952	40.5	55.3	36.1	20.1	50.7	27.1	80.8	95.3	48.0	25.1	10.9	7.49	41.3
1953	5.81	4.89	7.09	105	84.8	33.6	48.1	72.9	55.1	28.9	12.8	8.52	38.7
1954	9.14	41.6	131	56.9	80.2	37.5	60.8	101	106	51.2	18.2	15.8	57.4
1955	19.1	47.2	33.9	41.4	63.5	19.0	36.2	78.7	144	78.0	26.2	12.9	49.8
1956	61.5	103	81.7	34.1	17.8	25.2	89.9	157	105	42.2	13.8	10.2	61.8
1957	38.4	55.8	154	28.7	22.3	39.5	80.5	95.5	33.0	15.3	9.81	6.52	46.6
1958	7.29	21.1	60.0	59.1	73.6	33.9	66.9	62.4	22.9	12.3	7.55	7.72	36.0
1959	41.0	150	129	115	40.0	48.5	73.3	78.0	54.0	22.3	11.3	69.0	69.3
1960	89.5	166	77.5	24.0	50.0	39.6	78.2	87.6	56.9	18.6	10.5	9.76	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	2,280	5,820	6,150	3,750	5,550	2,020	4,890	6,070	2,780	1,010	588	510	41,400
1952	2,490	3,290	2,220	1,230	2,920	1,670	4,810	5,860	2,860	1,540	760	445	30,000
1953	357	291	456	6,480	4,710	2,070	2,860	4,480	3,280	1,770	784	507	28,020
1954	562	2,480	8,030	3,500	3,350	2,300	3,620	6,240	6,300	3,150	1,120	941	41,590
1955	1,170	2,810	2,080	2,540	3,530	1,170	2,150	4,840	8,560	4,790	1,610	766	36,040
1956	3,780	6,110	5,020	2,100	1,030	1,550	5,350	9,840	6,230	2,590	846	609	44,860
1957	2,360	3,320	9,480	1,770	1,240	2,430	4,790	5,870	1,960	939	603	388	35,150
1958	448	1,260	3,690	3,630	4,090	2,080	3,980	3,840	1,360	755	464	459	26,080
1959	2,520	8,900	7,930	7,070	2,220	2,980	4,360	4,800	3,210	1,370	695	4,110	50,160
1960	5,500	9,850	4,770	1,480	2,880	2,440	4,850	5,390	3,360	1,140	644	581	42,700

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	-	-	-	-	-	-	-	-	70.3	109.61	50,910	
1951	1216	457	Feb. 9, 1951	6.9	57.2	6.57	89.12	41,400	48.6	75.70	35,170	
1952	1246	147	May 21, 1952	6.9	41.3	4.74	64.60	30,000	31.8	49.71	23,090	
1953	1286	447	Jan. 31, 1953	4.2	38.7	4.44	60.33	28,020	52.5	81.82	38,010	
1954	1346	534	Dec. 9, 1953	7.2	57.4	6.59	89.51	41,590	50.5	78.74	36,580	
1955	1396	422	Feb. 8, 1955	10.4	49.8	5.72	77.59	36,040	62.0	96.65	44,890	
1956	1446	478	Dec. 12, 1955	8.8	61.8	7.10	96.58	44,860	62.1	97.09	45,100	
1957	1516	617	Dec. 10, 1956	6.1	48.6	5.58	75.67	35,150	35.1	54.67	25,390	
1958	1566	230	Apr. 20, 1958	5.8	36.0	4.13	56.10	26,060	55.3	86.11	40,010	
1959	1636	702	Nov. 12, 1958	6.7	69.3	7.96	107.96	50,160	70.3	109.63	50,940	
1960	1716	2,380	Nov. 23, 1959	8.6	58.8	6.75	91.93	42,700	-	-	-	

1057. North Fork Green River near Eagle Gorge, Wash.

Location.--Lat 47°18'40", long 122°46'20", in SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.15, T.21 N., R. 8 E., on right bank 2.4 miles upstream from mouth and 3 miles northwest of Eagle Gorge.

Drainage area.--16.5 sq mi.

Records available.--September 1956 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,320 ft (from topographic map). Prior to June 25, 1959, at site 1,000 ft upstream at different datum.

Extremes.--1956-60: Maximum discharge, about 2,000 cfs Nov. 23, 1959; minimum, 3.1 cfs Aug. 9, 10, 11, 12, 13, 1960; minimum gage height, 1.18 ft Aug. 25, 26, 1959.

Remarks.--No regulation or diversion 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
1956	-	-	-	-	-	-	-	-	-	-	-	14.5	-
1957	92.5	105	269	42.5	64.9	118	143	94.7	61.3	29.8	16.9	14.7	88.0
1958	24.8	80.4	174	157	132	52.1	86.8	49.4	24.7	14.9	8.51	16.7	68.0
1959	60.4	212	151	207	53.5	77.2	132	88.6	56.3	35.6	11.4	156	104
1960	153	237	143	50.7	113	83.8	130	132	62.2	13.2	11.7	14.6	95.0

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	-	-	-	-	-	-	-	-	-	-	-	862	-
1957	5,690	6,280	16,550	2,610	3,610	7,250	8,490	5,830	3,650	1,830	1,040	877	63,710
1958	1,530	4,780	10,670	9,640	7,320	3,200	5,160	3,030	1,470	919	523	995	49,240
1959	3,710	12,640	9,290	12,750	2,970	4,740	7,870	5,450	3,350	2,190	703	9,310	74,970
1960	9,400	14,070	8,780	3,120	6,490	5,150	7,720	8,150	3,700	809	717	867	68,970

Yearly 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
1956	1516	-	-	-	-	-	-	-	-	-	-
1957	1516	1,100	Dec. 10, 1956	12.5	88.0	5.33	72.37	63,710	72.1	59.28	52,170
1958	1566	645	Jan. 17, 1958	6.2	68.0	4.12	55.96	49,240	80.0	65.81	57,900
1959	1636	1,350	Apr. 1, 1959	7.2	104	6.30	85.22	74,970	113	92.72	81,580
1960	1716	2,000	Nov. 23, 1959	3.4	95.0	5.76	78.40	68,970	-	-	-

a About.

1065. Green River near Palmer, Wash.

Location.--Lat 47°17'40", long 121°49'20", in SW¼NW¼ sec. 20, T.21 N., R. 8 E., on right bank 1½ miles upstream from diversion dam and intake of Tacoma water-supply system, 2½ miles downstream from North Fork, and 3½ miles southeast of Palmer.

Drainage area.--230 sq mi.

Records available.--October 1931 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 912.6 ft above mean sea level (river-profile survey). Prior to Nov. 18, 1931, staff gage at same site and datum.

Average discharge.--29 years (1931-60), 1,095 cfs (792,700 acre-ft per year).

Extremes.--1931-60: Maximum discharge, 27,800 cfs Nov. 23, 1959 (gage height, 21.00 ft); minimum, 81 cfs Sept. 4, 5, 1934; minimum gage height, 3.35 ft Sept. 2, 3, 1945.

Flood in December 1917 reached a stage of about 20 ft, from crest head over city of Tacoma diversion dam and gage-height relationship curve (discharge, about 25,000 cfs).

Remarks.--No regulation or diversion above station. Records of water temperatures for the period August 1950 to September 1957 are published in reports of 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	900	2,157	2,278	1,603	2,614	979	1,769	1,722	746	241	146	145	1,265
1952	708	1,112	1,025	525	1,403	917	1,836	1,645	715	396	181	143	880
1953	110	115	220	3,029	2,106	924	1,310	1,412	1,101	492	216	166	926
1954	287	992	3,363	1,447	1,644	1,017	1,690	1,919	1,850	759	298	282	1,294
1955	341	938	855	1,099	1,695	689	1,362	2,037	2,479	1,096	404	246	1,097
1956	1,346	2,276	2,341	1,067	529	1,133	2,590	2,898	1,678	603	216	179	1,407
1957	796	1,179	3,285	675	753	1,288	1,876	1,522	532	284	197	153	1,048
1958	202	571	1,469	1,527	1,751	760	1,569	1,141	395	194	126	189	817
1959	789	3,282	2,581	2,655	921	1,226	1,861	1,644	863	412	207	1,487	1,504
1960	2,033	3,214	2,040	644	1,344	1,190	1,694	1,836	992	329	231	230	1,312

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	55,360	128,400	140,100	98,580	145,200	60,180	105,200	105,900	44,360	14,800	8,980	8,610	915,700
1952	43,520	66,160	63,030	32,290	80,710	56,380	109,300	101,100	42,560	24,370	11,150	8,510	639,100
1953	6,750	6,730	13,520	86,200	116,900	56,810	77,940	86,800	65,530	30,250	13,260	9,910	670,600
1954	17,670	59,000	206,800	88,970	91,290	62,560	100,600	118,000	110,100	46,670	18,300	16,770	936,700
1955	20,960	55,800	52,550	67,600	94,150	42,360	81,040	125,200	147,500	67,390	24,860	14,620	794,000
1956	82,740	135,400	143,900	65,610	30,440	69,680	154,100	178,200	99,870	37,100	13,290	10,660	1,021,000
1957	48,960	70,140	202,000	41,510	41,820	79,170	111,600	93,590	31,650	17,430	12,130	9,080	759,100
1958	12,400	34,000	90,300	93,890	96,160	46,710	93,340	70,140	23,520	11,950	7,750	11,230	591,400
1959	48,510	195,300	158,700	163,100	51,170	75,370	110,700	101,100	58,500	25,330	12,750	88,470	1,089,000
1960	125,000	191,200	125,400	39,620	77,300	73,160	100,800	113,000	59,020	20,250	14,190	13,680	952,600

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	-	-	-	-	-	-	-	-	1,534	90.16	1,111,000
1951	1216	14,500	Feb. 9, 1951	112	1,265	5.48	74.30	915,700	1,056	62.34	764,500
1952	1246	5,940	Feb. 4, 1952	124	880	3.83	52.10	639,100	680	40.22	493,400
1953	1286	12,700	Jan. 23, 1953	97	926	4.03	54.67	670,600	1,281	75.58	927,100
1954	1346	17,600	Dec. 9, 1953	197	1,294	5.63	76.35	956,700	1,081	63.78	782,600
1955	1396	14,100	Feb. 8, 1955	157	1,097	4.77	64.73	794,000	1,418	83.70	1,027,000
1956	1446	18,300	Dec. 11, 1955	154	1,407	6.12	83.23	1,021,000	1,350	79.89	980,000
1957	1516	14,500	Dec. 10, 1956	141	1,048	4.56	61.87	759,100	794	46.84	574,700
1958	1666	5,700	Apr. 20, 1958	108	817	3.55	48.21	591,400	1,184	69.88	857,200
1959	1636	15,800	Nov. 12, 1958	140	1,504	6.54	88.78	1,089,000	1,558	91.97	1,128,000
1960	1716	27,800	Nov. 23, 1959	178	1,312	5.70	77.67	952,600	-	-	-

1085. Newaukum Creek near Black Diamond, Wash.

Location.--Lat 47°16'30", long 122°03'30", in SW $\frac{1}{4}$ sec. 28, T.21 N., R.6 E., on right bank three-quarters of a mile upstream from mouth and $3\frac{1}{2}$ miles southwest of Black Diamond.

Drainage area.--25.5 sq mi.

Records available.--July 1944 to November 1950, September 1952 to September 1960, water years 1951-52 (annual maximum).

Gage.--Water-stage recorder. Altitude of gage is 310 ft (from topographic map). November 1950 to September 1952 stilling well with staff gage only.

Average discharge.--14 years (1944-50, 1952-60), 65.7 cfs (47,560 acre-ft per year).

Extremes.--1944-60: Maximum discharge, 1,820 cfs probably Feb. 17, 1949 (gage height, 3.54 ft, from recorded range in stage), from rating curve extended above 600 cfs.
1944-50, 1952-60: Minimum discharge, 8.0 cfs Oct. 13, 14, 1952; minimum gage height, 0.62 ft Aug. 26, 1958.

Revisions.--The momentary maximum discharge for the water year 1946, published in WSP 1316, has been revised to 570 cfs Jan. 5, 1946.

Remarks.--Many small diversions above station for irrigation and domestic use. No 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													
1952													
1953	9.42	10.1	11.4	155	131	65.1	76.4	52.5	58.4	30.7	22.4	19.7	53.0
1954	27.4	97.0	193	141	107	71.8	75.9	34.5	42.4	33.8	24.8	30.2	73.0
1955	27.5	57.8	70.8	72.0	90.9	71.2	109	62.6	40.1	36.6	25.1	19.5	56.6
1956	58.9	141	225	172	78.6	131	70.9	40.0	40.7	26.7	21.5	20.4	85.9
1957	33.5	45.6	128	63.8	106	140	78.1	45.3	33.8	26.1	22.5	19.6	61.6
1958	19.4	26.8	66.7	117	102	54.2	63.6	33.3	25.4	17.7	12.8	14.4	45.8
1959	17.7	94.0	128	150	87.2	80.8	73.6	57.0	49.8	29.7	22.3	39.2	69.0
1960	53.9	138	126	91.5	102	71.9	72.6	81.3	45.6	27.4	23.8	21.6	71.1

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951													
1952													
1953	579	601	698	9,540	7,290	4,000	4,550	3,230	3,470	1,890	1,380	1,170	38,400
1954	1,680	5,770	11,850	8,680	5,920	4,420	4,520	2,120	2,520	2,080	1,530	1,800	52,890
1955	1,690	3,440	4,350	4,430	5,050	4,380	6,470	3,850	2,390	2,250	1,540	1,160	41,000
1956	3,620	8,400	13,860	10,590	4,520	8,080	4,220	2,460	2,420	1,640	1,320	1,220	62,350
1957	2,060	2,720	7,860	3,920	5,860	8,580	4,650	2,780	2,010	1,610	1,390	1,170	44,610
1958	1,190	1,600	4,100	7,170	5,690	3,330	3,780	2,050	1,510	1,090	785	855	33,150
1959	1,090	5,590	7,890	9,240	4,840	4,920	4,380	3,510	2,960	1,820	1,370	2,330	49,940
1960	3,320	8,220	7,730	5,630	5,850	4,420	4,320	5,000	2,710	1,680	1,460	1,290	51,630

Yearly 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	1566	1,810	Feb. 9, 1951	-	-	-	-	-	-	-	-	-
1952	1566	507	Feb. 3, 1952	-	-	-	-	-	-	-	-	-
1953	1286	704	Jan. 31, 1953	8.3	53.0	2.08	28.21	38,400	77.1	41.03	55,820	
1954	1346	1,260	Dec. 9, 1953	18	73.0	2.86	38.88	52,890	59.5	31.65	43,070	
1955	1396	860	Feb. 7, 1955	18	56.6	2.22	30.16	41,000	79.3	42.21	57,400	
1956	1446	1,320	Dec. 11, 1955	18	85.9	3.37	45.83	62,350	67.6	36.11	49,110	
1957	1516	554	Mar. 7, 1957	18.5	61.6	2.42	32.81	44,610	53.7	28.57	38,860	
1958	1566	596	(a)	11.5	45.8	1.80	24.38	33,150	56.4	30.03	40,830	
1959	1636	528	Jan. 24, 1959	12.5	69.0	2.71	56.72	49,940	75.5	40.17	54,640	
1960	1716	878	Nov. 21, 1959	18	71.1	2.79	37.96	51,630	-	-	-	

a Probably Jan. 17, 1958.

1115. Covington Creek near Black Diamond, Wash.

Location.--Lat 47°20'10", long 122°02'40", in NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.4, T.21 N., R.6 E., on left bank 1,000 ft east of outlet of Lake Sawyer, 3 miles northwest of Black Diamond, and 5 miles upstream from Big Soos Creek.

Drainage area.--9.77 sq mi.

Records available.--January 1953 to October 1959.

Gage.--Water-stage recorder. Datum of gage is 526.5 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.--6 years (1953-59), 26.5 cfs (19,190 acre-ft per year).

Extremes.--1953-59: Maximum discharge, 210 cfs Dec. 12, 1955 (gage height, 4.04 ft); no flow at times in each year.

Remarks.--Natural and some artificial regulation by Lake Sawyer. Probably some small diversions for domestic 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	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	57.6	15.7	24.8	13.7	18.6	3.83	0.003	0	-
1954	0.016	24.7	80.5	75.4	58.2	41.0	35.1	12.8	8.80	6.48	1.15	1.83	28.7
1955	.18	10.9	23.9	38.9	45.0	30.0	50.9	33.2	15.3	11.1	2.76	.09	21.7
1956	10.4	54.3	118	95.0	41.7	60.1	39.9	15.6	10.5	2.48	0	0	37.5
1957	.68	13.8	56.5	36.7	51.5	72.0	38.8	17.0	6.60	1.27	0	0	24.5
1958	0	.26	14.5	52.0	60.5	32.1	30.4	18.9	5.10	.35	0	0	17.6
1959	0	11.3	59.8	83.5	54.2	36.2	37.4	33.5	17.3	7.13	.76	6.80	28.9
1960	15.8	-	-	-	-	-	-	-	-	-	-	-	-

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	-	-	-	-	3,200	964	1,480	840	1,110	235	0.20	0	-
1954	1.0	1,470	4,950	4,640	3,230	2,520	2,090	787	524	398	69	109	20,790
1955	11	651	1,470	2,390	2,500	1,850	3,030	2,040	911	683	170	5.2	15,710
1956	642	3,230	7,280	5,840	2,400	3,700	2,370	959	624	152	0	0	27,200
1957	42	824	3,480	2,260	2,860	4,430	2,310	1,050	393	78	0	0	17,730
1958	0	16	891	3,200	3,360	1,970	1,810	1,106	303	21	0	0	12,730
1959	0	673	3,680	5,130	3,010	2,230	2,230	2,060	1,030	438	47	405	20,930
1960	970	-	-	-	-	-	-	-	-	-	-	-	-

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	1286	124	Feb. 1, 1953	-	-	-	-	-
1954	1346	149	Dec. 11, 1953	0	28.7	20,790	22.8	16,500
1955	1396	104	Feb. 9, 1955	0	21.7	15,710	34.2	24,730
1956	1446	210	Dec. 12, 1955	0	37.5	27,200	28.1	20,390
1957	1516	114	Mar. 10, 1957	0	24.5	17,730	19.7	14,290
1958	1566	112	Jan. 18, 1958	0	17.6	12,730	22.3	16,180
1959	1636	158	Jan. 26, 1959	0	28.9	20,930	-	-
1960	1636	-	-	-	-	-	-	-

1125. Big Soos Creek near Auburn, Wash.

Location.--Lat 47°19'00", long 122°08'40", in SE $\frac{1}{4}$ sec.10, T.21 N., R.5 E., on right bank three-quarters of a mile downstream from Covington Creek, 2 miles upstream from mouth, and 4 miles east of Auburn.

Drainage area.--49.4 sq mi (excludes 3.95 sq mi in vicinity of Youngs Lake, flow from which has been diverted to Cedar River basin since about 1935).

Records available.--August 1944 to February 1951, August 1951 to April 1956.

Gage.--Staff gage. Altitude of gage is 170 ft (from topographic map). Aug. 26, 1944, to Feb. 10, 1951, water-stage recorder at site 700 ft upstream at different datum (gage destroyed by flood of Feb. 10, 1951). Aug. 1, 1951, to Dec. 22, 1955, water-stage recorder at same site and datum.

Average discharge.--10 years (1944-50, 1951-55), 117 cfs (34,700 acre-ft per year).

Extremes.--1944-56: Maximum discharge observed, 1,570 cfs Feb. 10, 1951 (gage height, 5.57 ft); minimum, 20 cfs July 23, 24, Sept. 19 to Oct. 12, 1952.

Remarks.--Several small diversions for farm use above station. City of Seattle diverts between 2 and 5 cfs from Youngs Lake into Little Soos Creek, a tributary, except during periods of 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	52.5	140	333	322	-	-	-	-	-	-	25.7	25.8	-
1952	56.5	56.7	109	108	166	122	85.5	60.4	39.3	28.0	26.5	21.8	71.3
1953	21.7	24.0	30.4	157	263	106	114	90.1	86.3	52.1	37.1	32.3	83.3
1954	42.5	108	296	340	241	157	132	71.7	57.1	47.8	35.2	37.8	130
1955	39.3	70.6	114	162	195	132	194	122	68.1	50.9	35.9	34.8	101
1956	60.7	206	423	435	157	247	-	-	-	-	-	-	-
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	3,230	8,320	20,490	19,830	-	-	-	-	-	-	1,580	1,540	-
1952	2,240	3,380	6,690	6,820	9,540	7,460	5,090	3,720	2,340	1,720	1,630	1,300	51,750
1953	1,330	1,430	1,870	9,640	14,580	6,530	6,810	5,540	5,140	3,200	2,280	1,940	60,290
1954	2,620	6,450	18,190	20,880	13,380	9,630	7,850	4,410	3,400	2,940	2,160	2,250	94,160
1955	2,410	4,200	7,040	9,960	10,840	8,110	11,560	7,510	4,050	3,130	2,210	2,070	73,090
1956	3,730	12,270	26,030	26,750	9,040	15,220	-	-	-	-	-	-	-
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	-	-	-	-	-	-	-	-	176	48.28	127,200
1951	1216	a1,570	Feb. 10, 1951	-	-	-	-	-	-	-	-
1952	1246	261	Feb. 4, 1952	20	71.3	1.44	19.63	51,750	60.7	16.72	44,070
1953	1266	580	Feb. 1, 1953	20	83.3	1.69	22.69	60,290	115	31.47	82,920
1954	1346	764	Jan. 6, 1954	32	130	2.63	35.74	94,160	111	30.58	80,550
1955	1396	545	Feb. 8, 1955	31	101	2.04	27.75	73,090	140	38.53	101,500
1956	1446	a952	Jan. 7, 1956	-	-	-	-	-	-	-	-
1957											
1958											
1959											
1960											

a Maximum observed.

1130. Green River near Auburn, Wash.

Location.--Lat 47°18'45", long 122°12'10", in lot 3, sec.17, T.21 N., R.5 E., on left bank $\frac{1}{2}$ miles east of Auburn and 2 miles downstream from Big Soos Creek.

Drainage area.--382 sq mi (excludes 4 sq mi in the vicinity of Youngs Lake, flow from which has been diverted to Cedar River basin since about 1935).

Records available.--August 1936 to September 1960.

Gage.--Water-stage recorder. Datum of gage is at mean sea level, datum of 1929. Prior to Oct. 19, 1936, staff gage at same site and datum.

Average discharge.--24 years (1936-60), 1,334 cfs (965,800 acre-ft per year).

Extremes.--1936-60: Maximum discharge, 28,100 cfs Nov. 23, 1959 (elevation, 69.75 ft); minimum, 81 cfs Sept. 23, 1952; minimum elevation, 53.85 ft Aug. 26, 1958.

Remarks.--City of Tacoma diverts about 110 cfs from river near Palmer, several miles above station, for municipal use. Minor diversions for domestic use. Minor regulation on Little Soos Creek, a tributary. Records of water temperatures for the period March 1952 to September 1960 are published in reports of 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	971	2,533	2,912	2,368	4,061	1,620	2,033	1,870	847	291	151	132	1,632
1952	727	1,137	1,253	746	1,732	1,166	1,955	1,694	734	414	173	108	983
1953	110	111	224	3,499	2,894	1,173	1,584	1,588	1,300	625	279	186	1,115
1954	355	1,261	4,184	2,343	2,300	1,451	2,002	1,987	1,962	917	379	356	1,622
1955	400	1,085	1,118	1,563	2,272	1,020	1,889	2,308	2,759	1,274	500	272	1,363
1956	1,447	2,845	3,491	2,075	1,032	1,655	2,905	3,042	1,748	680	251	186	1,782
1957	825	1,302	3,586	872	1,127	1,971	2,239	1,696	655	346	220	148	1,252
1958	217	654	1,692	2,098	2,352	1,103	1,841	1,303	466	217	139	194	1,015
1959	791	3,470	5,017	3,392	1,577	1,650	2,133	1,865	1,176	558	262	1,528	1,785
1960	2,125	3,679	2,806	1,158	1,950	1,541	2,043	2,154	1,227	446	289	273	1,658

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	59,710	150,700	179,100	145,600	225,600	99,610	121,000	115,000	50,370	17,920	9,310	7,850	1,182,000
1952	44,730	67,640	77,070	45,860	99,640	71,690	116,300	104,200	43,700	25,430	10,620	6,430	713,300
1953	6,750	6,630	13,750	215,200	156,800	72,120	94,250	97,630	77,340	38,440	17,140	11,070	807,100
1954	21,660	75,020	257,200	144,100	127,700	89,240	119,100	122,200	116,700	56,580	23,310	21,200	1,174,000
1955	24,590	64,580	68,710	96,130	126,200	62,710	112,400	141,900	164,200	78,360	30,760	16,190	986,700
1956	88,970	169,300	214,700	127,600	59,370	101,800	172,900	187,000	104,000	41,780	15,410	11,090	1,294,000
1957	50,700	77,450	220,500	53,630	62,600	121,200	133,200	104,300	39,000	21,250	13,550	8,790	906,200
1958	13,320	38,900	104,120	129,000	130,700	76,820	109,500	80,120	27,740	13,570	8,570	11,540	734,700
1959	46,620	206,500	300,185	500,208	500	87,590	101,500	126,900	114,600	69,990	34,340	16,130	90,930
1960	130,700	218,900	172,600	71,180	112,200	94,750	121,600	132,500	73,000	27,430	17,770	16,260	1,189,000

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	-	-	-	-	-	-	1,918	-	1,389,000
1951	1216	18,400	Feb. 10, 1951	96	1,632	1,182,000	1,356	981,700	981,700
1952	1246	6,280	Feb. 4, 1952	81	1,983	713,300	759	551,000	551,000
1953	1286	13,400	Feb. 1, 1953	87	1,115	807,100	1,566	1,134,000	1,134,000
1954	1346	18,300	Dec. 10, 1953	255	1,622	1,174,000	1,351	977,800	977,800
1955	1396	15,500	Feb. 8, 1955	210	1,563	986,700	1,798	1,302,000	1,302,000
1956	1446	20,300	Dec. 12, 1955	146	1,782	1,294,000	1,611	1,170,000	1,170,000
1957	1516	13,900	Dec. 10, 1956	132	1,252	906,200	986	713,800	713,800
1958	1556	5,780	Apr. 20, 1958	123	1,015	734,700	1,407	1,019,000	1,019,000
1959	1636	15,900	Nov. 13, 1958	145	1,785	1,291,000	1,896	1,375,000	1,375,000
1960	1716	28,100	Nov. 23, 1959	189	1,638	1,189,000	-	-	-

1135. North Fork Cedar River near Lester, Wash.

Location.--Lat 47°19'10", long 121°30'05", in SW¹ sec.11, T.21 N., R.10 E., on left bank 400 ft upstream from falls, 1½ miles upstream from confluence with South Fork, and 7½ miles north of Lester.

Drainage area.--8.81 sq mi.

Records available.--October 1944 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 2,360 ft (from topographic map). Oct. 12, 1944, to Nov. 30, 1951, at site 420 ft downstream at different datum. Dec. 1, 1951, to Sept. 23, 1953, at site 450 ft downstream at different datum. Sept. 24, 1953, to Nov. 22, 1959, at site 520 ft downstream at different datum (gage destroyed by flood of Nov. 22, 1959).

Average discharge.--16 years (1944-60), 72.2 cfs (52,270 acre-ft per year).

Extremes.--1944-60: Maximum discharge, 3,160 cfs Nov. 22, 1959 (gage height, about 8.4 ft, from floodmarks, site and datum then in use), result of slope-area measurement of peak flow; maximum gage height, 8.9 ft, datum then in use, probably Jan. 31, 1953 (from high-water mark, backwater from logjam); minimum daily discharge, 5.4 cfs Nov. 27-30, 1952.

Remarks.--No regulation or diversion 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	68.8	110	115	48.0	120	31.6	91.2	185	124	32.1	12.3	11.5	78.8
1952	45.9	51.2	28.7	19.3	48.8	28.5	107	170	106	43.9	13.3	8.69	55.9
1953	6.89	6.39	10.2	174	98.5	32.9	69.3	104	120	74.2	15.6	9.96	80.0
1954	21.7	65.4	132	43.9	45.1	32.1	58.1	155	191	146	40.0	26.2	80.0
1955	27.7	70.6	50.0	34.9	50.7	16.4	31.3	97.4	266	175	45.8	15.6	71.6
1956	95.6	113	85.9	21.9	14.5	17.7	91.6	222	189	119	21.3	13.6	83.8
1957	58.3	68.2	179	25.2	21.1	35.6	93.3	179	90.4	22.0	11.9	8.31	66.4
1958	12.6	33.6	69.1	51.4	71.7	37.4	87.5	165	61.2	18.7	9.37	18.4	52.8
1959	62.7	154	134	101	36.4	47.2	107	124	147	50.9	14.9	97.6	89.8
1960	96.7	185	113	24.8	48.3	53.0	96.2	169	141	27.3	13.7	15.6	81.7

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	4,230	6,550	7,100	2,950	6,680	1,940	5,420	11,360	7,370	1,970	758	684	57,010
1952	2,820	3,040	1,760	1,190	2,810	1,750	6,370	10,480	6,310	2,700	816	517	40,560
1953	423	380	630	10,720	5,470	2,030	4,120	6,420	7,110	4,560	957	593	43,410
1954	1,330	3,890	8,090	2,700	2,510	1,980	3,460	9,550	11,380	8,980	2,460	1,560	57,890
1955	1,700	4,200	1,850	2,140	2,820	1,010	1,860	5,990	15,800	10,740	2,820	929	51,860
1956	5,880	6,700	5,220	1,350	835	1,090	5,450	13,680	11,250	7,300	1,310	808	60,870
1957	3,590	4,060	11,010	1,550	1,170	2,190	5,550	11,010	5,380	1,350	730	495	48,080
1958	773	2,000	4,250	3,160	3,980	2,300	5,210	10,120	3,640	1,150	576	1,100	38,260
1959	3,850	9,140	8,240	6,220	2,020	2,900	6,380	7,650	8,770	3,130	919	5,810	65,050
1960	5,950	10,990	6,920	1,530	2,780	3,260	5,720	10,370	8,370	1,680	841	930	59,340

Yearly 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	-	-	-	-	-	-	-	-	90.0	140.26	65,820
1951	1216	1,200	Feb. 9, 1951	8.5	78.8	8.95	121.51	57,010	64.6	99.55	46,750
1952	1248	363	May 13, 1952	7.5	55.9	6.35	86.33	40,560	47.3	75.14	34,580
1953	1286	-	-	5.4	60.0	6.81	92.36	43,410	76.4	117.68	55,290
1954	1346,1446	858	Dec. 9, 1953	11.5	80.0	9.08	123.21	57,890	72.3	111.35	52,330
1955	1396,1446	754	June 9, 1955	11.8	71.6	8.13	110.34	51,860	85.5	131.73	61,910
1956	1446	1,280	Dec. 11, 1955	11.2	83.8	9.51	129.55	60,870	85.0	131.38	61,730
1957	1518	2,320	Dec. 9, 1956	7.2	66.4	7.54	102.32	48,080	50.3	77.55	36,450
1958	1566	402	Apr. 20, 1958	7.4	52.8	5.99	81.39	38,260	72.5	111.63	52,470
1959	1636	962	Nov. 2, 1958	11.5	89.8	10.2	136.43	65,050	93.5	144.03	67,660
1960	1716	3,160	Nov. 22, 1959	11.2	81.7	9.27	128.30	59,340	-	-	-

1140. South Fork Cedar River near Lester, Wash.

Location--Lat 47°18'30", long 121°31'00", in SWNE $\frac{1}{4}$ sec.15, T.21 N., R.10 E., on left bank about 0.6 mile upstream from confluence with North Fork and 7 miles northwest of Lester.

Drainage area--6.00 sq mi.

Records available--October 1944 to September 1960.

Gage--Water-stage recorder. Concrete control Aug. 31, 1951, to Dec. 9, 1956, and since Oct. 8, 1957. Altitude of gage is 2,300 ft (from topographic map).

Average discharge--16 years (1944-60), 40.7 cfs (29,470 acre-ft per year).

Extremes--1944-60: Maximum discharge, 2,340 cfs Dec. 9, 1956 (gage height, 10.41 ft, from floodmarks), from rating curve extended above 300 cfs on basis of slope-area measurement of peak flow; minimum, 1.9 cfs Nov. 27, 28, 1952; minimum gage height, 1.25 ft Oct. 17-19, 1946.

Revisions--The momentary maximum discharge for the water year 1950, published in WSP 1316, has been revised to 511 cfs.

Remarks--No regulation or diversion 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	38.2	77.1	76.8	29.5	75.4	16.3	56.4	98.6	42.3	9.45	4.25	3.83	43.7
1952	30.7	35.3	18.4	10.0	29.8	12.3	60.5	95.8	45.4	19.3	5.36	3.28	30.4
1953	2.59	2.49	4.91	92.8	55.5	17.3	43.5	77.4	57.6	23.9	6.39	4.27	32.3
1954	10.0	37.8	93.1	31.5	32.6	21.3	38.8	95.8	111	51.4	13.0	10.3	45.6
1955	15.8	39.8	18.6	22.3	43.8	9.29	18.7	59.2	145	78.7	20.8	7.38	39.8
1956	53.3	65.0	50.1	13.0	7.85	9.55	56.3	136	105	48.1	7.95	5.24	46.5
1957	37.3	45.7	125	14.2	13.0	21.6	70.4	87.5	29.4	8.72	4.27	3.02	38.6
1958	3.98	18.6	45.8	35.1	52.8	23.5	64.1	74.6	20.9	7.58	3.71	5.46	29.5
1959	36.6	81.9	65.7	65.6	21.1	28.2	61.1	68.2	50.9	15.6	5.57	46.7	45.6
1960	56.3	108	56.1	12.9	27.6	30.7	56.3	88.6	49.5	8.57	5.98	7.25	42.3

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2,350	4,590	4,720	1,810	4,190	1,000	3,380	6,060	2,520	581	261	228	31,670
1952	1,890	2,100	1,130	616	1,710	755	3,600	5,890	2,700	1,180	330	195	22,100
1953	159	148	302	5,710	3,080	1,060	2,590	4,760	3,430	1,470	393	254	23,360
1954	616	2,250	5,720	1,940	1,810	1,310	2,310	5,890	6,600	3,160	802	611	33,020
1955	974	2,370	1,140	1,370	2,430	571	1,110	3,640	8,660	4,840	1,280	439	28,820
1956	3,280	3,870	3,080	800	440	587	3,350	8,330	6,270	2,960	489	312	33,770
1957	2,500	2,720	7,700	876	724	1,330	4,190	5,380	1,750	536	263	180	27,950
1958	245	1,110	2,810	2,160	2,930	1,450	3,810	4,590	1,250	466	228	325	21,370
1959	2,250	4,870	4,040	4,030	1,170	1,740	3,630	4,190	3,030	959	343	2,780	33,030
1960	3,460	6,440	3,450	792	1,590	1,890	3,350	5,450	2,950	527	368	431	30,700

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	-	-	-	-	-	-	-	-	54.7	123.84	-	39,630
1951	1216	*556	Feb. 9, 1951	2.6	43.7	7.28	98.97	31,670	34.7	78.54	-	25,130
1952	1246	199	May 13, 1952	2.7	30.4	5.07	69.07	22,100	24.2	54.97	-	17,580
1953	1286, 1446	520	Jan. 31, 1953	2.0	32.3	5.38	72.97	23,360	43.3	97.91	-	31,330
1954	1346, 1446	596	Dec. 9, 1953	4.8	45.6	7.60	103.21	33,020	39.9	90.40	-	28,920
1955	1396	497	Feb. 8, 1955	5.3	39.8	6.63	90.10	28,820	47.7	106.03	-	34,570
1956	1446	511	Dec. 11, 1955	4.5	46.5	7.75	105.50	33,770	49.9	113.25	-	36,260
1957	1516	2,340	Dec. 9, 1956	2.8	38.6	6.43	87.29	27,950	26.8	60.61	-	19,390
1958	1566	284	Apr. 20, 1958	2.4	29.5	4.92	66.78	21,370	39.2	88.63	-	28,370
1959	1636	542	Nov. 12, 1958	4.5	45.6	7.60	103.25	33,030	48.7	110.10	-	33,220
1960	1716	1,940	Nov. 22, 1959	4.1	42.3	7.05	95.95	30,700	-	-	-	-

* Revised.

1145. Cedar River below Bear Creek, near Cedar Falls, Wash.

Location (revised)--Lat 47°20'30", long 121°32'50", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.32, T.22 N., R.10 E., on right bank 500 ft downstream from Bear Creek and 12 $\frac{1}{2}$ miles southeast of Cedar Falls.

Drainage area-- 25.4 sq mi.

Records Available--October 1945 to September 1960.

Gage--Water-stage recorder. Altitude of gage is 1,880 ft (from topographic map). Prior to Sept. 16, 1960, at site 25 ft upstream at datum 2.35 ft higher.

Average discharge--15 years (1945-60), 183 cfs (132,500 acre-ft per year).

Extremes--1945-60: Maximum discharge, 7,620 cfs Nov. 22, 1959, from rating curve extended above 890 cfs on basis of slope-area measurement of peak flow; maximum gage height, 7.08 ft Dec. 9, 1956, site and datum then in use; minimum discharge, 12.5 cfs Nov. 27, 1952.

Remarks--No regulation or diversion 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	153	297	289	149	311	95.2	271	412	233	57.1	25.4	23.4	192
1952	143	157	88.2	49.9	134	75.6	289	410	227	98.3	30.4	20.5	143
1953	16.2	16.5	27.9	459	251	94.4	199	309	266	133	34.6	24.4	152
1954	49.0	167	387	134	149	94.9	188	404	456	265	73.5	52.9	202
1955	67.4	180	92.1	101	169	49.4	102	293	594	352	92.0	36.0	177
1956	234	280	231	81.5	43.9	70.9	313	599	458	220	42.2	27.5	217
1957	150	180	448	71.8	64.4	102	296	393	157	47.7	27.7	18.9	164
1958	26.0	80.9	190	157	224	98.1	237	308	101	39.8	21.9	35.2	126
1959	152	443	384	339	108	144	274	294	294	106	33.9	231	234
1960	262	466	267	60.3	132	160	288	332	253	51.5	32.8	33.6	194

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	9,430	17,660	17,760	9,170	17,280	5,860	16,150	25,300	13,860	3,510	1,560	1,390	138,900
1952	8,820	9,370	5,420	3,070	7,690	4,650	17,180	25,240	13,480	6,040	1,870	1,220	104,000
1953	994	981	1,710	28,250	13,960	5,800	11,840	19,010	15,860	8,160	2,130	1,450	110,100
1954	3,010	9,920	23,770	8,220	8,280	5,840	11,160	24,830	27,140	16,280	4,520	3,150	146,100
1955	4,140	10,720	5,660	6,190	9,390	3,040	6,090	17,990	35,350	21,660	5,650	2,140	128,000
1956	14,370	16,680	14,210	5,010	2,520	4,360	18,640	36,840	27,280	13,550	2,600	1,630	157,700
1957	9,230	10,710	27,540	4,420	3,570	6,260	17,620	24,170	9,330	2,930	1,700	1,120	118,600
1958	1,600	4,810	11,670	9,650	12,460	6,030	14,120	18,910	6,030	2,450	1,350	2,100	91,180
1959	9,350	26,330	23,610	20,860	6,010	8,830	16,310	18,070	17,510	6,500	2,080	13,720	169,200
1960	16,150	27,750	16,390	3,710	7,580	9,830	17,140	20,420	15,060	3,170	2,020	2,000	141,200

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	-	-	-	-	-	-	-	-	226	120.82	163,600
1951	1216	1,800	Feb. 9, 1951	18	192	7.56	102.55	138,900	163	86.87	117,700
1952	1246	764	May 13, 1952	18	143	5.63	76.81	104,000	118	62.09	84,120
1953	1286	1,900	Jan. 31, 1953	13	152	5.98	81.28	110,100	198	105.67	143,200
1954	1546	1,770	Dec. 9, 1953	29	202	7.95	107.88	146,100	179	95.93	129,900
1955	1396	1,530	Feb. 8, 1955	28	177	6.97	94.49	128,000	211	112.76	152,800
1956	1446	2,200	Dec. 12, 1955	22	217	8.54	116.42	157,700	220	118.05	159,900
1957	1516	3,260	Dec. 9, 1956	17	164	6.46	87.55	118,600	123	65.85	89,200
1958	1566	938	Apr. 20, 1958	16	126	4.96	67.30	91,180	183	97.72	132,400
1959	1636	2,140	Nov. 12, 1958	26	234	9.21	124.90	169,200	235	125.63	170,200
1960	1716	7,620	Nov. 22, 1959	25	194	7.64	104.25	141,200	-	-	-

1150. Cedar River near Cedar Falls, Wash.

Location.--Lat 47°22'20", long 121°37'30", in SE1/4 sec.23, T.22 N., R.9 E., on left bank 2 miles upstream from Chester Morse Lake (formerly Cedar Lake) and 8 miles south-east of Cedar Falls.

Drainage area.--41.8 sq mi.

Records available.--October 1945 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,560 ft (from topographic map). Prior to Oct, 26, 1957, at site 80 ft downstream at same datum.

Average discharge.--15 years (1945-60), 284 cfs (205,600 acre-ft per year).

Extremes.--1945-60: Maximum discharge, 9,490 cfs Nov. 22, 1959 (gage height, 11.34 ft, from high-water mark in well), from rating curve extended above 4,300 cfs on basis of slope-area measurements at gage heights 10.16 and 11.34 ft; maximum gage height, 11.4 ft Feb. 11, 1951 (backwater from Chester Morse Lake, formerly Cedar Lake); minimum discharge, 20 cfs Nov. 30 to Dec. 1, 1952; minimum gage height recorded, 1.84 ft Sept. 30, 1957.

Revisions.--The momentary maximum discharges for some water years, published in WSP 1316, have been revised as follows:

Water year	Date	Discharge (cfs)
1946	Dec. 28, 1945	2,600
1947	Dec. 11, 1946	4,930
1948	Nov. 7, 1947	2,150
1950	Nov. 27, 1949	2,990

Remarks.--No regulation or diversion 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	279	487	508	303	658	185	362	535	285	78.0	39.6	36.8	309
1952	228	251	167	96.6	260	143	407	545	300	140	49.2	31.3	218
1953	24.3	27.1	63.5	722	430	183	311	426	370	178	54.0	34.1	234
1954	65.9	273	649	247	310	178	317	532	597	327	101	87.2	309
1955	113	293	172	198	316	99.1	214	450	768	472	143	58.6	274
1956	366	486	499	163	88.9	162	470	834	639	295	66.3	44.6	344
1957	238	287	745	119	123	218	449	556	222	74.7	43.9	29.2	260
1958	40.5	139	336	303	378	159	390	420	133	56.4	32.9	51.7	202
1959	234	758	620	532	189	268	486	450	380	140	51.1	365	373
1960	391	688	412	101	232	233	401	471	341	73.3	46.7	51.1	286

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	17,140	28,980	31,260	18,630	35,330	11,380	21,560	32,910	16,340	4,800	2,430	2,190	223,900
1952	14,010	14,940	10,240	5,940	14,970	8,760	24,220	33,520	17,820	8,610	3,020	1,860	157,900
1953	1,500	1,610	3,910	44,390	23,880	11,220	18,510	26,220	22,030	10,920	3,320	2,030	169,500
1954	5,280	16,250	39,890	15,180	17,220	10,950	18,880	32,710	35,540	20,110	6,220	5,190	223,400
1955	6,940	17,440	10,600	12,150	17,560	6,090	12,760	27,650	45,680	29,020	8,770	3,490	198,200
1956	22,520	28,920	30,700	10,010	5,110	9,940	27,970	51,290	38,040	18,160	4,080	2,680	249,400
1957	14,640	17,050	45,810	7,320	6,820	13,420	26,700	34,200	13,230	4,590	2,700	1,740	188,200
1958	2,590	8,250	20,680	18,630	20,980	9,780	23,230	25,810	7,890	3,470	2,030	3,080	146,300
1959	14,410	45,180	38,100	32,710	10,520	16,480	28,910	27,660	22,630	8,610	3,140	21,690	270,000
1960	24,050	40,960	25,360	6,180	13,320	14,350	23,880	28,980	20,290	4,500	2,870	3,040	207,800

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	-	-	-	-	-	-	-	-	364	118.09	263,300	
1951	1216	3,620	Feb. 9, 1951	27	309	7.39	100.28	223,600	256	83.15	185,400	
1952	1246	1,250	Feb. 4, 1952	26	218	5.22	70.83	157,900	173	56.39	125,700	
1953	1286	3,860	Jan. 31, 1953	20	234	5.60	76.03	169,500	309	100.44	223,900	
1954	1346	4,710	Dec. 9, 1953	49	309	7.39	100.22	223,400	272	88.35	197,000	
1955	1396	3,620	Feb. 8, 1955	47	274	6.56	88.87	198,200	339	110.03	245,300	
1956	1446	5,590	Dec. 11, 1955	35	344	8.23	111.86	249,400	337	109.79	244,800	
1957	1516	6,090	Dec. 10, 1956	26	260	6.22	84.43	188,200	196	63.76	142,100	
1958	1566	1,810	Apr. 20, 1958	25	202	4.83	65.65	146,300	294	95.36	212,600	
1959	1636	5,040	Nov. 12, 1958	42	373	8.92	121.12	270,000	363	117.85	262,700	
1960	1716	9,490	Nov. 22, 1959	40	286	6.84	93.20	207,800	-	-	-	

1155. Rex River near Cedar Falls, Wash.

Location.--Lat 47°21'10", long 121°39'50", in NE¼NW¼ sec.33, T.22 N., R.9 E., on right bank 2½ miles upstream from mouth and Chester Morse Lake (formerly Cedar Lake) and 7 miles southeast of Cedar Falls.

Drainage area.--13.0 sq mi.

Records available.--October 1945 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,600 ft (from topographic map).

Average discharge.--15 years (1945-60), 106 cfs (76,740 acre-ft per year).

Extremes.--1945-60: Maximum discharge, 4,200 cfs Nov. 22, 1959 (gage height, 8.20 ft), from rating curve extended above 1,600 cfs on basis of contracted-opening measurement at gage height 7.19 ft and slope-area measurement of peak flow; minimum, 4.3 cfs Nov. 29, 1952 (gage height, 2.43 ft).

Revisions.--The momentary maximum discharge for the water year 1946, published in WSP 1316, has been revised to 1,580 cfs.

Remarks.--No regulation or diversion 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	123	184	191	115	210	58.1	134	179	76.4	13.9	7.27	12.8	108
1952	103	104	62.7	34.3	97.7	50.6	145	181	108	37.5	10.4	8.02	78.3
1953	6.30	7.91	37.7	326	140	68.0	119	161	126	39.9	12.9	23.7	87.7
1954	50.2	123	261	91.4	145	60.0	128	181	218	90.5	28.5	58.6	118
1955	58.0	115	72.4	70.1	128	28.7	70.8	167	269	174	49.5	20.5	99.8
1956	155	184	193	63.2	31.7	56.3	168	256	205	91.0	14.7	13.8	120
1957	120	125	321	32.6	47.9	104	166	171	72.8	26.2	17.8	10.4	102
1958	27.2	74.0	141	136	148	55.2	152	95.8	28.7	12.3	7.37	23.7	74.6
1959	101	316	233	208	65.6	104	178	151	107	38.2	14.7	189	142
1960	159	261	158	45.1	98.2	89.1	150	190	116	19.7	19.4	26.6	111

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	7,590	10,940	11,740	7,080	11,840	3,570	7,980	10,980	4,550	855	447	759	78,130
1952	6,360	6,200	3,860	2,110	5,620	3,110	8,830	11,110	6,430	2,500	840	477	58,850
1953	387	470	2,320	20,020	7,750	4,060	7,090	9,890	7,490	2,460	793	767	63,500
1954	3,090	7,320	16,040	5,620	8,060	3,690	7,590	11,150	12,950	5,560	1,750	2,300	85,120
1955	2,340	6,840	4,450	4,510	7,110	1,760	4,210	10,260	15,990	10,680	3,040	1,220	72,210
1956	9,520	10,940	11,870	3,880	1,820	3,460	10,000	15,720	12,220	5,600	903	822	86,760
1957	7,350	7,430	19,730	2,010	2,660	6,410	9,870	10,500	4,330	1,610	1,090	619	73,610
1958	1,670	4,400	8,660	8,370	8,230	3,390	9,040	5,890	1,710	756	453	1,410	53,980
1959	6,240	18,790	14,300	12,790	3,850	6,380	10,620	9,270	6,370	2,350	902	11,230	102,900
1960	9,780	15,510	9,740	2,770	5,650	5,480	8,930	11,660	6,910	1,210	1,190	1,580	89,410

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		Mean	Runoff	
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet		Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	131	137.23	95,140	-	-	-
1951	1216,1446	1,660	Feb. 11, 1951	6.0	108	8.31	112.67	78,130	88.9	92.70	64,280	126	125.16	86,770
1952	1246	702	Feb. 4, 1952	6.4	78.3	6.02	82.00	56,850	60.1	62.89	43,600	126	125.16	86,770
1953	1286	1,640	Jan. 23, 1953	5.3	87.7	6.79	91.58	63,500	120	125.16	86,770	126	125.16	86,770
1954	1346	1,870	Dec. 9, 1953	17.6	118	9.08	122.78	85,120	99.9	104.28	72,300	126	125.16	86,770
1955	1396	1,570	Feb. 8, 1955	14	99.8	7.68	104.17	72,210	126	131.14	90,910	126	125.16	86,770
1956	1446	2,160	Dec. 11, 1955	7.9	120	9.23	125.11	86,760	123	128.26	88,940	126	125.16	86,770
1957	1516	2,550	Dec. 9, 1956	7.6	102	7.85	106.18	73,610	74.4	77.66	53,830	126	125.16	86,770
1958	1566	1,070	Apr. 19, 1958	5.9	74.6	5.74	77.85	53,980	109	113.30	78,580	126	125.16	86,770
1959	1636	2,160	Nov. 12, 1958	9.7	142	10.9	148.37	102,900	136	142.20	98,590	126	125.16	86,770
1960	1716	4,200	Nov. 22, 1959	8.2	111	8.54	115.96	80,410	126	125.16	86,770	126	125.16	86,770

1161. Canyon Creek near Cedar Falls, Wash.

Location.--Lat 47°25'10", long 121°45'55", in NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.3, T.22 N., R.8 E., on right bank 400 ft upstream from mouth and 1 mile east of Cedar Falls.

Drainage area.--0.19 sq mi.

Records available.--May 1945 to September 1960.

Gage.--Water-stage recorder and wooden control. Altitude of gage is 1,040 ft (from topographic map).

Average discharge.--15 years (1945-60), 18.7 cfs (13,540 acre-ft per year).

Extremes.--1945-60: Maximum discharge, 102 cfs Dec. 19, 1946 (gage height, 2.01 ft); minimum, 0.3 cfs for many days during water years 1953-55, 1958.

Remarks.--No regulation or diversion 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
1945	-	-	-	-	-	-	-	-	55.6	22.9	4.50	2.85	-
1946	2.21	13.0	11.8	16.3	6.47	7.53	5.75	40.9	73.1	41.2	16.0	3.92	19.9
1947	2.57	4.29	52.4	36.2	37.1	19.0	16.3	16.2	10.6	8.29	3.62	2.04	17.3
1948	5.46	67.3	46.6	37.0	20.3	13.7	5.73	9.58	62.2	34.0	11.0	5.09	26.3
1949	2.38	3.61	14.8	7.03	4.25	6.66	6.72	39.2	50.1	24.8	10.2	2.21	14.4
1950	1.69	7.97	44.2	43.1	21.8	47.7	36.9	35.5	40.4	34.5	22.6	13.9	29.3
1951	7.60	22.5	43.8	37.0	40.6	18.0	9.84	16.0	30.9	17.7	5.14	1.74	20.8
1952	1.13	7.03	11.5	6.62	6.74	6.29	6.88	11.5	14.5	9.06	3.58	1.56	7.22
1953	.95	.54	.46	5.34	65.6	18.4	8.47	16.3	21.1	20.3	15.4	3.01	14.4
1954	.54	.76	35.3	51.5	26.1	35.8	25.2	37.4	58.9	46.1	21.8	3.09	28.6
1955	.85	.79	11.2	17.0	23.8	15.8	7.92	7.77	37.3	63.9	39.8	18.4	20.4
1956	5.21	25.4	38.9	23.9	10.9	3.85	4.31	36.2	53.4	37.8	30.2	12.6	23.6
1957	1.94	8.34	35.0	26.3	8.56	5.58	7.77	20.3	23.1	16.5	7.66	2.73	13.7
1958	1.26	.64	3.38	7.90	13.9	12.2	12.3	22.3	18.7	12.5	3.73	1.03	9.13
1959	2.87	39.6	39.6	25.9	22.7	11.2	16.4	23.6	23.7	25.5	20.8	11.3	21.9
1960	22.6	22.9	23.8	9.63	6.19	4.80	8.63	10.9	26.5	20.9	6.12	1.79	13.8

Note.--Records not previously published; computed on basis of base data obtained in cooperation with city of Seattle.

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1945	-	-	-	-	-	-	-	-	3,310	1,410	277	170	-
1946	136	773	723	1,000	359	463	342	2,520	4,350	2,530	994	233	14,410
1947	158	255	3,220	2,230	2,060	1,170	968	994	633	510	223	121	12,540
1948	336	4,000	2,860	2,270	1,170	843	341	589	3,700	2,090	675	184	19,060
1949	146	215	911	432	236	410	400	2,410	2,980	1,520	626	132	10,420
1950	104	474	2,720	2,650	1,210	2,940	2,200	2,190	2,410	2,120	1,390	821	21,230
1951	467	1,340	2,690	2,270	2,260	1,110	586	981	1,840	1,090	316	104	15,050
1952	69	419	704	419	388	387	409	710	865	557	220	93	5,240
1953	59	32	28	365	3,640	1,130	504	1,000	1,250	1,250	948	179	10,380
1954	33	45	2,170	3,170	1,450	2,200	1,500	2,300	3,500	2,840	1,340	184	20,730
1955	52	47	691	1,040	1,320	974	471	478	2,220	3,930	2,450	1,100	14,770
1956	320	1,510	2,390	1,470	626	236	256	2,230	3,180	2,320	1,860	747	17,140
1957	119	496	2,150	1,620	475	343	462	1,250	1,380	1,010	471	162	8,940
1958	78	38	208	486	773	747	733	1,370	1,110	766	229	61	6,600
1959	176	2,360	2,440	1,590	1,260	686	974	1,450	1,110	1,570	1,280	671	15,870
1960	1,390	1,360	1,460	592	356	295	514	672	1,580	1,280	376	106	9,980

Note.--Records 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					
1945	-	-	-	-	-	-	-	-
1946	-	86	(a)	2.0	19.9	14,410	22.7	16,410
1947	-	102	Dec. 19, 1946	1.7	17.3	12,540	22.2	16,100
1948	-	96	Nov. 18-20, 1947	1.7	26.3	19,060	18.1	15,130
1949	-	65	May 26, 1949	1.4	14.4	10,420	17.2	12,440
1950	-	66	Mar. 12, 1950	1.2	29.3	21,230	31.0	22,430
1951	-	66	Feb. 15-16, 1951	1.3	20.8	15,050	16.2	11,750
1952	-	17	June 5, 1952	1.8	7.22	5,240	5.74	4,170
1953	-	94	Feb. 7, 1953	.3	14.4	10,380	17.3	12,510
1954	-	72	Dec. 27, 1953	.3	28.6	20,730	26.6	19,270
1955	-	76	July 8, 1955	.3	20.4	14,770	25.2	18,200
1956	-	64	May 26-29, 1956	2.7	23.6	17,140	21.6	15,690
1957	-	78	Dec. 23-24, 1956	1.4	13.7	9,940	10.4	7,500
1958	-	25	May 2-10, 1958	.3	9.13	6,600	15.5	11,250
1959	-	88	Nov. 27, 1958	.4	21.9	15,870	20.9	15,100
1960	-	41	Nov. 30, 1959	.9	13.8	9,980	-	-

a May 31, June 1, 1946.

Note.--Records not previously published.

1165. Cedar River at Cedar Falls, Wash.

Location.--Lat 47°25'10", long 121°47'20", in SE $\frac{1}{4}$ sec.4, T.22 N., R.8 E., on right bank three-quarters of a mile downstream from Seattle municipal powerplant at Cedar Falls and 3 miles downstream from Chester Morse Lake (formerly Cedar Lake).

Drainage area.--84.2 sq mi.

Records available.--April 1914 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 910 ft (from river-profile map).

Average discharge.--46 years (1914-60), 309 cfs (223,700 acre-ft per year).

Extremes.--1914-60: Maximum discharge, 6,440 cfs Dec. 22, 1933 (gage height, 11.5 ft); no flow part of Nov. 25, 1917, Aug. 18, 1923; minimum daily, 0.5 cfs Oct. 6, 1958.

Remarks.--All artificially diverted water returned to river above station. Some regulation by Chester Morse Lake (formerly Cedar Lake) for power.

Corrections.--In WSP 1316, the monthly mean for October 1928 is listed in error, it should be 168 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	370	714	448	959	574	316	332	301	298	109	53.3	380
1952	105	252	254	135	355	154	458	595	435	166	104	66.8	255
1953	34.7	24.9	47.7	472	972	394	291	458	412	108	88.1	48.7	273
1954	205	344	677	481	270	378	299	419	667	423	424	192	400
1955	204	111	204	181	395	298	364	471	610	515	243	146	311
1956	352	494	692	470	359	317	433	753	777	255	115	287	442
1957	247	407	842	421	191	438	512	540	271	71.0	45.9	28.3	336
1958	47.5	88.2	453	495	522	228	280	421	88.0	47.2	60.3	40.5	230
1959	49.4	960	817	865	483	388	462	560	400	68.4	107	524	456
1960	547	1,051	851	354	419	276	604	458	459	191	83.8	102	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	8,790	22,010	43,900	27,520	52,150	35,300	18,810	20,430	17,880	18,310	6,680	3,170	275,000
1952	6,450	15,010	15,610	8,160	20,410	9,470	27,260	36,610	25,870	10,210	6,380	3,980	185,400
1953	2,130	1,480	2,940	29,040	53,970	24,240	17,340	26,910	24,520	6,610	5,410	2,900	197,500
1954	12,610	20,490	41,640	29,590	15,000	23,240	17,810	25,770	39,680	25,980	26,050	11,420	289,500
1955	12,520	6,610	12,550	11,110	21,920	18,310	21,670	28,980	36,350	31,640	14,970	8,690	225,500
1956	21,670	29,390	42,540	28,900	20,660	19,490	25,750	46,310	46,230	15,710	7,060	17,100	320,800
1957	15,190	24,240	51,770	25,890	10,600	26,910	30,490	33,200	16,120	4,370	2,820	1,680	243,300
1958	2,920	5,250	27,870	30,420	28,980	13,990	16,660	25,860	5,230	2,900	3,710	2,410	166,200
1959	3,040	57,130	50,260	53,190	26,810	23,850	27,520	34,430	23,790	4,210	6,560	19,250	330,000
1960	33,640	61,320	51,110	20,540	24,110	16,970	35,950	28,160	26,140	11,750	5,150	6,090	320,900

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	-	-	-	-	-	-	456	329,900
1951	1216	3,860	Feb. 11, 1951	32	380	275,000	328	237,300
1952	1246	800	Dec. 21, 1951	30	255	185,400	213	154,900
1953	1286	2,250	Feb. 1, 1953	8.8	273	197,500	367	265,700
1954	1346	1,370	June 7, 1954	67	400	289,300	340	246,200
1955	1396	1,240	July 1, 1955	24	311	225,300	397	287,200
1956	1446	1,760	May 20, 1956	52	442	320,800	439	318,400
1957	1516	2,140	Dec. 18, 1956	25	336	243,300	260	188,100
1958	1566	958	Apr. 21, 1958	1.4	230	166,200	332	240,600
1959	1636	1,980	Jan. 26, 1959	.5	456	330,000	505	365,700
1960	1716	3,560	Nov. 24, 1959	20	442	320,900	-	-

1167. Middle Fork Taylor Creek near Selleck, Wash.

Location.--Lat 47°21'15", long 121°47'30", in NW $\frac{1}{4}$ sec.33, T.22 N., R.8 E., on left bank 0.7 mile upstream from mouth and 4 miles southeast of Selleck.

Drainage area.--4.85 sq mi.

Records available.--August 1956 to September 1960.

Gage.--Water-stage recorder. Concrete control since Aug. 15, 1958. Altitude of gage is 1,440 ft (from topographic map).

Extremes.--1956-60: Maximum discharge, 823 cfs Dec. 15, 1959 (gage height, 4.08 ft); minimum, 4.7 cfs Sept. 7-9, 1958.

Remarks.--No regulation or diversion 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
1956	-	-	-	-	-	-	-	-	-	-	9.08	8.87	-
1957	27.9	39.2	91.5	19.8	28.7	51.4	56.8	38.3	25.1	14.4	9.01	6.76	34.1
1958	9.98	19.7	43.9	62.9	50.1	22.0	39.4	16.6	9.66	5.79	5.51	7.05	24.3
1959	21.6	90.2	78.9	84.0	39.2	49.8	67.7	46.3	30.2	21.0	10.5	61.0	50.0
1960	49.5	87.6	74.3	30.5	51.5	35.3	53.6	54.0	27.6	12.1	11.2	11.6	41.5

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	-	-	-	-	-	-	-	-	-	-	558	528	-
1957	1,720	2,330	5,630	1,210	1,590	3,160	3,380	2,360	1,500	888	554	402	24,720
1958	613	1,180	2,700	3,870	2,780	1,350	2,350	1,040	575	418	339	420	17,640
1959	1,330	5,370	4,850	5,160	2,180	3,060	4,030	2,850	1,800	1,290	645	3,630	36,200
1960	3,040	5,210	4,570	1,870	2,960	2,170	3,109	3,320	1,640	743	688	691	30,090

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
1956	1516	-	-	-	-	-	-	-	-	-	-
1957	1516	450	Dec. 9, 1956	5.6	34.1	7.03	95.55	24,720	27.0	75.49	19,540
1958	1566	231	Apr. 19, 1958	4.7	24.3	5.01	68.14	17,640	34.1	95.44	24,690
1959	1636	452	Apr. 1, 1959	5.0	50.0	10.3	139.93	36,200	51.7	144.83	37,460
1960	1716	823	Dec. 15, 1959	7.6	41.5	8.56	116.35	30,090			

1168. North Fork Taylor Creek near Selleck, Wash.

Location.--Lat 47°22'20", long 121°48'20", in NE $\frac{1}{4}$ sec.29, T.22 N., R.8 E., on left bank at upstream side of bridge, 1 mile upstream from mouth and 3 miles east of Selleck.

Drainage area.--3.16 sq mi.

Records available.--June 1956 to September 1960.

Gage.--Water-stage recorder and log control. Altitude of gage is 1,500 ft (from topographic map).

Extremes.--1956-60: Maximum discharge, 522 cfs Dec. 15, 1959 (gage height, 4.17 ft); minimum, 0.8 cfs Aug. 21, 1958; minimum gage height, 0.57 ft July 28, 1958.

Remarks.--No regulation or diversion 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
1956	-	-	-	-	-	-	-	-	-	8.13	2.93	3.15	-
1957	20.9	26.6	58.0	12.3	30.4	36.0	28.9	17.1	14.6	6.94	3.88	1.97	21.4
1958	5.61	14.8	32.4	38.0	29.3	10.1	24.8	8.20	6.91	2.05	1.14	1.82	14.2
1959	9.75	52.1	47.1	55.2	25.0	30.2	38.8	24.5	16.8	11.5	3.57	39.7	29.5
1960	28.0	48.8	43.6	19.7	31.2	26.7	32.2	32.1	14.4	4.56	4.57	5.31	24.2

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	-	-	-	-	-	-	-	-	-	500	180	187	-
1957	1,280	1,580	3,570	756	1,690	2,210	1,720	1,050	869	427	238	117	15,510
1958	345	882	1,990	2,330	1,630	620	1,470	504	233	126	70	108	10,310
1959	599	3,100	2,900	3,400	1,390	1,850	2,310	1,510	1,000	706	219	2,360	21,340
1960	1,720	2,900	2,680	1,210	1,800	1,640	1,920	1,970	858	282	281	316	17,580

Yearly 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
1956	1516	-	-	-	-	-	-	-	-	-	-
1957	1516	185	Dec. 10, 1956	1.4	21.4	6.77	91.98	15,510	17.0	72.91	12,290
1958	1566	108	Jan. 17, 1958	.9	14.2	4.49	61.21	10,310	18.9	81.25	13,690
1959	1636	243	Jan. 24, 1959	1.4	29.5	9.34	128.57	21,340	30.5	130.81	22,040
1960	1716	522	Dec. 15, 1959	2.6	24.2	7.66	104.32	17,580	-	-	-

LAKE WASHINGTON BASIN

1170. Taylor Creek near Selleck, Wash.

Location.--Lat 47°23'10", long 121°50'45", in NW¼NW¼ sec.19, T.22 N., R.8 E., on left bank half a mile upstream from mouth and 1¼ miles northeast of Selleck.

Drainage area.--16.4 sq mi (revised).

Records available.--June to October 1945, August 1956 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 940 ft (from topographic map). June to October 1945 on right bank 350 ft downstream at different datum.

Extremes.--1945, 1956-60: Maximum discharge, 2,170 cfs Dec. 15, 1959 (gage height, 5.20 ft); minimum, 16 cfs Oct. 2-7, 1958.

Remarks.--No regulation or diversion 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
1956	-	-	-	-	-	-	-	-	-	-	30.0	25.4	-
1957	91.7	120	207	65.4	103	149	139	102	73.7	44.6	32.0	22.8	97.5
1958	29.1	54.1	119	152	155	83.6	109	61.5	38.6	25.6	19.7	20.0	71.6
1959	41.7	201	204	239	145	138	158	127	91.6	65.9	37.0	128	131
1960	132	229	221	115	157	117	151	144	87.4	44.0	36.4	34.3	122

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	-	-	-	-	-	-	-	-	-	-	1,840	1,510	-
1957	5,640	7,110	12,760	5,250	5,720	9,160	8,260	6,250	4,390	2,740	1,970	1,360	70,610
1958	1,790	3,220	7,340	9,360	8,610	5,140	6,480	3,780	2,300	1,580	1,210	1,190	52,000
1959	2,560	11,960	12,570	14,700	8,050	8,500	9,420	7,820	5,450	4,050	2,280	7,620	94,980
1960	8,100	13,610	13,590	7,070	9,030	7,170	8,980	8,960	5,200	2,700	2,240	2,040	88,590

Yearly 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	
1956	1516	-	-	-	-	-	-	-	-	-	-	-
1957	1516	1,090	Dec. 9, 1956	20	97.5	5.95	80.71	70,610	79.3	65.67	57,450	-
1958	1566	425	Jan. 17, 1958	16.5	71.8	4.38	59.45	52,000	92.2	76.30	66,740	-
1959	1636	1,240	Nov. 12, 1958	16	131	7.99	108.58	94,980	143	117.98	103,200	-
1960	1716	2,170	Dec. 15, 1959	25	122	7.44	101.30	88,590	-	-	-	-

1175. Cedar River near Landsburg, Wash.

Location.--Lat 47°23'35", long 121°56'50", in NE¼SW¼ sec.17, T.22 N., R.7 E., on left bank 2 miles upstream from Landsburg and intake of Seattle water-supply system, 4½ miles east of Maple Valley, 5 miles downstream from Taylor Creek, and 12 miles downstream from Chester Morse Lake (formerly Cedar Lake).

Drainage area.--125 sq mi, excludes that of Rock Creek.

Records available.--July 1895 to September 1960 (prior to October 1948, flow of Rock Creek included). Monthly discharge only for some periods, published in WSP 1316. Published as "near Seattle" 1895-98, "near Maple Valley" 1902, and as "near Ravensdale" 1898-1901, 1903-12.

Gage.--Water-stage recorder. Altitude of gage is 600 ft (from river-profile map). Prior to Oct. 1, 1898, staff gage at site 2½ miles downstream at different datum. Mar. 24, 1901, to May 15, 1913, staff gage at site 2 miles downstream at datum 535.84 ft above mean sea level (levels by city of Seattle). Apr. 30, 1914, to Oct. 22, 1928, water-stage recorder a quarter of a mile downstream at different datum.

Average discharge.--65 years (1895-1960), 694 cfs (502,400 acre-ft per year), unadjusted.

Extremes.--1895-98, 1901-60: Maximum discharge, 14,200 cfs Nov. 19, 1911 (gage height, 10.0 ft, from graph based on gage readings, site and datum then in use), from computation of peak flow over dam, peak caused by failure of flashboards at Chester Morse Lake (formerly Cedar Lake); minimum observed, 83 cfs Sept. 19, 1898.

Remarks.--All diversions except Rock Creek returned to river above station. Rock Creek, which entered naturally just above station prior to 1932, has been diverted to enter river at a point about 2 miles downstream from Seattle municipal water-supply intake. Some regulation by Chester Morse Lake. Records of water temperatures for the period August 1953 to September 1960 are published in reports of Geological Survey.

Correction.--In WSP 1316, the date for momentary maximum for water year 1909 is listed in error; it should be Jan. 20, 1909.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	476	850	1,299	1,080	1,773	1,072	729	682	616	579	343	241	806
1952	332	516	590	457	760	521	852	946	726	416	319	241	555
1953	190	162	179	944	1,516	838	733	862	803	427	367	301	604
1954	438	688	1,252	1,049	868	870	761	795	1,079	776	735	477	816
1955	426	372	487	539	882	686	873	926	1,052	886	555	434	675
1956	743	1,064	1,431	1,074	779	787	916	1,123	1,126	551	379	512	874
1957	568	767	1,468	837	738	962	968	899	604	345	288	231	716
1958	228	301	746	907	1,010	623	660	755	379	309	285	240	535
1959	241	1,445	1,442	1,598	1,013	875	972	1,015	790	398	383	716	906
1960	1,015	1,872	1,467	784	907	690	1,034	886	779	479	355	*331	865

* Revised; revised daily discharge for the period thus affected are available and will be published in a future water-supply paper. *

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	29,280	50,610	79,880	66,390	98,460	65,890	43,400	41,960	36,640	35,590	21,120	14,360	583,600
1952	20,410	30,750	36,290	28,110	43,700	32,040	50,750	58,160	43,180	25,610	19,610	14,350	402,900
1953	11,650	9,660	11,030	58,020	84,200	51,530	43,610	52,980	47,800	26,260	22,570	17,910	437,200
1954	26,930	40,940	76,970	64,470	48,230	53,470	45,290	48,860	64,200	47,850	45,170	28,400	580,800
1955	26,200	22,140	29,940	33,140	48,990	42,150	51,930	57,040	62,580	54,480	34,150	25,850	488,600
1956	45,660	63,300	87,990	66,040	44,810	48,410	54,490	69,050	67,000	33,890	23,280	30,460	634,400
1957	34,940	45,640	90,270	51,480	35,450	59,180	57,600	55,310	35,960	21,190	17,700	13,730	518,400
1958	14,030	17,910	45,870	55,750	56,060	38,290	39,260	46,420	22,570	18,980	17,540	14,290	387,000
1959	14,800	85,960	88,650	98,230	56,280	53,810	57,830	62,390	47,020	24,490	23,540	42,620	655,800
1960	62,400	99,490	90,170	48,180	52,150	42,420	61,540	54,500	46,360	29,440	21,850	*19,670	*628,200

* Revised; see footnote to table above.

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	-	-	-	-	-	-	906	656,200
1951	1216	6,200	Feb. 11, 1951	208	808	583,600	706	511,200
1952	1246	1,740	Feb. 4, 1952	191	555	402,900	479	347,800
1953	1286	5,370	Feb. 1, 1953	148	604	437,200	759	549,700
1954	1346	2,770	Dec. 9, 1953	344	816	590,800	724	524,200
1955	1396	2,720	Feb. 8, 1955	225	675	488,600	839	607,300
1956	1446	3,280	Dec. 11, 1955	300	874	634,400	838	608,300
1957	1516	3,240	Dec. 18, 1956	207	716	518,400	588	425,400
1958	1566	1,570	Jan. 17, 1958	190	535	387,000	689	498,600
1959	1636	3,460	Jan. 24, 1959	189	906	655,800	992	718,300
1960	1716	4,840	Nov. 24, 1959	198	865	*628,200	-	-

* Revised.

LAKE WASHINGTON BASIN

1183. Rock Creek near Ravensdale, Wash.

Location.--Lat 47°21'45", long 121°59'45", in E½SE¼ sec.26, T.22 N., R.6 E., on right bank half a mile upstream from State Highway 5-A and 1 mile northwest of Ravensdale.

Records available.--August 1956 to October 1958.

Gage.--Water-stage recorder. Altitude of gage is 580 ft (from topographic map).

Extremes.--1956-58: Maximum discharge, 46 cfs Mar. 11-13, 1957 (gage height, 2.34 ft); minimum, 0.1 cfs Sept. 18, 20, 22-25, Sept. 29 to Oct. 3, Oct. 8-16, 1958; minimum gage height, 0.37 ft Sept. 24, 1958.

Remarks.--No regulation or diversion 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
1956	-	-	-	-	-	-	-	-	-	-	-	0.93	-
1957	1.01	3.63	16.6	16.5	17.9	35.6	21.4	8.85	4.18	2.37	1.50	.88	10.8
1958	.53	.67	2.34	13.6	26.2	17.1	9.07	7.68	3.65	1.83	.72	.26	6.85

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	-	-	-	-	-	-	-	-	-	-	-	58	-
1957	62	216	1,020	1,020	994	2,190	1,270	544	249	146	92	53	7,860
1958	32	40	144	836	1,460	1,050	540	472	217	112	44	15	4,960

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	1516	-	-	-	-	-	-	-
1957	1516	46	Mar. 11-13, 1957	0.6	10.8	7,860	9.35	6,770
1958	1566	50	(a)	.1	6.85	4,960	-	-

a Feb. 16-18, 26-28, 1958.

1184. Rock Creek at State Highway 5A, near Ravensdale, Wash.

Location.--Lat 47°21'45", long 122°00'35", in NE¼SW¼ sec.26, T.22 N., R.6 E., on left bank near upstream ends of culverts on State Highway 5A, 1½ miles northeast of Ravensdale.

Records available.--June 1956 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 530 ft (from topographic map).

Extremes.--1956-60: Maximum discharge, 114 cfs Dec. 16, 1959 (gage height, 2.89 ft); minimum, 2.7 cfs Sept. 13-15, 1958; minimum gage height, 1.07 ft Oct. 12, 14, 1956.

Remarks.--No regulation. Occasional diversion of 1 cfs above station during summer months by city of Kent.

Monthly and 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	8.92	7.65	-
1957	7.05	10.7	24.4	25.2	26.4	39.9	28.3	17.6	13.2	10.0	7.55	6.84	18.1
1958	6.45	5.67	10.1	20.0	29.4	20.6	14.0	12.4	7.59	5.51	4.85	3.86	11.6
1959	5.66	7.27	26.4	46.5	37.9	23.1	21.8	18.4	13.1	10.4	8.86	7.92	18.7
1960	11.6	28.9	48.7	29.0	35.7	23.9	23.5	21.3	16.5	9.80	7.40	6.30	21.7

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	-	-	-	-	-	-	-	-	-	690	548	455	-
1957	434	638	1,500	1,550	1,460	2,460	1,680	1,080	785	618	464	407	13,080
1958	396	337	620	1,230	1,630	1,270	833	765	452	339	299	230	8,400
1959	225	433	1,620	2,860	2,110	1,420	1,300	1,130	780	640	545	471	13,530
1960	711	1,720	3,000	1,780	1,940	1,470	1,400	1,310	982	602	455	375	15,740

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	1516	-	-	-	-	-	-	-
1957	1516	50	Mar. 11-12, 1957	6.0	18.1	13,080	4.8	11,860
1958	1566	33	Feb. 15, 1958	2.7	11.6	8,400	12.9	9,330
1959	1636	98	Jan. 25, 1959	3.3	18.7	13,530	23.0	16,690
1960	1716	114	Dec. 16, 1959	5.9	21.7	15,740	-	-

1185. Rock Creek near Maple Valley, Wash.

Location.--Lat 47°22'50", long 122°01'10", in NE¼ sec.22, T.22 N., R.6 E., on left bank 650 ft upstream from mouth and 2 miles southeast of Maple Valley.

Drainage area.--14.0 sq mi.

Records available.--June 1945 to September 1960.

- Gage.--Water-stage recorder and woodbox culvert control. Altitude of gage is 425 ft (from topographic map). Prior to Mar. 16, 1953, at site 50 ft downstream at datum 0.82 ft higher.

Average discharge.--15 years (1945-60), 21.7 cfs (15,710 acre-ft per year).

Extremes.--1945-60: Maximum discharge, 165 cfs Feb. 11, 1951 (gage height, 4.26 ft, datum then in use, from recorded range in stage); minimum, 2.7 cfs Dec. 23, 24, 1952; minimum gage height, 0.19 ft Oct. 9-12, 14, 15, 1952, datum then in use.

Remarks.--No regulation or diversion 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	7.48	16.3	46.2	59.4	83.7	46.1	25.5	14.6	9.84	7.24	5.86	5.44	27.0
1952	5.55	8.45	14.2	12.3	21.7	20.0	18.3	12.4	8.97	7.08	5.82	4.82	11.6
1953	4.78	4.83	4.04	15.8	42.8	18.7	21.3	17.8	16.8	12.2	8.35	6.53	14.3
1954	7.41	15.5	42.1	50.2	40.4	31.1	26.1	16.4	11.2	9.98	8.24	7.40	22.1
1955	7.65	9.49	13.3	23.1	27.4	20.8	33.5	27.4	16.9	12.6	9.70	7.43	17.4
1956	9.55	27.6	82.8	81.0	38.9	41.7	35.5	17.1	11.7	9.29	7.70	6.84	30.9
1957	7.19	13.1	30.5	29.5	30.6	47.5	30.7	17.8	12.0	9.28	6.41	5.64	20.0
1958	5.78	6.82	9.59	24.7	40.1	24.2	16.3	14.2	8.18	5.65	4.95	3.85	13.5
1959	3.53	9.38	31.8	56.5	48.0	28.3	27.1	23.6	16.5	11.0	7.97	8.32	22.5
1960	14.5	38.4	58.3	33.7	39.0	26.8	26.5	24.5	18.4	10.7	7.08	5.90	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	460	972	2,840	3,650	4,650	2,830	1,520	899	585	445	360	324	19,540
1952	342	503	872	757	1,250	1,230	1,090	783	534	436	358	287	8,420
1953	294	287	249	969	2,370	1,150	1,270	1,090	998	751	513	388	10,330
1954	458	922	2,590	3,080	2,240	1,910	1,560	1,010	668	614	507	440	16,000
1955	470	564	816	1,420	1,520	1,280	2,000	1,680	1,000	778	596	442	12,570
1956	587	1,640	5,090	4,980	2,240	2,570	2,110	1,050	695	571	473	407	22,410
1957	442	780	1,680	1,810	1,700	2,920	1,830	1,090	712	571	394	336	14,460
1958	355	406	590	1,520	2,230	1,490	972	873	487	348	304	229	9,800
1959	217	558	1,960	3,480	2,670	1,740	1,610	1,450	983	678	490	495	16,330
1960	894	2,280	3,590	2,070	2,240	1,650	1,580	1,510	1,090	658	435	351	18,350

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	
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	32.7	31.66	23,640
1951	1216	165	(a)	4.8	27.0	1.93	26.17	19,540	23.5	22.74	16,980
1952	1246	24	(b)	4.3	11.6	.829	11.25	8,420	10.4	10.05	7,540
1953	1268	70	Jan. 30, 1953	2.8	14.3	1.02	13.63	10,330	18.6	18.04	13,470
1954	1346	75	Jan. 9, 1954	5.9	22.1	1.58	21.42	16,000	19.2	18.59	13,880
1955	1396	39	Apr. 21, 1955	6.5	17.4	1.24	16.35	12,570	24.9	24.16	18,030
1956	1446	146	Dec. 12, 1955	6.2	30.9	2.21	30.03	22,410	25.1	24.37	18,200
1957	1516	59	Mar. 11-13, 1957	5.2	20.0	1.43	19.38	14,460	17.6	17.04	12,710
1958	1566	45	Feb. 17, 18, 1958	2.8	13.5	.964	13.12	9,800	15.4	14.97	11,190
1959	1636	111	Jan. 26, 1959	3.3	22.5	1.61	21.87	16,330	28.1	27.27	20,360
1960	1716	151	Dec. 17, 1959	5.3	25.3	1.81	24.56	18,350	-	-	-

a Probably Feb. 11, 1951.

b Feb. 8-12, 15-17, 1952.

1190. Cedar River at Renton, Wash.

Location.--Lat 47°29'00", long 122°12'10", in NW $\frac{1}{4}$ sec.17, T.23 N., R.5 E., on left bank 125 ft downstream from bridge on U. S. Highway 10 alternate at Renton and $\frac{1}{2}$ miles upstream from mouth.

Drainage area.--197 sq mi (includes 4 sq mi in vicinity of Youngs Lake in Big Soos Creek basin).

Records available.--March 1901 to July 1903 (fragmentary), September 1906 to December 1907 (monthly discharge only), August 1945 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 15.20 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Jan. 1, 1908, staff gages within 1 mile of present site at datum 10.67 ft below mean sea level, unadjusted. Aug. 7, 1945, to Aug. 15, 1947, water-stage recorder at site 700 ft upstream at datum 20.13 ft above mean sea level and Aug. 16, 1947, to Dec. 7, 1950, at datum 19.13 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.--15 years (1945-60), 722 cfs (522,700 acre-ft per year).

Extremes.--1901-3, 1906-7, 1945-60: Maximum discharge not determined, probably occurred Feb. 11, 1951, during period of no gage-height record (discharge measurement of 6,640 cfs, gage height, 9.48 ft, made Feb. 10, 1951); minimum recorded, 39 cfs Sept. 5, 6, 11, 12, 1957 (gage height, 2.51 ft).

Remarks.--Flow partly regulated by Chester Morse Lake (formerly Cedar Lake) for operation of powerplant. More than 250 cfs is diverted at Landsburg at times by the city of Seattle for municipal 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	385	953	1,439	1,146	2,029	1,023	604	548	439	368	150	119	759
1952	259	463	595	444	855	579	850	879	576	239	135	109	497
1953	76.4	61.2	91.2	1,059	1,590	769	680	803	706	288	184	173	533
1954	354	674	1,363	1,197	962	879	747	659	1,014	640	582	402	789
1955	332	336	510	565	981	658	940	917	916	785	405	270	632
1956	711	1,103	1,769	1,336	779	876	907	1,008	1,043	373	167	432	876
1957	517	701	1,595	785	740	1,151	992	832	467	200	123	66.9	682
1958	152	229	716	992	1,110	584	642	609	168	44.9	41.1	52.9	441
1959	105	1,386	1,380	1,740	952	804	874	931	648	182	138	587	809
1960	864	1,761	1,556	779	1,007	714	1,203	935	677	270	129	210	840

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	23,680	56,700	88,450	70,480	112,700	62,900	35,920	33,690	26,120	22,600	9,240	7,080	549,600
1952	15,940	27,550	36,600	27,280	49,180	35,530	20,560	54,050	34,500	14,680	8,310	6,490	360,600
1953	4,700	3,640	5,610	65,110	88,310	47,290	40,440	49,370	41,990	17,720	11,290	10,290	385,800
1954	21,750	40,090	83,780	73,610	53,430	54,070	44,480	40,540	60,330	39,330	35,770	23,910	571,100
1955	20,420	19,990	31,340	34,750	54,480	40,460	55,920	56,390	54,490	48,270	24,890	16,070	457,500
1956	43,740	65,650	108,800	82,170	44,810	53,870	53,990	61,960	62,040	22,930	10,260	25,730	636,000
1957	31,780	41,700	98,090	48,270	41,100	70,750	59,010	51,140	27,800	12,310	7,570	3,980	493,500
1958	9,330	13,620	44,010	60,990	61,640	35,910	38,180	37,460	9,970	2,760	2,530	3,150	319,600
1959	6,430	82,490	84,850	107,000	52,890	49,430	52,000	57,260	38,560	11,170	8,480	34,930	585,500
1960	53,120	104,800	95,640	47,890	57,930	43,880	71,560	57,510	40,270	16,650	7,960	12,470	609,700

Yearly discharge, in cubic feet per second

Year	MSP	Water year ending Sept. 30				Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean
		Discharge	Date				
1950	-	-	-	-	-	-	922
1951	1216	-	-	82	759	549,600	637
1952	1246	2,190	Feb. 4, 1952	64	497	360,600	406
1953	1266	4,110	Feb. 1, 1953	51	533	385,800	715
1954	1346	3,250	Dec. 9, 1953	249	789	571,100	667
1955	1396	3,480	Feb. 8, 1955	136	632	457,500	834
1956	1446	3,640	Dec. 11, 1955	102	876	636,000	812
1957	1516	3,460	Dec. 18, 1956	42	682	493,500	537
1958	1566	2,160	Jan. 17, 1958	-	441	319,600	589
1959	1636	3,520	Jan. 25, 1959	45	809	585,500	919
1960	1716	5,860	Dec. 15, 1959	50	840	609,700	-

1195. May Creek near Renton, Wash.

Location.--Lat 47°31'25", long 122°11'45", in SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.32, T.24 N., R.5 E., on left bank 1 mile upstream from mouth and 2 $\frac{1}{2}$ miles north of Renton.

Drainage area.--12.5 sq mi (revised).

Records available.--June 1945 to October 1950, June 1955 to September 1958.

- Gage.--Water-stage recorder. Altitude of gage is 60 ft (from topographic map). Prior to June 1955, at different datum.

Average discharge.--8 years (1945-50, 1955-58), 21.2 cfs (15,350 acre-ft per year).

Extremes.--1945-50, 1955-58: Maximum discharge, 401 cfs Feb. 17, 1949 (gage height, 3.98 ft, datum then in use); minimum, 1.7 cfs for many days during July, August, and September 1958.

Remarks.--Some small diversions for irrigation and domestic use. No 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
1955	-	-	-	-	-	-	-	-	-	3.31	2.73	2.58	-
1956	8.24	43.8	87.1	76.9	21.2	41.2	19.2	6.07	5.10	2.95	2.89	3.45	26.6
1957	11.5	15.4	38.7	25.1	49.5	50.1	22.0	8.24	4.79	3.15	3.31	2.67	19.4
1958	3.71	5.43	19.4	44.2	37.2	15.2	16.3	6.87	2.94	1.95	1.86	2.12	13.0

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1955	-	-	-	-	-	-	-	-	-	204	168	153	-
1956	507	2,600	5,350	4,730	1,220	2,530	1,140	373	304	181	178	205	19,320
1957	709	914	2,380	1,550	2,750	3,080	1,310	507	285	193	203	159	14,040
1958	228	323	1,190	2,720	2,060	935	971	423	175	120	114	126	9,380

Yearly 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
1955	1446	-	-	-	-	-	-	-	-	-	-
1956	1446	240	Dec. 21, 1955	2.3	26.6	2.13	29.01	19,320	20.5	22.31	14,860
1957	1516	194	Feb. 26, 1957	2.2	19.4	1.55	21.04	14,040	16.3	17.65	11,780
1958	1566	180	Jan. 17, 1958	1.7	13.0	1.04	14.08	9,380	-	-	-

1200. Mercer Creek near Bellevue, Wash.

Location.--Lat 47°36'10", long 122°10'55", in NW 1/4 sec. 4, T.24 N., R.5 E., on left bank 40 ft upstream from Northern Pacific Railway trestle, 1 mile southeast of Bellevue, and 1 1/2 miles upstream from mouth.

Drainage area.--12.0 sq mi (revised).

Records available.--June to October 1945, June 1955 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 20 ft (from topographic map). Prior to June 5, 1959, at site 600 ft downstream at different datums.

Average discharge.--5 years (1955-60), 20.8 cfs (15,060 acre-ft per year).

Extremes.--1945, 1955-60: Maximum discharge, 242 cfs Dec. 20, 1955 (gage height, 5.08 ft, site and datum then in use); minimum, 1.9 cfs Aug. 6, 1958 (gage height, 1.52 ft, site and datum then in use).

Remarks.--Many small diversions for irrigation and domestic use. No 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													
1952													
1953													
1954													
1955	-	-	-	-	-	-	-	-	-	5.25	4.26	5.05	-
1956	15.5	37.1	59.5	60.5	25.4	37.7	18.6	11.0	11.1	5.75	5.57	7.76	24.7
1957	17.4	18.2	25.7	21.1	47.6	38.9	21.9	8.79	8.51	5.86	6.08	5.72	18.6
1958	10.9	13.2	29.0	56.3	47.2	22.9	20.6	8.45	5.34	3.22	3.44	5.39	18.7
1959	8.78	26.4	36.7	61.7	32.8	24.1	22.5	15.8	9.53	7.04	5.50	11.7	21.8
1960	13.0	30.7	43.0	30.6	36.4	23.5	21.4	15.7	7.83	4.76	6.97	6.95	20.0

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951													
1952													
1953													
1954													
1955	-	-	-	-	-	-	-	-	-	323	262	301	-
1956	955	2,210	3,660	3,720	1,460	2,320	1,110	675	661	354	343	462	17,930
1957	1,070	1,080	1,580	1,300	2,640	2,390	1,300	540	506	360	374	340	13,480
1958	669	787	1,780	3,460	2,620	1,410	1,230	520	319	198	211	321	13,520
1959	540	1,570	2,260	3,790	1,820	1,480	1,340	969	567	433	338	696	15,800
1960	802	1,850	2,640	1,880	2,090	1,440	1,270	963	466	293	428	414	14,520

Yearly 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	1446	-	-	-	-	-	-	-	-	-	-
1956	1446	242	Dec. 20, 1955	4.4	24.7	2.06	26.00	17,930	20.4	23.19	14,840
1957	1516	180	Feb. 25, 1957	3.4	18.6	1.55	21.07	13,480	18.0	20.29	12,990
1958	1566	238	Jan. 17, 1958	2.5	18.7	1.56	21.14	13,520	20.2	22.91	14,660
1959	1636	220	Jan. 24, 1959	3.5	21.8	1.82	24.72	15,800	23.1	26.13	16,700
1960	1716	210	Dec. 15, 1959	4.3	20.0	1.67	22.71	14,520	-	-	-

1210. Issaquah Creek near Issaquah, Wash.

Location.--Lat 47°28'55", long 122°02'10", in NW $\frac{1}{4}$ sec.15, T.23 N., R.6 E., on left bank $\frac{3}{4}$ miles south of Issaquah and 4 miles upstream from East Fork Issaquah Creek.

Drainage area.--26.4 sq mi (revised).

Records available.--June 1945 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 210 ft (from topographic map). Prior to Oct. 1, 1948, at datum 0.99 ft higher. Oct. 1, 1948, to July 6, 1952, at site 70 ft upstream at datum 0.41 ft lower.

Average discharge.--15 years (1945-60), 70.3 cfs (50,900 acre-ft per year).

Extremes.--1945-60: Maximum discharge, 2,610 cfs Feb. 9 or 10, 1951 (gage height, 6.08 ft, site and datum then in use); minimum, 9.4 cfs Aug. 21, 1958 (gage height, 0.58 ft).

Remarks.--Many small diversions for irrigation and domestic use above station. No 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	47.4	116	145	171	252	91.5	43.5	39.1	25.1	16.2	14.4	14.8	80.2
1952	33.8	50.5	81.6	64.2	95.2	80.6	44.3	30.5	21.2	15.5	12.6	11.8	45.0
1953	12.2	13.0	17.3	145	119	56.8	61.6	58.4	55.3	25.2	18.8	15.2	49.4
1954	28.0	98.7	164	157	137	75.7	72.1	33.7	48.5	38.0	23.3	29.9	75.1
1955	21.4	52.4	74.0	85.9	109	66.9	113	70.3	43.0	38.6	26.2	20.0	59.7
1956	67.2	157	211	186	83.9	143	74.4	33.0	33.9	21.6	17.5	18.9	87.4
1957	55.5	58.5	130	69.5	143	140	69.0	39.9	29.5	21.8	18.4	14.8	65.5
1958	22.7	39.8	82.6	139	127	55.5	65.0	28.3	19.8	14.1	12.1	13.8	51.2
1959	19.1	77.8	129	185	90.7	81.0	92.2	66.7	40.9	26.0	16.7	39.8	72.1
1960	49.8	140	144	88.9	105	77.3	81.1	80.1	33.5	20.8	20.0	19.8	71.6

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2,910	6,900	8,930	10,490	13,980	5,630	2,590	2,400	1,490	997	884	880	58,080
1952	2,080	3,010	5,020	3,950	5,470	4,950	2,630	1,880	1,260	956	777	704	32,690
1953	750	777	1,070	8,920	6,830	3,490	3,670	3,590	3,290	1,550	1,150	902	35,790
1954	1,720	5,870	10,070	9,650	7,620	4,650	4,290	2,070	2,890	2,330	1,430	1,780	54,370
1955	1,320	3,120	4,550	5,280	6,060	4,110	6,740	4,320	2,560	2,370	1,610	1,190	43,230
1956	4,130	9,340	12,960	11,410	4,820	8,770	4,430	2,030	2,020	1,330	1,080	1,120	63,440
1957	3,410	3,480	8,020	4,270	7,920	8,610	4,110	2,460	1,760	1,330	1,130	882	47,380
1958	1,400	2,370	5,060	8,530	7,070	3,410	3,670	1,740	1,180	866	745	823	37,080
1959	1,170	4,630	7,960	11,390	5,040	4,980	5,480	4,100	2,440	1,600	1,030	2,370	52,190
1960	3,060	8,320	8,850	5,470	6,070	4,750	4,830	4,920	2,000	1,280	1,230	1,180	51,960

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	-	-	-	-	-	-	-	91.9	47.98	66,530	
1951	1216	2,610	(a)	11.5	80.2	3.08	41.90	58,080	68.3	35.67	49,450
1952	1246	342	Feb. 4, 1952	11	45.0	1.73	23.58	32,690	34.7	18.16	25,170
1953	1286	580	Jan. 31, 1953	11	49.4	1.90	25.81	35,790	70.3	36.68	50,850
1954	1346	781	Dec. 9, 1953	15.5	75.1	2.89	39.21	54,370	63.1	32.95	45,700
1955	1396	740	Feb. 8, 1955	17.5	59.7	2.30	31.19	43,230	83.8	43.10	60,670
1956	1446	1,050	Dec. 11, 1955	15.5	87.4	3.31	45.06	63,440	71.5	36.88	51,920
1957	1516	596	Feb. 25, 1957	14	65.5	2.48	33.66	47,380	57.1	29.35	41,320
1958	1566	566	Jan. 17, 1958	11.5	51.2	1.94	26.32	37,080	58.0	29.81	41,990
1959	1636	680	Jan. 24, 1959	13	72.1	2.73	37.07	52,190	81.0	41.68	58,660
1960	1716	1,130	Dec. 15, 1959	16	71.6	2.71	36.91	51,960	-	-	-

a Feb. 9 or 10, 1951.

1230. Cottage Lake Creek near Redmond, Wash.

Location (revised).--Lat 47°44'15", long 122°04'45", in NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.18, T.26 N., R.6 E., on left bank 100 ft downstream from county road bridge, 2 miles upstream from mouth, and $\frac{1}{2}$ miles northeast of Redmond.

Drainage area.--11.0 sq mi.

Records available.--June to September 1945, June 1955 to September 1960. Prior to June 1955, at different datum.

Gage.--Water-stage recorder. Altitude of gage is 210 ft (from topographic map).

Average discharge.--5 years (1955-60), 14.2 cfs (10,280 acre-ft per year).

Extremes.--1945, 1955-60: Maximum discharge, 132 cfs Jan. 6, 1956, and on or about Feb. 26, 1957; maximum gage height, 2.19 ft Jan. 6, 1956; minimum discharge, 3.3 cfs Aug. 2, 1959; minimum gage height, 0.68 ft Aug. 19, 1956.

Remarks.--Several small diversions for irrigation and domestic use above station. Some natural regulation in 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													
1952													
1953													
1954	-	-	-	-	-	-	-	-	-	8.62	5.64	6.22	-
1955													
1956	9.10	20.2	50.1	47.8	16.9	19.8	15.7	9.07	10.1	6.10	6.07	6.78	18.2
1957	10.0	11.7	14.3	12.3	30.8	29.2	16.4	8.36	7.36	6.39	5.93	5.87	13.1
1958	7.56	9.75	15.1	21.1	27.6	15.2	14.2	7.87	5.92	4.31	4.23	4.31	11.4
1959	6.84	13.4	17.6	37.3	21.7	19.2	17.0	13.8	9.45	7.33	5.48	6.70	14.6
1960	7.85	18.3	24.9	18.8	31.8	13.7	11.9	12.8	9.05	5.68	5.59	5.98	13.8

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	-	-	-	-	-	-	-	-	-	530	347	370	-
1955													
1956	560	1,200	3,080	2,940	975	1,220	933	558	604	375	373	404	13,220
1957	618	693	881	758	1,710	1,800	973	514	438	393	365	349	9,490
1958	465	580	927	1,300	1,530	934	844	484	352	265	260	292	8,230
1959	421	799	1,080	2,290	1,210	1,180	1,010	846	562	451	337	398	10,580
1960	483	1,090	1,530	1,160	1,830	843	707	785	539	348	344	356	10,020

Yearly 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	1446	-	-	-	-	-	-	-	-	-	-
1956	1446	132	Jan. 6, 1956	4.8	18.2	1.65	22.52	13,220	14.6	18.01	10,570
1957	1516	132	(a)	5.6	13.1	1.19	16.17	9,490	12.8	15.80	9,270
1958	1566	59	Jan. 16, 1958	3.9	11.4	1.04	14.02	8,230	11.8	14.59	8,560
1959	1638	85	Jan. 24, 1959	4.4	14.6	1.33	18.05	10,580	15.7	19.41	11,390
1960	1716	110	Nov. 20, 1959	4.7	13.8	1.25	17.07	10,020	-	-	-

a Probably Feb. 26, 1957.

1240. Evans Creek above mouth, near Redmond, Wash.

Location.--Lat 47°40'30", long 122°04'50", on line between secs.6 and 7, T.25 N., R.5 E., on right bank 25 ft upstream from county bridge, three-quarters of a mile upstream from mouth, and 2 miles east of Redmond.

Drainage area.--13.0 sq mi.

Records available.--June 1955 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 50 ft (from topographic map).

Average discharge.--5 years (1955-60), 22.8 cfs (16,510 acre-ft per year).

Extremes.--1955-60: Maximum discharge, 145 cfs Dec. 22, 1955 (gage height, 3.49 ft); minimum, 5.3 cfs Aug. 8, 1959; minimum gage height, 1.46 ft Sept. 1, 2, 1957.

Remarks.--Several small diversions for irrigation and domestic use. No 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													
1952													
1953													
1954													
1955	-	-	-	-	-	-	-	-	-	9.65	7.81	8.09	-
1956	16.0	41.4	68.7	67.2	29.3	42.5	24.9	13.8	13.2	8.69	7.89	9.93	28.7
1957	13.8	15.8	25.2	21.0	46.2	47.0	26.3	13.4	10.3	8.45	7.73	7.44	20.1
1958	10.3	13.4	18.1	42.0	45.0	25.7	27.7	12.8	8.63	6.36	6.17	7.37	18.5
1959	9.16	24.5	42.4	62.1	41.3	34.3	26.6	18.7	12.7	7.79	7.00	10.3	24.7
1960	11.5	26.6	47.5	30.6	41.2	23.4	23.3	22.7	12.7	7.46	8.52	9.51	22.0

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951													
1952													
1953													
1954													
1955	-	-	-	-	-	-	-	-	-	593	480	481	-
1956	983	2,470	4,220	4,130	1,680	2,620	1,480	847	765	534	485	591	20,820
1957	851	941	1,550	1,290	2,570	2,890	1,560	826	611	519	475	443	14,530
1958	632	799	1,110	2,580	2,500	1,580	1,650	787	513	391	379	438	13,360
1959	563	1,460	2,610	3,820	2,290	2,110	1,580	1,150	754	479	430	614	17,860
1960	709	1,580	2,920	1,880	2,370	1,440	1,390	1,400	753	459	524	566	15,990

Yearly 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	1446	-	-	-	-	-	-	-	-	-	-	-
1956	1446	145	Dec. 22, 1955	7.2	28.7	2.21	30.03	20,820	22.7	23.79	16,490	
1957	1516	136	Feb. 26, 1957	6.9	20.1	1.55	20.96	14,530	19.0	19.79	13,720	
1958	1566	103	Jan. 17, 1958	5.8	18.5	1.42	19.26	13,360	21.3	22.27	15,450	
1959	1636	127	Jan. 25, 1959	5.8	24.7	1.90	25.75	17,860	25.5	26.60	18,440	
1960	1716	137	Dec. 16, 1959	6.5	22.0	1.69	23.07	15,990	-	-	-	

1245. Bear Creek at Redmond, Wash.

Location.--Lat 47°40'10", long 122°06'30", at SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 12, T.25 N., R.5 E., on right bank 300 ft downstream from State Highway 2, half a mile east of Redmond, and three-quarters of a mile upstream from mouth.

Drainage area.--47.5 sq mi.

Records available.--June 1945 to November 1950, June 1955 to October 1958.

Gage.--Water-stage recorder. Altitude of gage is 30 ft (from topographic map). Prior to June 1955, at different datum.

Average discharge.--8 years (1945-50, 1955-58), 82.4 cfs (59,660 acre-ft per year).

Extremes.--1945-50, 1955-58: Maximum discharge, 654 cfs Mar. 5, 1950; maximum gage height, 6.53 ft Jan. 22, 1950, datum then in use; minimum discharge, 13 cfs Aug. 26, 1947; minimum gage height, 1.49 ft Sept. 7, 1958.

Remarks.--Many small diversions for irrigation and domestic use. Minor regulation by fish trap half 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
1955	-	-	-	-	-	-	-	-	-	38.5	25.1	22.8	-
1956	49.1	129	249	257	105	137	94.2	47.6	45.9	26.7	24.1	29.6	99.8
1957	49.9	60.0	83.9	73.0	182	182	106	50.5	32.4	24.2	25.8	20.9	73.5
1958	34.1	46.3	73.5	171	192	96.5	99.0	40.3	24.2	17.8	18.9	21.1	68.7

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1955	-	-	-	-	-	-	-	-	-	2,370	1,540	1,360	-
1956	3,020	7,680	15,330	15,830	6,010	8,450	5,600	2,930	2,730	1,640	1,480	1,760	72,440
1957	3,070	3,570	5,160	4,490	10,090	11,200	6,310	3,100	1,930	1,490	1,590	1,240	53,240
1958	2,100	2,750	4,520	10,490	10,640	5,940	5,890	2,480	1,440	1,090	1,160	1,250	49,750

Yearly 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
1955	1446	-	-	-	-	-	-	-	-	-	-
1956	1446	560	Dec. 22, 1955	19	99.8	2.10	28.60	72,440	80.2	22.99	58,230
1957	1516	578	Feb. 26, 1957	18.5	73.5	1.55	21.01	53,240	70.2	20.06	50,810
1958	1566	492	Jan. 17, 1958	16	68.7	1.45	19.64	49,750	-	-	-

Location.--Lat 47°40'10", long 122°07'50", in NE $\frac{1}{4}$ sec.11, T.25 N., R.5 E., on right bank at highway crossing 500 ft downstream from Bear Creek, half a mile west of Redmond, and $\frac{1}{2}$ miles downstream from outlet of Sammamish Lake.

Records available.--January 1939 to April 1957.

Gage.--Water-stage recorder. Datum of gage is 23.08 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Nov. 14, 1946, May 30 to Nov. 15, 1950, staff gages at sites $\frac{1}{2}$ miles or 2 miles uplake on west shore of lake at datum approximately 2.0 ft higher. Nov. 14, 1946, to July 8, 1947, water-stage recorder at present site at datum 1.52 ft higher.

Extremes.--1939-57: Maximum discharge, 1,520 cfs Feb. 11, 1951 (gage height, 9.17 ft); minimum, 43 cfs Aug. 20, 21, 24, 1951.

Remarks.--Some small diversions from tributaries for irrigation and domestic use. Slight regulation on some tributaries.

[illegible][illegible][illegible]

1260. North Creek near Bothell, Wash.

Location.--Lat 47°47'30", long 122°11'45", on line between secs.29 and 32, T.27 N., R.5 E., on left bank 2 miles north of Bothell and 2½ miles upstream from mouth.

Drainage area.--23.7 sq mi (revised).

Records available.--June 1945 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 70 ft (from topographic map). Apr. 5, 1950, to Sept. 30, 1951, at datum 0.59 ft higher.

Average discharge.--15 years (1945-60), 36.2 cfs (26,210 acre-ft per year).

Extremes.--1945-60: Maximum discharge, 680 cfs Mar. 5 or 6, 1950 (gage height, 7.0 ft, present datum, from high-water mark, from information by local resident); minimum, 1.0 cfs Aug. 10, 1946 (gage height, 0.45 ft, present datum).

Remarks.--Many small diversions for irrigation and domestic use. Slight regulation 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
1951	19.5	51.2	85.9	104	109	53.1	23.6	19.1	9.73	6.26	6.85	10.0	41.2
1952	19.5	25.4	55.5	51.2	53.5	52.6	19.6	12.6	10.2	7.47	7.59	7.09	26.8
1953	7.74	9.99	16.1	69.1	37.2	30.6	31.8	17.8	20.0	8.70	7.12	9.34	22.0
1954	21.4	49.6	73.4	104	129	51.6	27.8	14.9	21.4	16.9	11.4	11.6	43.9
1955	10.9	51.5	67.2	51.6	54.0	37.0	45.5	29.3	17.0	15.4	7.54	8.20	32.8
1956	24.2	53.6	129	136	64.2	59.0	31.7	17.8	26.6	8.68	8.58	11.6	47.7
1957	25.5	31.6	41.6	39.8	99.7	104	47.8	19.3	13.1	9.43	9.03	8.17	37.0
1958	15.3	19.5	36.5	76.1	103	47.9	39.8	13.2	9.71	7.06	5.41	7.32	31.3
1959	13.3	33.8	43.4	115	64.5	51.4	39.6	31.5	19.0	8.32	6.40	10.3	36.3
1960	16.1	39.0	65.7	56.4	78.1	36.6	33.6	24.9	12.4	6.38	10.6	9.67	32.3

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,200	3,050	5,280	6,390	6,060	3,260	1,400	1,180	579	385	421	598	29,800
1952	1,200	1,510	3,410	3,150	3,080	3,250	1,170	776	607	459	454	422	19,490
1953	476	595	990	4,250	2,070	1,880	1,880	1,090	1,190	535	438	556	15,950
1954	1,320	2,950	4,510	6,370	7,180	3,180	1,660	913	1,270	1,040	704	689	31,790
1955	668	3,070	4,130	3,170	3,000	2,260	2,710	1,800	1,010	950	464	488	23,740
1956	1,490	3,190	7,930	8,380	3,690	3,630	1,890	1,090	1,580	534	527	691	34,620
1957	1,570	1,680	2,560	2,450	5,540	6,380	2,840	1,190	790	580	555	486	26,810
1958	939	1,160	2,240	4,680	5,700	2,950	2,370	811	578	434	333	436	22,630
1959	816	2,010	2,670	7,080	3,580	3,160	2,360	1,940	1,130	512	393	613	26,260
1960	992	2,320	4,040	3,470	4,490	2,250	2,000	1,530	740	392	652	575	23,450

Yearly 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	1216	320	Feb. 9, 1951	5.1	41.2	1.71	23.20	29,800	49.2	27.69	35,600
1952	1246	177	Feb. 1, 1952	5.6	26.8	1.11	15.14	19,490	36.5	20.54	26,390
1953	1286	172	Jan. 8, 1953	5.3	22.0	1.913	12.40	15,950	21.2	11.99	15,430
1954	1346	346	Jan. 6, 1954	8.5	43.9	1.82	24.75	31,790	51.3	17.64	22,670
1955	1396	258	Feb. 8, 1955	5.9	32.8	1.36	18.46	23,740	42.6	24.02	30,870
									39.3	22.53	28,480
1956	1446	360	Jan. 6, 1956	7.2	47.7	2.01	27.40	34,620	38.6	22.17	28,020
1957	1516	387	Feb. 24, 1957	6.9	37.0	1.56	21.20	26,810	34.7	19.88	25,140
1958	1566	266	Jan. 16, 1958	4.8	31.3	1.32	17.98	22,630	32.8	18.80	23,790
1959	1636	319	Jan. 9, 1959	5.7	36.3	1.53	20.78	26,260	38.8	22.25	28,120
1960	1716	289	Dec. 15, 1959	5.7	32.3	1.36	18.57	23,450	-	-	-

1265. Sammamish River at Bothell, Wash.

Location.--Lat 47°45'20", long 122°11'35", in NW $\frac{1}{4}$ sec. 8, T.26 N., R.5 E., on left bank in Bothell, a quarter of a mile downstream from North Creek and $3\frac{1}{2}$ miles upstream from mouth.

Drainage area.--209 sq mi (revised).

Records available.--October 1939 to September 1960.

Gage.--Water-stage recorder. Datum of gage is at mean lower low water at Seattle (Corps of Engineers bench mark), or 6.54 ft below mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Dec. 28, 1939, staff gages at same site and datum.

Average discharge.--21 years (1939-60), 367 cfs (265,700 acre-ft per year).

Extremes.--1939-60: Maximum discharge, 1,910 cfs Jan. 6, 1956 (gage height, 32.22 ft), but may have been higher Feb. 12 or 13, 1951; minimum, 62 cfs Aug. 22, 23, 1951 (gage height, 22.92 ft).

Remarks.--Some small diversions from tributaries for irrigation and domestic use. Slight regulation on some 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	193	461	907	1,026	1,351	731	396	256	163	101	76.6	82.8	474
1952	151	215	432	427	556	468	334	213	142	112	80.5	74.8	266
1953	77.8	93.1	131	508	680	400	398	288	248	142	95.8	95.9	260
1954	171	356	768	992	990	680	455	269	243	194	140	148	448
1955	136	307	464	517	614	446	558	415	252	200	136	114	343
1956	215	544	1,152	1,334	675	688	569	283	215	130	102	115	502
1957	188	305	446	447	681	944	568	266	185	126	103	92.3	364
1958	129	186	301	675	902	599	450	253	148	101	72.3	82.0	321
1959	117	280	582	1,017	848	620	533	400	223	171	129	141	420
1960	193	394	791	624	781	496	450	368	236	150	121	129	393

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	11,860	27,450	55,750	63,120	75,020	44,940	23,570	15,720	9,680	6,230	4,710	4,920	343,000
1952	9,250	12,780	26,570	26,230	31,950	28,790	19,890	13,080	8,440	6,890	4,950	4,450	193,300
1953	4,780	5,540	8,080	31,140	37,790	24,610	23,680	17,680	14,770	8,710	5,890	5,700	188,400
1954	10,540	21,200	47,240	61,010	54,980	41,820	27,100	16,560	14,440	11,950	8,600	8,820	324,300
1955	8,350	18,260	28,560	31,770	34,100	27,430	31,990	25,490	15,000	12,270	8,390	6,790	248,400
1956	13,230	32,360	70,810	82,020	38,850	42,280	33,830	17,380	12,820	8,010	6,290	6,830	364,700
1957	11,590	18,170	27,430	27,480	37,800	58,030	35,020	17,590	11,000	7,730	6,350	5,490	265,700
1958	7,920	11,070	18,490	41,480	50,110	36,850	26,780	15,540	8,820	6,230	4,450	4,880	232,600
1959	7,200	16,680	35,810	62,540	47,110	38,090	31,740	24,580	13,290	10,540	7,320	8,380	305,900
1960	11,860	23,440	48,630	38,360	44,910	30,510	26,780	22,640	14,040	9,220	7,460	7,650	285,500

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	-	-	-	-	-	-	-	531	35.19	384,800		
1951	1216	a1,900	(b)	64	474	2.31	31.37	343,000	410	27.13	297,000	
1952	1246	779	Feb. 4, 1952	67	266	1.30	17.68	193,300	225	14.92	163,100	
1953	1266	889	Feb. 4, 1953	71	260	1.27	17.25	186,400	344	22.78	249,000	
1954	1346	1,500	Jan. 6, 1954	113	448	2.19	29.66	324,300	415	27.48	300,400	
1955	1396	1,100	Feb. 8, 1955	105	343	1.67	22.72	248,400	428	27.78	309,600	
1956	1446	1,910	Jan. 6, 1956	92	502	2.40	32.72	364,700	421	27.41	305,500	
1957	1516	1,530	Feb. 26, 1957	87	364	1.74	23.66	263,700	337	21.89	244,000	
1958	1566	1,160	Jan. 17, 1958	64	321	1.54	20.87	232,600	352	22.87	254,800	
1959	1636	1,400	Jan.10,25, 1959	89	420	2.01	27.27	303,900	453	29.43	328,100	
1960	1716	1,310	Dec.15,16, 1959	107	393	1.88	25.61	285,500	-	-	-	

a Estimated.

b Feb. 12 and/or 13, 1951.

1330. South Fork Skykomish River near Index, Wash.

Location.--Lat 47°48'20", long 121°32'40", in NE¹ sec.29, T.27 N., R.10 E., on right bank 600 ft upstream from Sunset Falls, 1 mile southeast of Index, and 2 miles upstream from confluence with North Fork. Discharge measurements made about 2 miles upstream from gage.

Drainage area.--355 sq mi.

Records available.--October 1902 to September 1905, April 1911 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 574.80 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Mar. 15, 1934, at site 300 ft downstream. Oct. 6, 1902, to Sept. 30, 1905, staff gage at datum 0.39 ft higher and Apr. 26, 1911, to Sept. 30, 1913, at datum 1 ft higher. Oct. 1, 1913, to Sept. 13, 1920, staff gage, Sept. 14, 1920, to Oct. 1, 1921, water-stage recorder, and Jan. 23, 1922, to Mar. 14, 1934, staff gage, at present datum.

Average discharge.--52 years (1902-5, 1911-60), 2,405 cfs (1,741,000 acre-ft per year).

Extremes.--1902-5, 1911-60: Maximum discharge, 55,000 cfs Dec. 12, 1921 (gage height, 22.8 ft, from high-water marks, site then in use), from rating curve extended above 14,000 cfs by logarithmic plotting; minimum, 165 cfs Nov. 29, 1952 (gage height, 1.35 ft). Flood in 1897 reached a stage of about 5 ft higher than that of Dec. 12, 1921 (discharge, about 70,000 cfs).

Remarks.--Small diversion for domestic use. No 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	2,945	3,926	4,321	2,268	4,844	1,419	3,059	4,622	3,614	1,363	536	589	2,775
1952	2,682	2,048	1,386	873	1,891	1,123	2,973	4,563	3,340	1,728	587	376	1,962
1953	267	316	892	6,868	3,375	1,398	2,410	4,057	3,860	3,172	925	603	2,343
1954	1,410	2,843	4,652	2,126	2,778	1,593	2,564	4,893	5,477	5,075	2,007	1,264	3,059
1955	1,534	3,502	1,948	1,354	2,188	913	1,964	3,710	6,865	4,643	1,663	668	2,575
1956	3,383	5,022	3,373	1,450	746	1,429	4,031	6,929	6,034	4,032	948	885	3,193
1957	2,928	2,625	5,679	1,029	1,652	1,887	3,214	5,694	3,925	1,403	822	403	2,588
1958	603	1,251	2,600	2,429	2,455	1,334	2,522	5,023	2,642	832	434	714	1,900
1959	1,855	5,603	4,860	4,148	1,446	2,055	4,621	4,491	5,509	3,096	831	2,971	3,460
1960	3,875	6,040	4,051	1,170	1,997	1,655	3,041	3,860	4,043	1,516	709	610	2,710

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	181,100	233,600	265,700	139,500	269,000	87,260	182,000	284,200	215,000	83,820	32,930	35,040	2,009,000
1952	164,900	121,900	85,210	53,680	108,800	69,020	176,900	280,600	180,106	300,106	36,120	22,400	1,425,000
1953	16,410	18,850	54,840	22,300	87,400	85,970	143,400	249,500	229,700	195,100	56,860	35,850	1,696,000
1954	86,700	169,200	285,000	130,700	54,300	97,920	152,500	300,800	325,900	312,000	123,400	75,230	2,215,000
1955	94,310	208,400	119,800	83,280	21,500	56,130	116,900	228,100	408,500	285,500	102,300	39,770	1,664,000
1956	208,000	298,800	207,400	89,140	42,910	87,870	239,800	426,000	359,100	247,900	58,280	52,670	2,318,000
1957	180,000	156,200	349,200	63,250	91,750	116,100	191,300	350,100	227,600	86,280	38,270	24,000	1,874,000
1958	37,050	74,450	159,800	149,400	36,400	82,010	150,100	308,800	157,200	51,170	26,680	42,510	1,376,000
1959	114,000	333,400	298,800	254,900	80,320	26,400	274,900	276,100	327,800	301,400	51,100	76,800	2,505,000
1960	238,300	359,400	249,100	71,940	114,900	101,700	181,000	237,300	240,600	93,240	43,590	36,320	1,967,000

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	-	-	-	-	-	-	-	-	3,420	130.78	2,476,000
1951	121.6	33,300	Feb. 9, 1951	325	2,775	7.82	106.12	2,009,000	2,349	89.84	1,701,000
1952	124.6	7,600	Oct. 3, 1951	302	1,962	5.53	75.24	1,425,000	1,574	60.35	1,143,000
1953	128.6	25,100	Jan. 31, 1953	190	2,343	6.60	89.58	1,696,000	2,967	113.45	2,148,000
1954	134.6	17,800	Dec. 9, 1953	640	3,059	8.62	116.98	2,215,000	2,894	110.67	2,095,000
1955	139.6	16,900	Feb. 8, 1955	465	2,575	7.25	98.47	1,664,000	2,978	113.87	2,156,000
1956	144.6	27,900	Nov. 4, 1955	455	3,193	8.99	122.42	2,318,000	3,153	120.90	2,289,000
1957	151.6	31,900	Dec. 10, 1956	333	2,588	7.29	98.98	1,874,000	2,017	77.11	1,460,000
1958	156.6	8,520	May 25, 1958	324	1,900	5.35	72.65	1,376,000	2,556	97.73	1,850,000
1959	163.6	24,400	Nov. 12, 1958	400	3,460	9.75	132.28	2,505,000	3,599	137.60	2,606,000
1960	171.6	51,800	Dec. 15, 1959	428	2,710	7.63	103.91	1,967,000	-	-	-

1345. Skykomish River near Gold Bar, Wash.

Location.--Lat 47°50'15", long 121°40'00", in SW 1/4 sec. 9, T.27 N., R.9 E., on right bank 2 miles southeast of Gold Bar and 5 miles upstream from Wallace River and Startup.

Drainage area.--535 sq mi.

Records available.--September 1928 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 209.26 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.--32 years (1928-60), 3,899 cfs (2,823,000 acre-ft per year).

Extremes.--1928-60: Maximum discharge, 88,700 cfs Dec. 21, 1933 [gage height, 21.3 ft], from rating curve extended above 32,000 cfs by logarithmic plotting; minimum, 315 cfs Nov. 29, 1952; minimum gage height, 2.73 ft Dec. 1, 1936.

Remarks.--No regulation. Small diversion 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	4,568	6,019	6,740	3,552	8,108	2,315	4,617	6,964	5,558	2,132	843	1,105	4,339
1952	4,440	3,213	2,192	1,383	3,101	1,775	4,593	7,192	5,430	2,850	991	646	3,146
1953	488	606	1,673	11,030	5,227	2,318	3,848	6,376	6,020	5,090	1,608	1,121	3,782
1954	2,648	4,728	7,437	3,535	4,595	2,553	3,844	7,510	8,428	7,841	3,304	2,220	4,873
1955	2,591	5,938	3,207	2,204	3,465	1,469	3,099	5,590	10,590	7,304	2,743	1,150	4,106
1956	5,516	7,903	5,362	2,475	1,548	2,378	6,177	10,720	9,534	6,326	1,620	1,586	5,086
1957	5,020	4,320	9,154	1,652	2,793	2,965	4,761	8,818	5,737	2,127	1,006	635	4,095
1958	1,076	2,157	4,229	3,883	3,895	2,037	3,907	7,988	4,237	1,291	654	1,226	3,043
1959	3,204	8,915	7,779	6,557	2,255	3,203	7,553	7,079	8,835	5,035	1,422	4,942	5,570
1960	6,565	10,200	6,737	2,053	3,258	2,685	4,845	6,354	6,628	2,547	1,215	1,064	4,507

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	280,900	358,200	414,400	218,400	450,300	142,400	274,700	428,200	330,700	131,100	51,850	60,420	3,142,000
1952	273,000	91,200	34,900	85,040	178,400	90,090	100,273	300,441	000,323	100,175	300	60,930	2,788,000
1953	30,030	36,090	02,800	678,300	290,300	42,500	229,000	392,100	358,200	313,000	98,900	66,690	2,834,000
1954	162,800	281,300	457,300	217,400	255,200	157,000	228,800	449,500	501,500	482,100	203,100	32,100	3,528,000
1955	159,300	353,400	197,200	135,500	192,400	90,350	184,400	343,700	630,000	449,100	168,600	68,410	2,972,000
1956	339,200	470,300	329,700	152,200	77,510	146,200	367,600	659,100	567,300	389,000	99,630	94,400	3,692,000
1957	308,600	257,100	562,800	101,600	155,100	182,300	283,300	542,200	341,400	130,800	61,880	37,790	2,965,000
1958	66,140	128,300	260,000	238,800	216,300	25,300	232,500	491,100	252,100	79,410	40,240	72,970	2,203,000
1959	197,000	530,500	478,300	403,200	25,300	198,900	449,500	435,300	25,700	309,600	87,430	294,100	4,033,000
1960	403,700	607,100	414,200	126,200	187,400	165,100	288,300	590,700	394,400	156,600	74,700	63,300	3,272,000

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	-	-	-	-	-	-	-	-	5,357	135.91	3,879,000
1951	1216	65,600	Feb. 10, 1951	479	4,339	8.11	110.09	3,142,000	3,711	94.17	2,687,000
1952	1246	13,300	Oct. 5, 1951	535	3,146	5.88	80.03	2,284,000	2,553	64.96	1,854,000
1953	1268	40,600	Jan. 31, 1953	385	3,782	7.07	95.94	2,738,000	4,794	121.62	4,707,000
1954	1346	27,500	Dec. 9, 1953	1,190	4,873	9.11	123.66	3,528,000	4,809	116.93	2,337,000
1955	1396	30,600	Feb. 8, 1955	625	4,106	7.67	104.17	2,972,000	4,699	119.23	3,402,000
1956	1446	46,900	Dec. 11, 1955	814	5,086	9.51	129.39	3,692,000	5,071	129.02	3,681,000
1957	1516	59,100	Dec. 10, 1956	528	4,095	7.65	103.91	2,965,000	3,164	80.28	2,291,000
1958	1566	14,100	Jan. 17, 1958	499	3,043	5.69	77.22	2,203,000	4,081	103.55	2,955,000
1959	1656	42,100	Nov. 12, 1958	704	5,570	10.4	141.32	4,033,000	5,873	149.01	4,252,000
1960	1716	78,800	Nov. 13, 1959	738	4,507	8.42	114.66	3,272,000	-	-	-

1350. Wallace River at Gold Bar, Wash.

Location.--Lat 47°51'50", long 121°41'45", in NE $\frac{1}{4}$ sec.6, T.27 N., R.9 E., on right bank (revised) 30 ft downstream from highway bridge, a quarter of a mile north of Gold Bar, and $1\frac{1}{4}$ miles upstream from Olney Creek.

Drainage area.--19.8 sq mi.

Records available.--October 1928 to September 1933, July 1946 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Altitude of gage is 200 ft (from topographic map). December 1928 to Sept. 30, 1933, staff gage 50 ft upstream at different datum.

Average discharge.--19 years (1928-33, 1946-60), 161 cfs (116,600 acre-ft per year).

Extremes.--1928-33, 1946-60: Maximum discharge, 3,220 cfs Dec. 14, 1959 (gage height, 8.22 ft, from rating curve extended above 1,000 cfs on basis of slope-area measurement of peak flow; minimum recorded, 9.2 cfs Oct. 18, 19, 1952; minimum gage height observed, 0.32 ft Aug. 27, Sept. 3-5, 1930, site and datum then in use.

Remarks.--Some natural regulation in Wallace Lake. No diversion above station. Records of water temperatures for the period July 1955 to September 1960 are published in reports of 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	232	266	162	285	128	187	203	103	26.5	14.6	51.4	150
1952	244	124	100	75.5	139	96.7	180	233	158	66.7	30.0	26.5	123
1953	17.2	31.2	132	479	183	119	199	228	192	87.6	33.3	54.4	146
1954	154	213	350	171	223	107	142	205	287	164	91.7	121	185
1955	92.3	263	168	109	158	60.2	172	260	394	257	83.9	37.8	171
1956	228	263	248	152	63.5	105	260	301	264	105	26.3	72.4	174
1957	242	215	359	59.5	174	180	267	298	148	61.0	30.4	19.2	171
1958	82.7	147	183	214	230	110	209	193	84.0	30.7	12.8	49.3	128
1959	200	379	311	332	117	155	330	273	226	88.0	38.2	227	223
1960	240	402	264	132	143	105	170	304	172	37.6	62.0	62.0	174

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	10,320	13,800	16,360	9,940	14,720	7,880	11,130	12,470	6,130	1,630	899	3,080	108,300
1952	15,000	7,390	6,170	4,650	8,010	5,940	10,720	14,320	9,430	4,100	1,850	1,580	89,150
1953	1,080	1,850	8,100	29,440	10,190	7,330	11,830	10,040	11,450	5,390	2,050	3,240	106,000
1954	9,470	12,680	21,490	10,530	12,390	6,570	8,470	12,600	17,090	10,090	5,640	7,180	134,200
1955	5,670	15,680	10,430	6,710	8,750	3,700	10,260	16,010	23,410	15,820	5,160	2,250	123,800
1956	13,990	15,640	15,230	9,370	3,650	6,430	15,480	18,480	15,730	6,480	1,620	4,310	126,400
1957	14,850	12,800	22,100	3,660	9,640	11,040	15,880	18,340	8,790	3,750	1,870	1,140	123,900
1958	5,080	8,720	11,230	13,170	12,780	6,780	12,430	11,880	5,000	1,890	787	2,930	92,660
1959	12,300	22,580	19,140	20,390	6,480	9,580	19,610	16,810	13,420	5,410	2,350	13,530	161,600
1960	14,740	23,900	16,210	8,140	8,230	6,450	10,100	18,660	10,200	2,310	3,810	3,690	126,400

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	-	-	-	-	-	-	-	-	199	136.56	144,200
1951	1216	1,780	Feb. 9, 1951	11	150	7.58	102.58	108,300	133	91.29	96,410
1952	1246	1,450	Oct. 3, 1951	16	123	6.21	84.43	89,150	95.6	67.81	71,610
1953	1286	1,750	Jan. 23, 1953	9.8	148	7.37	100.37	106,000	191	131.26	138,600
1954	1346	1,890	Oct. 31, 1953	36	185	9.34	127.07	134,200	169	115.74	122,200
1955	1396	1,720	Nov. 16, 1954	21	171	8.64	117.17	123,800	189	129.66	136,900
1956	1446	1,930	Nov. 9, 1955	13.5	174	8.79	119.69	126,400	181	124.31	131,300
1957	1516	1,890	Oct. 15, 1956	11.5	171	8.64	117.28	123,900	137	93.89	99,140
1958	1566	1,720	Oct. 30, 1957	10	128	6.46	87.75	92,660	168	115.19	121,600
1959	1636	1,890	Apr. 29, 1959	19	223	11.3	152.98	161,600	224	153.78	162,400
1960	1716	3,220	Dec. 14, 1959	11	174	8.79	119.75	126,400	-	-	-

1375. Sultan River near Startup, Wash.

Location.--Lat 47°58'30", long 121°46'30", in NE $\frac{1}{4}$ sec.28, T.29 N., R.8 E., on left bank $\frac{1}{2}$ miles upstream from intake of Everett water-supply system and $7\frac{1}{2}$ miles north of Startup.

Drainage area.--74.5 sq mi (revised).

Records available.--May 1934 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 750 ft (from topographic map). Prior to July 2, 1934, staff gage at same site and datum.

Average discharge.--26 years (1934-60), 794 cfs (574,800 acre-ft per year).

Extremes.--1934-60: Maximum discharge, 34,600 cfs Feb. 9, 1951 (gage height, 17.22 ft, from high-water mark in well), from rating curve extended above 5,000 cfs on basis of slope-area measurement of peak flow; minimum, 48 cfs Sept. 25, 27, 29, 30, 1942; minimum gage height, 3.32 ft Sept. 22, 23, 24, 1938, Oct. 19, 20, 1952.

Remarks.--No regulation or diversion 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	1,144	1,328	1,502	824	2,589	460	827	908	566	202	96.4	271	865
1952	1,232	720	447	384	766	423	980	1,159	866	457	179	123	644
1953	93.6	176	662	3,143	1,031	538	883	1,052	816	566	229	395	799
1954	990	1,099	1,859	799	1,196	502	845	1,136	1,378	929	499	517	976
1955	608	1,618	806	487	902	260	749	1,353	1,741	1,128	472	216	859
1956	1,567	1,624	1,526	683	279	574	1,176	1,482	1,220	645	190	443	948
1957	1,325	962	2,077	251	729	778	1,194	1,270	778	365	194	116	858
1958	390	666	1,060	1,037	991	465	898	853	506	170	89.5	390	623
1959	987	1,981	1,533	1,517	483	733	1,923	1,178	1,141	559	264	1,407	1,141
1960	1,313	2,202	1,446	631	762	570	881	1,290	906	301	373	319	915

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	70,320	79,000	92,580	50,670	132,700	28,260	49,230	55,830	33,680	12,420	5,920	16,120	626,500
1952	75,770	42,850	27,510	23,620	44,080	26,000	58,310	71,240	51,550	28,070	11,000	7,340	467,300
1953	5,760	10,470	40,690	193,200	57,240	33,110	52,550	64,700	48,570	34,800	14,070	23,480	578,600
1954	60,850	65,400	113,100	49,100	66,430	30,870	50,290	69,870	81,970	57,130	30,690	30,780	706,500
1955	37,400	96,290	49,560	29,920	50,110	15,990	44,550	83,170	103,600	69,370	29,050	12,860	621,900
1956	96,330	96,640	93,820	42,000	16,050	31,580	69,970	91,150	72,610	39,650	11,710	26,350	687,900
1957	81,480	57,230	127,700	15,430	40,500	47,720	71,040	78,110	46,290	22,440	11,950	6,890	606,800
1958	23,990	39,630	65,190	63,750	55,060	28,610	53,430	52,450	30,080	10,460	5,500	23,200	451,400
1959	60,680	117,900	94,240	93,260	26,820	45,050	114,500	72,430	67,880	33,140	16,200	83,710	825,800
1960	80,710	131,000	88,900	38,790	43,810	35,040	52,420	79,330	53,880	18,500	22,920	18,980	664,300

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	-	-	-	-	-	-	-	1,068	194.68	773,500	
1951	1216	34,600	Feb. 9, 1951	62	865	11.6	157.67	626,500	733	133.61	531,000
1952	1246	7,550	Oct. 3, 1951	82	644	8.65	117.62	467,300	521	95.18	378,100
1953	1286	17,700	Jan. 23, 1953	61	799	10.7	145.64	578,600	1,051	191.53	761,100
1954	1346	14,100	Oct. 30, 1953	212	973	13.1	177.79	706,500	898	163.68	650,400
1955	1396	15,000	Feb. 7, 1955	125	859	11.5	156.50	621,900	1,002	182.56	725,400
1956	1446	a34,300	Dec. 11, 1955	92	948	12.7	173.11	687,900	919	167.99	667,500
1957	1516	24,000	Dec. 9, 1956	83	838	11.2	152.72	606,800	648	118.09	469,200
1958	1566	6,500	Oct. 30, 1957	67	623	8.36	113.60	451,400	822	149.84	595,400
1959	1636	20,000	Apr. 29, 1959	130	1,141	15.3	207.83	825,800	1,179	214.83	853,600
1960	1716	28,000	Dec. 15, 1959	94	915	12.3	167.20	664,300	-	-	-

a May have been less because of indeterminate amount of surge.

1410. Woods Creek near Monroe, Wash.

Location.--Lat 47°52'20", long 121°55'10", in W $\frac{1}{2}$ sec.33, T.28 N., R.7 E., on right bank 0.4 mile downstream from West Fork and 2 miles northeast of Monroe.

Drainage area.--55.0 sq mi.

Records available.--July 1946 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 100 ft (from topographic map). Prior to June 6, 1957, at site 0.4 mile upstream at different datum.

Average discharge.--14 years (1946-60), 156 cfs (112,900 acre-ft per year).

Extremes.--1946-60: Maximum discharge, 2,220 cfs Nov. 21, 1959 (gage height, 6.60 ft); maximum gage height, 7.18 ft Feb. 26, 1950, datum then in use; minimum discharge, 10.5 cfs Aug. 26, 1958 (gage height, 1.11 ft).

Remarks.--No regulation. Several small diversions above station 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
1951	78.2	297	300	340	347	231	85.3	67.2	33.5	17.5	13.7	17.6	151
1952	120	132	257	131	178	213	104	54.1	35.4	27.4	17.9	14.4	107
1953	14.7	19.6	46.0	352	225	179	209	119	130	36.9	21.3	22.5	114
1954	87.2	203	429	325	359	147	132	67.3	239	85.4	47.3	55.0	180
1955	54.2	332	264	246	236	188	281	136	78.9	87.7	44.1	29.3	164
1956	127	339	548	504	207	245	155	68.8	92.6	42.5	27.0	27.3	199
1957	138	223	307	193	345	315	175	66.5	48.2	27.2	21.9	19.2	155
1958	31.6	105	232	277	338	157	177	58.3	28.2	20.7	14.7	17.8	120
1959	45.4	229	260	463	228	233	212	142	90.0	51.3	28.0	65.5	170
1960	202	455	341	221	260	99.2	120	188	61.6	25.1	25.6	29.9	169

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	4,810	17,650	18,430	20,930	19,290	14,230	5,080	4,130	1,990	1,080	845	1,050	109,500
1952	7,370	7,880	15,780	8,080	10,220	13,120	6,170	3,320	2,100	1,690	1,100	859	77,670
1953	904	1,170	2,830	21,630	12,490	11,010	12,430	7,500	7,750	2,270	1,310	1,340	82,430
1954	5,360	12,060	26,360	20,010	19,960	9,040	7,840	4,140	14,220	5,250	2,910	3,270	130,400
1955	3,330	19,780	16,230	15,120	13,090	11,570	16,690	8,330	4,690	5,400	2,710	1,750	118,700
1956	7,830	20,170	33,680	31,000	11,890	15,080	9,230	4,230	5,510	2,610	1,660	1,620	144,500
1957	8,510	13,300	18,860	11,230	19,180	19,370	10,420	4,090	2,870	1,670	1,350	1,140	112,000
1958	1,940	6,250	14,250	17,020	18,770	9,670	10,550	3,580	1,680	1,280	905	1,060	86,960
1959	2,790	13,610	15,970	28,440	12,650	14,340	12,640	8,750	5,360	3,150	1,720	3,900	123,300
1960	12,390	27,080	20,950	13,560	14,950	6,100	7,150	11,580	3,660	1,550	1,570	1,780	122,300

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	-	-	-	-	-	-	-	-	19.5	49.67	141,500
1951	1216	1,260	Feb. 10, 1951	12	151	2.83	38.46	109,500	138	34.99	99,640
1952	1246	764	Dec. 22, 1951	12.5	107	2.00	27.29	77,670	71.0	17.57	51,560
1953	1286	740	Jan. 23, 1953	12.5	114	2.07	28.10	82,430	168	41.36	121,300
1954	1346	1,250	Dec. 6, 1953	31	180	3.27	44.47	130,400	174	42.95	126,000
1955	1396	1,310	Nov. 17, 1954	26	164	2.98	40.45	118,700	195	48.07	141,000
1956	1446	1,450	Dec. 21, 1955	19	199	3.62	49.27	144,500	170	42.10	123,500
1957	1516	-	-	16	155	2.82	38.17	112,000	130	31.96	93,760
1958	1566, 1636	905	Jan. 17, 1958	11.5	120	2.18	29.64	86,960	134	33.02	96,880
1959	1636	1,350	Jan. 24, 1959	14	170	3.09	42.05	123,300	209	51.62	151,400
1960	1716	2,220	Nov. 21, 1959	17	169	3.07	41.72	122,300	-	-	-

1437. Boxley Creek near Cedar Falls, Wash.

Location--Lat 47°26'00", long 121°45'05", in NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.35, T.23 N., R.8 E., on left bank 1 mile upstream from mouth and $\frac{1}{2}$ miles east of Cedar Falls.

Drainage area--1.57 sq mi.

Records available--August 1945 to September 1960.

Gage--Water-stage recorder. Altitude of gage is 1,220 ft (from topographic map).

Average discharge--15 years (1945-60), 30.8 cfs (22,300 acre-ft per year).

Extremes--1945-60: Maximum discharge, 182 cfs Dec. 22-23, 1946; maximum gage height, 2.18 ft May 26, 1949; minimum discharge, 0.1 cfs for many days during water year 1953.

Remarks--No regulation or diversion 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
1945	-	-	-	-	-	-	-	-	-	-	-	3.46	-
1946	1.76	9.77	21.8	24.4	15.0	9.28	7.90	47.0	129	82.4	40.2	9.67	33.3
1947	2.91	2.64	72.3	64.5	62.0	34.3	28.9	31.1	20.0	13.3	6.24	1.46	28.2
1948	.95	78.4	70.5	70.7	43.3	31.0	11.7	11.5	56.9	72.2	26.1	5.56	39.9
1949	1.87	2.24	19.7	14.0	4.10	5.60	9.37	63.7	76.4	51.9	24.9	4.74	23.4
1950	1.18	4.29	64.9	79.1	45.7	79.5	68.3	62.4	74.2	67.3	45.8	28.9	51.9
1951	13.0	38.1	80.0	72.8	79.5	36.4	13.6	18.0	60.8	38.4	10.1	2.04	38.3
1952	.68	1.61	13.9	10.7	6.17	9.39	6.48	13.4	20.0	12.8	6.09	1.78	8.61
1953	.78	.34	.25	.48	103	42.1	14.5	21.0	33.1	35.0	27.9	75.9	23.3
1954	.97	.52	38.6	79.1	54.2	71.0	46.9	61.3	86.0	84.5	49.4	9.83	48.6
1955	1.62	.65	5.97	26.5	46.1	33.1	11.7	8.41	53.8	89.0	74.8	40.3	32.6
1956	12.7	31.0	76.9	62.1	25.1	8.04	4.03	49.5	83.1	81.7	58.7	29.8	43.7
1957	4.85	4.81	46.5	55.5	18.6	7.95	7.01	21.7	33.7	26.5	13.9	5.51	20.6
1958	1.84	.63	.97	7.47	18.4	19.4	13.0	31.4	29.5	20.3	7.97	1.84	12.7
1959	.52	34.6	72.5	47.3	42.5	24.7	26.5	35.2	35.8	37.2	32.4	19.7	34.1
1960	34.5	38.9	46.8	22.8	8.48	9.37	9.56	17.1	37.1	35.1	13.9	2.34	23.1

Note.--Records not previously published; computed on basis of base data obtained in cooperation with city of Seattle.

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1945	-	-	-	-	-	-	-	-	-	-	-	206	-
1946	108	581	1,340	1,500	831	570	470	2,890	7,700	5,070	2,470	575	24,100
1947	179	157	4,450	3,960	3,450	2,110	1,720	1,910	1,190	816	384	87	20,410
1948	58	4,670	4,330	4,350	2,490	1,910	696	709	3,380	4,440	1,600	331	28,960
1949	115	133	1,210	858	228	345	557	3,920	4,550	3,190	1,530	282	16,920
1950	73	255	3,990	4,860	2,540	4,890	4,070	3,840	4,410	4,140	2,810	1,720	37,600
1951	799	2,270	4,920	4,480	4,420	2,240	809	1,100	3,620	2,360	624	122	27,760
1952	42	96	854	660	355	577	386	822	1,190	788	374	106	6,250
1953	48	20	15	29	5,690	2,590	861	1,290	1,970	2,150	1,720	451	16,830
1954	60	31	2,370	4,860	3,010	4,370	2,790	3,770	5,120	5,200	3,040	585	35,210
1955	100	39	567	1,630	2,560	2,030	695	517	3,200	5,470	4,600	2,400	23,610
1956	779	1,850	4,730	3,820	1,440	494	240	3,040	4,950	5,020	3,610	1,780	31,750
1957	299	286	2,860	3,420	1,040	489	417	1,330	2,000	1,630	853	328	14,950
1958	113	57	60	459	1,020	1,190	773	1,950	1,760	1,250	490	109	9,190
1959	32	2,060	4,480	2,910	2,360	1,520	1,580	2,160	2,130	2,280	1,990	1,170	24,650
1960	2,120	2,310	2,880	1,400	468	576	569	1,050	2,210	2,160	853	139	16,760

Note.--Records 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				
1946	-	156	June 15, 1946	1.6	33.3	24,100	37.1
1947	-	182	Dec. 22-23, 1946	.9	28.2	20,410	34.1
1948	-	156	Nov. 17, 18, 1947	.6	39.9	28,960	29.4
1949	-	175	May 26, 1949	1.5	23.4	16,920	27.3
1950	-	105	Jan. 3, 1950	.9	51.9	39,600	57.0
1951	-	141	Feb. 17, 1951	1.3	38.3	27,760	28.7
1952	-	24	June 11, 12, 1952	.4	8.61	6,250	7.36
1953	-	173	Feb. 11, 1953	.1	23.3	16,830	26.5
1954	-	110	Dec. 25, 26, 1953	.3	48.6	35,210	45.9
1955	-	107	June 26, 1955	.6	32.6	23,610	42.1
1956	-	105	(a)	3.6	43.7	31,750	38.3
1957	-	125	Dec. 29, 1956	1.8	20.6	14,950	16.2
1958	-	32	(b)	.4	12.7	9,190	21.4
1959	-	123	Nov. 28, 29, 1958	.3	34.1	24,650	35.1
1960	-	66	Dec. 2-3, 1959	1.0	23.1	16,760	-

a Dec. 29, 1955, May 23, 25, 26, 1956.

b May 5-11, May 16 to June 2, 1958.

Note.--Records not previously published.

1445. Snoqualmie River near Snoqualmie, Wash.

Location.--Lat 47°32'45", long 121°50'35", in SW¼SW¼ sec.19, T.24 N., R.8 E., on left bank an eighth of a mile downstream from Snoqualmie Falls, half a mile upstream from Tokui Creek, and 1½ miles northwest of Snoqualmie.

Drainage area.--375 sq mi.

Records available.--May 1898 to July 1899; August to September 1899 (monthly discharge only); January to July 1900, September 1902 to July 1904; August to September 1904 (monthly discharge only); October 1904 to September 1905 and November to December 1906 (gage heights only); August 1907 to May 1926 (monthly discharge only); June 1926 to September 1927; October 1927 to September 1932 (monthly discharge only); August 1958 to September 1960. Published as "near Snoqualmie Falls" 1904-6.

Gage.--Water-stage recorder. Altitude of gage is 120 ft (from river-profile map). Prior to Nov. 3, 1902, and Nov. 1 to Dec. 31, 1906, staff gages above and below Snoqualmie Falls at different datums. Nov. 3, 1902, to Sept. 30, 1905, staff gage at site 4 miles upstream and 300 ft downstream from South Fork at different datum.

Average discharge.--30 years (1898-99, 1902-4, 1907-32, 1958-60), 2,504 cfs (1,813,000 acre-ft per year).

Extremes.--1898-1900, 1902-4, 1926-27, 1958-60: Maximum discharge, 61,000 cfs Nov. 23, 1959 (gage height, 19.78 ft); minimum, 12 cfs Sept. 16, 1960 (gage height, -0.37 ft).

Remarks.--Medium and low flows affected by powerplant above station. No diversion 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	-	-	-	-	-	-	-	-	-	-	-	938	-
1959	2,355	6,126	5,288	5,288	1,969	2,623	4,678	4,163	4,156	2,013	764	3,937	3,615
1960	3,931	6,958	4,782	1,635	2,612	2,184	3,140	4,119	3,537	1,212	829	861	2,978

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1958	-	-	-	-	-	-	-	-	-	-	-	55,790	-
1959	144,800	564,500	325,200	325,100	109,400	161,300	278,400	255,900	247,300	123,800	46,980	234,300	2,617,000
1960	241,700	414,000	294,000	100,500	150,300	134,300	186,900	253,200	210,500	74,520	50,960	51,230	2,162,000

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						
1958	1636	-	-	-	-	-	-	-	-
1959	1636	26,000	Nov. 12, 1958	491	3,615	2,617,000	3,774	2,732,000	-
1960	1716	61,000	Nov. 23, 1959	88	2,978	2,162,000	-	-	-

1460. Patterson Creek near Fall City, Wash.

Location (revised).--Lat 47°34'50", long 121°56'25", in SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.8, T 24 N., R 7 E., 2 miles upstream from mouth and 2 $\frac{1}{2}$ miles northwest of Fall City.

Drainage area.--15.5 sq mi (revised).

Records available.--February 1947 to October 1950, June 155 to September 1960. Records for June to October 1945 at site 1 $\frac{1}{4}$ miles downstream not equivalent owing to intervening drainage area.

Gage.--Water-stage recorder. Altitude of gage is 70 ft (from topographic map). Prior to June 1955, at different datum.

Average discharge.--8 years (1947-50, 1955-60), 34.7 cfs (25,120 acre-ft per year).

Extremes.--1947-50, 1955-60: Maximum discharge, 480 cfs Feb. 17, 1949, from rating curve extended above 130 cfs; maximum gage height, 6.46 ft Dec. 15, 1959; minimum discharge, 6.4 cfs July 22, 1956, July 26, 1958; minimum gage height, 1.12 ft July 22, 1956.

Remarks.--No regulation. Many small diversions for irrigation and domestic 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													
1952													
1953													
1954													
1955	-	-	-	-	-	-	-	-	-	12.3	8.93	9.47	-
1956	32.1	80.1	101	88.1	40.4	61.2	32.1	17.2	16.5	9.48	9.37	13.6	41.8
1957	26.9	32.0	48.6	26.9	74.0	61.2	33.7	17.0	12.6	9.90	9.27	8.92	29.8
1958	12.3	14.2	29.9	65.8	59.4	33.0	37.5	13.2	9.07	7.36	6.97	8.53	24.6
1959	10.9	36.0	57.5	80.7	46.4	46.4	38.1	26.7	15.6	12.9	9.25	13.5	32.8
1960	19.3	57.7	79.5	45.0	57.4	33.3	39.5	34.1	13.6	9.63	9.60	10.1	34.0

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951													
1952													
1953													
1954													
1955	-	-	-	-	-	-	-	-	-	755	549	564	-
1956	1,970	4,760	6,180	5,410	2,320	3,760	1,910	1,060	984	583	576	808	30,320
1957	1,680	1,900	2,990	1,680	4,110	3,760	2,000	1,050	752	609	570	531	21,590
1958	757	843	1,840	4,040	3,300	2,030	2,230	809	540	453	428	507	17,780
1959	667	2,140	3,530	4,960	2,580	2,850	2,270	1,640	925	794	568	805	23,730
1960	1,190	3,430	4,890	2,770	3,300	2,050	2,350	2,090	807	592	590	603	24,660

Yearly 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	1446	-	-	-	-	-	-	-	-	-	-
1956	1446	194	Dec. 22, 1955	7.6	41.8	2.70	36.70	30,320	33.0	29.00	23,960
1957	1516	206	Feb. 26, 1957	8.4	29.8	1.92	26.10	21,590	25.5	22.34	18,480
1958	1566	209	Jan. 16, 1958	6.6	24.6	1.59	21.51	17,780	28.6	25.02	20,670
1959	1636	196	Jan. 24, 1959	8.1	32.8	2.12	28.71	23,730	37.2	32.54	26,900
1960	1716	258	Dec. 15, 1959	8.5	34.0	2.19	29.63	24,660	-	-	-

1470. Griffin Creek near Carnation, Wash.

Location.--Lat 47°37'00", long 121°54'15", in SW¼SW¼ sec.27, T.25 N., R.7 E., on left bank a quarter of a mile upstream from bridge on State Highway 15B, three-quarters of a mile upstream from mouth, and 2 miles south of Carnation.

Drainage area.--17.1 sq mi.

Records available.--June 1945 to September 1960. Prior to October 1951, published as "near Tolt."

Gage.--Water-stage recorder. Altitude of gage is 120 ft (from topographic map). Prior to Sept. 21, 1951, at site 1,000 ft downstream at different datum.

Average discharge.--15 years (1945-60), 42.9 cfs (31,060 acre-ft per year).

Extremes.--1945-60: Maximum discharge, 738 cfs Feb. 10, 1951 (gage height, 5.03 ft, site and datum then in use), from rating curve extended above 200 cfs; minimum, 1.1 cfs Aug. 14, 15, 21, 23, 25, 26, 1958; minimum gage height, 0.75 ft Aug. 22, 23, 1945 (site and datum then in use).

Remarks.--No regulation. Some small diversions for irrigation and domestic 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	24.4	94.1	88.5	87.2	104	45.5	22.9	17.1	11.1	4.22	3.28	4.46	41.8
1952	25.3	36.1	87.5	35.5	51.4	49.9	19.6	13.6	9.94	13.2	3.21	2.90	29.0
1953	3.17	3.98	7.38	103	57.9	37.4	46.9	38.2	39.6	7.77	3.25	3.27	29.1
1954	14.7	56.3	111	84.6	87.5	37.6	28.0	12.8	46.3	18.5	6.44	13.2	42.8
1955	7.70	51.7	59.5	50.3	67.9	45.5	70.1	46.8	20.0	20.1	12.2	7.45	38.0
1956	60.2	114	157	124	38.9	98.2	40.8	13.1	15.5	6.73	3.59	5.10	56.7
1957	39.7	55.5	64.0	35.9	104	81.7	53.3	19.6	12.2	6.59	5.52	4.55	39.8
1958	8.34	32.6	57.6	97.0	83.4	40.3	55.1	14.8	4.71	2.05	1.49	2.30	33.0
1959	6.35	62.9	101	142	56.1	70.4	49.8	47.4	24.9	9.11	3.48	12.2	48.9
1960	31.4	112	102	54.1	64.5	34.8	41.8	47.6	14.8	4.18	3.63	4.20	42.7

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,500	5,600	5,440	5,360	5,780	2,800	1,360	1,050	659	259	202	265	30,280
1952	1,550	2,150	5,380	2,180	2,960	3,070	1,170	839	591	814	197	173	21,070
1953	195	237	454	6,310	3,220	2,300	2,790	2,350	2,360	478	200	195	21,090
1954	908	3,350	6,820	5,200	4,860	2,310	1,680	784	2,780	1,140	396	788	30,970
1955	473	3,080	3,660	3,090	3,770	2,800	4,170	2,890	1,190	1,240	751	443	27,550
1956	3,700	6,780	9,680	7,630	2,240	6,040	2,430	804	922	414	221	303	41,160
1957	2,440	3,300	3,930	2,210	5,790	5,030	3,170	1,200	728	405	339	271	28,810
1958	513	1,940	3,540	5,970	4,630	2,480	3,280	911	280	126	91	137	23,900
1959	390	3,740	6,230	8,750	3,120	4,330	2,960	2,910	1,480	560	214	725	35,410
1960	1,930	6,650	6,250	3,320	3,710	2,140	2,490	2,930	880	257	223	250	31,030

Yearly 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	-	-	-	-	-	-	-	-	-	52.9	42.74	38,300
1951	1216	758	Feb. 10, 1951	2.8	41.8	2.49	33.80	30,280	37.1	29.95	26,820	
1952	1246	248	Dec. 22, 1951	2.5	29.0	1.73	23.52	21,070	17.7	14.12	12,880	
1953	1286	200	Jan. 23, 1953	2.4	29.1	1.70	23.10	21,090	43.2	34.28	31,280	
1954	1346	343	Jan. 6, 1954	3.7	42.8	2.50	35.96	30,970	37.4	29.71	27,110	
1955	1396	257	Feb. 9, 1955	5.3	38.0	2.22	30.20	27,550	55.9	44.40	40,490	
1956	1446	393	Dec. 12, 22, 1955	3.0	56.7	3.32	45.10	41,160	42.2	33.61	30,670	
1957	1516	407	Feb. 25, 1957	4.0	39.8	2.33	31.60	28,810	34.7	27.56	25,140	
1958	1566	347	Jan. 17, 1958	1.3	33.0	1.93	26.21	23,900	39.0	31.00	28,260	
1959	1636	*473	Jan. 24, 1959	1.8	48.9	2.86	38.81	35,410	55.1	43.71	39,880	
1960	1716	*658	Nov. 21, 1959	2.6	42.7	2.50	34.03	31,030	-	-	-	

* Revised.

1475. North Fork Tolt River near Carnation, Wash.

Location.--Lat 47°42'40", long 121°47'35", in SE 1/4 NW 1/4 sec.28, T.26 N., R.8 E., on right bank 2 1/2 miles upstream from confluence with South Fork and 7 miles northeast of Carnation.

Drainage area.--39.2 sq mi.

Records available.--October 1952 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 600 ft above mean sea level (from river-profile map).

Average discharge.--8 years (1952-60), 394 cfs (285,200 acre-ft per year).

Extremes.--1952-60: Maximum discharge, 9,560 cfs Dec. 15, 1959 (gage height, 13.15 ft), from rating curve extended above 2,800 cfs; minimum, 38 cfs Sept. 13, 14, 1958 (gage height, 3.53 ft), but may have been less sometime during period of no gage-height record in October 1952.

Remarks.--No regulation or diversion 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													
1952													
1953	50.5	69.0	221	1,160	588	304	409	445	362	191	91.5	111	332
1954	328	459	919	465	554	301	354	398	520	315	198	282	424
1955	194	508	398	315	456	178	373	550	751	496	222	109	376
1956	505	760	747	465	247	320	549	624	520	249	103	182	440
1957	509	504	766	222	370	448	522	484	320	159	112	62.0	373
1958	120	307	440	554	503	257	388	266	159	80.1	48.7	98.7	269
1959	301	798	817	838	376	463	709	599	495	237	114	563	526
1960	536	800	687	329	437	340	436	573	373	142	148	138	411

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	3,110	4,110	13,590	71,330	32,630	18,690	24,310	27,390	21,540	11,750	5,630	6,580	240,700
1954	20,190	27,290	56,520	28,590	30,790	18,480	21,070	24,450	30,960	19,350	12,190	16,770	306,600
1955	11,910	30,090	24,490	19,340	25,320	10,960	22,210	33,850	43,480	30,480	13,680	6,480	272,300
1956	31,080	45,200	45,930	28,600	14,200	19,670	32,640	38,340	30,950	15,320	6,350	10,810	319,100
1957	31,290	29,970	47,100	13,630	20,530	27,530	31,050	29,790	19,030	9,760	6,890	3,690	270,200
1958	7,350	18,290	27,080	34,040	27,920	15,810	23,060	17,600	9,450	4,920	3,000	5,870	194,400
1959	18,520	47,510	50,260	51,500	20,890	28,470	42,170	36,860	29,440	14,560	7,040	33,490	380,700
1960	32,970	47,570	42,220	20,200	25,130	20,890	25,960	35,220	22,200	8,750	9,090	8,190	298,400

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											
1952											
1953	1266	5,850	Jan. 23, 1953	40	332	8.47	115.11	240,700	447	154.90	323,800
1954	1346	5,310	Dec. 9, 1953	117	424	10.8	146.66	306,800	372	128.74	269,100
1955	1396	4,640	Feb. 7, 1955	90	376	9.59	130.25	272,300	453	156.89	326,000
1956	1446	7,360	Dec. 11, 1955	48	440	11.2	152.63	319,100	420	146.01	305,200
1957	1516, 1566	3,610	Dec. 9, 1956	50	373	9.52	129.27	270,200	296	102.65	214,600
1958	1566	2,250	Jan. 16, 1958	39	269	6.86	92.98	194,400	356	123.39	258,000
1959	1636	4,360	Nov. 20, 1958	53	526	13.4	182.11	380,700	535	185.20	387,200
1960	1716	9,560	Dec. 15, 1959	71	411	10.5	142.72	298,400	-	-	-

1476. South Fork Tolt River near Index, Wash.

Location.--Lat 47°42'25", long 121°35'55", in NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.25, T.26 N., R.9 E., on left bank half a mile upstream from Phelps Creek, 8 miles south of Index, and 15 miles east of Carnation.

Drainage area.--5.34 sq mi.

Records available.--December 1959 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,850 ft (from topographic map).

Extremes.--1959-60: Maximum discharge, 1,780 cfs Dec. 14, 1959 (gage height, 6.28 ft), from rating curve extended above 120 cfs on basis of slope-area measurements at gage heights 5.5 and 6.28 ft; minimum, 4.7 cfs Aug. 14, 1960 (gage height, 0.29 ft).
Peak discharges of 1,330 cfs occurred on Jan. 23, 1959 (stage unknown), and 1,200 cfs on Apr. 29, 1959 (gage height, 5.5 ft, from floodmarks), results of slope-area measurements.

Remarks.--No regulation or diversion above station.

Monthly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1960	-	-	128	44.2	62.9	56.6	79.2	111	82.6	19.4	22.5	20.3	-

Monthly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1960	-	-	7,850	2,720	3,620	3,480	4,710	6,840	4,920	1,190	1,380	1,210	-

1478. South Fork Tolt River at upper station, near Carnation, Wash.

Location.--Lat 47°42'30", long 121°36'50", in SE $\frac{1}{4}$ sec.26, T.26 N., R.9 E., on right bank 10 miles upstream from mouth and 14 $\frac{1}{2}$ miles east of Carnation.

Drainage area.--8.82 sq mi.

Records available.--October 1957 to September 1959.

Gage.--Water-stage recorder. Altitude of gage is 1,850 ft (from topographic map).

Extremes.--1957-59: Maximum discharge, 2,760 cfs Nov. 12, 1958 (gage height, 6.13 ft), from rating curve extended above 800 cfs on basis of slope-area measurements at gage heights 5.77 and 5.05 ft; minimum, 1.1 cfs Aug. 27, 1958.

Remarks.--No regulation or diversion 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	36.0	74.9	113	127	93.2	37.4	95.8	97.1	39.5	8.57	2.78	29.9	62.7
1959	110	310	255	206	58.1	60.3	157	128	131	48.4	11.7	131	134

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1958	2,210	4,460	6,920	7,810	5,180	2,300	5,700	5,970	2,350	527	171	1,780	45,380
1959	6,770	18,430	15,670	12,690	3,230	3,710	9,560	7,850	7,820	2,980	721	7,780	97,010

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	Runoff	
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1958	1566,1636	773	Jan. 15, 1958	1.2	62.7	7.11	96.48	45,380	100	154.42	72,660
1959	1636	2,760	Nov. 12, 1958	5	134	15.2	206.18	97,010	-	-	-

1480. South Fork Tolt River near Carnation, Wash.

Location.--Lat 47°41'20", long 121°42'35", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.31, T.26 N., R.9 E., on left bank 7 miles upstream from confluence with North Fork and 10 miles northeast of Carnation.

Drainage area.--19.7 sq mi.

Records available.--October 1952 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,300 ft (from river-profile map).

Average discharge.--8 years (1952-60), 204 cfs (147,700 acre-ft per year).

Extremes.--1952-60: Maximum discharge, 6,500 cfs Dec. 15, 1959 (gage height, 7.45 ft), from rating curve extended above 2,700 cfs; maximum gage height, 7.62 ft Nov. 20, 1958 (backwater from debris); minimum discharge, 12.5 cfs Aug. 23-27, 1958 (gage height, 0.81 ft).

Remarks.--No regulation except for a few days in 1959 when flow was diverted by cofferdam around damsite. No diversion 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													
1952													
1953	21.4	40.2	136	675	245	139	205	211	171	81.9	32.7	48.2	167
1954	185	249	473	195	287	124	189	206	278	143	86.8	128	211
1955	94.6	280	182	132	246	65.0	192	305	390	252	95.4	48.7	189
1956	307	384	352	191	90.2	154	300	350	284	129	43.9	102	224
1957	289	257	428	74.6	187	215	276	262	163	72.6	54.1	28.7	192
1958	77.6	177	247	284	242	108	208	145	69.7	28.2	18.7	60.6	138
1959	195	535	404	495	222	268	478	285	239	115	43.8	34.5	301
1960	287	487	405	139	192	163	216	292	181	56.3	72.3	85.1	214

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	1,320	2,390	8,380	41,520	13,610	8,560	12,220	12,980	10,150	5,040	2,010	2,870	121,000
1954	11,350	14,840	29,070	11,990	15,950	7,630	11,230	12,680	16,540	8,800	5,340	7,600	153,000
1955	5,820	16,640	11,220	8,140	13,680	4,000	11,440	18,750	23,180	15,520	5,870	2,900	137,200
1956	18,850	22,830	21,620	11,760	5,190	9,480	17,870	21,530	16,900	7,910	2,700	6,080	162,700
1957	17,770	15,300	26,310	4,590	10,390	13,190	16,440	16,100	9,720	4,470	3,330	1,710	139,300
1958	4,770	10,540	15,160	17,480	13,430	6,650	12,400	8,990	4,150	1,730	1,020	3,600	99,920
1959	11,990	31,840	24,850	30,440	12,350	16,450	28,460	17,390	14,240	7,050	2,690	20,510	218,300
1960	17,670	28,950	24,930	8,530	11,050	10,030	12,820	17,920	10,780	3,460	4,440	5,060	155,600

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												
1951												
1952												
1953	1286	3,160	Jan. 23, 1953	14	167	8.48	15.21	121,000	227	156.30	164,200	
1954	1346	3,180	Dec. 9, 1953	44	211	10.7	145.63	153,000	182	125.10	131,400	
1955	1396	3,230	Feb. 8, 1955	32	189	9.59	130.54	137,200	230	158.73	166,800	
1956	1446	5,900	Dec. 11, 1955	25	224	11.4	154.87	162,700	219	151.14	158,800	
1957	1518	2,290	Dec. 10, 1956	22	192	9.75	132.61	139,300	153	105.10	110,400	
1958	1566	1,130	Jan. 17, 1958	12.5	138	7.01	95.13	99,920	191	131.48	138,100	
1959	1636	5,000	Nov. 12, 1958	25	301	15.3	207.73	218,300	305	210.47	221,100	
1960	1716	6,500	Dec. 15, 1959	23	214	10.9	148.15	155,600	-	-	-	

1485. Tolt River near Carnation, Wash.

Location.--Lat 47°41'45", long 121°49'30", in S¹/₄NE¹/₄ sec.31, T.26 N., R.8 E., on right bank 500 ft downstream from the forks, a quarter of a mile upstream from Stossel Creek, and 5 miles northeast of Carnation.

Drainage area.--79.7 sq mi.

Records available.--August 1928 to January 1932, September 1937 to September 1960. Prior to October 1951, published as "near Tolt."

Gage.--Water-stage recorder. Datum of gage is 348 ft above mean sea level (river-profile survey). Prior to Oct. 31, 1928, staff gage and Oct. 31, 1928, to Jan. 3, 1932, water-stage recorder, at site 350 ft upstream at datum 7.1 ft higher (river-profile survey). Sept. 1 to Oct. 6, 1937, staff gage at present site at datum 1.64 ft higher.

Average discharge.--26 years (1928-31, 1937-60), 608 cfs (440,200 acre-ft per year).

Extremes.--1928-32, 1937-60; Maximum discharge, 17,400 cfs Dec. 15, 1959 (gage height, 13.04 ft), from rating curve extended above 7,600 cfs on basis of slope-area measurement of peak flow; minimum, 53 cfs Sept. 22, 23, 1951 (gage height, 3.84 ft).

Remarks.--Slight regulation by dam construction several miles upstream during 1959 and 1960. No diversion 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	686	1,050	1,112	882	1,534	522	601	598	375	134	80.3	135	636
1952	853	722	547	417	728	500	718	831	585	300	129	103	535
1953	80.7	123	432	2,058	928	524	711	753	606	300	135	165	567
1954	522	846	1,648	810	975	487	598	626	887	504	301	460	720
1955	333	892	709	572	860	333	702	996	1,177	802	358	177	657
1956	896	1,317	1,274	851	420	623	996	1,078	894	405	155	310	767
1957	903	819	1,354	361	688	774	893	805	525	248	175	93.8	637
1958	203	545	732	994	918	438	719	485	244	120	74.9	166	472
1959	538	1,478	1,405	1,533	679	823	1,275	1,022	809	381	165	95.4	922
1960	933	1,465	1,332	554	765	580	733	967	604	211	233	227	720

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	42,170	62,490	68,350	54,240	85,180	32,080	35,730	36,780	22,340	8,240	4,930	8,050	460,600
1952	52,460	42,990	33,660	25,610	41,890	30,740	42,710	51,110	34,800	18,460	7,950	6,110	388,500
1953	4,960	7,300	26,550	126,600	51,560	32,200	42,300	46,280	36,040	18,450	8,280	9,800	410,300
1954	32,080	50,320	101,300	49,820	54,160	29,980	35,580	38,470	52,810	31,000	18,530	27,380	521,400
1955	20,450	53,060	43,620	35,180	47,730	20,450	41,790	61,220	70,040	49,280	21,990	10,550	475,400
1956	55,100	78,360	78,360	51,090	24,140	38,310	59,250	66,310	53,210	24,880	9,510	18,440	557,000
1957	55,520	48,740	83,260	22,200	38,210	47,570	53,140	49,510	31,240	15,250	10,730	5,580	461,000
1958	12,490	32,420	48,710	61,140	50,960	26,950	42,780	29,840	14,490	7,380	4,600	9,910	341,700
1959	33,080	87,920	86,370	94,260	37,710	50,580	75,880	62,860	48,140	23,430	10,200	56,780	667,200
1960	57,390	88,340	81,900	34,060	44,000	35,660	43,960	60,690	35,950	12,970	14,340	13,490	522,800

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	-	-	-	-	-	-	-	818	139.28	592,000		
1951	1216	16,800	Feb. 9, 1951	53	636	7.98	108.36	460,600	576	98.03	416,700	
1952	1246	4,890	Feb. 4, 1952	77	535	6.71	91.40	388,500	411	70.17	298,200	
1953	1286	10,000	Jan. 23, 1953	63	567	7.11	96.54	410,300	767	130.63	555,200	
1954	1346	9,870	Dec. 9, 1953	172	720	9.03	122.67	521,400	628	106.99	454,800	
1955	1396	9,190	Feb. 8, 1955	132	657	8.24	111.82	475,400	767	134.09	570,000	
1956	1446	15,000	Dec. 11, 1955	94	767	9.62	131.02	557,000	734	125.32	532,700	
1957	1516	6,780	Dec. 10, 1956	74	637	7.99	108.45	461,000	507	86.36	367,000	
1958	1566	3,640	Jan. 17, 1958	61	472	5.92	80.38	341,700	629	107.13	455,400	
1959	1636	8,960	Nov. 20, 1958	96	922	11.6	156.96	667,200	950	161.73	687,500	
1960	1716	17,400	Dec. 15, 1959	118	720	9.03	122.97	522,800	-	-	-	

1487. Stossel Creek near Carnation, Wash.

Location.--Lat 47°41'45", long 121°49'50", in SW 1/4 sec. 31, T.26 N., R.8 E., on right bank 550 ft upstream from mouth and 5 miles northeast of Carnation.

Drainage area.--5.58 sq mi.

Records available.--July 1957 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 340 ft (from topographic map).

Extremes.--1957-60: Maximum discharge, 311 cfs Nov. 21, 1959 (gage height, 2.53 ft); minimum, 0.2 cfs Sept. 6, 1958 (gage height, 0.81 ft).

Remarks.--No regulation or diversion 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
1957	-	-	-	-	-	-	-	-	-	-	2.12	1.72	-
1958	3.20	17.0	40.8	38.0	34.7	16.4	18.3	5.83	2.59	1.25	.75	.91	14.9
1959	2.82	28.5	38.7	55.0	26.0	30.1	23.5	21.3	15.1	4.81	2.16	6.39	21.2
1960	14.9	43.4	46.4	24.4	35.8	16.4	17.1	24.9	7.33	2.09	1.94	2.05	19.7

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957	-	-	-	-	-	-	-	-	-	-	130	102	-
1958	197	1,010	2,510	2,340	1,950	1,010	1,090	558	154	77	46	54	10,780
1959	174	1,700	2,580	3,380	1,440	1,850	1,400	1,310	897	296	133	380	15,340
1960	915	2,590	2,850	1,500	2,060	1,010	1,020	1,530	456	128	119	122	14,280

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		Mean	Runoff	
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1957	1566	-	-	-	-	-	-	-	-	-	-
1958	1566	173	Dec. 29, 1957	0.3	14.9	2.67	56.18	10,780	15.6	37.95	11,310
1959	1636	297	Jan. 24, 1959	.6	21.2	3.80	51.52	15,340	24.1	58.61	17,440
1960	1716	311	Nov. 21, 1959	1.2	19.7	3.53	47.97	14,280	-	-	-

1490. Snoqualmie River near Carnation, Wash.

Location.--Lat 47°39'55", long 121°55'30", in W $\frac{1}{2}$ sec. 9, T.25 N., R.7 E., on left bank, 40 ft downstream from highway bridge, 1 mile northwest of Carnation, and 2 miles downstream from Tolt River.

Drainage area.--608 sq mi.

Records available.--October 1928 to September 1960. Prior to October 1951, published as "near Tolt."

Gage.--Water-stage recorder. Datum of gage is at mean sea level, unadjusted. Prior to Dec. 20, 1933, chain or wire-weight gage on old bridge, 100 ft upstream at datum 42.96 ft higher. Dec. 20, 1933, to Sept. 30, 1939, water-stage recorder at present site at datum 42.96 ft higher than present datum. Auxiliary water-stage recorder $1\frac{1}{4}$ miles upstream from base gage.

Average discharge.--33 years (1928-60), 3,777 cfs (2,734,000 acre-ft per year).

Extremes.--1928-60: Maximum discharge, 59,500 cfs Feb. 27, 1932 (elevation, 59.88 ft, from graph based on elevation readings); maximum elevation observed, 59.93 ft Nov. 13, 1932; minimum discharge, 239 cfs Aug. 21, 1945, but may have been less sometime during period of faulty intake action Sept. 13 or 14, 1949; minimum elevation recorded, 43.30 ft Sept. 11, 1930; minimum daily discharge, 396 cfs Sept. 24, 1938.

Revisions.--The momentary maximum discharge for the water year 1934, published in WSP 1316, has been revised to 48,700 cfs Nov. 3, 1933.

Remarks.--Several small diversions for irrigation and domestic use above station. Low flow diverted for operation of powerplant at Snoqualmie Falls but returned to river above station. Some pondage at Snoqualmie Falls and some diurnal fluctuation caused by powerplant.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	4,281	6,842	7,502	5,203	9,219	3,012	3,800	4,955	3,524	1,376	578	719	4,200
1952	4,374	3,424	3,362	2,098	4,030	2,688	4,392	5,578	3,884	2,327	790	593	3,124
1953	479	619	1,756	1,140	6,169	3,012	4,413	5,302	4,703	2,955	1,126	871	3,533
1954	2,518	5,133	9,176	5,017	6,044	3,181	3,962	4,856	6,254	4,221	2,030	2,150	4,535
1955	1,843	4,716	3,518	3,172	4,684	2,212	4,208	5,676	7,871	5,629	2,226	1,125	3,894
1956	5,444	7,885	7,906	4,544	2,279	3,817	5,704	7,103	6,273	3,698	1,138	1,436	4,777
1957	4,722	4,558	6,388	2,116	3,674	4,287	4,929	5,701	3,452	1,534	910	576	3,742
1958	1,026	2,625	4,547	5,208	4,974	2,446	4,022	4,152	2,245	895	517	1,178	2,805
1959	3,067	8,931	7,641	8,424	3,323	4,211	6,793	5,985	5,272	2,617	1,019	5,129	5,202
1960	5,248	9,342	6,965	2,845	4,241	3,137	4,692	6,040	4,627	1,594	1,197	1,236	4,256

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	263,200	85,200	461,300	19,900	512,000	185,200	226,100	304,600	209,700	84,630	35,570	42,770	3,040,000
1952	269,000	203,700	206,700	129,000	231,800	165,100	261,300	343,000	231,100	143,100	48,590	35,310	2,268,000
1953	29,470	36,830	108,000	684,800	342,600	185,200	262,600	326,000	279,800	181,700	69,220	51,850	2,558,000
1954	154,800	805,000	400,564	203,088	500,335	600,195	600,235	800,298	600,372	200,259	600,124	800,128	3,283,000
1955	113,300	280,600	216,300	195,000	260,100	136,000	250,400	349,000	468,000	346,100	136,900	66,920	2,819,000
1956	334,800	469,200	486,100	279,400	131,100	234,700	339,400	436,700	373,300	227,400	69,980	85,440	3,468,000
1957	290,400	271,200	515,700	130,100	204,100	263,600	283,300	350,500	205,400	94,350	55,980	34,270	2,709,000
1958	63,120	156,200	279,600	300,200	276,200	150,400	239,300	255,300	300,133	600,55,040	31,760	69,620	2,030,000
1959	188,600	531,400	469,800	517,900	184,500	258,900	404,200	358,000	513,700	160,900	62,630	505,100	3,766,000
1960	522,700	555,900	428,300	174,900	244,000	192,900	279,200	371,400	275,300	98,040	73,590	73,520	3,090,000

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	-	-	-	-	-	-	-	5,197	116.60	3,763,000	
1951	1216	52,200	Feb. 10, 1951	416	4,200	6.94	94.24	3,040,000	3,591	80.18	2,600,000
1952	1246	14,300	Feb. 4, 1952	454	3,124	5.14	69.94	2,268,000	2,428	54.37	1,763,000
1953	1286	32,400	Feb. 1, 1953	423	3,533	5.81	78.88	2,558,000	4,708	105.09	3,408,000
1954	1346	35,700	Dec. 10, 1953	1,260	4,535	7.46	101.24	3,283,000	3,963	88.46	2,869,000
1955	1396	25,300	Feb. 8, 1955	874	3,894	6.40	86.90	2,819,000	4,833	107.87	3,499,000
1956	1446	40,800	Dec. 12, 1955	620	4,777	7.86	106.93	3,468,000	4,483	100.36	3,255,000
1957	1516	27,500	Dec. 10, 1956	498	3,742	6.15	83.53	2,709,000	2,943	65.71	2,131,000
1958	1566	15,400	Jan. 17, 1958	446	2,805	4.61	62.63	2,030,000	3,759	83.94	2,721,000
1959	1636	31,200	Jan. 24, 1959	656	5,202	8.56	116.14	3,766,000	5,363	119.73	3,883,000
1960	1716	49,400	Nov. 23, 1959	480	4,256	7.00	95.27	3,090,000	-	-	-

1525. Pilchuck River near Granite Falls, Wash.

Location.--Lat 48°03'15", long 121°57'25", in SE $\frac{1}{4}$ sec.30, T.30 N., R.7 E., on right bank 200 ft upstream from county road bridge and 2 miles southeast of Granite Falls.

Drainage area.--53.5 sq mi.

Records available.--May to October 1911, January 1943 to November 1957, water years 1958-60 (annual maximum).

Gage.--Crest-stage gage. Altitude of gage is 340 ft (from topographic map). Prior to Oct. 13, 1911, staff gage at approximately same site at different datum. Jan. 14, 1943, to July 9, 1946, several staff gages within 150 ft of present site at same datum. Water-stage recorder July 10, 1946, to Nov. 30, 1957.

Average discharge.--14 years (1943-57), 344 cfs (249,000 acre-ft per year).

Extremes.--1911, 1943-60: Maximum discharge, 10,500 cfs Oct. 25, 1945 (gage height, 10.4 ft, from graph based on gage readings), from rating curve extended above 4,100 cfs on basis of slope-area measurement at gage height 8.00 ft. 1911, 1943-57: minimum discharge, 27 cfs Oct. 19, 20, 1952; minimum gage height, 1.89 ft Aug. 23, 24, 1945.

Revisions.--The momentary maximum discharge for the water year 1948, published in WSP 1316, has been revised to 5,380 cfs.

Remarks.--City of Snohomish diverts about 5 cfs, 5 miles above station, for municipal use. Slight regulation at low flow from manipulation of diversion gates.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	331	488	525	573	729	394	273	227	120	45.6	32.6	79.4	316
1952	437	298	396	277	411	373	275	250	198	99.4	51.2	53.9	259
1953	44.6	72.7	245	1,016	480	360	385	309	306	116	83.2	145	296
1954	360	463	666	571	646	256	341	210	452	223	185	217	399
1955	152	654	475	437	521	294	553	419	399	301	144	74.6	367
1956	503	627	669	656	272	439	426	261	346	117	49.7	115	374
1957	495	443	824	263	562	563	465	285	193	85.2	63.2	39.4	356
1958	116	307	-	-	-	-	-	-	-	-	-	-	-
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	20,340	29,020	32,290	35,230	40,480	24,210	16,240	13,930	7,170	2,800	2,010	4,730	226,400
1952	26,660	17,720	24,340	17,040	23,610	22,910	16,240	15,390	11,760	6,110	3,150	3,210	188,300
1953	2,750	4,320	15,090	62,460	26,650	22,160	22,890	18,980	18,190	7,110	5,110	8,640	214,400
1954	22,150	28,730	53,230	35,140	35,860	15,740	20,280	12,910	26,920	13,730	11,380	12,920	289,000
1955	9,320	38,930	29,220	26,870	28,910	18,090	32,910	25,740	23,740	18,510	8,830	4,440	265,500
1956	30,910	37,320	41,130	40,360	15,630	27,020	25,440	16,070	20,580	7,190	3,060	6,850	271,600
1957	30,420	26,330	50,690	16,170	31,180	34,600	27,560	17,510	11,490	5,240	3,890	2,340	257,400
1958	7,120	18,270	-	-	-	-	-	-	-	-	-	-	-
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	-	-	-	-	-	-	398	288,000
1951	1218	6,760	Feb. 9, 1951	28	316	228,400	298	215,700
1952	1246	3,420	Oct. 19, 1951	34	259	188,300	195	141,600
1953	1286	5,600	Jan. 2, 1953	28	296	214,400	409	296,300
1954	1346	3,950	Jan. 5, 1954	66	399	289,000	362	262,400
1955	1398	15,530	Nov. 16, 1954	57	367	265,500	411	297,400
1956	1446	4,600	Oct. 26, 1955	36	374	271,600	371	269,600
1957	1516	4,480	Dec. 16, 1956	34	356	257,400	-	-
1958	1568	3,520	Jan. 17, 1958	-	-	-	-	-
1959	1656	5,640	Nov. 12, 1958	-	-	-	-	-
1960	1716	7,640	Dec. 15, 1959	-	-	-	-	-

† Corrected.

1530. Little Pilchuck Creek near Lake Stevens, Wash.

Location.--Lat 48°02'00", long 122°03'00", in NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 4, T.29 N., R.6 E., on right bank just downstream from highway crossing, $\frac{1}{2}$ miles northeast of Lake Stevens and 2 miles upstream from Stevens Creek.

Drainage area.--17.5 sq mi.

Records available.--June 1946 to September 1951, September 1952 to September 1960.

Gage.--Water-stage recorder and wooden control. Altitude of gage is 200 ft (from topographic map).

Average discharge.--13 years (1946-51, 1952-60), 32.4 cfs (23,460 acre-ft per year).

Extremes.--1946-60: Maximum discharge, 625 cfs Nov. 21, 1959 (gage height, 6.02 ft, from floodmarks); no flow for part of Aug. 31, 1959.

Remarks.--Several small diversions above station for farm use. No 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	7.50	52.0	65.1	84.8	59.4	68.4	14.4	10.4	2.72	1.38	1.29	1.76	30.7
1952													
1953	1.70	2.09	5.67	51.9	51.9	36.6	41.8	17.9	24.2	3.87	1.49	1.48	19.8
1954	12.8	46.8	113	84.5	78.0	43.8	27.5	10.7	31.2	12.2	5.23	7.66	39.3
1955	5.51	81.3	66.0	76.3	54.4	41.1	40.0	24.2	17.6	15.3	4.92	2.55	35.6
1956	29.8	63.3	82.2	92.8	47.4	46.2	19.4	7.37	16.9	3.39	1.75	2.33	34.4
1957	29.2	47.1	78.4	44.3	93.8	71.5	30.4	12.2	6.00	3.17	1.78	1.70	34.6
1958	2.93	14.6	38.5	57.9	89.3	36.6	42.2	6.26	2.86	1.71	1.09	1.82	24.2
1959	3.31	24.2	52.0	108	65.0	58.6	41.2	21.5	11.1	2.17	1.23	4.05	32.4
1960	29.7	107	80.6	61.2	60.8	18.7	23.2	27.9	8.19	1.33	2.68	2.85	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
1951	461	3,090	4,000	5,210	3,300	4,210	858	639	162	85	79	105	22,200
1952													
1953	105	124	348	3,190	2,880	2,250	2,490	1,100	1,440	238	91	88	14,340
1954	786	2,780	6,970	5,190	4,330	2,690	1,640	660	1,860	752	322	456	28,440
1955	339	4,840	4,060	4,690	3,020	2,520	2,380	1,490	1,050	943	302	152	25,790
1956	1,830	3,770	5,050	5,710	2,730	2,840	1,150	453	1,010	208	108	139	25,000
1957	1,790	2,800	4,820	2,730	5,210	4,400	1,810	752	357	195	109	101	25,070
1958	180	871	2,370	3,560	4,960	2,250	2,510	385	170	105	67	108	17,540
1959	204	1,440	3,200	6,660	3,610	3,480	2,450	1,320	658	134	76	241	23,470
1960	1,830	6,370	4,950	3,760	3,500	1,150	1,380	1,710	488	119	165	170	25,590

Yearly 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	1216	225	Jan. 2-3, 1951	1.0	30.7	2.40	32.53	22,200	36.2	38.34	26,180	-
1952												
1953	1286	137	Feb. 1, 1953	1.0	19.8	1.13	15.37	14,340	33.6	26.05	24,300	
1954	1346	279	Jan. 6, 1954	1.6	39.3	2.25	30.46	28,440	37.5	29.08	27,140	
1955	1396	382	Jan. 1, 1955	2.0	35.6	2.03	27.63	25,790	37.6	29.15	27,200	
1956	1446	339	(a)	1.1	34.4	1.97	26.77	25,000	32.7	25.44	23,760	
1957	1516	288	(b)	1.2	34.6	1.98	26.85	25,070	26.3	20.43	19,080	
1958	1566	200	Feb. 10, 1958	.6	24.2	1.38	18.77	17,540	26.2	20.31	18,960	
1959	1656	324	Jan. 25, 1959	.4	32.4	1.85	25.16	23,470	43.9	34.05	31,780	
1960	1716	625	Nov. 21, 1959	1.1	35.3	2.02	27.43	25,590	-	-	-	

a Probably Dec. 22, 1955.

b Probably Feb. 25, 1957.

1555. Snohomish River at Snohomish, Wash.

Location (revised).--Lat 47°54'45", long 122°06'30", NE 1/4 sec. 13, T. 28 N., R. 5 E., in right bank pier of bridge on State Highway 1A in Snohomish.

Drainage area.--1,720 sq mi, approximately.

Records available.--February 1941 to September 1960 (high-water discharges only). High-water elevations prior to 1932 and high-water profiles on flood peaks since that time are available at the Seattle office of Corps of Engineers.

Gage.--Water-stage recorder. Datum of gage is 9.86 ft below mean sea level, datum of 1929. Prior to Feb. 3, 1960, at site half a mile upstream at datum 0.14 ft higher. Auxiliary water-stage recorder 2 miles downstream.

Extremes.--1941-60: Maximum discharge, 136,000 cfs Feb. 10, 1951 (gage height, 30.12 ft). Maximum stage known, 35 ft at base gage and 31 ft at auxiliary gage in 1906, from flood profile furnished by Corps of Engineers.

Remarks.--Large diurnal fluctuation because of tides. No appreciable regulation or diversion at stages for which discharges are published. Station operated for flood flows only; discharge below 10,000 cfs not generally computed. Records of water temperatures for the period July 1959 to September 1960 are published in reports of Geological Survey.

Monthly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	19,570	-	-	-	-	14,270	-	-	-	-	-
1952	-	-	-	-	-	-	-	15,790	-	-	-	-	-
1953	-	-	-	50,110	-	-	-	14,810	13,350	-	-	-	-
1954	-	-	22,930	-	-	-	-	-	18,690	-	-	-	-
1955	-	-	-	-	-	-	-	-	22,080	-	-	-	-
1956	-	-	-	-	-	-	-	20,440	18,320	-	-	-	-
1957	-	-	-	-	-	-	-	17,330	-	-	-	-	-
1958	-	-	-	-	-	-	-	-	-	-	-	-	-
1959	-	-	20,580	22,140	-	-	-	17,490	16,520	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

Monthly discharge, in thousands of acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	1,203	-	-	-	-	877.7	-	-	-	-	-
1952	-	-	-	-	-	-	-	970.9	-	-	-	-	-
1953	-	-	-	1,851	-	-	-	910.8	794.2	-	-	-	-
1954	-	-	1,410	-	-	-	-	-	1,112	-	-	-	-
1955	-	-	-	-	-	-	-	-	1,514	-	-	-	-
1956	-	-	-	-	-	-	-	1,257	1,090	-	-	-	-
1957	-	-	-	-	-	-	-	1,065	-	-	-	-	-
1958	-	-	-	-	-	-	-	-	-	-	-	-	-
1959	-	-	1,253	1,361	-	-	-	1,075	982.8	-	-	-	-
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	1216	136,000	Feb. 10, 1951	-	-	-	-	-
1952	1246	28,800	Oct. 4, 1951	-	-	-	-	-
1953	1286	65,800	Jan. 23, 1953	-	-	-	-	-
1954	1346	54,000	Dec. 10, 1953	-	-	-	-	-
1955	1396	54,800	Feb. 8, 1955	-	-	-	-	-
1956	1446	58,600	Nov. 4, 1955	-	-	-	-	-
1957	1516	59,000	Dec. 10, 1956	-	-	-	-	-
1958	1566	37,500	Jan. 17, 1958	-	-	-	-	-
1959	1636	59,800	Apr. 29, 1959	-	-	-	-	-
1960	1716	115,300	Nov. 23, 1959	-	-	-	-	-

1570. Quilceda Creek near Marysville, Wash.

Location.--Lat 48°06'20", long 122°09'40", in NE¼NE¼ sec.9, T.30 N., R.5 E., on right bank 300 ft downstream from Middle Fork and 3½ miles north of Marysville.

Drainage area.--13.9 sq mi.

Records available.--June 1946 to September 1960.

Gage.--Water-stage recorder and wooden control. Datum of gage is 28.2 ft above mean sea level (stadia traverse).

Average discharge.--14 years (1946-60), 25.6 cfs (18,530 acre-ft per year).

Extremes.--1946-60: Maximum discharge, 240 cfs Nov. 21, 1959 (gage height, 6.83 ft); minimum, 2.2 cfs July 16, 1951; minimum gage height, 1.49 ft Sept. 19, 1953, July 29, Aug. 2, 1958.

Remarks.--Several diversions above station for irrigation and domestic use. Some regulation during 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	13.3	37.0	46.9	62.5	48.8	56.2	17.8	13.6	6.93	3.59	3.37	4.59	26.1
1952	8.66	14.3	46.5	37.3	38.4	42.6	22.3	9.86	8.44	4.74	4.02	4.22	19.9
1953	4.66	5.79	8.48	26.1	35.8	27.1	27.3	15.7	18.9	6.28	3.85	4.67	15.2
1954	10.4	31.7	67.2	66.3	54.9	35.3	24.8	12.4	22.2	12.4	7.60	9.80	29.4
1955	8.35	51.1	52.4	59.0	46.6	36.8	33.6	21.6	17.8	13.5	6.78	5.38	29.3
1956	16.6	41.9	76.2	78.6	41.9	37.6	17.9	9.95	15.1	6.36	4.26	5.11	29.3
1957	22.9	32.6	60.3	37.8	76.0	60.3	32.2	12.9	8.95	7.00	5.22	4.81	29.8
1958	7.32	20.4	26.0	47.0	71.0	31.7	31.6	8.78	6.92	5.00	3.26	5.77	21.7
1959	6.61	16.9	36.3	70.4	52.6	47.2	36.9	17.5	12.0	9.17	5.99	5.96	26.3
1960	17.7	57.0	63.5	50.7	50.8	19.9	24.6	19.4	10.3	5.20	4.86	6.00	27.4

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	818	2,200	2,890	3,840	2,710	3,460	1,050	835	413	221	207	273	18,920
1952	532	851	2,860	2,290	2,210	2,620	1,330	606	383	291	247	251	14,470
1953	287	345	521	1,610	1,990	1,670	1,630	963	1,130	386	237	278	11,050
1954	640	1,890	4,130	4,070	3,050	2,170	1,480	760	1,320	764	468	583	21,320
1955	514	3,040	3,220	3,630	2,590	2,260	2,000	1,330	1,060	832	417	320	21,210
1956	1,020	2,490	4,690	4,830	2,410	2,310	1,070	612	900	391	262	304	21,290
1957	1,410	1,940	3,710	2,320	4,220	3,710	1,910	796	533	431	321	286	21,590
1958	450	1,210	1,600	2,890	3,950	1,950	1,880	540	412	307	201	344	15,730
1959	406	1,010	2,230	4,330	2,920	2,900	2,190	1,080	711	554	369	354	19,060
1960	1,090	3,390	3,910	3,120	2,920	1,230	1,460	1,190	614	320	299	357	19,900

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	-	-	-	-	-	-	-	-	27.5	26.88	19,930	
1951	1216	144	Mar. 13, 1951	2.8	26.1	1.88	25.51	18,920	23.8	23.28	17,250	
1952	1246	128	Dec. 22, 1951	3.8	19.9	1.43	19.54	14,470	15.7	15.37	11,580	
1953	1286	104	Feb. 3, 1953	3.4	15.2	1.09	14.88	11,050	22.8	22.29	16,550	
1954	1346	199	Jan. 6, 1954	5.1	29.4	2.12	28.75	21,320	29.6	28.91	21,440	
1955	1396	229	Dec. 31, 1954	4.6	29.3	2.11	28.59	21,210	31.3	30.51	22,640	
1956	1446	215	Dec. 20, 1955	3.7	29.3	2.11	28.71	21,290	27.8	27.18	20,150	
1957	1516	193	Feb. 24, 1957	4.4	29.8	2.14	29.11	21,590	24.6	24.00	17,790	
1958	1566, 1636	162	Jan. 17, 1958	2.7	21.7	1.56	21.23	15,730	22.3	21.74	16,120	
1959	1636	206	Jan. 24, 1959	3.0	26.3	1.89	25.72	19,060	32.9	32.12	23,810	
1960	1716	240	Nov. 21, 1959	3.1	27.4	1.97	26.84	19,900	-	-	-	

1610. South Fork Stillaguamish River near Granite Falls, Wash.

Location.--Lat 48°06'10", long 121°56'40", in SW 1/4 sec. 8, T.30 N., R.7 E., on right bank a quarter of a mile upstream from county road bridge, 1 1/2 miles upstream from Canyon Creek, and 2 miles northeast of Granite Falls.

Drainage area.--119 sq mi.

Records available.--December 1902 to July 1903 (gage heights only), July 1928 to September 1960. Published as "at Robe" 1902-3.

Gage.--Water-stage recorder. Altitude of gage is 310 ft (from river-profile map). Prior to Aug. 31, 1928, staff gage at site 8 miles upstream at different datum.

Average discharge.--32 years (1928-60), 1,062 cfs (768,900 acre-ft per year).

Extremes.--1928-60: Maximum discharge, 38,800 cfs Feb. 26, 1932 (gage height, 19.7 ft, from graph based on gage readings), from rating curve extended above 15,000 cfs; minimum, 55 cfs Sept. 23, 24, 1938; minimum gage height, 2.99 ft Aug. 19-21, 1941.

Revisions.--The momentary maximum discharges, in cubic feet per second, for some water years published in WSP 1316, have been revised as follows:

Water year	Momentary maximum	
	Discharge	Date
1932	32,400	Feb. 26, 1932
1933	22,800	Nov. 13, 1932
1934	19,600	Dec. 21, 1933
1935	24,300	Jan. 24, 1935
1938	17,200	Apr. 18, 1938
1944	21,400	Dec. 3, 1943
1945	20,700	Jan. 7, 1945
1946	16,500	Oct. 25, 1945
1947	22,600	Oct. 25, 1946
1948	19,500	Oct. 19, 1947

Remarks.--No regulation. Some small diversions for domestic use above station.

Corrections.--In WSP 1316, the acre-feet for September 1938 is listed in error; it should be 4,660 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	1,557	1,788	2,112	1,387	3,216	746	1,055	1,176	683	264	156	375	1,194
1952	1,609	1,043	799	697	1,178	599	1,216	1,465	1,045	509	221	177	878
1953	164	297	944	4,093	1,545	785	1,131	1,357	1,074	700	356	601	1,087
1954	1,316	1,594	2,441	1,307	1,915	752	1,159	1,402	1,681	1,150	679	687	1,336
1955	750	2,174	1,211	777	1,212	454	1,214	1,597	2,079	1,425	590	288	1,144
1956	2,097	2,224	1,737	1,193	450	856	1,401	1,855	1,543	812	258	558	1,235
1957	1,729	1,256	2,668	466	1,387	1,209	1,455	1,494	931	454	259	149	1,119
1958	504	848	1,505	1,592	1,422	654	1,115	941	579	210	114	417	821
1959	1,132	2,506	2,057	2,129	764	1,178	2,350	1,302	1,235	568	375	1,566	1,430
1960	1,609	2,750	1,712	1,020	1,214	846	1,224	1,698	1,104	382	423	413	1,197

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	95,750	106,400	129,800	85,260	178,600	45,850	62,770	72,280	40,630	16,200	8,340	22,330	864,200
1952	98,900	62,040	49,110	42,880	67,780	36,840	72,380	90,070	62,200	31,310	13,590	10,560	637,700
1953	10,100	17,700	58,030	251,700	85,810	48,290	67,320	83,420	63,920	43,070	21,910	35,750	787,000
1954	80,940	94,850	150,100	80,360	108,400	46,220	68,970	86,230	100,000	70,730	41,780	40,880	967,500
1955	46,090	29,400	74,480	47,770	67,330	27,900	72,210	98,180	123,700	87,610	36,290	17,160	826,100
1956	128,900	132,400	106,800	73,580	25,860	52,630	83,380	102,400	91,820	49,910	15,840	33,180	896,500
1957	106,300	73,530	164,000	28,620	77,020	74,330	86,590	91,830	55,370	27,940	15,900	8,850	810,300
1958	31,000	50,480	92,510	97,880	79,000	40,200	66,360	57,850	34,430	12,920	7,030	24,830	594,500
1959	69,590	149,100	126,500	130,900	42,400	72,460	139,900	80,080	73,460	34,910	23,050	93,210	1,036,000
1960	98,910	63,700	105,300	62,730	69,800	52,010	72,810	104,400	65,670	23,470	25,990	24,570	869,400

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		
1950	-	-	-	-	-	-	-	-	1,472	1,066,000
1951	1216	*27,600	Feb. 9, 1951	103	1,194	10.0	156.16	864,200	1,025	1,166.94
1952	1246	8,720	Jan. 30, 1952	106	878	7.38	100.45	637,700	707	80.88
1953	1286	16,300	Jan. 31, 1953	78	1,087	9.13	123.99	787,000	1,419	161.61
1954	1346	13,000	Dec. 9, 1953	274	1,336	11.2	152.42	967,500	1,231	140.47
1955	1396	16,300	Feb. 8, 1955	166	1,144	9.61	130.43	826,100	1,307	149.09
1956	1446	*20,600	Dec. 11, 1955	126	1,235	10.4	141.24	896,500	1,201	137.43
1957	1516	*25,000	Dec. 9, 1956	111	1,119	9.40	127.65	810,500	885	100.88
1958	1566	11,100	Dec. 25, 1957	89	821	6.90	93.67	594,500	1,058	120.65
1959	1636	*22,100	Nov. 12, 1958	151	1,430	12.0	163.17	1,036,000	1,462	166.74
1960	1716	24,800	Dec. 15, 1959	133	1,197	10.1	136.97	869,400	-	-

* Revised.

1625. South Fork Stillaguamish River above Jim Creek, near Arlington, Wash.

Location.--Lat 48°10'05", long 122°04'05", in SW $\frac{1}{4}$ sec.17, T.31 N., R.6 E., on right bank 2 miles upstream from Jim Creek and 3 miles southeast of Arlington.

Drainage area.--199 sq mi.

Records available.--October 1936 to October 1957.

Gage.--Water-stage recorder. Datum of gage is 80.00 ft above mean sea level, datum of 1929. Prior to Dec. 31, 1936, staff gage at same site and datum.

Average discharge.--21 years (1936-57), 1,592 cfs (1,153,000 acre-ft per year).

Extremes.--1936-57: Maximum discharge, 27,700 cfs Feb. 9, 1951 (gage height, 27.26 ft); minimum, 110 cfs Sept. 23, 24, 1951; minimum gage height, 10.44 ft Oct. 19, 20, 1952. Peak of Nov. 22, 1959, reached a stage of 27.84 ft, from high-water mark in well (discharge, 28,800 cfs).

Remarks.--No regulation. Some diversion for irrigation and domestic 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	2,158	2,627	3,256	2,558	4,224	1,321	1,721	1,724	1,050	383	169	489	1,785
1952	2,385	1,564	1,272	1,148	1,823	1,027	1,902	2,057	1,491	719	320	305	1,332
1953	259	453	1,473	5,733	2,469	1,313	1,843	2,071	1,615	930	500	818	1,621
1954	1,882	2,513	3,946	2,205	3,054	1,241	1,801	1,987	2,401	1,563	999	1,070	2,032
1955	993	3,582	1,914	1,391	1,975	830	1,930	2,587	2,999	2,085	911	444	1,764
1956	3,025	3,306	2,831	2,075	827	1,355	2,123	2,321	2,190	1,088	346	832	1,863
1957	2,601	1,839	4,081	753	2,246	2,011	2,366	2,332	1,364	654	391	198	1,735
1958	761	-	-	-	-	-	-	-	-	-	-	-	-
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	151,500	156,300	199,000	156,000	234,600	81,240	102,400	106,000	62,480	23,550	10,380	29,090	1,293,000
1952	146,700	95,060	78,210	70,590	104,900	63,180	113,200	126,500	88,720	44,210	19,670	18,140	967,100
1953	15,930	26,930	90,570	352,500	137,100	80,730	109,600	127,300	96,100	57,210	30,710	48,690	1,173,000
1954	115,700	157,600	242,600	135,600	169,800	76,500	107,200	122,200	142,800	96,100	61,400	63,690	1,471,000
1955	61,040	201,300	117,700	85,520	109,700	51,040	114,900	146,800	178,400	128,200	56,020	28,390	1,277,000
1956	186,000	196,700	174,000	127,600	47,570	83,300	126,300	142,700	130,300	66,910	21,260	49,480	1,352,000
1957	159,900	109,500	250,900	46,300	124,800	123,700	140,800	143,400	81,170	40,190	24,040	11,770	1,256,000
1958	46,770	-	-	-	-	-	-	-	-	-	-	-	-
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	-	-	-	-	-	-	-	-	2,186	149.13	1,585,000
1951	1216	27,700	Feb. 9, 1951	114	1,785	8.97	121.79	1,293,000	1,552	105.89	1,124,000
1952	1246	12,700	Jan. 30, 1952	185	1,332	6.69	91.11	967,100	1,078	73.72	782,500
1953	1286	20,500	Jan. 31, 1953	139	1,621	8.15	110.57	1,173,000	2,122	144.73	1,536,000
1954	1346	18,900	Dec. 9, 1953	444	2,032	10.2	138.59	1,471,000	1,871	127.66	1,355,000
1955	1396	20,000	Feb. 8, 1955	304	1,764	8.86	120.32	1,277,000	2,008	136.98	1,454,000
1956	1446	23,400	Dec. 11, 1955	164	1,863	9.36	127.40	1,352,000	1,813	123.96	1,316,000
1957	1516	26,800	(a)	155	1,735	8.72	118.37	1,256,000	-	-	-
1958	1516	-	-	-	-	-	-	-	-	-	-
1959	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-

a Probably Dec. 9, 1956.

1640. Jim Creek near Arlington, Wash.

Location.--Lat 48°10'25", long 122°04'05", in W $\frac{1}{2}$ sec.17, T.31 N., R.6 E., on right bank at abandoned bridge, 1 $\frac{1}{4}$ miles upstream from mouth and 3 miles southeast of Arlington.

Drainage area.--48.9 sq mi.

Records available.--October 1937 to September 1951, September 1952 to April 1957, water years 1957-60 (annual maximum).

Gage.--Crest-stage gage. Datum of gage is 103.4 ft above mean sea level (stadia traverse). Prior to May 1957, water-stage recorder at same site and datum.

Average discharge.--18 years (1937-51, 1952-56), 206 cfs (149,100 acre-ft per year).

Extremes.--1937-51, 1952-60. Maximum discharge, 4,730 cfs Dec. 28, 1949 (gage height, 9.28 ft), from rating curve extended above 1,900 cfs.
1937-51, 1952-57: Minimum discharge, 5.9 cfs Sept. 16, 1943 (gage height, 0.62 ft).

* Remarks.--Small diversions for irrigation and domestic use. No regulation. Records of water temperatures for the period October 1951 to September 1957 are published in reports of 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	215	345	429	427	443	275	169	140	50.9	13.7	9.83	21.4	210
1952	22.5	44.4	180	595	349	208	211	161	149	50.0	39.5	65.0	172
1954	220	309	623	391	491	228	275	159	230	126	96.1	119	271
1955	68.5	404	337	316	325	169	323	228	239	175	61.5	32.9	224
1956	315	424	509	496	168	303	227	147	201	59.3	22.2	56.4	245
1957	350	251	561	212	408	367	263	-	-	-	-	-	-
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	13,220	20,540	26,360	26,280	24,610	16,930	10,070	8,580	3,030	842	604	1,270	152,300
1952	1,380	2,640	11,060	36,590	19,380	12,770	12,560	9,920	8,890	3,070	2,430	3,870	124,600
1954	13,540	18,400	38,290	24,060	27,250	13,990	16,360	9,760	13,690	7,720	5,910	7,100	196,100
1955	4,210	24,020	20,740	19,400	18,030	10,410	19,230	14,000	14,230	10,790	5,010	1,960	182,000
1956	19,390	25,210	31,280	30,530	9,680	18,630	13,510	9,070	11,950	3,650	1,360	3,360	177,600
1957	21,540	14,950	34,480	13,060	22,680	22,580	15,630	-	-	-	-	-	-
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	-	-	-	-	-	-	-	-	261	72.58	189,300
1951	1216	2,820	Feb. 10, 1951	7.2	210	4.29	58.42	152,300	-	-	-
1952											
1953	1286	1,940	Jan. 31, 1953	13	172	3.52	47.76	124,600	248	68.91	179,700
1954	1346	3,520	Dec. 9, 1953	24	271	5.54	75.17	196,100	241	67.02	174,800
1955	1396	2,600	Dec. 31, 1954	19	224	4.58	62.12	162,000	261	72.42	188,900
1956	1446	2,920	Oct. 29, 1955	12	245	5.01	68.09	177,600	238	66.22	172,700
1957	1518	3,650	Dec. 9, 1956	-	-	-	-	-	-	-	-
1958	1568	2,260	Dec. 25, 1957	-	-	-	-	-	-	-	-
1959	1636	3,590	Nov. 12, 1958	-	-	-	-	-	-	-	-
1960	1716	4,530	Nov. 22, 1959	-	-	-	-	-	-	-	-

1650. Squire Creek near Darrington, Wash.

Location.--Lat 48°16'15", long 121°40'00", in SE $\frac{1}{4}$ sec.8, T.32 N., R.9 E., on left bank 150 ft upstream from road crossing, a third of a mile upstream from Ashton Creek, and $\frac{3}{4}$ miles northwest of Darrington.

Drainage area.--18.8 sq mi.

Records available.--June 1950 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 490 ft (from topographic map).

Average discharge.--10 years (1950-60), 188 cfs (136,100 acre-ft per year).

Extremes.--1950-60: Maximum discharge, 6,440 cfs Feb. 10, 1951 (gage height, 10.52 ft), from rating curve extended above 700 cfs by logarithmic plotting; minimum, 7.3 cfs Oct. 20-24, 1952 (gage height, 0.57 ft).

Remarks.--No regulation or diversion 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	271	319	428	213	548	104	187	231	193	78.9	31.0	66.6	218
1952	254	160	125	83.6	183	83.0	199	230	205	127	46.5	30.9	143
1953	19.7	39.3	136	639	275	104	153	202	174	174	72.6	107	174
1954	206	251	357	204	336	150	184	232	268	249	121	94.3	220
1955	126	245	168	95.1	143	74.5	174	220	304	261	128	58.8	166
1956	350	344	260	184	59.0	117	221	301	304	224	65.6	130	214
1957	307	169	368	58.7	211	182	198	253	195	98.2	49.0	29.1	176
1958	82.5	104	198	248	234	110	156	214	154	48.1	21.2	63.0	136
1959	172	435	320	281	101	146	366	215	248	151	60.9	242	228
1960	320	501	292	176	199	119	194	266	219	105	67.6	65.9	210

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	16,670	18,970	26,220	13,070	30,430	6,380	9,950	14,200	11,460	4,850	1,900	3,960	158,100
1952	15,610	9,500	7,690	5,140	10,520	5,100	11,200	14,170	12,200	7,830	2,860	1,840	103,700
1953	1,210	2,340	8,380	39,310	15,280	6,390	9,110	12,420	10,350	10,670	4,470	6,360	126,300
1954	12,680	14,950	21,940	12,560	18,680	9,230	10,960	14,280	15,950	15,280	7,450	5,610	159,600
1955	7,780	14,560	10,310	5,850	7,930	4,580	10,340	13,500	18,070	16,080	7,850	3,500	120,400
1956	21,500	20,490	15,980	11,340	3,390	7,190	13,160	18,520	18,080	13,760	4,040	7,750	155,200
1957	18,900	10,030	22,650	3,610	11,720	11,190	11,770	16,530	11,590	5,910	3,010	1,730	127,600
1958	5,070	6,200	12,200	15,270	13,010	6,770	9,260	13,190	9,190	2,960	1,300	3,750	98,170
1959	10,550	25,900	19,650	17,300	5,610	8,960	21,760	13,200	14,780	9,300	3,740	14,410	165,200
1960	19,670	29,810	17,960	10,850	11,460	7,300	11,560	16,390	13,030	6,440	4,160	3,920	152,600

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	-	-	-	-	-	-	-	-	-	-	-	-
1951	1216	6,440	Feb. 10, 1951	13	218	11.6	157.65	158,100	178	28.68	129,000	
1952	1246	1,480	Oct. 3, 1951	15.5	143	7.61	103.39	103,700	114	82.57	82,790	
1953	1286	3,290	Jan. 11, 1953	7.3	174	9.26	125.95	126,300	226	163.47	163,900	
1954	1346	2,460	Dec. 19, 1953	49	220	11.7	159.13	159,600	197	142.26	142,600	
1955	1396	1,610	Feb. 7, 1955	32	166	8.83	120.01	120,400	201	145.28	145,700	
1956	1446	4,450	Nov. 3, 1955	34	214	11.4	154.77	155,200	205	148.40	148,800	
1957	1516	3,760	Dec. 9, 1956	19	176	9.36	127.33	127,600	137	99.29	99,530	
1958	1566	2,120	Dec. 25, 1957	12	136	7.23	97.92	98,170	181	130.46	130,800	
1959	1636	3,840	Nov. 20, 1958	20	228	12.1	164.72	165,200	244	176.04	176,500	
1960	1716	4,490	Nov. 20, 1959	33	210	11.2	152.15	152,600	-	-	-	

1655. North Fork Stillaguamish River near Darrington, Wash.

Location.--Lat 48°16'40", long 121°42'00", in NW¼ sec. 7, T.32 N., R.9 E., in pier at left bank at highway bridge, 1 mile downstream from Squire Creek and 5 miles northwest of Darrington.

Drainage area.--82.2 sq mi.

Records available.--June 1950 to September 1957.

Gage.--Water-stage recorder. Altitude of gage is 410 ft (from topographic map).

Average discharge.--7 years (1950-57), 593 cfs (429,300 acre-ft).

Extremes.--1950-57: Maximum discharge, 17,500 cfs Nov. 3, 1955 (gage height, 9.55 ft); minimum, 28 cfs Oct. 18-24, 1952; minimum gage height, 0.70 ft Sept. 23-30, 1957.

Remarks.--No regulation or diversion above station. Records of water temperatures for the period March 1952 to September 1957 are published in reports of 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	871	1,134	1,454	742	1,760	478	816	787	466	165	63.1	134	732
1952	702	512	468	356	788	298	759	787	467	235	91.9	70.4	459
1953	48.3	88.2	457	2,210	977	418	539	614	436	298	122	197	533
1954	553	840	1,264	716	1,248	497	642	751	701	508	231	232	678
1955	336	1,054	556	378	614	232	713	749	882	525	258	98.4	529
1956	884	1,267	1,002	710	236	482	890	972	809	422	121	210	668
1957	859	557	1,400	251	701	670	747	710	380	172	92.3	54.6	549
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	53,580	67,500	89,430	45,600	97,720	29,410	48,530	48,370	27,720	10,130	3,880	7,970	529,800
1952	43,150	30,470	28,790	21,910	45,340	18,190	45,150	48,370	27,770	14,430	5,650	4,190	333,400
1953	2,970	5,250	28,080	135,900	54,280	25,720	32,070	37,730	25,940	18,350	7,480	11,740	385,500
1954	34,010	49,970	77,700	44,020	69,310	30,580	38,230	46,160	41,710	31,050	14,230	13,830	490,800
1955	20,680	62,690	34,200	23,250	34,120	14,260	42,430	46,070	52,490	32,310	14,630	5,860	383,000
1956	54,360	75,360	61,600	43,660	13,570	29,660	52,980	59,780	48,120	25,940	7,430	12,490	485,000
1957	52,850	33,160	86,060	15,410	38,930	41,200	44,430	43,630	22,610	10,590	5,670	3,250	397,800
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	-	-	-	-	-	-	-	-	-	-	-
1951	1216	15,500	Feb. 10, 1951	39	732	8.91	120.86	529,800	583	96.20	421,700
1952	1246	4,320	Jan. 30, 1952	43	459	5.58	76.05	333,400	368	60.98	267,300
1953	1286	11,800	Jan. 31, 1953	28	533	6.48	87.97	385,500	706	116.56	510,900
1954	1346	7,290	(a)	136	678	8.25	111.95	490,800	617	101.89	446,700
1955	1396	7,750	Feb. 7, 1955	62	529	6.44	87.36	383,000	631	104.18	456,700
1956	1446	17,500	Nov. 3, 1955	71	668	9.13	110.63	485,000	641	106.23	465,700
1957	1516	16,000	Dec. 9, 1956	44	549	6.68	90.73	397,800	-	-	-
1958											
1959											
1960											

a Probably Dec. 20, 1953.

1670. North Fork Stillaguamish River near Arlington, Wash.

Location.--Lat 48°15'40", long 122°02'50", in SE¹/₄ NW¹/₄ sec.16, T.32 N., R.6 E., on right bank 6 miles northeast of Arlington, 7 miles upstream from mouth, and 8 miles downstream from Deer Creek.

Drainage area.--269 sq mi.

Records available.--July 1928 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 89.34 ft above mean sea level, datum of 1929. Prior to Sept. 18, 1928, staff gage at same site and datum.

Average discharge.--32 years (1928-60), 1,808 cfs (1,309,000 acre-ft per year).

Extremes.--1928-60: Maximum discharge, 30,600 cfs Feb. 9, 1951; maximum gage height, 13.46 ft Feb. 10, 11, 1951; minimum discharge, 117 cfs Sept. 23, 1938; minimum gage height, 0.97 ft Sept. 10, 12, 1944.

Remarks.--No regulation. Small diversions for domestic use 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	2,493	3,181	4,368	2,493	4,828	1,558	1,998	2,055	1,079	489	271	415	2,084
1952	2,509	1,856	1,807	1,394	2,555	1,317	2,221	2,247	1,438	899	379	409	1,565
1953	283	447	1,680	5,852	3,198	1,584	1,827	2,057	1,528	916	492	672	1,703
1954	2,122	2,839	4,723	2,582	3,787	1,593	2,317	2,375	2,514	1,611	926	1,019	2,359
1955	1,109	3,474	2,198	1,704	2,440	1,208	2,491	2,480	3,159	1,953	874	418	1,950
1956	2,876	3,750	3,310	2,502	910	1,684	2,516	2,781	2,488	1,185	454	805	2,104
1957	2,999	2,023	4,686	1,041	2,344	2,379	2,383	2,212	1,236	639	452	275	1,890
1958	591	1,350	2,538	3,189	3,046	1,348	1,865	1,356	737	374	231	488	1,416
1959	1,934	4,480	4,057	4,512	1,769	2,440	4,040	2,558	2,059	844	469	2,418	2,615
1960	2,440	4,719	3,493	2,218	2,867	1,720	2,677	2,812	1,740	639	648	669	2,214

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	153,300	189,300	268,600	153,300	268,000	95,810	118,900	126,300	64,190	30,040	16,670	24,720	1,509,000
1952	154,300	110,600	111,100	85,740	147,000	81,010	132,200	138,200	85,550	42,980	23,270	24,340	1,136,000
1953	17,370	26,600	103,300	359,800	177,600	95,540	108,700	126,500	80,940	56,430	30,260	39,980	1,233,000
1954	130,400	169,000	290,400	159,400	210,300	97,940	157,800	146,000	149,600	99,070	56,930	60,610	1,707,000
1955	68,190	206,700	135,200	104,700	135,500	74,290	148,200	152,500	188,000	120,100	53,760	24,880	1,412,000
1956	176,900	223,100	203,500	153,800	52,330	103,500	149,700	167,900	148,100	72,860	27,910	47,890	1,527,000
1957	184,400	120,400	288,100	64,020	130,200	146,300	141,800	136,000	73,530	39,280	27,790	16,370	1,368,000
1958	56,340	80,300	156,100	196,100	169,200	82,900	111,000	83,370	43,840	22,970	14,220	29,060	1,025,000
1959	118,900	266,600	249,400	225,200	98,260	150,000	240,400	157,300	122,500	51,890	28,330	143,900	1,893,000
1960	150,000	280,800	214,800	136,400	164,900	105,800	159,300	172,900	103,500	39,310	39,870	39,830	1,607,000

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year		
		Momentary		Date	Minimum day	Mean	Per square mile	Runoff		Runoff
		Discharge	maximum					Inches	Acre-feet	
1950	-	-	-	-	-	-	-	-	-	-
1951	1216	30,600	Feb. 9, 1951	172	2,084	7.75	105.16	1,509,000	2,524	127.38
1952	1246	13,600	Jan. 30, 1952	264	1,585	5.92	79.21	1,136,000	1,760	88.80
1953	1286	23,500	Jan. 31, 1953	200	1,703	6.33	85.94	1,233,000	2,314	116.79
1954	1346	19,500	Dec. 20, 1953	500	2,359	8.77	119.03	1,707,000	2,110	106.50
1955	1396	21,100	Feb. 8, 1955	280	1,950	7.25	98.42	1,412,000	2,216	111.91
1956	1446	26,500	Nov. 3, 1955	265	2,104	7.82	106.50	1,527,000	2,090	105.75
1957	1516	26,800	Dec. 10, 1956	214	1,890	7.03	95.35	1,368,000	1,448	73.04
1958	1566	15,700	Jan. 16, 1958	198	1,416	5.26	71.47	1,025,000	1,916	96.72
1959	1636	28,400	Nov. 12, 1958	269	2,615	9.72	131.97	1,893,000	2,650	132.71
1960	1716	29,400	Nov. 23, 1959	297	2,214	8.23	112.04	1,607,000	-	-

167

Location.--Lat 48°13'15", long 122°08'00", in NW¹/₄ sec.35, T.32 N., R.5 E., on right bank at Northern Pacific Railway culvert, 1 mile north of Arlington.

Records available.--June 1950 to September 1951, September 1952 to December 1957.

Gage.--Water-stage recorder and wooden control on concrete base. Datum of gage is 56.6 ft (stadia traverse).

Average discharge.--6 years (1950-51, 1952-57), 15.9 cfs (11,510 acre-ft per year).

Extremes.--1950-57: Maximum discharge, 129 cfs Dec. 10, 1956 (gage height, 1.10 ft), but may have been higher sometime in December 1953; maximum gage height, 3.26 ft Feb. 9, 1951 (backwater from Stillaguamish River); minimum discharge, 1.2 cfs Sept. 14, 1951; minimum gage height, 0.14 ft July 5, 1951 (from outside gage, control leaking).

Remarks.--Some regulation in Armstrong Lake. No diversion above station.

[illegible][illegible][illegible]

1685. Pilchuck Creek near Bryant, Wash.

Location.--Lat 48°16'00", long 122°09'45", in NE $\frac{1}{4}$ sec.16, T.32 N., R.5 E., on right bank 500 ft upstream from highway bridge and 2 miles north of Bryant.

Drainage area.--49.7 sq mi.

Records available.--March 1929 to September 1931, June 1950 to September 1951, September 1952 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 119.8 ft above mean sea level (stadia traverse). Prior to Oct. 1, 1931, staff gage at site 100 ft downstream at different datum.

Average discharge.--11 years (1929-31, 1951-60), 280 cfs (202,700 acre-ft per year).

Extremes.--1929-31, 1950-60: Maximum discharge, 6,240 cfs Dec. 9, 1956 (gage height, 7.60 ft), from rating curve extended above 3,900 cfs; minimum observed, 0.5 cfs Aug. 29 to Sept. 1, 1931 (gage height, 0.90 ft, site and datum then in use).

Remarks.--No regulation or diversion above station. Records of water temperatures for the period March 1952 to September 1960 are published in reports of 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	334	455	588	537	567	307	197	161	27.0	2.94	2.29	15.9	265
1952													
1953	15.4	48.1	357	804	462	322	259	228	218	38.8	10.6	31.7	232
1954	292	502	883	494	573	240	328	166	256	106	121	162	342
1955	133	490	449	428	463	248	458	293	286	228	88.5	33.3	298
1956	467	552	565	649	203	434	329	147	178	36.1	7.51	79.9	305
1957	537	332	722	205	397	511	296	127	60.2	37.8	32.2	8.89	272
1958	65.7	245	467	502	552	209	276	63.9	23.6	7.47	1.59	39.3	204
1959	352	666	591	719	403	478	519	237	159	41.2	32.5	348	378
1960	271	741	531	434	551	323	460	304	103	13.6	57.6	73.1	320

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	20,540	27,080	36,160	33,010	31,470	18,870	11,720	9,880	1,600	180	141	944	191,600
1952													
1953	949	2,860	21,940	49,460	25,630	19,820	15,390	14,030	12,990	2,380	649	1,880	168,000
1954	17,960	29,880	54,320	30,380	31,840	14,760	19,490	10,200	15,220	6,530	7,450	9,670	247,700
1955	8,190	29,150	27,620	26,330	25,710	15,220	27,260	17,990	17,020	14,020	5,440	1,980	215,900
1956	26,710	32,820	34,730	39,900	11,680	26,670	19,560	9,030	10,620	2,220	462	4,750	221,200
1957	33,020	19,770	44,410	12,620	22,070	31,400	17,620	7,820	3,580	2,320	1,980	529	197,100
1958	4,040	14,590	29,940	30,850	30,660	12,830	16,430	3,930	1,420	459	98	2,340	147,600
1959	21,640	39,610	36,360	44,190	22,380	29,370	30,890	14,570	9,470	2,530	2,000	20,680	273,700
1960	16,670	44,100	32,620	26,700	31,670	19,870	27,350	18,670	6,110	839	3,540	4,350	232,500

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	-	-	-	-	-	-	-	-	-	-	-
1951	1216	3,990	Feb. 9, 1951	1.4	265	5.33	72.29	191,600	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-
1953	1296	2,540	Jan. 23, 1953	3.9	232	4.67	63.38	168,000	338	92.20	244,400
1954	1346	3,870	Dec. 20, 1953	12.5	342	6.88	95.44	247,700	291	79.41	210,500
1955	1396	4,370	Feb. 8, 1955	8.5	298	6.00	81.46	215,900	341	93.26	247,200
1956	1446	3,570	Nov. 3, 1955	2.4	305	6.14	83.43	221,200	306	83.79	222,100
1957	1516	6,240	Dec. 9, 1956	5.8	272	5.47	74.39	197,100	205	56.04	148,500
1958	1566	2,540	Dec. 25, 1957	1.1	204	4.10	55.68	147,600	272	74.18	199,600
1959	1636	5,980	Nov. 12, 1958	4.6	378	7.61	103.24	273,700	372	101.66	269,500
1960	1716	6,030	Nov. 22, 1959	3.1	320	6.44	87.72	232,500	-	-	-

1695. Fish Creek near Arlington, Wash.

Location.--Lat 48°10'30", long 122°13'30", in NW $\frac{1}{4}$ sec. 18, T.31 N., R.5 E., on right bank three-quarters of a mile upstream from mouth and $4\frac{1}{2}$ miles west of Arlington.

Drainage area.--7.6 sq mi, approximately.

Records available.--June 1950 to November 1953, water years 1955-60 (annual maximum).

Gage.--Crest-stage gage. Altitude of gage is 50 ft (from topographic map). Prior to Mar. 13, 1952, water-stage recorder at same site and datum and Mar. 13, 1952, to Nov. 23, 1953, water-stage recorder at site 250 ft downstream at different datum.

Extremes.--1950-53, 1955-60: Maximum discharge, 207 cfs Dec. 20, 1955, may have been affected by failure of beaver dam upstream (gage height, 12.09 ft).
1950-53: Minimum discharge, 0.3 cfs part of each day Aug. 20-26, Sept. 4-7, 1951; minimum gage height, 0.5 ft July 25, Aug. 14, 15, 16, 18, 1953, present datum.
Note.--Maximum discharge for water years 1951-52 were incorrectly published in WSP 1566; they should be as originally published in WSP 1216 and 1246.

Remarks.--Slight regulation; cause unknown. Several small diversions for irrigation and domestic use 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	4.00	11.4	17.6	27.9	16.6	21.6	4.21	3.31	1.38	0.61	0.46	0.56	9.12
1952	1.92	3.84	14.9	14.9	15.9	15.6	6.75	2.84	1.59	1.03	.86	.90	6.74
1953	.94	1.38	2.61	9.52	9.16	9.09	7.57	4.33	4.51	1.05	.82	.98	4.30
1954	2.15	-	-	-	-	-	-	-	-	-	-	-	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	246	676	1,080	1,710	923	1,330	251	203	82	38	28	34	6,600
1952	118	228	918	918	913	958	402	175	95	83	53	53	4,890
1953	58	82	161	585	509	559	450	266	269	64	50	58	3,110
1954	132	-	-	-	-	-	-	-	-	-	-	-	-

Yearly 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	1216	92	Jan. 2, 1951	0.3	9.12	1.20	16.29	6,600	8.10	14.46	5,860
1952	1246	70	Dec. 18, 1951	.7	6.74	.887	12.06	4,890	5.41	9.69	3,930
1953	1286	31	Mar. 28, 1953	.5	4.30	.556	7.67	3,110	-	-	-
1954	1286	-	-	-	-	-	-	-	-	-	-
1955	1566	71.1	Dec. 31, 1954	-	-	-	-	-	-	-	-
1956	1566	207	Dec. 20, 1955	-	-	-	-	-	-	-	-
1957	1566	154	Feb. 24, 1957	-	-	-	-	-	-	-	-
1958	1566	68.5	Feb. 24, 1958	-	-	-	-	-	-	-	-
1959	1636	123	Jan. 24, 1959	-	-	-	-	-	-	-	-
1960	1716	108	Jan. 29, 1960	-	-	-	-	-	-	-	-

1705. Skagit River near Hope, British Columbia

(International gaging station)

Location.--Lat 49°02'50", long 121°05'45", on left bank just downstream from Galena Creek, 4 miles upstream from the international boundary and 27 miles southeast of Hope.

Drainage area.--357 sq mi.

Records available.--April to December 1915, April 1916 to September 1922, October 1934 to September 1955. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Chain gage. Altitude of gage is 1,670 ft (from topographic map). Prior to October 1934, water-stage recorder at site 550 ft downstream at different datum. October 1934 to June 11, 1955, water-stage recorder at present site and datum.

Average discharge.--27 years (1916-22, 1934-55), 999 cfs (723,200 acre-ft per year).

Extremes.--1915-22, 1934-55: Maximum discharge observed, 10,200 cfs June 21, 1950 (gage height, 12.20 ft); minimum recorded, 81 cfs Feb. 9, 1937.

Remarks.--No regulation or diversion.

Cooperation.--This station is 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	602	1,180	1,650	788	1,010	477	1,520	3,270	3,070	1,450	477	277	1,320
1952	377	404	343	221	268	219	1,390	2,970	2,160	1,060	360	201	832
1953	147	139	122	561	824	396	910	2,930	3,080	2,030	700	416	1,020
1954	679	960	785	549	766	593	885	3,570	4,010	3,970	1,480	892	1,600
1955	576	1,360	930	496	351	289	665	1,710	4,430	2,540	847	420	1,220

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	37,010	70,300	101,200	48,440	56,080	29,330	90,650	201,200	182,800	89,320	29,330	16,490	952,200
1952	23,200	24,030	21,100	13,580	15,400	13,460	82,710	182,500	128,500	65,230	22,160	11,940	603,800
1953	9,030	8,300	7,500	34,470	45,770	24,320	54,130	179,900	183,500	125,100	43,070	24,770	739,800
1954	41,760	57,140	48,280	33,760	42,540	36,440	52,640	219,300	238,400	244,000	91,140	53,060	1,158,000
1955	35,430	80,990	57,170	30,520	19,470	17,800	39,550	105,200	263,400	155,700	52,080	25,000	882,300

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	-	-	-	-	-	-	-	-	1,620	61.57	1,172,000
1951	1216	5,560	May 24, 1951	222	1,320	3.70	50.01	952,200	1,120	42.63	812,000
1952	1246	4,970	May 19, 1952	161	832	2.33	31.70	603,800	772	29.41	560,300
1953	1286	5,720	June 13, 1953	90	1,020	2.86	38.87	739,800	1,190	45.30	862,200
1954	1346	6,820	May 19, 1954	412	1,600	4.48	60.88	1,158,000	1,640	62.27	1,185,000
1955	1396	9,760	June 12, 1955	272	1,220	3.42	46.34	882,300	-	-	-

1735. Ruby Creek below Panther Creek, near Newhalem, Wash.

Location.--Lat 48°42'30", long 120°58'10", in NW $\frac{1}{4}$ sec.10, T.37 N., R.14 E. (unsurveyed), on right bank 200 ft downstream from Panther Creek, 4 miles upstream from mouth, and 13 miles northeast of Newhalem.

Drainage area.--199 sq mi.

Records available.--September 1948 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 1,640 ft (by barometer).

Average discharge.--8 years (1948-56), 744 cfs (538,600 acre-ft per year).

Extremes.--1948-56: Maximum discharge, 8,640 cfs Nov. 27, 1949 (gage height, 10.95 ft), from rating curve extended above 5,600 cfs; minimum, 46 cfs Feb. 10, 1949, Nov. 28, 1952; minimum gage height, 0.70 ft Feb. 10, 1949.

Remarks.--No regulation or diversion 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	363	561	744	365	657	261	862	2,173	2,234	1,186	394	232	836
1952	248	215	152	96.6	132	114	719	1,822	1,564	815	326	161	531
1953	98.9	74.7	71.5	247	327	187	494	1,855	1,885	1,251	461	227	600
1954	351	369	302	226	271	221	367	2,006	2,445	2,599	980	448	887
1955	298	757	393	226	168	86.8	295	957	2,361	1,676	520	221	665
1956	557	943	297	174	115	113	844	2,421	2,536	1,592	499	284	866
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	22,340	33,360	45,740	22,430	36,470	16,060	51,300	133,600	132,900	72,910	24,200	13,780	605,100
1952	15,230	12,780	9,370	5,940	7,580	7,010	42,810	112,000	93,090	50,080	20,070	9,590	385,600
1953	6,080	4,440	4,390	15,170	18,180	11,520	29,390	114,000	112,100	76,930	28,350	13,510	434,100
1954	21,800	21,850	18,540	13,900	15,030	13,580	21,860	23,300	145,500	59,800	60,250	26,650	642,000
1955	18,350	45,050	24,140	13,910	9,350	5,340	17,570	58,870	140,500	103,100	31,990	13,160	481,300
1956	34,280	56,110	18,270	10,700	6,600	6,970	50,230	148,900	150,900	97,880	30,700	16,880	628,400
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	-	-	-	-	-	-	-	872	59.47	631,200	
1951	1216	4,170	May 23, 1951	156	836	4.20	57.00	605,100	747	50.97	541,000
1952	1246	3,150	May 18, 1952	75	531	2.67	36.32	385,600	500	34.20	363,100
1953	1286	3,820	June 13, 1953	49	600	3.02	40.90	434,100	665	45.36	481,200
1954	1346	4,630	July 1, 1954	150	887	4.46	60.51	642,000	922	62.89	667,400
1955	1396	6,540	(a)	59	665	3.34	45.34	481,300	694	47.34	502,400
1956	1446	6,240	Oct. 25, 1955	80	866	4.35	59.21	628,400	-	-	-
1957											
1958											
1959											
1960											

a About June 11, 1955.

1750. Ross Reservoir near Newhalem, Wash.

(International gaging station)

Location.--Lat 48°44'00", long 121°04'10", in SE $\frac{1}{4}$ sec.35, T.38 N., R.13 E., at Ross Dam on Skagit River, 1 mile downstream from Ruby Creek and 9 miles northeast of Newhalem.

Drainage area.--980 sq mi, approximately.

Records available.--March 1940 to September 1960 (prior to October 1946, month-end elevations and contents only). Prior to October 1945, published as Ruby Reservoir near Newhalem.

Gage.--Water-stage recorder. Datum of gage is at mean sea level (city of Seattle Ross Dam datum); 1.79 ft above mean sea level, U. S. Coast and Geodetic Survey datum of 1929, 1947 adjustment; and 0.88 ft above mean sea level, Geodetic Survey of Canada 1959 datum (by water level transfer of elevation from the international boundary). Prior to Sept. 24, 1940, staff gage on west shore at site just uplake from Ross Dam at same datum. Sept. 24, 1940, to June 28, 1943, water-stage recorder at present site and datum. June 29, 1943, to Apr. 29, 1948, staff gage on right bank at site 500 ft uplake from dam at present datum.

Extremes.--1940-60: Maximum contents observed, 1,406,500 acre-ft Aug. 23, 1954 (elevation, 1,600.10 ft, from plant log); minimum not determined.

Remarks.--Reservoir is formed by concrete dam completed to elevation 1,615 ft in 1949; storage began Mar. 11, 1940. Capacity, 1,202,920 acre-ft between elevations 1,250 (lowest outlet) and 1,582 ft (spillway crest). Dead storage negligible. Water used for power and to supplement low flow of Skagit River through city of Seattle's Diablo and Newhalem powerplants. Figures given herein represent total contents.

Cooperation.--This station is maintained by the United States under agreement with Canada.

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	1,087.0	1,121.9	1,122.9	892.80	851.12	729.47	562.60	776.41	1,163.7	1,203.0	1,169.0	1,084.9
1952	926.3	715.01	534.24	318.22	157.60	60.18	220.01	720.61	1,077.8	1,202.0	1,194.5	1,140.6
1953	975.8	782.29	647.16	703.90	725.43	642.71	630.26	980.60	1,296.1	1,398.3	1,396.0	1,345.5
1954	1,258.5	1,202.0	1,081.9	943.00	821.53	622.30	488.82	763.07	1,157.4	1,400.7	1,403.0	1,379.8
1955	1,309.5	1,245.3	1,148.0	969.20	802.63	589.37	496.66	625.18	1,258.5	1,399.5	1,391.4	1,244.4
1956	1,314.0	1,247.5	1,128.1	943.90	731.89	530.59	571.11	1,005.6	1,278.4	1,403.0	1,397.2	1,352.4
1957	1,326.3	1,250.8	1,181.7	930.00	746.57	608.76	602.44	1,191.3	1,384.4	1,394.9	1,398.3	1,323.0
1958	1,199.8	1,055.7	918.10	787.35	723.02	604.53	616.57	1,188.1	1,372.9	1,400.7	1,401.8	1,355.8
1959	1,276.2	1,205.2	1,168.0	1,009.5	801.78	603.14	582.49	846.74	1,363.8	1,403.0	1,379.8	1,393.7
1960	1,305.0	1,251.9	1,116.7	895.50	748.20	677.40	731.90	933.70	1,329.7	1,405.3	1,342.2	1,325.8

Note.--All contents are from elevations at 12 p.m.

1754. Thunder Creek below McAllister Creek, near Newhalem, Wash.

Location.--Lat 48°38', long 121°03', in SE $\frac{1}{4}$ sec.1, T.36 N., R.13 E. (unsurveyed), on right bank a quarter of a mile downstream from McAllister Creek, 4 miles upstream from mouth, and 10 miles east of Newhalem.

Drainage area.--96 sq mi, approximately.

Records available.--October 1957 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,703 ft (from river-profile map). Prior to Mar. 22, 1959, at datum 0.99 ft higher.

Extremes.--1957-60: Maximum discharge, 4,320 cfs Nov. 23, 1959 (gage height, 9.50 ft, from high-water mark in well), from rating curve extended above 2,300 cfs by logarithmic plotting; minimum, 82 cfs Mar. 14, 1960 (gage height, 0.73 ft).

Remarks.--No regulation or diversion 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	302	204	151	177	191	144	212	1,185	1,400	1,323	984	603	576
1959	546	401	584	267	126	131	460	759	1,394	1,476	880	833	657
1960	755	764	309	137	172	165	376	649	1,312	1,389	886	543	622

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1958	18,560	12,130	9,300	10,890	10,610	8,630	12,640	72,840	83,300	81,350	60,530	35,880	416,900
1959	33,550	23,850	35,910	16,430	6,990	8,080	27,360	46,670	82,330	90,750	54,100	49,550	475,600
1960	46,390	45,430	19,000	8,420	9,880	10,130	22,360	39,930	78,070	85,390	54,490	32,290	451,800

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year			
		Momentary			Per square mile			Runoff		Runoff	
		Discharge	Date	Maximum	Minimum	Mean	Inches	Acres-foot	Mean	Inches	Acres-foot
1958	1566.1636	4,010	Oct. 30, 1957	115	576	6.00	81.42	416,900	649	91.83	470,200
1959	1636	3,660	Dec. 2, 1958	100	657	6.64	92.88	475,600	681	96.30	495,100
1960	1716	4,320	Nov. 23, 1959	82	622	6.48	88.25	451,800	-	-	-

1755. Thunder Creek near Newhalem, Wash.

Location.--Lat 48°40'20", long 121°04'20", in SE $\frac{1}{4}$ sec.23, T.37 N., R.13 E..(unsurveyed), on right bank half a mile upstream from high-water line of Diablo Reservoir at elevation 1,205 ft, 8 miles east of Newhalem, and 20 miles northeast of Marblemount.

Drainage area.--110 sq mi (revised), approximately.

Records available.--October 1930 to September 1960. Published as "above Colonial Creek, near Marblemount" 1930-31.

Gage.--Water-stage recorder. Altitude of gage is 1,220 ft (from river-profile map).

Average discharge.--30 years (1930-60), 620 cfs (448,900 acre-ft per year).

Extremes.--1930-60: Maximum discharge, 10,800 cfs Oct. 25, 1955 (gage height, 12.68 ft), from rating curve extended above 2,900 cfs on basis of logarithmic plotting; minimum not determined, probably less than 50 cfs during period of ice effect or no gage-height record in February 1936.

Remarks.--No regulation or diversion 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	562	582	700	246	564	169	527	1,035	1,271	1,367	924	640	717
1952	480	246	152	92.3	140	105	437	905	1,053	1,258	1,083	592	547
1953	390	120	132	401	566	152	308	858	932	1,410	1,030	698	568
1954	526	391	379	216	270	194	288	958	1,190	1,591	1,166	744	683
1955	364	777	296	162	127	92.3	211	568	1,475	1,457	1,031	636	602
1956	777	732	247	140	89.3	91.1	458	1,168	1,462	1,709	1,066	794	730
1957	602	339	448	143	149	173	348	1,336	1,372	997	739	679	613
1958	356	239	178	220	233	179	257	1,345	1,518	1,424	1,095	684	647
1959	624	477	699	336	164	162	523	836	1,476	1,576	927	879	727
1960	827	810	352	157	193	188	438	706	1,407	1,485	926	543	671

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	34,570	34,640	43,060	15,150	31,310	10,380	31,360	63,670	75,610	84,050	56,840	38,100	518,700
1952	29,530	14,650	9,370	5,670	8,040	6,480	25,980	55,660	62,670	77,240	66,590	35,240	†397,100
1953	24,000	7,140	8,140	24,660	20,300	9,360	18,350	52,770	55,480	86,440	63,070	41,620	411,300
1954	32,330	23,240	23,300	13,310	15,000	11,900	17,110	58,910	70,790	97,840	71,670	44,250	479,600
1955	22,350	46,240	18,200	9,960	7,040	5,670	12,550	34,910	87,780	89,570	63,380	37,870	435,500
1956	47,800	43,550	15,200	8,610	5,140	5,600	27,270	71,840	87,000	105,100	65,550	47,240	529,900
1957	37,010	20,190	27,530	8,790	8,260	10,620	20,560	82,170	81,640	61,310	45,420	40,380	443,900
1958	21,860	14,210	10,920	13,560	12,970	11,010	15,270	82,700	90,320	87,530	67,320	40,710	468,400
1959	38,370	28,400	42,970	20,670	9,090	9,970	31,130	51,410	87,840	96,900	56,980	52,310	526,000
1960	50,830	48,200	21,660	9,660	11,130	11,580	26,070	43,410	83,720	91,290	56,940	32,300	486,800

† 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	-	-	-	-	-	-	-	-	768	94.73	555,600	-
1951	1216	3,870	Feb. 10, 1951	142	717	6.52	88.42	518,700	635	78.42	460,000	-
1952	1246	2,580	June 4, 1952	77	547	4.97	67.71	†397,100	527	65.28	382,800	-
1953	1286	2,690	Sept. 28, 1953	62	568	5.16	70.12	411,300	623	76.66	450,900	-
1954	1346	2,850	Aug. 23, 1954	110	663	6.03	81.77	479,600	673	83.12	487,600	-
1955	1396	3,160	July 16, 1955	84	602	5.47	74.23	435,500	629	77.60	455,300	-
1956	1446	10,800	Oct. 25, 1955	72	730	6.64	90.31	529,900	700	86.59	508,100	-
1957	1516	2,790	June 11, 1957	86	613	5.57	75.66	443,900	561	69.23	406,200	-
1958	1566	4,060	Oct. 30, 1957	142	647	5.88	79.84	468,400	734	90.53	531,100	-
1959	1636	4,750	Dec. 2, 1958	128	727	6.61	89.66	526,000	742	91.53	537,000	-
1960	1716	5,880	Nov. 23, 1959	100	671	6.10	82.97	486,800	-	-	-	-

† Corrected.

1765. Diablo Reservoir near Newhalem, Wash.

Location.--Lat 48°43'00", long 121°08'00", in SE $\frac{1}{4}$ sec.5, T.37 N., R.13 E. (unsurveyed), in Diablo Dam on Skagit River, 1 mile downstream from Thunder Creek and 6 miles northeast of Newhalem.

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

Records available.--October 1929 to September 1960. October 1929 to September 1938 monthly change in reservoir contents published with records for Skagit River at Newhalem.

Gage.--Water-stage recorder. Datum of gage is at mean sea level, subject to adjustment to datum of 1929. Prior to Oct. 12, 1931, staff gage at approximately same site and datum.

Extremes.--1929-60: Maximum contents, 90,600 acre-ft July 14, 1933 (elevation, 1,206.5 ft); minimum since storage began, not determined.

Remarks.--Reservoir is formed by concrete dam, completed in 1930; storage began October 1929. Usable capacity, 76,220 acre-ft between elevations 1,040 (bottom of outlet pipes) and 1,205 ft (top of taintor gates). Dead storage, 13,000 acre-ft. Crest of spillway is at elevation 1,187 ft. Water is used by city of Seattle for power development at Diablo and Newhalem powerplants. Figures given herein represent total contents.

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

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	79,080	79,400	77,700	78,910	30,280	28,420	79,160	77,780	61,140	74,800	84,500	85,990
1952	79,400	88,400	86,700	87,050	87,400	87,140	88,760	87,050	87,770	89,680	88,950	88,580
1953	86,700	79,490	86,700	88,580	87,050	85,990	86,700	85,730	88,040	86,790	86,830	84,760
1954	87,410	88,400	82,940	86,430	86,960	88,670	87,230	85,020	86,430	89,130	88,130	86,520
1955	86,700	87,140	85,640	88,490	88,400	87,860	85,200	84,760	85,820	87,140	87,950	86,430
1956	86,790	87,410	85,290	88,400	87,410	85,990	85,290	86,960	86,700	85,990	86,080	85,110
1957	87,230	87,320	86,790	86,790	85,200	83,890	87,590	85,020	84,240	83,800	89,130	84,060
1958	83,550	82,770	84,760	87,590	85,460	83,290	86,340	83,960	75,110	87,860	85,480	88,220
1959	89,220	84,670	85,820	86,340	83,630	88,040	85,290	83,800	82,170	83,800	84,150	84,320
1960	84,240	84,240	87,320	84,150	88,760	88,950	83,980	78,750	80,060	79,900	87,950	83,290

a Estimated on basis of records observed by city of Seattle.

1775. Stettatle Creek near Newhalem, Wash.

Location.--Lat 48°43'30", long 121°09'20", in NE 1/4 sec. 6, T.37 N., R.13 E., on left bank three-quarters of a mile upstream from mouth, 5 1/2 miles northeast of Newhalem, and 18 1/2 miles northeast of Marblemount.

Drainage area.--21.4 sq mi.

Records available.--December 1913 to November 1915 (fragmentary), September 1933 to September 1960. Published as "near Marblemount" 1913-15.

Gage.--Water-stage recorder. Altitude of gage is 925 ft (by barometer). Dec. 19, 1913, to Nov. 14, 1915, staff gage at site about half a mile downstream at different datum. Sept. 7 to Oct. 20, 1933, staff gage and Oct. 21, 1933, to Aug. 26, 1937, water-stage recorder, at site 750 ft (revised) upstream at datum 1.69 ft higher. Aug. 27, 1937, to Nov. 20, 1957, water-stage recorder at site 600 ft upstream at same datum.

Average discharge.--27 years (1933-60), 179 cfs (129,600 acre-ft per year).

Extremes.--1913-15, 1933-60: Maximum discharge, 8,580 cfs Nov. 26, 1949 (gage height, 9.70 ft), from rating curve extended above 1,600 cfs on basis of slope-area measurement of peak flow; minimum, 9 cfs Nov. 9-11, 1936.

Remarks.--No regulation or diversion 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	216	292	327	104	279	55.5	217	354	362	245	112	100	221
1952	195	104	65.7	36.2	55.2	52.3	218	354	356	259	111	85.6	155
1953	41.2	40.5	65.8	34.6	153	66.5	174	320	292	316	157	167	179
1954	202	195	169	80.4	143	77.6	150	360	411	481	276	184	230
1955	169	360	110	51.8	53.8	30.5	117	272	464	396	182	93.1	192
1956	310	245	120	52.7	26.6	45.5	233	455	431	396	169	174	222
1957	267	139	216	45.5	85.9	93.1	205	428	328	204	118	86.7	185
1958	94.7	81.9	109	146	150	74.5	136	412	339	162	81.8	118	159
1959	194	222	303	160	52.6	91.8	310	309	455	380	163	285	244
1960	279	266	128	73.9	98.8	104	207	288	430	287	125	89.3	198

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	13,290	17,360	20,110	6,420	15,510	3,410	12,900	21,760	21,530	15,040	6,880	5,970	160,200
1952	11,870	6,190	4,040	2,220	5,480	3,220	12,960	20,530	20,000	15,920	6,850	3,310	112,600
1953	2,530	2,410	4,050	21,240	8,520	4,090	10,340	19,700	17,380	19,400	9,660	9,920	129,200
1954	12,400	11,610	10,420	4,940	7,970	4,770	8,900	23,360	24,450	29,600	16,970	10,970	166,400
1955	10,360	21,440	6,780	3,190	3,200	1,880	6,970	16,700	27,580	24,370	11,190	5,540	139,200
1956	19,070	14,560	7,370	3,240	1,530	2,800	13,880	27,980	25,620	24,320	10,390	10,330	161,100
1957	16,450	8,280	13,680	2,800	4,770	5,720	12,200	26,300	19,500	12,560	7,280	5,180	134,300
1958	5,820	4,880	6,720	8,980	8,360	4,580	8,120	25,320	20,190	9,940	5,030	7,050	115,000
1959	11,910	13,190	18,620	9,840	2,920	5,640	18,420	18,990	27,100	23,360	10,040	16,970	177,000
1960	17,180	15,850	7,900	4,540	5,680	6,370	12,310	17,680	25,570	17,650	7,710	5,250	143,700

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		Mean	Runoff	
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet		Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	-	-	-	236	149.50	170,600
1951	1216	a3,300	Feb. 10, 1951	40	221	10.3	140.34	160,200	182	115.23	131,500	182	115.23	131,500
1952	1246	1,480	June 4, 1952	23	355	7.24	98.64	112,600	137	87.16	99,480	137	87.16	99,480
1953	1286	1,820	(b)	20	179	8.36	113.24	129,200	214	135.52	154,700	214	135.52	154,700
1954	1346	1,710	Oct. 30, 1953	34	230	10.7	145.75	166,400	235	149.37	170,500	235	149.37	170,500
1955	1396	1,620	Nov. 22, 1954	26	192	8.97	121.92	139,200	196	124.07	141,600	196	124.07	141,600
1956	1446	4,330	Oct. 25, 1955	18	222	10.4	141.16	161,100	218	138.50	158,100	218	138.50	158,100
1957	1516	1,710	Oct. 20, 1956	19	185	8.64	117.64	134,300	157	99.63	113,700	157	99.63	113,700
1958	1566	1,100	Oct. 30, 1957	29	159	7.43	100.75	115,000	195	123.80	141,300	195	123.80	141,300
1959	1636	2,050	Dec. 2, 1958	36	244	11.4	155.08	177,000	241	152.63	174,200	241	152.63	174,200
1960	1716	1,690	Nov. 24, 1959	25	198	9.25	125.92	143,700	-	-	-	-	-	-

a Estimated.

b Probably Sept. 30, 1953.

1777. Gorge Reservoir near Newhalem, Wash.

Location.--Lat 48°41'55", long 121°12'20", in N $\frac{1}{4}$ sec. 14, T. 37 N., R. 12 E., on Skagit River 2 miles upstream from city of Seattle Gorge powerplant at Newhalem.

Drainage area.--1,110 sq mi, approximately.

Records available.--June to September 1960.

Gage.--Reference point on Gorge Dam. Datum of gage is at mean sea level, Gorge High Dam datum, and 1.792 ft below mean sea level, datum of 1929, supplementary adjustment of 1947 (levels by Corps of Engineers).

Extremes.--June to September 1960: Maximum contents observed, 1,621 acre-ft Aug. 10 (elevation, 820.6 ft); minimum not determined.

Remarks.--Reservoir is formed by concrete dam, completed Dec. 27, 1960; storage began June 27, 1960. Usable capacity, 6,700 acre-ft between elevations 820 and 875 ft (storage between normal operating elevations 870 and 875 ft, 1,033 acre-ft). Dead storage, 7,235 acre-ft. Crest of spillway is at elevation 825 ft. Water is used by city of Seattle for power development at Gorge powerplant. Figures given herein represent total contents.

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

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1960	-	-	-	-	-	-	-	-	183	1,464	1,013	1,609

1780. Skagit River at Newhalem, Wash.

Location.--Lat 48°40'20", long 121°14'45", in SE $\frac{1}{4}$ sec. 21, T.37 N., R.12 E., on right bank a quarter of a mile upstream from Newhalem Creek, half a mile downstream from city of Seattle powerplant at Newhalem, 11 miles upstream from Bacon Creek, and 13 miles north-east of Marblemount.

Drainage area.--1,160 sq mi, approximately, of which 400 sq mi is in Canada.

Records available.--October 1908 to May 1914 and October 1920 to September 1960 in reports of Geological Survey. October 1908 to September 1953 (monthly discharge only) in State Water-Supply Bulletin 6. Published as "near Marblemount" 1908-14, 1920-31.

Gage.--Water-stage recorder. Datum of gage is 401.5 ft above mean sea level (river-profile survey). Prior to May 24, 1914, staff gages at site half a mile upstream at datum 91 ft higher. Nov. 15, 1920, to June 4, 1923, staff gage at site 500 ft upstream at same datum.

Average discharge.--52 years (1908-60), 4,430 cfs (3,207,000 acre-ft per year), adjusted for storage in Diablo Reservoir since October 1929, Ross Reservoir since March 1940, and Gorge Reservoir since June 1960.

Extremes.--1908-14, 1920-60: Maximum discharge, 63,500 cfs Nov. 29, 1909 (gage height, 22.0 ft, from floodmark, site and datum then in use); minimum, 54 cfs Nov. 1, 1943 (gage height, 78.15 ft); minimum daily, 136 cfs Aug. 24, 1930.

Flood in 1815 reached a stage of approximately 20.5 ft at Reflector Bar 6 miles upstream (discharge, about 115,000 cfs).

Remarks.--Water is diverted 3 miles above station and is returned to river at Seattle powerplant just above station. Flow regulated for power at Gorge Dam since August 1924 and by Diablo, Ross, and Gorge Reservoirs (see elsewhere in this report), having a combined capacity of 1,280,000 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	3,555	4,946	7,268	6,757	7,138	3,999	7,732	8,060	5,140	6,301	3,616	3,666	5,675
1952	5,060	5,299	4,516	4,327	4,488	2,860	2,300	2,039	2,316	3,555	3,147	2,644	3,545
1953	3,891	4,153	2,987	3,302	3,190	3,073	3,788	4,205	4,365	6,776	4,299	3,124	3,936
1954	4,720	4,807	5,676	4,618	5,477	5,498	5,804	7,208	6,671	9,855	6,392	4,196	5,920
1955	3,795	7,563	4,916	4,710	4,529	4,578	4,337	4,269	4,644	7,557	4,340	3,184	4,870
1956	5,575	7,670	4,561	4,495	4,759	4,591	5,387	7,230	9,529	7,630	4,192	3,834	5,784
1957	5,049	4,586	5,614	5,731	5,121	4,523	3,996	4,772	6,080	4,279	2,487	3,415	4,635
1958	3,560	3,910	3,929	4,400	3,779	4,028	2,710	3,439	5,575	3,643	2,853	3,113	3,761
1959	4,799	5,349	6,862	6,439	5,687	5,269	5,922	5,472	5,917	8,642	4,049	4,209	5,724
1960	6,918	6,695	5,797	5,413	4,616	3,612	4,456	4,495	5,311	6,006	4,246	2,409	5,019

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	218,600	294,300	448,100	415,500	396,400	245,900	460,100	495,600	305,800	387,500	222,300	218,100	4,108,000
1952	311,000	315,000	277,000	266,000	258,100	175,800	136,800	125,400	137,600	218,800	193,500	157,300	2,574,000
1953	239,200	247,100	183,700	203,000	177,200	168,900	225,400	258,600	259,700	416,600	264,300	185,900	2,850,000
1954	290,200	286,000	49,000	284,000	304,200	336,000	345,300	443,200	397,000	806,000	393,000	249,700	4,286,000
1955	233,300	450,000	320,300	289,600	251,500	281,500	258,000	262,500	276,300	464,600	266,600	189,400	3,526,000
1956	342,800	456,400	280,400	276,400	273,800	282,300	320,500	444,600	567,000	469,100	257,800	228,100	4,199,000
1957	310,500	272,900	345,200	352,400	284,400	278,100	237,800	293,400	361,800	263,100	152,900	293,200	3,556,000
1958	218,900	232,600	241,600	270,500	209,900	247,600	161,300	211,400	331,700	236,300	175,400	185,200	2,722,000
1959	295,100	318,300	421,900	395,900	351,800	325,200	352,400	336,400	352,100	531,400	249,000	250,500	4,144,000
1960	425,400	398,400	356,500	332,800	277,000	222,100	265,200	276,400	316,000	369,300	261,100	145,300	3,644,000

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30										Calendar year			
		Observed					Adjusted					Observed			
		Momentary maximum		Mini- mum	Mean	Runoff in acre-feet	Mean	Per square mile	Runoff in inches	Mean	Runoff in acre-feet	Mean	Runoff in inches	Mean	Runoff in inches
		Discharge	Date												
1950	-	-	-	-	-	-	-	-	-	-	5,917	4,284,000	6,106	71.45	-
1951	1216	18,300	Dec. 24, 1950	1,240	5,675	4,108,000	5,689	4.90	66.57	5,596	4,051,000	4,795	56.12	-	-
1952	1246	12,000	Oct. 29, 1951	702	3,545	2,574,000	3,625	3.12	42.53	3,223	2,339,000	3,378	39.62	-	-
1953	1286	19,700	July 14, 1953	1,180	3,938	2,850,000	4,214	3.63	49.31	4,289	3,105,000	4,684	57.16	-	-
1954	1346	18,600	July 3, 1954	720	5,920	4,286,000	5,969	5.15	69.85	6,003	4,346,000	6,098	71.35	-	-
1955	1396	20,100	July 16, 1955	1,190	4,870	3,526,000	4,821	4.16	55.41	5,000	3,620,000	4,972	58.18	-	-
1956	1446	17,500	Oct. 25, 1955	1,100	5,764	4,199,000	5,794	4.99	67.99	5,576	4,048,000	5,652	66.32	-	-
1957	1516	10,900	June 7, 1957	1,180	4,635	3,356,000	4,594	3.96	53.75	4,310	3,120,000	3,942	46.15	-	-
1958	1566	7,930	June 20, 1958	1,160	3,761	2,722,000	3,811	3.29	44.59	4,233	3,085,000	4,580	53.58	-	-
1959	1636	11,900	July 2, 1959	1,080	5,724	4,144,000	5,771	4.98	67.54	5,924	4,289,000	5,655	-	-	-
1960	1716	15,000	Nov. 23, 1959	1,150	5,019	3,644,000	4,927	-	-	-	-	-	-	-	-

1790. Skagit River above Alma Creek, near Marblemount, Wash.

Location.--Lat 48°36'25", long 121°21'35", in NE $\frac{1}{4}$ sec.15, T.36 N., R.11 E., on right bank three-quarters of a mile upstream from Alma Creek and 7 miles north of Marblemount.

Drainage area.--1,260 sq mi, approximately, of which 400 sq mi is in Canada.

Records available.--October 1950 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 358.8 ft above mean sea level (river-profile survey).

Average discharge.--10 years (1950-60), 5,747 cfs (4,161,000 acre-ft per year).

Extremes.--1950-60: Maximum discharge, 29,400 cfs Oct. 25, 1955 (gage height, 14.64 ft); minimum, 990 cfs Dec. 29, 1957 (gage height, 4.55 ft); minimum daily, 1,360 cfs Mar. 18, 1956.

Remarks.--All diversions returned to river above gage. Flow partly regulated by power-plants on upper Skagit River, and by Ross, Diablo and Gorge Reservoirs (see elsewhere in this report). Records of water temperatures for the period January 1953 to September 1960 are published in reports of 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	4,932	6,048	8,739	7,370	8,952	4,436	8,754	9,418	6,454	7,089	3,987	4,032	6,670
1952	5,973	5,804	4,862	4,514	4,964	3,171	3,165	3,321	3,310	4,474	3,594	2,893	4,170
1953	4,038	4,193	3,266	4,565	3,804	3,461	4,487	5,404	5,512	8,202	4,842	3,572	4,621
1954	5,477	5,640	6,559	5,065	6,122	5,864	6,285	8,517	7,813	11,770	7,384	4,859	6,792
1955	4,467	9,329	5,522	5,019	4,861	4,732	4,826	5,203	6,511	9,212	5,117	3,555	5,699
1956	6,896	9,382	5,254	4,926	4,970	4,897	6,385	9,066	11,590	9,255	4,740	4,237	6,798
1957	6,234	5,351	6,793	6,117	5,705	5,073	4,867	6,555	7,512	5,181	2,976	3,834	5,516
1958	4,126	4,448	4,615	5,389	4,674	4,509	3,344	5,098	7,043	4,580	5,207	3,687	4,558
1959	5,893	6,705	8,425	7,370	5,784	5,495	6,930	6,586	7,603	10,490	4,513	5,189	6,759
1960	8,120	7,985	6,891	5,926	5,516	4,128	5,406	5,797	6,778	6,876	4,609	2,762	5,886

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	303,300	359,900	537,400	453,200	497,200	272,700	520,900	579,100	384,100	435,900	245,200	239,900	4,829,000
1952	367,200	345,400	298,900	277,600	285,500	195,000	188,400	204,200	197,000	275,100	221,000	172,200	3,028,000
1953	248,300	249,500	200,800	280,700	211,300	212,800	267,000	332,300	328,600	504,300	297,700	212,500	3,345,000
1954	356,800	355,600	405,300	311,400	340,000	380,600	374,000	523,700	464,900	723,600	454,000	289,100	4,917,000
1955	274,700	555,100	339,500	308,600	270,000	291,000	267,200	319,900	397,400	566,400	314,600	211,500	4,126,000
1956	424,000	558,200	323,000	302,900	285,900	301,100	380,000	557,500	689,700	569,000	291,400	252,100	4,935,000
1957	383,300	318,400	417,700	376,100	316,800	311,900	289,600	403,000	447,000	318,500	183,000	228,100	3,993,000
1958	253,700	264,700	283,800	331,400	259,800	277,200	199,000	313,500	419,100	281,600	197,200	219,400	3,300,000
1959	362,300	399,000	518,100	453,100	321,200	337,900	412,300	405,600	452,400	644,900	277,500	308,800	4,893,000
1960	499,300	475,100	411,400	364,400	317,300	253,800	321,700	356,400	403,300	422,800	283,400	164,300	4,273,000

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	1216	28,000	Feb. 10, 1951	1,650	6,670	4,829,000	6,409	4,640,000
1952	1246	12,900	Oct. 29, 1951	1,400	4,170	3,028,000	3,739	2,715,000
1953	1286	20,200	July 14, 1953	1,450	4,621	2,345,000	5,141	3,722,000
1954	1346	19,400	July 3, 1954	3,370	6,792	4,917,000	6,921	5,011,000
1955	1396	24,600	July 16, 1955	1,530	5,699	4,126,000	5,887	4,262,000
1956	1446	29,400	Oct. 25, 1955	1,360	6,798	4,935,000	6,542	4,749,000
1957	1516	16,800	Oct. 17, 1956	1,450	5,516	3,993,000	5,078	3,676,000
1958	1566	10,100	June 20, 1958	1,480	4,558	3,300,000	5,218	3,777,000
1959	1636	19,100	Dec. 2, 1958	2,400	6,759	4,893,000	6,906	5,000,000
1960	1716	20,100	Nov. 23, 1959	1,430	5,886	4,273,000	-	-

1810. Skagit River at Marblemount, Wash.

Location.--Lat 48°32'00", long 121°25'40", in NW¼ sec.7, T.35 N., R.11 E., on right bank half a mile north of Marblemount and 0.6 mile upstream from Cascade River.

Drainage area.--1,360 sq mi, approximately, of which 400 sq mi is in Canada.

Records available.--September 1943 to July 1944, October 1946 to September 1951.

Gage.--Water-stage recorder. Datum of gage is 305.1 ft above mean sea level (river-profile survey).

Average discharge.--5 years (1946-51), 6,580 cfs (4,764,000 acre-ft per year).

Extremes.--1943-44, 1946-51: Maximum discharge, 59,300 cfs Nov. 27, 1949 (gage height, 11.37 ft), from rating curve extended above 20,000 cfs; minimum, 620 cfs Mar. 6, 1944 (gage height, 0.55 ft); minimum daily, 1,190 cfs Feb. 25, 1944.

Remarks.--All diversions returned to river above gage. Flow partly regulated by power-plants on upper Skagit River, and by Ross Reservoir (see p. 172) and Diablo Reservoir (see p. 174).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	6,153	7,848	10,300	7,928	10,340	4,988	9,534	10,630	7,535	7,719	4,204	4,292	7,604

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	578,300	467,000	533,300	487,500	574,300	506,700	567,300	653,800	448,400	474,600	258,500	255,400	5,505,000

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	-	-	-	-	-	-	8,404	6,084,000
1951	1216	42,400	Feb. 10, 1951	1,990	7,604	5,505,000	-	-

1811. South Fork Cascade River, near Marblemount, Wash.

Location.--Lat 48°22'14", long 121°04'20", on left bank at outlet of South Cascade Lake, 9 miles upstream from confluence with North Fork and 21 miles southeast of Marblemount.

Drainage area.--2.36 sq mi.

Records available.--July 1957 to September 1960 (seasonal records only).

Gage.--Water-stage recorder. Datum of gage is 5,289 ft above mean sea level (from U. S. Coast and Geodetic Survey triangulation point). Prior to Sept. 23, 1960, at datum 0.96 ft higher.

Extremes.--1957-60: Maximum discharge recorded, 194 cfs Oct. 24, 1959; minimum daily, 1 cfs Dec. 31, 1959, May 2, 1960.

Remarks.--No regulation or diversion above station. Flow originates at South Cascade Glacier. Records not previously published by Geological Survey.

Monthly and yearly mean discharge, in cubic feet per second

Year			May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		
1957			-	-	69.6	51.4	51.0	-	-	-		
1958			-	-	98.1	88.6	53.9	33.3	13.6	-		
1959			-	-	97.7	73.7	60.5	35.0	16.5	7.85		
1960			13.3	50.9	63.2	62.7	38.9	26.5	9.00	2.76		

Monthly and yearly discharge, in acre-feet

Year			May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		
1957			-	-	4,280	3,160	3,030	-	-	-		
1958			-	-	6,030	5,450	3,210	2,050	808	-		
1959			-	-	6,010	4,530	3,600	2,150	981	493		
1960			819	3,030	5,110	3,850	2,320	1,630	535	170		

Yearly discharge, in cubic feet per second

Year	WSP	The season						Calendar year		
		Maximum discharge recorded		Minimum day	Mean	Per square mile	Runoff		Mean	Inches
		Discharge	Date				Inches	Acre-feet		
1957	-	132	Sept. 6, 1957							
1958	-	159	Sept. 19, 1958							
1959	-	177	July 19, 1959							
1960	-	194	Oct. 24, 1959							

1825. Cascade River at Marblemount, Wash.

Location.--Lat 48°31'25", long 121°23'00", in N $\frac{1}{4}$ sec.16, T.35 N., R.11 E., on right bank 1 $\frac{1}{2}$ miles downstream from Boulder Creek, 2 miles east of Marblemount, and 2 $\frac{1}{2}$ miles upstream from mouth.

Drainage area.--171 sq mi.

Records available.--September 1928 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 380.3 ft above mean sea level (river-profile survey).

Average discharge.--32 years (1928-60), 1,017 cfs (736,300 acre-ft per year).

Extremes.--1928-60: Maximum discharge, 17,800 cfs Nov. 27, 1949 (gage height, 11.47 ft), from rating curve extended above 5,000 cfs by logarithmic plotting; minimum, 118 cfs Nov. 30, 1952; minimum gage height, 1.11 ft Feb. 8, 1937.
Flood in about 1815 reached a stage of approximately 22 ft (discharge 46,000 cfs).

Remarks.--No regulation or diversion above station. Records of water temperatures for the period May 1952 to September 1960 are published in reports of 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	1,065	1,252	1,568	678	1,524	479	1,087	1,782	1,968	1,425	710	571	1,172
1952	875	611	448	230	551	337	984	1,702	1,720	1,549	789	461	856
1953	294	185	252	1,324	952	415	697	1,566	1,686	2,136	1,071	719	943
1954	898	1,054	1,210	717	1,071	581	750	1,629	2,213	2,790	1,794	1,195	1,345
1955	754	1,468	693	441	407	257	619	1,153	2,780	2,275	1,178	640	1,057
1956	1,202	1,604	918	466	257	311	1,113	2,278	2,353	2,056	919	761	1,189
1957	1,154	761	1,165	381	485	593	847	2,283	1,969	1,217	718	529	1,011
1958	477	484	547	775	729	472	651	2,111	1,868	1,065	691	717	883
1959	1,017	1,191	1,655	1,055	452	491	1,178	1,637	2,609	2,370	1,000	1,439	1,345
1960	1,512	1,797	964	481	666	556	1,047	1,490	2,225	1,800	909	635	1,174

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	65,480	74,470	96,430	41,690	84,630	29,460	64,710	109,600	117,100	87,610	43,670	33,970	848,800
1952	53,780	36,380	27,580	14,160	31,690	20,730	58,580	104,600	102,400	95,220	48,510	27,460	621,100
1953	19,110	11,050	15,480	81,390	52,880	25,530	41,480	96,300	100,300	131,400	65,840	42,810	682,500
1954	55,210	62,740	74,410	44,060	59,500	35,730	44,840	112,500	131,700	171,600	110,300	71,100	973,500
1955	46,360	87,360	42,590	27,110	22,580	15,800	36,830	70,870	165,400	139,900	72,460	38,100	765,400
1956	73,930	95,460	56,470	28,650	14,760	19,150	66,220	140,100	140,600	126,400	56,480	45,270	863,500
1957	69,710	45,270	71,630	23,430	26,950	36,460	50,400	140,400	117,200	74,800	44,140	31,500	731,900
1958	29,340	28,810	33,630	47,630	40,460	29,030	38,760	129,800	111,200	65,490	42,490	42,680	639,300
1959	62,540	70,850	101,800	64,840	25,110	30,170	70,100	100,700	155,200	145,700	61,470	85,610	974,100
1960	92,980	106,900	59,280	29,600	38,320	34,200	62,280	91,610	132,400	110,700	55,920	37,770	852,000

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	-	-	-	-	-	-	-	-	1,374	103.64	995,000
1951	1216	9,650	Feb. 10, 1951	332	1,172	6.51	88.43	848,800	1,009	76.07	730,200
1952	1246	4,280	June 4, 1952	155	856	4.76	64.69	621,100	755	60.08	548,000
1953	1286	4,750	Jan. 31, 1953	118	943	5.51	74.84	682,500	1,147	91.03	830,300
1954	1346	5,470	Aug. 23, 1954	349	1,345	7.87	106.72	973,500	1,322	104.96	957,400
1955	1396	6,290	June 11, 1955	222	1,057	6.18	83.93	765,400	1,128	89.37	814,900
1956	1446	10,800	Oct. 25, 1955	208	1,189	6.95	94.68	863,500	1,135	90.36	824,200
1957	1516	4,650	Oct. 17, 1956	212	1,011	5.91	80.24	731,900	880	69.86	637,100
1958	1566	5,060	Oct. 30, 1957	235	883	5.16	70.10	639,300	1,081	85.82	782,700
1959	1636	9,110	Dec. 3, 1958	312	1,345	7.87	106.82	974,100	1,379	109.45	998,100
1960	1716	10,600	Nov. 23, 1959	272	1,174	6.87	93.43	852,000	-	-	-

1860. Sauk River above Whitechuck River, near Darrington, Wash.

Location.--Lat 48°10'00", long 121°27'45" in NW¼ sec.24, T.31 N., R.10 E., on right bank half a mile upstream from Whitechuck River and 9½ miles southeast of Darrington.

Drainage area.--152 sq mi.

Records available.--August to November 1910 (fragmentary gage heights only), October 1917 to September 1922, August 1928 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 930 ft (from river-profile map). Prior to Nov. 18, 1910, staff gage three-eighths of a mile downstream at different datum.

Average discharge.--37 years (1917-22, 1928-60), 1,136 cfs (822,400 acre-ft per year).

Extremes.--1917-22, 1928-60: Maximum discharge, 30,200 cfs Nov. 27, 1949 (gage height, 14.90 ft, in gage well), from rating curve extended above 15,000 cfs; minimum, 115 cfs Nov. 15, 16, 30, Dec. 1, 1936.

Remarks.--No regulation or diversion 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	1,362	1,611	1,988	921	2,369	581	1,252	2,202	1,843	997	406	428	1,322
1952	1,248	828	582	353	730	363	1,208	2,302	1,969	1,319	502	278	974
1953	194	230	516	2,584	1,444	570	967	1,973	2,008	2,131	815	545	1,185
1954	901	1,314	1,687	919	1,328	697	949	2,101	2,494	2,878	1,393	843	1,460
1955	818	1,715	760	472	669	293	724	1,429	3,117	2,357	982	431	1,147
1956	1,692	2,255	1,308	647	286	483	1,398	2,875	2,948	2,345	739	639	1,471
1957	1,435	1,062	1,986	437	765	774	1,168	2,724	1,938	918	456	328	1,170
1958	427	595	924	1,117	1,006	580	987	2,464	1,784	712	324	493	951
1959	1,010	1,999	2,018	1,504	525	722	1,718	1,895	2,675	1,975	638	1,480	1,516
1960	1,845	2,268	1,483	612	811	610	1,232	1,760	2,188	1,289	524	383	1,250

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	83,770	95,870	22,200	56,630	31,600	35,750	74,490	135,400	109,600	61,320	24,940	25,490	957,100
1952	76,760	49,280	35,800	21,720	41,970	22,320	71,890	141,600	117,200	81,080	30,850	16,520	707,000
1953	11,940	13,670	31,730	158,900	80,200	35,040	57,540	21,300	19,500	31,080	50,140	32,410	843,400
1954	55,380	78,200	103,700	56,490	73,770	42,830	56,480	29,200	48,400	76,800	85,640	50,160	1,057,000
1955	50,330	102,000	46,710	29,050	37,170	17,990	43,060	87,850	185,500	144,900	60,390	25,620	830,600
1956	104,000	134,200	80,410	39,790	16,450	29,680	83,210	176,800	175,400	144,200	45,450	38,000	1,068,000
1957	98,220	63,200	22,100	26,870	42,480	47,590	69,470	167,500	115,300	56,430	28,020	19,530	848,700
1958	26,230	35,390	56,840	68,710	55,880	35,680	58,720	51,500	106,200	43,780	19,910	29,360	688,200
1959	62,130	118,900	124,100	92,470	29,170	44,410	102,200	116,500	59,200	121,400	39,240	88,080	1,098,000
1960	113,500	134,900	91,180	37,600	46,680	37,520	73,320	108,200	130,200	79,230	32,240	22,820	907,400

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	Acres	Acres	Acres	Acres	Mean	Inches	Acres
1950	-	-	-	-	-	-	-	-	-	-	-	1,565	139.79	1,133,000
1951	1216	-	-	-	220	1,322	8.70	118.07	957,100	1,129	100.80	817,100	100.80	817,100
1952	1246	5,080	June 5, 1952	220	974	6.41	87.22	707,000	850	74.32	602,500	1,129	100.80	817,100
1953	1286	9,360	Jan. 31, 1953	138	1,165	7.66	104.03	843,400	1,414	126.23	1,023,000	1,414	126.23	1,023,000
1954	1346	5,600	Oct. 31, 1953	380	1,460	9.61	130.39	1,057,000	1,407	125.68	1,019,000	1,407	125.68	1,019,000
1955	1396	6,460	June 10, 1955	228	1,147	7.55	102.47	830,600	1,312	117.21	950,100	1,312	117.21	950,100
1956	1446	14,400	Nov. 4, 1955	220	1,471	9.68	131.70	1,068,000	1,408	126.14	1,022,000	1,408	126.14	1,022,000
1957	1516	9,650	Dec. 10, 1956	184	1,170	7.70	104.45	846,700	955	85.32	691,600	955	85.32	691,600
1958	1568	4,440	May 25, 1958	181	951	6.26	84.88	688,200	1,208	107.91	874,900	1,208	107.91	874,900
1959	1636	11,200	Nov. 20, 1958	257	1,516	9.97	135.43	1,086,000	1,564	139.69	1,133,000	1,564	139.69	1,133,000
1960	1716	14,700	Dec. 15, 1959	239	1,250	8.22	111.94	907,400	-	-	-	-	-	-

1895. Sauk River near Sauk, Wash.

Location.--Lat 48°25'15", long 121°34'00", in NW¹/₄ sec.19, T.34 N., R.10 E., on left bank 5 miles upstream from mouth, 5 miles southeast of Sauk, and 8 miles downstream from Suiattle River.

Drainage area.--714 sq mi; at site 1910-12, 684 sq mi.

Records available.--August to October 1910 (fragmentary gage heights), March 1911 to August 1912, July 1928 to September 1960. Published as "near Suiattle Crossing, near Sauk" 1910-12.

Gage.--Water-stage recorder. Datum of gage is 266 ft above mean sea level (from river-profile survey). Prior to Aug. 4, 1912, staff or chain gages at several sites 1 mile downstream to 5 miles upstream from present site at various datums.

Average discharge.-- 32 years (1928-60), 4,304 cfs (3,116,000 acre-ft per year).

Extremes.--1910-12, 1928-60: Maximum discharge, 82,400 cfs Nov. 27, 1949 (gage height, 16.93 ft); minimum, 572 cfs Dec. 5, 1929, but may have been less during period of ice effect Jan. 10-27, 1930.

Remarks.--No regulation. Small diversion for millpond at Darrington and for domestic use.

Corrections.--In WSP 1316, the mean discharge for February 1948 is listed in error; it should be 2,975 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	4,647	6,135	7,418	4,122	9,062	2,775	4,777	7,442	7,628	4,757	2,215	1,853	5,206
1952	4,164	3,209	2,760	1,695	3,491	1,798	4,431	7,188	6,590	5,043	2,347	1,511	3,684
1953	1,089	886	1,457	7,956	5,615	2,465	3,393	6,029	6,216	7,174	3,492	2,280	4,000
1954	3,152	4,284	6,140	3,929	5,686	3,049	3,707	7,119	8,471	10,140	5,452	3,563	5,394
1955	2,942	6,513	3,832	2,532	3,083	1,523	3,311	5,212	11,480	9,099	4,173	2,070	4,648
1956	5,580	7,752	5,055	3,273	1,627	2,328	4,970	9,054	9,709	8,068	3,122	2,562	5,267
1957	4,780	3,832	6,922	2,238	3,594	3,696	4,175	9,197	7,326	3,975	2,211	1,648	4,476
1958	1,704	2,040	3,213	4,275	3,945	2,412	3,369	8,134	6,741	3,195	1,682	2,115	3,583
1959	3,744	7,046	7,571	5,952	2,506	2,950	5,934	6,626	9,347	7,673	3,015	4,941	5,621
1960	6,380	6,827	5,832	2,714	3,756	2,769	4,527	6,074	7,762	5,575	2,655	1,981	4,901

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	285,700	365,100	456,100	253,500	503,300	170,700	284,300	457,600	453,900	292,500	136,200	110,300	3,769,000
1952	256,000	190,900	169,700	104,300	200,800	110,500	263,600	442,000	392,100	310,100	144,300	89,930	2,674,000
1953	66,950	52,740	89,590	489,200	311,900	51,500	201,900	370,700	369,900	441,100	214,700	135,700	2,896,000
1954	193,800	254,900	377,500	241,600	315,800	87,500	220,600	437,800	504,100	623,500	335,200	213,200	3,906,000
1955	180,900	387,600	235,600	155,700	171,200	93,640	197,000	320,400	683,300	559,500	256,600	123,200	3,365,000
1956	343,100	461,300	310,800	201,300	93,600	143,100	295,800	556,700	577,700	496,100	192,000	152,400	3,824,000
1957	293,900	228,000	400,425,600	137,600	199,600	27,300	248,400	565,500	435,900	244,400	135,900	98,060	3,240,000
1958	104,700	121,400	197,600	262,800	219,100	148,300	200,500	500,100	401,100	196,500	115,700	25,900	2,594,000
1959	230,200	419,300	465,500	366,000	139,200	181,400	353,100	407,400	556,200	471,800	185,400	294,000	4,070,000
1960	592,300	625,200	558,600	166,800	216,000	170,300	269,400	373,500	461,900	542,800	63,200	117,900	3,558,000

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year		
		Momentary maximum		Date	Minimum day	Mean	Per square mile	Runoff	Mean	Inches	Runoff
		Discharge									
1950	-	-	-	-	-	-	-	-	5,997	114.01	4,341,000
1951	1216	62,700	Feb. 10, 1951	1,260	5,206	7.29	99.00	3,769,000	4,529	86.12	3,279,000
1952	1246	13,600	June 5, 1952	1,060	3,684	5.16	70.22	2,674,000	3,123	59.52	2,267,000
1953	1286	28,400	Jan. 31, 1953	590	4,000	5.60	76.04	2,696,000	4,852	92.24	3,513,000
1954	1346	15,600	Dec. 20, 1953	1,600	5,394	7.55	102.54	3,906,000	5,364	101.97	3,883,000
1955	1396	23,900	June 11, 1955	1,270	4,648	6.51	86.36	3,365,000	5,077	96.52	3,676,000
1956	1446	40,600	Oct. 25, 1955	1,220	5,267	7.38	100.42	3,824,000	5,036	96.03	3,656,000
1957	1516	28,500	Dec. 10, 1956	1,300	4,476	6.27	85.10	3,240,000	3,752	71.34	2,716,000
1958	1566	14,600	May 26, 1958	921	3,583	5.02	69.10	2,594,000	4,539	86.26	3,285,000
1959	1636	36,100	Nov. 20, 1958	1,000	5,621	7.87	106.87	4,070,000	5,844	111.09	4,321,000
1960	1716	44,600	Nov. 23, 1959	1,460	4,901	6.86	93.42	3,558,000	-	-	-

1910. Sandy Creek near Concrete, Wash.

Location.--Lat 48°41'05", long 121°42'23", in NE $\frac{1}{4}$ sec.24, T.37 N., R.8 E. (unsurveyed), on left bank at downstream side of road crossing, $1\frac{1}{2}$ miles upstream from mouth and $10\frac{1}{2}$ miles northeast of Concrete.

Drainage area.--10.8 sq mi.

Records available.--March 1953 to October 1954.

Gage.--Water-stage recorder. Altitude of gage is 940 ft (from topographic map).

Extremes.--1953-54: Maximum discharge, 597 cfs Dec. 20, 1953 (gage height, 2.36 ft); minimum, 25 cfs Sept. 18, 1953 (gage height, 0.85 ft).

Remarks.--No regulation or diversion 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
1953	-	-	-	-	-	47.6	75.5	138	128	124	55.8	59.0	-
1954	119	138	139	85.0	124	63.5	81.0	167	173	150	91.0	68.2	117

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1953	-	-	-	-	-	2,930	4,490	8,500	7,640	7,610	3,430	3,510	-
1954	7,540	8,220	8,520	5,230	6,870	3,910	4,820	10,270	10,290	9,250	5,590	4,060	84,370

Yearly 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		
1953	1286	-	-	-	-	-	-	-	-	-	-	-	-
1954	1346	597	Dec. 20, 1953	33	117	10.8	146.46	84,370	-	-	-	-	-

1915. Baker River below Anderson Creek, near Concrete, Wash.

Location.--Lat 48°39'50", long 121°40'25", in SE $\frac{1}{4}$ sec.30, T.37 N., R.9 E., on right bank 100 ft downstream from Anderson Creek and $9\frac{1}{2}$ miles northeast of Concrete.

Drainage area.--211 sq mi.

Records available.--September 1910 to October 1925, August 1928 to November 1931, January 1955 to September 1959.

Gage.--Water-stage recorder. Datum of gage is 521 ft above mean sea level (river-profile survey). Prior to Oct. 22, 1910, staff gage at site an eighth of a mile upstream at different datum. Oct. 22, 1910, to Oct. 3, 1925, and Aug. 30, 1928, to Nov. 11, 1931, staff gages and water-stage recorder at site 250 ft downstream at different datum.

Average discharge.--22 years (1910-25, 1928-31, 1955-59), 2,011 cfs (1,456,000 acre-ft per year).

Extremes.--1910-25, 1928-31, 1955-59: Maximum discharge, 36,800 cfs Dec. 29, 1917 (gage height, 13.7 ft, site and datum then in use), from rating curve extended above 8,100 cfs; minimum recorded, 219 cfs Dec. 15, 16, 1919.

Flood in about 1815 reached a stage about 2 ft higher than that of Dec. 29, 1917.

Flood in 1897 reached a stage about equal to that of Dec. 29, 1917. Flood in November

1909 reached a stage 1.6 ft higher than that of Dec. 29, 1917 (discharge, 46,200 cfs).

Remarks.--No regulation or diversion 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
1955	-	-	-	963	893	523	1,290	2,264	4,228	3,905	2,381	1,395	-
1956	2,861	2,951	1,580	1,104	553	731	2,080	3,435	4,425	3,903	1,908	1,662	2,270
1957	2,827	1,545	2,235	697	1,217	1,301	1,953	3,475	2,892	2,254	1,456	1,166	1,924
1958	1,069	1,036	1,484	2,126	2,093	995	1,215	3,032	2,804	1,700	1,096	1,204	1,652
1959	1,995	2,268	3,272	2,375	911	1,118	2,444	2,892	3,951	3,276	1,621	2,635	2,404

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1955	-	-	-	59,180	49,610	32,170	76,740	139,200	251,600	240,100	146,400	83,000	-
1956	175,900	175,600	97,150	67,890	31,820	44,920	123,800	211,200	263,300	240,000	117,200	98,900	1,648,000
1957	173,800	91,910	137,400	42,880	67,580	79,970	116,200	213,700	172,100	138,600	89,530	69,360	1,593,000
1958	65,750	61,870	91,240	130,700	163,300	61,160	72,180	186,400	166,800	104,500	67,370	71,650	1,196,000
1959	122,700	135,000	201,200	146,000	50,810	68,760	145,400	177,800	235,100	201,400	99,650	156,800	1,740,000

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		Mean	Runoff
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet		
1955	1396	8,180	June 10, 1955	-	-	-	-	-	2,109	135.67	1,527,000	-	-
1956	1446	20,100	Nov. 3, 1955	439	2,270	10.8	146.42	1,648,000	2,207	142.38	1,602,000	-	-
1957	1516	12,200	Oct. 20, 1956	350	1,924	9.12	123.81	1,393,000	1,669	107.41	1,209,000	-	-
1958	1566	7,710	Apr. 16, 1958	464	1,652	7.83	106.28	1,196,000	1,983	127.60	1,436,000	-	-
1959	1636	15,700	Jan. 29, 1959	593	2,404	11.4	154.65	1,740,000	-	-	-	-	-

1916. Baker Lake at upper Baker Dam, near Concrete, Wash.

Location--Lat 48°38'55", long 121°41'25", in NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.31, T.37 N., R.9 E., at upper Baker Dam on Baker River near center of dam, 0.3 mile upstream from Sulphur Creek and 8 miles north of Concrete.

Drainage area--215 sq mi, approximately.

Records available--July 1959 to September 1960.

Gage--Water-stage recorder. Datum of gage is at mean sea level, datum of 1929, adjustment of 1947.

Extremes--1959-60: Maximum contents, 286,520 acre-ft Aug. 29, 1960 (elevation, 724.21 ft); minimum not determined.

Remarks--Reservoir is formed by concrete dam, completed in June 1959; storage began July 9, 1959. Usable capacity, 220,630 acre-ft between elevations 724 (normal full pool) and 655 ft (minimum operating pool). Dead storage, 64,840 acre-ft. Crest of spillway is at elevation 694 ft. Water is used by Puget Sound Power & Light Co. for power development. Figures given herein represent total contents.

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

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1959	-	-	-	-	-	-	-	-	-	96,210	80,920	130,090
1960	214,890	221,610	223,780	168,640	103,150	106,960	104,300	151,670	283,440	284,080	284,780	268,220

1920. Bear Creek near Concrete, Wash.

Location--Lat 48°37'10", long 121°44'35", in SE $\frac{1}{4}$ sec.10, T.36 N., R.8 E., on left bank at downstream side of road bridge, half a mile upstream from North Fork and $\frac{5}{8}$ miles north of Concrete.

Drainage area--10.0 sq mi.

Records available--March 1953 to October 1954.

Gage--Water-stage recorder. Altitude of gage is 925 ft (from topographic map).

Extremes--1953-54: Maximum discharge, 1,080 cfs Dec. 20, 1953 (gage height, 4.00 ft), from rating curve extended above 570 cfs; minimum, 6.2 cfs Sept. 14-17, 1953 (gage height, 1.33 ft).

Remarks--No known regulation or diversion 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
1953	-	-	-	-	-	-	62.5	71.9	58.9	43.8	12.1	15.8	-
1954	67.0	127	152	91.8	150	68.6	86.3	88.0	99.7	69.0	35.3	28.3	88.2

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1953	-	-	-	-	-	-	3,720	4,420	3,510	2,690	741	938	-
1954	4,120	7,580	9,360	5,640	8,360	4,220	5,130	5,410	5,930	4,240	2,170	1,690	63,850

Yearly 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	
1953	1286	-	-	-	-	-	-	-	-	-	-	-
1954	1346	1,080	Dec. 20, 1953	17	88.2	88.2	119.69	63,850	-	-	-	-

1925. North Fork Bear Creek near Concrete, Wash.

Location.--Lat 48°38'05", long 121°44'20", in SW $\frac{1}{4}$ sec.2, T.36 N., R.8 E., on right bank at road bridge, 1 mile upstream from mouth and $6\frac{1}{2}$ miles north of Concrete.

Drainage area.--20.2 sq mi, includes 8.27 sq mi from Sulphur Creek, and 10.75 sq mi from Rocky Creek for greater part of year.

Records available.--March 1953 to October 1954.

Gage.--Water-stage recorder. Altitude of gage is 1,040 ft (from topographic map).

Extremes.--1953-54: Maximum discharge, 185 cfs Dec. 20, 1953 (gage height, 3.84 ft), from rating curve extended above 90 cfs; minimum, 10 cfs Aug. 27, 1954 (gage height, 0.80 ft).

Remarks.--Regulation at diversion dams on Rocky and Sulphur Creeks. Not all high-water flow diverted from Rocky and Sulphur Creeks.

Monthly and 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	-	-	-	-	-	49.5	55.2	78.4	73.9	71.5	56.4	48.0	-
1954	55.0	79.0	85.2	52.5	54.2	27.7	60.5	69.2	73.2	68.5	70.7	47.3	62.0

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1953	-	-	-	-	-	3,040	3,280	4,820	4,400	4,400	3,470	2,860	-
1954	3,380	4,700	5,240	3,230	3,010	1,700	3,600	4,260	4,380	4,210	4,350	2,810	44,850

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	1286	-	-	-	-	-	-	-
1954	1346	185	Dec. 20, 1953	16.5	62.0	44,850	-	-

1930. Lake Shannon at Concrete, Wash.

Location.--Lat 48°32'55", long 121°44'25", in SW $\frac{1}{4}$ (revised) sec.2, T.35 N., R.8 E., at Baker Dam on Baker River near left bank, half a mile north of Concrete and 1 mile upstream from mouth of Baker River.

Drainage area.--297 sq mi.

Records available.--November 1925 to September 1960.

Gage.--Water-stage recorder. Prior to Nov. 11, 1959, water-stage indicator in powerplant. Datum of gage is at mean sea level, datum of 1929, adjustment of 1947. Prior to March 1959, at datum 1.72 ft lower.

Extremes.--Maximum contents, 160,780 acre-ft Nov. 24, 1959 (elevation, 439.19 ft); minimum not determined.

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

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	157,980	158,160	157,820	157,320	149,040	119,580	157,840	155,160	158,250	155,790	152,470	156,580
1952	156,200	123,980	115,690	109,620	121,260	72,240	132,740	156,650	158,230	158,860	158,160	158,640
1953	145,680	127,890	147,980	160,020	150,960	67,900	66,970	155,900	160,160	157,870	159,520	160,450
1954	152,400	159,640	157,460	116,910	156,830	123,220	114,730	159,560	159,750	159,140	159,040	156,780
1955	141,230	160,200	140,900	78,610	64,680	106,150	140,840	151,080	159,610	159,700	152,270	123,020
1956	160,130	156,580	156,060	148,840	71,750	49,790	133,810	158,610	159,820	158,950	156,850	159,320
1957	155,680	132,760	151,000	86,760	112,300	106,910	130,520	146,260	154,510	150,860	155,610	141,890
1958	146,660	126,060	151,000	160,200	159,390	126,500	153,720	159,700	159,070	154,870	159,410	151,420
1959	149,550	156,240	160,130	159,270	132,500	126,840	159,450	158,430	158,820	159,470	158,760	154,650
1960	159,470	156,730	144,980	160,150	142,030	104,470	122,170	149,150	143,340	156,600	159,890	155,830

1935. Baker River at Concrete, Wash.

Location.--Lat 48°32'35", long 121°44'35", on line between secs.10 and 11, T.35 N., R.8 E., on left bank just upstream from fish barrier, 1,500 ft (revised) downstream from Baker River powerplant, a quarter of a mile northeast of Concrete, and half a mile (revised) upstream from mouth.

Drainage area.--297 sq mi.

Records available.--September 1910 to March 1915, September 1943 to September 1960.

Gage.--Water-stage recorder. Datum of gage is at mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Mar. 5, 1915, staff gage at site a quarter of a mile downstream at different datum. Sept. 1, 1943, to Jan. 22, 1958, at site 700 ft upstream at datum 172.6 ft above mean sea level (river-profile survey). Supplementary water-stage recorder on left bank about 40 ft downstream from fish barrier and on tail-race of powerhouse at same datum.

Average discharge.--21 years (1910-14, 1943-60), 2,621 cfs (1,898,000 acre-ft per year), adjusted for storage in Lake Shannon since November 1925 and Baker Lake since July 1959.

Extremes.--1910-15, 1943-60: Maximum discharge, 35,200 cfs Nov. 27, 1949 (gage height, 20.32 ft, from high-water mark, datum then in use), from rating curve extended above 16,000 cfs on basis of computation of peak flow over dam and through the powerplant by Puget Sound Power and Light Co.; minimum, 21 cfs Feb. 7, 1949 (gage height, 0.20 ft, datum then in use); minimum daily, 55 cfs Feb. 17, 1957.

Remarks.--Flow regulated by Baker River powerplant and by Baker and Shannon Lakes (see elsewhere in this report). No diversions which are not returned to river 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	3,357	3,397	5,188	2,448	4,861	1,781	1,860	3,689	3,582	2,487	1,409	1,232	2,930
1952	2,773	2,041	1,707	1,028	1,734	1,872	1,691	3,598	3,938	3,303	1,786	1,098	2,217
1953	1,134	1,263	1,459	4,907	3,244	2,287	2,000	2,100	3,443	4,113	2,121	1,738	2,482
1954	5,177	3,308	3,635	2,740	2,244	2,169	2,163	3,097	4,612	5,130	3,221	2,311	3,150
1955	2,660	4,951	2,535	2,328	1,596	160	1,349	2,852	5,403	4,768	2,751	1,943	2,776
1956	3,014	4,178	2,398	1,940	2,164	1,590	1,535	4,363	5,704	4,808	2,198	2,097	3,000
1957	3,873	2,548	2,996	2,040	1,296	2,036	2,085	4,510	3,573	2,577	1,516	1,574	2,564
1958	1,293	1,717	1,727	2,669	2,902	1,923	1,474	4,337	3,932	2,224	1,307	1,714	2,281
1959	2,945	3,410	4,528	3,409	1,848	1,890	2,948	3,734	4,985	2,547	2,182	2,279	3,065
1960	1,498	3,778	2,668	2,624	3,909	2,304	2,546	2,338	2,200	3,275	1,628	1,860	2,561

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	206,400	202,100	19,000	50,500	270,000	109,500	110,700	228,600	213,100	52,900	86,660	73,300	2,121,000
1952	170,500	121,400	105,000	53,190	99,750	115,100	100,600	221,500	234,300	203,100	109,600	65,340	1,609,000
1953	89,760	75,180	89,690	301,700	80,200	40,600	119,000	29,100	204,900	252,900	30,400	103,400	1,797,000
1954	195,300	196,800	217,400	168,500	24,600	33,300	128,700	190,500	274,400	315,400	98,000	137,500	2,280,000
1955	163,600	294,600	155,800	143,200	88,660	9,840	80,300	175,300	321,500	293,200	167,900	115,600	2,010,000
1956	185,300	248,600	147,400	119,300	124,500	97,790	91,350	268,300	339,400	295,700	130,350	200,124,800	2,178,000
1957	238,100	151,600	184,200	125,400	72,000	125,200	124,100	277,300	212,600	158,500	95,240	83,670	1,856,000
1958	79,470	102,200	108,200	176,400	161,200	118,300	87,680	228,600	234,000	136,800	80,560	102,000	1,651,000
1959	181,100	202,900	278,400	209,800	102,600	116,200	175,400	229,600	296,600	156,800	34,200	135,600	2,219,000
1960	92,090	224,800	164,000	161,300	224,900	141,700	151,500	143,700	130,900	261,400	112,400	110,700	1,859,000

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30										Calendar year			
		Observed					Adjusted					Observed		Adjusted	
		Momentary maximum		Mini-	Mean	Runo-	Mean		Per	Runo-	Mean	Runoff		Mean	Runoff
		Discharge	Date	um day		in acre-feet			square in mile	inches		in acre-feet	in inches		
1950	-	-	-	-	-	-	-	-	-	-	3,364	2,435,000	3,567	153.86	
1951	1216	29,700	Feb. 10, 1951	505	2,930	2,121,000	2,930	9.87	133.90	2,473	1,790,000	2,415	110.37		
1952	1246	11,000	Oct. 19, 1951	121	2,217	1,609,000	2,220	7.47	101.74	1,993	1,447,000	2,038	93.40		
1953	1286	16,200	Jan. 12, 1953	400	2,482	1,797,000	2,484	8.36	113.55	3,000	2,172,000	3,013	137.70		
1954	1346	14,200	Oct. 31, 1953	1,470	3,150	2,280,000	3,145	10.6	143.73	3,156	2,285,000	3,153	143.20		
1955	1596	18,500	Nov. 18, 1954	73	2,776	2,010,000	2,729	9.19	124.73	2,731	1,977,000	2,751	125.75		
1956	1446	26,900	Nov. 4, 1955	446	3,000	2,178,000	3,050	10.3	139.76	2,989	2,170,000	2,983	136.68		
1957	1516	20,400	Oct. 17, 1955	55	2,564	1,856,000	2,539	8.55	116.04	2,168	1,570,000	2,168	99.09		
1958	1566	11,400	Jan. 17, 1958	114	2,281	1,651,000	2,294	7.72	104.85	2,798	2,026,000	2,611	128.46		
1959	1636	23,500	(a)	158	3,065	2,219,000	3,249	10.9	148.50	2,814	2,037,000	3,102	-		
1960	1716	20,600	Nov. 24, 1959	94	2,561	1,859,000	2,752	-	-	-	-	-	-		

a Apr. 29, 1930, 1959.

1940. Skagit River near Concrete, Wash.

Location.--Lat 48°31'30", long 121°46'10", in NE $\frac{1}{4}$ sec.16, T.35 N., R.8 E., on right bank at dikes, $\frac{1}{2}$ miles southwest of Concrete and $2\frac{1}{2}$ miles downstream from Baker River.

Drainage area.--2,700 sq mi, approximately, of which 400 sq mi is in Canada.

Records available.--September 1924 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 130.0 ft above mean sea level, datum of 1929. Prior to Dec. 10, 1924, staff gage 200 ft upstream and Dec. 10, 1924, to Sept. 30, 1937, water-stage recorder at present site; both gages at datum 12.7 ft higher.

Average discharge.--36 years (1924-60), 14,810 cfs (10,720,000 acre-ft per year).

Extremes.--1924-60: Maximum discharge, 154,000 cfs Nov. 27, 1949 (gage height, 40.8 ft); minimum, probably less than 2,160 cfs during period Oct. 1-24, 1925, when recorder was not operating and gates in Baker River Dam were first closed; minimum daily recorded, 2,610 cfs Nov. 14, 1936.

Maximum stage known, 69.3 ft, present datum, at site 200 ft upstream, from flood-marks (discharge, about 500,000 cfs); occurred about 1815.

Remarks.--Flow regulated by powerplants on Baker and upper Skagit Rivers, by Ross, Diablo, and Gorge Reservoirs, Baker Lake, and Lake Shannon (see elsewhere in this report).

Correction.--In WSP 1316, the mean discharge for December 1947 was listed in error; it should be 16,810 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	16,050	19,470	26,950	17,250	28,700	11,000	19,270	25,350	21,550	16,980	8,850	8,148	18,220
1952	16,150	13,710	11,500	8,605	13,000	8,440	12,290	19,020	18,380	16,210	9,316	6,305	12,740
1953	6,753	7,079	7,595	23,150	16,370	9,740	12,320	18,250	20,060	24,320	12,010	8,668	13,860
1954	14,490	17,410	21,310	14,930	18,590	13,390	14,790	23,620	26,720	33,360	20,370	13,360	19,580
1955	12,480	24,980	14,880	11,980	11,640	7,664	12,250	16,750	29,550	28,110	14,980	9,023	16,200
1956	18,100	26,630	15,970	12,330	9,355	9,946	15,120	27,370	32,470	26,890	12,270	10,810	18,200
1957	18,670	14,530	21,070	11,950	12,430	13,520	14,130	26,070	22,940	14,350	8,006	7,784	15,500
1958	7,802	9,526	11,820	15,950	14,790	10,570	10,240	22,310	21,530	12,090	7,440	8,581	12,710
1959	14,860	20,770	25,330	21,150	12,250	12,620	19,970	22,450	28,110	25,430	12,180	16,400	19,330
1960	20,460	26,040	19,030	13,270	16,460	11,140	16,100	18,910	22,730	19,790	10,800	7,858	16,870

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	986.6	1,158	1,657	1,061	1,594	676.4	1,147	1,557	1,283	1,044	544.2	484.9	13,190
1952	992.9	816.0	706.8	529.1	747.5	519.0	731.1	1,169	1,093	996.7	572.8	375.2	9,249
1953	415.2	421.2	467.0	1,425	909.0	598.9	733.1	1,122	1,194	1,496	738.3	515.8	10,030
1954	891.1	1,036	1,310	918.2	1,032	823.3	880.3	1,453	1,590	2,051	1,253	795.1	14,030
1955	767.1	1,486	914.8	736.6	646.6	471.2	728.7	1,030	1,758	1,728	921.4	536.9	11,730
1956	1,113	1,585	982.0	758.4	538.1	611.6	958.9	1,683	1,932	1,653	754.4	643.5	13,210
1957	1,160	864.4	1,295	735.1	690.1	831.5	840.8	1,603	1,365	882.2	492.3	463.2	11,220
1958	479.7	566.8	726.8	980.6	821.2	650.1	609.0	1,372	1,281	743.3	457.4	510.6	9,198
1959	914.0	1,236	1,558	1,301	680.5	775.9	1,188	1,380	1,673	1,564	749.1	975.6	14,000
1960	1,258	1,549	1,170	815.8	946.9	684.9	957.8	1,163	1,352	1,217	663.9	467.6	12,250

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					
1950	-	-	-	-	-	-	20,210	14,630,000
1951	1216	139,000	Feb. 10, 1951	5,400	18,220	13,190,000	16,450	11,910,000
1952	1246	43,500	June 5, 1952	4,390	12,740	9,249,000	11,070	8,037,000
1953	1286	66,000	Feb. 1, 1953	4,470	13,860	10,030,000	16,530	11,870,000
1954	1346	58,000	Oct. 31, 1953	9,160	19,380	14,030,000	19,290	13,960,000
1955	1396	56,500	June 11, 1955	5,600	16,200	11,730,000	16,900	12,240,000
1956	1446	106,000	Nov. 3, 1955	4,950	18,200	13,210,000	17,710	12,850,000
1957	1516, 1566	81,000	Oct. 20, 1956	4,230	15,500	11,220,000	13,370	9,676,000
1958	1566	41,400	Jan. 17, 1958	4,120	12,710	9,198,000	15,380	11,130,000
1959	1636	90,700	Apr. 30, 1959	5,910	19,330	14,000,000	19,700	14,260,000
1960	1716	89,500	Nov. 23, 1959	4,050	16,870	12,250,000	-	-

1960. Alder Creek near Hamilton, Wash.

Location.--Lat 48°31'40", long 121°56'55" (revised), in NW¹/₄NE¹/₄ sec.18, T.35 N., R.7 E., on left bank 3 ft downstream from logging road culvert, a quarter of a mile upstream from highway bridge, three-quarters of a mile upstream from mouth, and 2 miles east of Hamilton.

Drainage area.--10.7 sq mi.

Records available.--August 1943 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 125 ft (by barometer). Prior to Jan. 14, 1960, at several sites within 350 ft downstream at various datums.

Average discharge.--17 years (1943-60), 35.7 cfs (25,850 acre-ft per year).

Extremes.--1943-60: Maximum discharge, 714 cfs Dec. 9, 1956 (gage height, 5.28 ft, site and datum then in use); minimum, 4.3 cfs Sept. 16, 1956, site then in use; minimum gage height, 1.08 ft Dec. 9, 10, 1959, site and datum then in use.

Remarks.--No regulation or diversion 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	33.5	47.9	72.2	82.5	127	53.9	42.5	23.6	15.7	10.9	8.59	7.00	43.3
1952	18.6	32.3	34.0	28.6	65.0	33.1	32.2	19.2	12.6	11.0	8.65	7.44	25.1
1953	6.64	7.93	19.7	80.9	63.4	32.8	32.2	23.1	19.0	13.2	9.73	8.47	26.2
1954	15.5	48.6	111	70.7	77.2	43.0	51.5	27.5	27.6	18.7	14.9	14.5	43.2
1955	14.7	57.5	43.5	62.7	69.3	40.4	68.3	48.8	33.8	22.5	15.3	10.8	40.4
1956	45.4	91.0	75.1	67.5	35.0	47.4	50.7	26.6	20.2	14.0	11.1	9.75	41.2
1957	65.1	37.1	94.3	32.2	36.9	67.1	46.1	23.3	17.3	12.6	9.92	9.75	37.8
1958	11.7	13.5	35.2	51.5	46.7	30.0	24.3	13.6	9.64	7.58	5.93	6.92	21.3
1959	19.6	70.4	65.0	90.4	52.8	59.6	76.4	44.3	22.1	15.1	11.7	23.2	45.8
1960	35.5	74.1	65.2	42.7	75.2	40.2	51.3	42.2	23.2	14.5	12.8	14.0	40.7

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2,060	2,850	4,440	5,070	7,040	3,320	2,530	1,450	935	671	528	417	31,310
1952	1,140	1,920	2,090	1,780	3,740	2,040	1,920	1,180	748	676	532	443	18,190
1953	408	472	1,210	4,980	3,520	2,020	1,910	1,420	1,130	813	598	504	18,980
1954	952	2,890	6,810	4,350	4,290	2,640	3,060	1,690	1,840	1,150	916	861	31,250
1955	905	3,420	2,670	3,680	3,850	2,490	4,060	3,000	2,010	1,380	941	644	29,230
1956	2,790	5,410	4,620	4,150	2,010	2,910	3,020	1,640	1,200	880	682	580	29,870
1957	4,000	2,210	5,800	1,980	2,050	4,130	2,740	1,430	1,030	776	610	580	27,340
1958	717	803	2,170	3,170	2,590	1,850	1,440	836	574	466	365	412	15,390
1959	1,200	4,190	3,990	5,560	2,930	3,670	4,550	2,720	1,320	927	717	1,380	33,150
1960	2,180	4,410	4,010	2,630	4,330	2,470	3,050	2,600	1,380	894	784	856	29,570

Yearly 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	-	-	-	-	-	-	-	-	-	46.1	71.06	-	33,340	-
1951	1216	654	Feb. 10, 1951	6.4	43.3	4.92	66.73	31,310	37.3	57.79	27,110	-	-	-
1952	1246	212	Feb. 4, 1952	6.9	25.1	2.85	38.75	18,190	20.8	26.50	15,130	-	-	-
1953	1266	364	Jan. 31, 1953	6.1	26.2	2.45	33.27	18,980	36.0	48.26	27,550	-	-	-
1954	1346	239	Dec. 11, 1953	7.5	43.2	4.04	54.75	31,250	36.1	48.36	27,590	-	-	-
1955	1396	300	Feb. 8, 1955	9.5	40.4	3.78	51.23	29,230	46.4	61.43	35,060	-	-	-
1956	1446	a363	Nov. 3, 1955	4.5	41.2	3.85	52.37	29,870	40.0	50.94	29,060	-	-	-
1957	1516	714	Dec. 9, 1956	9.0	37.8	3.53	47.90	27,340	26.3	33.33	19,020	-	-	-
1958	1566	166	Jan. 16, 1958	5.3	21.3	1.99	27.00	15,390	29.1	36.99	21,080	-	-	-
1959	1636	410	Nov. 12, 1958	7.1	45.8	4.28	58.12	33,150	47.5	60.23	34,370	-	-	-
1960	1716	681	Nov. 22, 1959	9.6	40.7	3.80	51.81	29,570	-	-	-	-	-	-

a Maximum recorded.

1965. Day Creek near Lyman, Wash.

Location.--Lat 48°30'05", long 122°02'45", in NW¼ sec. 28, T.35 N., R.6 E., on left bank at highway bridge, 1 mile upstream from mouth and 1¼ miles southeast of Lyman.

Drainage area.--36.3 sq mi.

Records available.--July 1943 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 90 ft (from topographic map).

Average discharge.--17 years (1943-60), 266 cfs (192,600 acre-ft per year).

Extremes.--1943-60: Maximum discharge, 5,570 cfs Dec. 28, 1949, from rating curve extended above 3,000 cfs on basis of logarithmic plotting; maximum gage height, 8.80 ft Dec. 9, 1956; minimum discharge, 5.9 cfs Feb. 1, 1945.

Remarks.--No regulation or diversion 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	398	423	644	433	701	198	261	228	60.1	19.8	11.7	29.6	282
1952	556	287	224	249	377	173	359	343	228	53.1	34.2	50.0	227
1953	33.1	72.1	343	984	403	232	235	256	211	58.2	33.5	79.2	245
1954	374	484	634	336	516	200	307	278	255	113	87.7	86.6	304
1955	143	476	588	254	310	133	392	419	428	269	90.1	51.4	279
1956	501	631	468	418	105	269	368	323	300	84.9	22.8	114	301
1957	449	258	601	113	276	341	333	210	78.8	58.3	50.7	20.6	233
1958	69.8	173	404	500	462	176	245	96.1	36.6	14.1	9.23	60.0	186
1959	312	556	540	546	163	315	586	244	172	45.8	43.5	363	324
1960	284	621	442	330	378	306	442	344	131	27.8	85.9	66.2	287

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	24,470	25,190	39,580	26,590	38,930	12,170	15,560	14,040	3,580	1,220	722	1,760	203,800
1952	21,910	17,070	13,770	15,300	21,710	10,610	21,350	21,090	13,570	3,270	2,100	2,970	164,700
1953	2,030	4,290	21,110	60,500	22,370	14,240	13,970	15,750	12,550	3,580	2,060	4,710	177,200
1954	23,010	28,810	39,000	20,660	28,650	12,300	18,240	17,100	15,180	6,950	5,290	5,150	220,400
1955	8,790	28,320	23,870	15,590	17,240	8,200	23,310	25,750	25,440	16,540	5,540	3,060	201,600
1956	30,780	37,530	28,760	25,710	6,050	16,540	21,920	19,880	17,870	5,220	1,400	6,800	218,500
1957	27,600	15,380	26,930	6,920	15,320	21,000	19,790	12,910	4,690	3,580	3,120	1,220	168,500
1958	4,290	10,320	24,840	30,710	25,650	10,830	14,580	5,910	2,180	869	567	3,570	134,300
1959	19,180	31,910	33,230	33,600	10,170	19,370	34,890	15,000	10,260	2,810	2,670	21,600	234,700
1960	17,460	36,930	27,180	20,310	21,750	18,790	26,280	21,150	7,800	1,710	5,280	3,940	208,600

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	-	-	-	-	-	-	-	-	351	131.41	254,400
1951	1218	4,510	Feb. 9, 1951	9.5	282	7.77	105.29	203,800	231	86.43	167,300
1952	1246	3,350	Oct. 2, 1951	13	227	6.23	85.06	164,700	192	72.01	138,400
1953	1286	3,690	Jan. 2, 1953	12.5	245	6.78	91.47	177,200	332	124.23	240,600
1954	1346	4,180	Oct. 30, 1953	29	304	8.37	113.85	220,400	263	98.44	190,600
1955	1396	3,750	Feb. 7, 1955	18.5	279	7.69	104.14	201,600	328	122.78	237,700
1956	1446	4,750	Nov. 3, 1955	14	301	8.29	112.84	218,500	277	103.98	201,300
1957	1516	5,360	Dec. 9, 1956	15	233	6.42	87.01	168,500	177	66.11	128,000
1958	1566	3,250	Jan. 16, 1958	7.8	188	5.12	69.36	134,300	248	92.53	179,200
1959	1636	5,440	Apr. 29, 1959	18	324	8.93	121.21	234,700	320	119.79	251,900
1960	1716	4,700	Nov. 22, 1959	12.5	287	7.91	107.71	208,600	-	-	-

2005. Skagit River near Mount Vernon, Wash.

Location.--Lat 48°26'40", long 122°20'00", in SE $\frac{1}{4}$ sec.7, T.34 N., R.4 E., on drawrest of and 150 ft downstream from bridge on U. S. Highway 99 and 1 mile north of Mount Vernon.

Drainage area.--3,060 sq mi, approximately, of which 400 sq mi is in Canada.

Records available.--October 1940 to September 1960. Monthly discharge only October 1940, published in WSP 1316.

Gage.--Water-stage recorder and crest-stage gage. Datum of gage is at mean sea level, datum of 1929. Supplementary water-stage recorder in bridge pier a quarter of a mile downstream from base gage.

Average discharge.--20 years (1940-60), 16,340 cfs (11,830,000 acre-ft per year).

Extremes.--1940-60: Maximum discharge, 144,000 cfs Feb. 11, 1951 (elevation, 36.85 ft); minimum, 2,740 cfs Oct. 26, 1942 (elevation, 7.37 ft).
Maximum stage known, 37 ft in 1906, from Great Northern Railway high-water profile.

Remarks.--Flow regulated by powerplants on Baker and upper Skagit Rivers, and by Ross, Diablo, and Gorge Reservoirs, Lake Shannon and Baker Lake (see elsewhere in this report). Small diversions for domestic and municipal 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	17,120	21,000	30,560	19,650	31,140	11,760	19,580	26,400	21,700	17,460	9,269	8,329	19,420
1952	16,800	14,480	12,790	9,541	14,910	9,501	13,690	20,260	18,810	16,260	9,607	6,642	13,600
1953	6,698	7,252	8,417	26,740	20,170	10,930	13,180	19,180	20,030	23,920	12,430	8,995	14,830
1954	14,810	19,540	24,900	17,730	21,230	15,290	16,640	25,150	27,770	34,840	20,290	13,950	21,030
1955	12,840	27,200	15,810	13,550	13,560	9,192	13,990	17,250	31,010	28,420	15,010	9,201	17,250
1956	20,430	29,620	18,580	15,120	10,500	11,460	17,590	28,420	34,460	26,950	12,220	10,690	19,700
1957	21,100	15,110	23,770	12,230	13,270	15,010	14,790	26,660	23,240	14,240	8,488	7,962	16,360
1958	8,086	10,170	12,770	17,420	16,540	11,570	11,600	22,410	21,080	12,080	7,677	8,838	13,330
1959	16,040	23,450	27,720	24,420	13,680	14,170	21,730	24,760	27,960	25,360	12,510	17,540	20,820
1960	20,850	29,350	21,190	14,530	18,110	12,330	17,470	19,510	22,140	18,980	11,050	8,383	17,810

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	1,053	1,250	1,879	1,208	1,729	723.4	1,165	1,623	1,291	1,073	569.9	495.6	14,060
1952	1,033	861.4	786.5	586.7	857.8	584.2	614.7	1,247	1,119	1,000	590.7	395.2	9,876
1953	424.1	431.5	517.6	1,644	1,120	671.9	784.3	1,179	1,192	1,471	764.1	535.2	10,730
1954	910.8	1,163	1,531	1,090	1,179	940.2	990.0	1,547	1,652	2,142	1,248	829.9	15,220
1955	789.4	1,619	972.3	832.9	753.0	565.2	832.4	1,060	1,845	1,747	922.7	547.5	12,490
1956	1,256	1,763	1,142	929.5	603.7	704.7	1,047	1,747	2,051	1,657	751.6	647.7	14,300
1957	1,297	899.3	1,462	752.0	736.9	922.7	880.3	1,639	1,393	875.3	521.9	473.8	11,840
1958	497.2	605.1	784.9	1,071	918.3	711.6	690.2	1,378	1,254	742.8	472.1	525.9	9,651
1959	986.2	1,396	1,704	1,501	759.7	871.5	1,293	1,578	1,664	1,559	769.1	1,044	15,070
1960	1,282	1,746	1,303	893.2	1,042	757.9	1,040	1,199	1,317	1,167	679.2	498.8	12,930

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	-	-	-	-	-	-	22,310	16,150,000
1951	1216	144,000	Feb. 11, 1951	5,660	19,420	14,060,000	17,550	12,560,000
1952	1246	41,400	June 5, 1952	4,970	13,600	9,876,000	11,800	8,568,000
1953	1286	65,700	Feb. 1, 1953	4,920	14,830	10,730,000	17,910	12,970,000
1954	1346	57,900	Nov. 1, 1953	10,200	21,030	15,220,000	20,720	15,000,000
1955	1396	60,800	Nov. 20, 1954	6,320	17,250	12,490,000	18,330	13,270,000
1956	1446	107,000	Nov. 4, 1955	6,510	19,700	14,300,000	19,010	13,800,000
1957	1516	64,000	Oct. 20, 1956	5,140	16,360	11,840,000	13,910	10,070,000
1958	1566	43,900	Jan. 17, 1958	5,110	13,330	9,651,000	16,370	11,850,000
1959	1536	92,300	Apr. 30, 1959	6,980	20,820	15,070,000	21,160	15,320,000
1960	1716	81,600	Nov. 24, 1959	4,740	17,810	12,930,000	-	-

2015. Samish River near Burlington, Wash.

Location.--48°32'45", long 122°20'15", in SE $\frac{1}{4}$ sec.6, T.35 N., R.4 E., on left bank 500 ft downstream from bridge on U. S. Highway 99, half a mile downstream from Friday Creek, and 5 miles north of Burlington.

Drainage area.--87.8 sq mi.

Records available.--July 1943 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 45 ft (from topographic map). Prior to Dec. 1, 1948, at site 500 ft upstream at different datum. Dec. 1, 1948, to Jan. 7, 1949, staff gage 200 ft upstream at datum 3.14 ft higher than present datum.

Average discharge.--17 years (1943-60), 244 cfs (176,600 acre-ft per year).

Extremes.--1943-60: Maximum discharge, 5,830 cfs Dec. 28, 1949 (gage height, 11.89 ft); minimum recorded, 11 cfs July 10, 1951 (gage height, 2.01 ft).

Remarks.--State fish hatchery on Friday Creek diverts about 4 cfs, which is returned above station. There is evidence of slight regulation and there may be some pumping 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	149	340	589	618	793	390	179	138	54.2	26.8	21.1	21.0	274
1952	97.6	194	313	301	377	297	236	169	78.3	42.0	27.4	25.1	179
1953	25.5	30.4	89.2	578	546	299	292	165	122	51.4	29.0	27.7	186
1954	117	408	854	615	490	234	221	133	124	91.4	83.5	69.2	286
1955	92.9	410	328	401	467	333	345	240	181	119	64.9	37.1	250
1956	155	496	558	462	262	424	292	123	115	54.8	30.6	45.3	252
1957	497	326	805	293	401	474	264	120	65.7	43.1	30.2	24.6	279
1958	39.5	92.0	266	404	445	205	199	84.3	41.2	23.0	19.1	21.8	152
1959	206	594	389	603	376	373	477	262	121	51.0	31.4	134	301
1960	214	548	487	401	475	266	304	235	128	43.0	36.5	41.3	264

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	9,160	20,220	36,210	38,000	44,030	24,010	10,680	8,470	3,230	1,650	1,300	1,250	198,200
1952	6,000	11,560	19,220	18,500	21,680	18,240	14,030	10,420	4,660	2,580	1,680	1,490	130,100
1953	1,560	1,810	5,490	35,560	30,340	18,370	17,380	10,170	7,260	3,160	1,790	1,650	134,500
1954	7,200	24,310	52,510	37,830	27,190	14,370	13,130	8,190	7,380	5,620	5,140	4,120	207,000
1955	5,710	24,400	20,180	24,680	25,930	20,470	20,540	14,740	10,800	7,290	3,990	2,210	180,900
1956	9,550	29,490	34,320	28,430	15,050	26,080	17,400	7,540	6,820	3,370	1,880	2,700	182,600
1957	30,560	19,380	49,460	18,000	22,280	29,160	15,700	7,360	3,910	2,650	1,860	1,460	201,800
1958	2,430	5,470	16,370	24,640	24,730	12,620	11,830	5,180	2,450	1,420	1,170	1,300	109,600
1959	12,690	35,340	23,890	37,100	20,860	22,920	26,580	16,100	7,220	3,130	1,930	8,000	217,600
1960	13,160	32,610	29,920	24,650	27,330	16,370	16,070	14,440	7,620	2,640	2,250	2,460	191,500

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	-	-	-	-	-	-	-	324	49.99	234,400	
1951	1216	4,030	Feb. 10, 1951	17.5	274	3.12	42.34	198,200	234	36.18	169,400
1952	1246	1,210	Jan. 31, 1952	22	179	2.04	27.79	130,100	141	21.83	102,100
1953	1286	2,150	Jan. 31, 1953	21	186	2.12	28.71	134,500	290	44.76	209,700
1954	1346	2,330	Dec. 9, 1953	35	286	3.26	44.21	207,000	239	37.01	173,300
1955	1396	2,420	Feb. 8, 1955	30	250	2.98	38.65	180,900	282	43.58	204,000
1956	1446	2,000	Nov. 3, 1955	26	252	2.87	39.01	182,600	287	44.58	208,700
1957	1516	3,670	Dec. 9, 1956	23	279	3.18	43.11	201,800	175	27.06	126,600
1958	1566	1,490	Jan. 16, 1958	16.5	152	1.73	23.45	109,800	217	33.62	157,500
1959	1636	2,670	Nov. 12, 1958	18.5	301	3.43	46.46	217,600	306	47.26	221,300
1960	1716	2,690	Dec. 15, 1959	27	264	3.01	40.90	191,500	-	-	-

WHATCOM CREEK BASIN

2020. Austin Creek near Bellingham, Wash.

Location.--Lat 48°42'45", long 122°19'50", in SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.8, T.37 N., R.4 E., on right bank 200 ft downstream from bridge on Whatcom Lake Boulevard, three-quarters of a mile upstream from mouth, and 5 miles southwest of Bellingham.

Drainage area.--7.80 sq mi.

Records available.--July to September 1948, June to October 1954.

Gage.--Water-stage recorder. Altitude of gage is 330 ft (from topographic map). July to September 1948 at different datum.

Extremes.--1948-1954: Maximum discharge, 17.5 cfs Aug. 22, 1954 (gage height, 2.92 ft); minimum, 0.6 cfs Aug. 12-15 (gage height, 2.10 ft); minimum gage height, 0.78 ft Aug. 12, 13, 17, 18, 1948, datum then in use.

Remarks.--No regulation or diversion above station.

Monthly mean discharge, in cubic feet per second, of Austin Creek near Bellingham, Wash.

Year				June	July	Aug.	Sept.	Oct.				
1954				6.98	3.15	2.75	2.39	5.51				

Monthly discharge, in acre-feet

Year				June	July	Aug.	Sept.	Oct.				
1954				415	193	169	142	339				

2035. Whatcom Creek below hatchery, near Bellingham, Wash.

Location.--Lat 48°45'10", long 122°25'40", in NW 1/4 sec. 28, T. 38 N., R. 3 E., on right bank in Whatcom Falls Park, seven-eighths of a mile downstream from Lake Whatcom and 2 miles east of Bellingham.

Drainage area.--55.5 sq mi.

Records available.--October 1945 to November 1956.

Gage.--Water-stage recorder. Datum of gage is 252.55 ft above mean sea level, city of Bellingham datum.

Average discharge.--11 years (1945-56), 84.8 cfs (61,390 acre-ft per year).

Extremes.--1945-56: Maximum discharge, 1,350 cfs about Dec. 29, 1949 (gage height, 6.0 ft, from recorded range in stage); minimum, 0.7 cfs Nov. 24, 1952; minimum gage height, 1.31 ft Oct. 11, 1956.

Remarks.--Flow completely regulated by Lake Whatcom (usable capacity, about 28,800 acre-ft under normal operating conditions). City of Bellingham diverts about 30 cfs from lake for 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	5.03	8.62	268	357	387	104	7.38	7.57	6.08	5.61	5.02	3.82	95.8
1952	6.06	5.45	7.34	7.09	115	89.7	70.9	36.5	9.93	9.26	8.58	6.71	30.6
1953	5.71	4.47	2.33	5.88	180	112	58.2	13.1	11.4	12.0	10.0	6.70	34.1
1954	5.37	8.45	419	325	226	13.9	8.59	8.10	7.93	6.73	4.35	3.26	86.1
1955	2.40	5.94	24.0	212	261	16.6	134	16.6	14.6	10.9	9.58	7.03	58.1
1956	6.30	33.1	397	229	19.6	199	88.7	10.8	8.44	7.09	5.90	5.41	85.1
1957	22.3	-	-	-	-	-	-	-	-	-	-	-	-
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	309	513	16,500	21,960	21,510	6,420	439	465	362	345	309	227	69,360
1952	311	324	451	436	6,590	5,510	4,220	2,240	591	570	527	399	22,170
1953	351	266	143	362	9,990	6,870	3,460	805	680	740	617	339	24,680
1954	330	503	25,740	20,000	12,550	856	611	498	472	414	267	194	62,540
1955	147	354	1,480	13,060	14,500	1,020	7,950	1,020	869	671	589	418	42,080
1956	388	1,970	24,400	14,050	1,130	12,240	5,280	662	502	436	363	322	61,740
1957	1,370	-	-	-	-	-	-	-	-	-	-	-	-
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	-	-	-	-	-	-	134	96,690
1951	1216	1,100	Feb. 11, 1951	3.3	95.8	69,360	73.4	53,120
1952	1246	381	Mar. 18, 1952	4.4	30.6	22,170	30.1	21,840
1953	1286	685	Feb. 4, 1953	1.1	34.1	24,680	69.8	50,800
1954	1346	821	Dec. 12, 1953	1.3	86.1	62,540	52.1	37,740
1955	1396	614	Feb. 8, 1955	1.4	58.1	42,080	92.4	66,860
1956	1446	432	Dec. 12, 1955	3.3	85.1	61,740	-	-
1957	1446	-	-	-	-	-	-	-
1958								
1959								
1960								

2040. Squalicum Creek at Bellingham, Wash.

Location.--Lat 48°46'50", long 122°26'25", in NW¼SW¼ sec.16, T.38 N., R.3 E., on right bank at Bellingham city limits, 200 ft upstream (revised) from railroad bridge and 3½ miles upstream from mouth.

Drainage area.--12.0 sq mi.

Records available.--July to December 1948, May to October 1954.

Gage.--Water-stage recorder. Altitude of gage is 120 ft (from topographic map). July to December 1948 at different datum.

Extremes.--1948, 1954: Maximum discharge, 269 cfs Dec. 1, 1948 (gage height, 4.21 ft, datum then in use), from rating curve extended above 77 cfs by logarithmic plotting; minimum, 0.2 cfs for several days during each period; minimum gage height, 0.99 ft July 1, 1954.

Remarks.--No regulation or diversion above station.

Monthly mean discharge, in cubic feet per second

Year					June	July	Aug.	Sept.	Oct.				
1954					1.05	0.69	0.53	0.51					

Monthly discharge, in acre-feet

Year					June	July	Aug.	Sept.	Oct.				
1954					62	42	33	31	47				

2050. Nooksack River below Cascade Creek, near Glacier, Wash.
(Formerly published as Nooksack River above Cascade Creek, near Glacier)

Location (revised).--Lat 48°54'20", long 121°50'30", in SE¹/₄SW¹/₄ sec.36, T.40 N., R.7 E., on right bank a quarter of a mile downstream from Cascade Creek, half a mile downstream from Dead Horse Creek, 4½ miles east of Glacier, and 6 miles upstream from Glacier Creek.

Drainage area.--105 sq mi.

Records available.--October 1937 to September 1960. Prior to October 1958, published as "above Cascade Creek, near Glacier."

Gage.--Water-stage recorder. Altitude of gage is 1,245 ft (from river-profile map). Supplementary water-stage recorder on left bank at datum 1.19 ft lower (used as principal gage prior to Oct. 1, 1953, and used Oct. 8, 1958, to Sept. 30, 1959).

Average discharge.--23 years (1937-60), 755 cfs (546,600 acre-ft per year).

Extremes.--1937-60: Maximum discharge, 10,300 cfs Nov. 26, 1949 (gage height, 10.50 ft, supplementary gage), from rating curve extended above 2,900 cfs on basis of contracted-opening measurement at gage height 8.13 ft (supplementary gage); minimum, 73 cfs Feb. 16, 1949.

Remarks.--Some regulation at low flow by powerplant at Excelsior. No diversion 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	1,219	1,023	1,186	471	792	313	637	1,081	1,275	1,091	581	468	845
1952	658	397	348	179	366	221	650	1,340	1,322	1,231	732	418	656
1953	275	216	273	827	535	309	490	1,103	1,252	1,517	950	716	707
1954	1,001	1,019	746	433	651	393	427	1,115	1,470	1,917	1,244	784	936
1955	755	1,553	576	304	251	192	328	764	1,967	1,759	955	566	833
1956	817	1,015	438	326	165	202	644	1,604	2,194	1,834	847	638	895
1957	916	570	708	244	341	383	510	1,532	1,364	974	623	543	728
1958	526	398	439	629	763	366	389	1,175	1,262	815	555	470	648
1959	759	638	1,125	642	266	337	708	1,103	1,851	1,806	677	961	891
1960	896	921	584	391	536	370	665	1,014	1,551	1,281	699	482	784

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	74,980	60,890	72,940	28,970	43,960	19,230	37,900	66,450	75,840	67,090	35,700	27,750	611,700
1952	40,440	23,630	21,400	10,980	21,050	13,580	38,690	82,400	78,640	75,670	44,980	24,860	476,300
1953	16,910	12,880	16,760	50,840	29,720	19,010	29,180	67,790	74,480	93,300	58,410	42,580	511,900
1954	61,520	60,620	45,900	26,600	36,130	24,160	25,410	68,540	87,470	117,900	76,470	46,630	677,400
1955	46,420	92,420	35,400	18,710	13,930	11,780	19,530	46,980	117,000	108,200	58,720	33,710	602,800
1956	50,210	60,400	26,930	20,060	9,510	12,450	38,350	98,650	130,600	112,700	52,100	37,950	649,900
1957	56,310	33,910	43,410	15,000	18,950	23,560	30,340	94,200	81,180	59,880	38,300	32,310	527,400
1958	32,320	23,710	26,960	38,690	42,380	22,500	23,170	72,250	75,120	50,110	34,140	27,960	469,300
1959	45,440	37,950	69,230	39,450	14,780	20,730	42,140	67,810	110,100	98,740	41,640	57,190	645,200
1960	55,090	54,800	35,880	24,010	30,810	22,730	40,760	62,350	92,270	78,750	43,010	28,660	569,100

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	-	-	-	-	-	-	-	-	1,058	136.96	767,000
1951	1216	6,050	Dec. 24, 1950	249	845	8.05	109.24	611,700	675	87.21	488,400
1952	1246	3,660	June 4, 1952	130	656	6.25	85.04	476,300	603	78.09	437,400
1953	1286	4,710	Sept. 30, 1953	150	707	6.73	91.40	511,900	875	113.11	633,400
1954	1346	4,040	Oct. 10, 1953	230	936	6.91	120.97	677,400	944	122.06	683,600
1955	1396	6,460	Nov. 22, 1954	169	833	7.93	107.64	602,800	782	101.10	566,100
1956	1446	6,960	Nov. 3, 1955	129	895	8.52	116.07	649,900	890	115.37	646,000
1957	1516	6,040	Oct. 17, 1956	140	726	6.93	94.18	527,400	658	85.12	476,700
1958	1566	3,460	Oct. 30, 1957	236	648	6.17	83.80	469,300	744	96.24	538,900
1959	1636	5,860	Dec. 1, 1958	190	891	8.49	115.22	645,200	882	114.00	638,400
1960	1716	4,810	Nov. 23, 1959	177	784	7.47	101.63	569,100	-	-	-

2065. Kendall Creek near mouth, at Kendall, Wash.

Location.--Lat 48°54'20", long 122°08'20", in NE $\frac{1}{4}$ sec.3, T.39 N., R.5 E., on left bank at Mt. Baker highway crossing, three-quarters of a mile upstream from mouth and three-quarters of a mile south of Kendall.

Drainage area.--29.2 sq mi, of which 5.6 sq mi is in Canada.

Records available.--May to November 1954.

Gage.--Water-stage recorder. Altitude of gage is 410 ft (from topographic map).

Extremes.--May to November 1954: Maximum discharge, 100 cfs Nov. 19 (gage height, 2.04 ft); minimum discharge, 5.7 cfs Oct. 16, 18, Oct. 31 to Nov. 4 (gage height, 0.55 ft).

Remarks.--No known regulation or diversion above station.

Monthly mean discharge, in cubic feet per second

Year				May	June	July	Aug.	Sept.	Oct.	Nov.			
1954				-	37.2	26.4	16.6	11.8	8.02	-			

Monthly discharge, in acre-feet

Year				May	June	July	Aug.	Sept.	Oct.	Nov.			
1954				-	2,220	1,620	1,020	703	493	-			

2070. Coal Creek near Kendall, Wash.

Location.--Lat 48°53'20", long 122°09'05", in NW $\frac{1}{4}$ sec.10, T.39 N., R.5 E., on left bank a quarter of a mile upstream from mouth and 2 miles south of Kendall.

Drainage area.--4.57 sq mi.

Records available.--July to September 1948, May to October 1954.

Gage.--Water-stage recorder. Altitude of gage is 400 ft (from river-profile map). Prior to May 26, 1954, at different datum.

Extremes.--1948, 1954: Maximum discharge, 331 cfs Aug. 22, 1954 (gage height, 3.89 ft), from rating curve extended above 40 cfs by logarithmic plotting; minimum, 0.7 cfs Aug. 13, 1948 (gage height, 0.78 ft, datum then in use).

Remarks.--No known regulation or diversion above station.

Monthly mean discharge, in cubic feet per second

Year					May	June	July	Aug.	Sept.	Oct.			
1954					-	13.1	4.47	15.3	8.19	8.22			

Monthly discharge, in acre-feet

Year					May	June	July	Aug.	Sept.	Oct.			
1954					-	780	275	940	487	505			

2090. South Fork Nooksack River near Wickersham, Wash.

Location.--Lat 48°39'50", long 122°07'50", in lot 2, SW $\frac{1}{4}$ sec.26, T.37 N., R.5 E., on bank three-quarters of a mile upstream from Skookum Creek and 4 miles east of Wickersham.

Drainage area.--103 sq mi.

Records available.--October 1933 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 385 ft (from river-profile map). Prior to July 9, 1934, staff gage at same site and datum.

Average discharge.--27 years (1933-60), 731 cfs (529,200 acre-ft per year).

Extremes.--1933-60: Maximum discharge, 19,300 cfs Nov. 3, 1955 (gage height, 13.40 ft), from rating curve extended above 11,000 cfs; minimum, 66 cfs Oct. 9, 1940, Sept. 11-13, 1944; minimum gage height, 1.91 ft Aug. 26, 27, 1958.

Remarks.--No regulation or diversion 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	987	1,029	1,739	1,108	1,847	514	897	1,043	571	205	113	149	844
1952	992	672	553	461	781	403	940	1,253	812	378	154	137	627
1953	121	184	500	2,092	1,026	509	747	1,029	828	542	199	324	674
1954	902	1,174	1,430	846	1,211	580	813	1,187	1,280	919	501	375	933
1955	621	1,570	764	531	603	324	814	1,045	1,546	949	356	163	774
1956	970	1,434	920	747	288	523	975	1,366	1,347	629	201	346	814
1957	1,255	765	1,223	302	506	767	895	1,230	615	512	190	116	684
1958	245	501	875	1,326	1,316	507	673	892	432	137	81.5	236	598
1959	831	1,314	1,302	1,233	510	684	1,456	1,117	1,021	490	202	791	913
1960	780	1,238	951	654	875	614	947	1,059	839	357	280	260	736

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	60,720	61,210	106,900	68,150	102,600	31,620	53,370	64,110	34,000	12,590	6,920	8,880	611,100
1952	61,000	39,990	34,000	28,320	44,900	24,810	55,920	77,020	48,330	23,250	9,450	8,140	455,100
1953	7,460	10,960	30,740	128,600	57,000	31,520	44,470	63,260	49,300	33,350	12,240	19,300	488,000
1954	55,480	69,840	87,950	52,040	67,240	35,650	48,370	72,980	76,170	56,490	30,790	22,310	675,300
1955	36,200	93,420	46,990	32,650	33,510	19,910	48,460	64,250	91,970	56,370	21,910	10,920	560,600
1956	59,630	85,320	56,540	45,930	16,590	32,180	58,000	85,250	80,160	38,670	12,560	20,590	591,200
1957	77,180	45,560	75,190	18,600	28,130	47,170	53,160	75,620	36,580	19,190	11,710	6,880	495,000
1958	15,030	29,800	53,820	81,520	73,100	31,160	40,050	54,860	25,720	8,440	5,010	14,040	432,600
1959	51,080	78,180	80,050	75,800	28,320	42,070	86,640	68,680	60,750	30,120	12,430	47,060	661,200
1960	47,980	73,650	58,470	40,200	50,330	37,770	56,350	65,140	49,950	21,960	17,200	15,440	534,400

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	-	-	-	-	-	-	-	-	974	128.35	705,100	
1951	1216	15,600	Feb. 10, 1951	80	844	8.19	111.25	611,100	714	94.16	517,200	
1952	1246	5,450	Jan. 30, 1952	97	627	6.09	82.84	455,100	509	67.23	369,300	
1953	2196	8,100	Jan. 31, 1953	80	674	6.54	88.85	488,000	901	118.71	652,100	
1954	1346	6,590	Oct. 31, 1953	213	933	9.06	122.93	675,300	885	116.62	640,600	
1955	1396	8,840	Nov. 18, 1954	123	774	7.51	102.05	560,600	806	106.21	583,400	
1956	1446	19,300	Nov. 3, 1955	112	814	7.90	107.62	591,200	810	106.98	587,700	
1957	1516	9,640	Dec. 9, 1956	90	684	6.64	90.11	495,000	547	72.05	395,700	
1958	1566	8,020	Jan. 16, 1958	70	598	5.81	78.76	432,600	750	98.89	543,200	
1959	1636	12,600	Apr. 29, 1959	109	913	8.86	120.36	661,200	873	115.04	632,000	
1960	1716	10,800	Nov. 22, 1959	111	736	7.15	97.28	534,400	-	-	-	

2095. Skookum Creek near Wickersham, Wash.

Location.--Lat 48°40'20", long 122°08'25", in NE $\frac{1}{4}$ sec. 27, T.37 N., R.5 E., on left bank 100 ft upstream from private road crossing, 500 ft upstream from mouth, and 3 $\frac{1}{2}$ miles northeast of Wickersham.

Drainage area.--23.1 sq mi.

Records available.--July 1948 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 400 ft (from river-profile map).

Average discharge.--12 years (1948-60), 134 cfs (97,010 acre-ft per year).

Extremes.--1948-60: Maximum discharge, 3,050 cfs Nov. 27 or Dec. 1, 1949 (gage height, 9.0 ft, from floodmark), from rating curve extended above 400 cfs by logarithmic plotting; minimum, 17 cfs Feb. 9, 10, 1949, Sept. 23, 24, 1951; minimum gage height, 1.70 ft Oct. 19, 20, 1952.

Remarks.--No regulation or diversion 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	160	167	277	181	288	85.7	147	157	89.6	43.5	27.2	28.8	137
1952	156	124	95.3	69.0	134	67.8	178	214	130	79.5	41.8	35.0	110
1953	25.0	31.7	88.8	315	156	91.4	139	189	146	101	48.7	71.5	117
1954	162	232	255	131	225	99.3	130	204	202	143	96.5	75.5	164
1955	106	274	139	100	103	55.7	131	184	286	169	72.8	48.2	139
1956	146	211	177	155	49.5	104	189	265	231	105	44.2	62.6	145
1957	217	138	217	67.5	93.9	166	171	198	105	69.2	46.8	29.0	127
1958	54.1	86.4	142	225	235	93.8	122	129	78.1	35.9	21.1	44.6	105
1959	132	188	261	213	90.0	111	222	194	162	87.6	47.1	138	154
1960	124	162	167	112	145	112	161	172	146	70.2	56.8	50.7	125

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	9,850	9,920	17,050	11,140	16,020	5,270	8,750	9,670	5,330	2,670	1,670	1,710	99,050
1952	9,580	7,410	5,860	4,240	7,690	4,170	10,600	13,150	7,730	4,890	2,570	1,970	79,860
1953	1,530	1,890	5,460	19,390	8,670	5,620	8,250	11,620	8,670	6,190	2,990	4,250	84,530
1954	9,940	13,810	15,690	9,270	12,500	6,110	7,710	12,520	12,000	8,790	5,940	4,490	118,800
1955	6,510	16,290	8,540	6,180	5,750	3,430	7,800	11,330	17,040	10,400	4,480	2,870	100,600
1956	8,970	12,540	10,850	9,540	2,850	6,410	11,260	16,280	13,730	6,460	2,720	3,720	105,300
1957	13,360	8,200	13,330	4,150	5,220	10,200	10,200	12,170	6,230	4,250	2,880	1,720	91,910
1958	3,330	5,140	8,740	13,860	13,040	5,770	7,290	7,960	4,650	2,180	1,300	2,650	75,910
1959	8,140	11,190	16,030	13,110	5,000	6,820	13,220	11,910	9,620	5,390	2,890	8,240	111,600
1960	7,620	10,810	10,240	6,880	8,360	6,860	9,590	10,590	8,680	4,320	3,490	3,020	90,480

Yearly 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	-	-	-	-	-	-	-	-	165	96.88	119,400	-	-
1951	1216	2,100	Feb. 10, 1951	17	137	5.93	80.41	99,050	118	69.97	85,080	-	-
1952	1246	960	Oct. 19, 1951	23	110	4.82	65.68	79,860	90.8	53.48	65,890	-	-
1953	1286	1,320	Jan. 31, 1953	18	117	5.06	68.63	84,530	159	93.43	115,100	-	-
1954	1346	1,070	Oct. 31, 1953	42	164	7.10	96.39	118,800	153	89.82	110,700	-	-
1955	1396	1,640	Nov. 19, 1954	34	139	6.02	81.66	100,600	140	82.43	101,600	-	-
1956	1446	1,290	Nov. 3, 1955	19	145	6.28	85.48	105,300	149	87.54	107,900	-	-
1957	1516	1,880	Oct. 20, 1956	25	127	5.50	74.60	91,910	103	60.24	74,230	-	-
1958	1568	1,010	Jan. 16, 1958	17.5	105	4.55	61.58	75,910	130	76.32	94,060	-	-
1959	1636	1,320	Apr. 30, 1959	25	154	6.67	90.55	111,600	145	85.13	104,900	-	-
1960	1716	1,180	Nov. 22, 1959	27	125	5.41	73.42	90,480	-	-	-	-	-

2105. Nooksack River at Deming, Wash.

Location.--Lat 48°48'40", long 122°12'15", in lot 12, sec.6, T.38 N., R.5 E., on left bank 800 ft downstream from South Fork and 1 mile southeast of Deming.

Drainage area.--580 sq mi.

Records available.--September 1910 to March 1911 (gage heights only), July 1935 to September 1957, October 1957 to September 1960 (discharges above 3,500 cfs only). Published as "near Deming" 1910-11.

Gage.--Water-stage recorder. Datum of gage is 203.6 ft above mean sea level, datum of 1929. Prior to Dec. 5, 1910, staff gage at site 1 1/8 miles downstream at different datum. Dec. 5, 1910, to Mar. 31, 1911, staff gage at site 5 miles downstream at different datum. July 20 to Sept. 19, 1935, staff gage at same site and datum.

Average discharge.--22 years (1935-57), 3,244 cfs (2,349,000 acre-ft per year).

Extremes.--1935-60: Maximum discharge, 43,200 cfs Feb. 10, 1951 (gage height, 15.69 ft), from rating curve extended above 25,000 cfs; minimum recorded, 502 cfs Nov. 29, 1952 (gage height, 3.72 ft).

Revisions.--The momentary maximum discharge for the water year 1937, published in WSP 1316, has been revised to 20,900 cfs June 21, 1957.

Peak of Mar. 15, 1908, reportedly reached a stage of 20 ft. Peak of Feb. 27, 1932, reached a stage of 16.8 ft, from floodmarks (discharge, 49,300 cfs). Peak of November 1909 reached a stage about equal to that of 1932 peak.

Remarks.--Slight regulation by powerplant at Excelsior. No diversion 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	3,856	4,175	6,244	4,247	7,118	2,284	3,205	4,067	3,458	2,368	1,432	1,218	3,617
1952	3,316	2,509	2,416	1,560	3,193	1,828	3,590	5,260	4,158	3,160	1,855	1,252	2,839
1953	895	901	1,760	6,941	4,365	2,293	3,041	4,365	4,056	3,811	1,978	1,847	3,017
1954	3,923	5,618	6,552	4,055	5,223	2,622	2,930	4,694	5,568	5,298	3,319	2,371	4,342
1955	2,608	6,986	3,409	2,656	2,686	1,609	3,069	4,238	7,228	5,365	2,817	1,716	3,696
1956	3,779	5,967	4,063	3,032	1,473	2,368	4,061	5,993	7,091	4,152	2,133	1,950	3,841
1957	5,835	3,517	5,801	1,791	2,595	3,723	3,464	5,496	3,751	2,632	1,870	1,569	3,516
1958	-	-	-	-	-	-	-	-	-	-	-	-	-
1959	-	-	-	-	-	-	-	5,377	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	5,233	-	-	-	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	237,100	248,400	383,900	261,200	395,300	140,400	200,900	250,100	205,700	145,500	88,050	72,490	2,619,000
1952	203,900	149,300	148,500	95,940	183,600	112,400	113,600	323,400	247,400	194,300	114,000	74,460	2,061,000
1953	55,030	53,600	108,200	426,800	243,500	140,800	900,268	400,241	300,234	300,121	600,099	90,900	2,184,000
1954	241,200	334,200	402,800	249,300	290,400	161,200	174,300	288,600	331,300	325,200	204,100	141,100	3,144,000
1955	160,400	415,700	209,600	163,300	149,200	98,920	182,600	260,600	430,100	329,900	173,200	102,100	2,676,000
1956	232,300	355,100	249,800	186,400	84,730	145,800	241,600	368,500	421,900	255,300	131,100	116,100	2,798,000
1957	358,800	209,300	356,700	110,100	144,100	228,900	206,100	337,900	223,200	161,900	115,000	93,360	2,545,000
1958	-	-	-	-	-	-	-	-	-	-	-	-	-
1959	-	-	-	-	-	-	-	330,600	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	511,400	-	-	-	-

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	1216	43,200	Feb. 10, 1951	797	3,617	6.24	84.65	2,619,000	4,252	99.50	3,079,000
1952	1246	14,200	Jan. 30, 1952	698	2,839	4.89	66.64	2,061,000	3,110	72.77	2,251,000
1953	1286	22,700	Jan. 31, 1953	526	3,017	5.20	70.62	2,184,000	2,447	57.43	1,775,000
1954	1346	24,900	Oct. 31, 1953	1,370	4,342	7.49	101.63	3,144,000	4,069	95.23	2,946,000
1955	1396	23,300	Nov. 19, 1954	990	3,696	6.39	86.48	2,676,000	4,076	95.41	2,951,000
1956	1446	38,500	Nov. 3, 1955	1,000	3,841	6.62	90.15	2,788,000	3,767	88.15	2,727,000
1957	1516	a27,500	Oct. 20, 1956	1,080	3,516	6.06	82.28	2,545,000	3,962	92.97	2,876,000
1958	1568	22,000	Jan. 16, 1958	-	-	-	-	-	-	-	-
1959	1636	31,400	Apr. 30, 1959	-	-	-	-	-	-	-	-
1960	1716	25,700	Nov. 23, 1959	-	-	-	-	-	-	-	-

a Maximum recorded.

2110. Anderson Creek at Goshen, Wash.

Location.--Lat 48°51'20", long 122°20'20", in E $\frac{1}{2}$ sec.19, T.39 N., R.4 E., on right bank at downstream side of county bridge at Goshen, half a mile upstream from mouth.

Drainage area.--12.9 sq mi.

Records available.--July to September 1948, May to October 1954.

Gage.--Water-stage recorder. Altitude of gage is 145 ft (from topographic map). July to September 1948 at different datum.

Extremes.--1948, 1954: Maximum discharge, 35 cfs June 6, 1954 (gage height, 2.63 ft); minimum, 0.3 cfs Aug. 1-3, 9-15, 1954; minimum gage height, 0.79 ft Aug. 18, 1948 (datum then in use).

Remarks.--No regulation. Minor diversions for irrigation and domestic use above station.

Monthly mean discharge, in cubic feet per second

Year					June	July	Aug.	Sept.	Oct.				
1954					7.01	3.24	3.44	2.35	7.20				

Monthly discharge, in acre-feet

Year					June	July	Aug.	Sept.	Oct.				
1954					417	199	212	140	443				

2115. Nooksack River near Lynden, Wash.

Location.--Lat 48°55'10", long 122°29'10", in NE¼NE¼ sec.36, T.40 N., R.2 E., on right bank 150 ft downstream from bridge on State Highway 1B, 1½ miles upstream from Fishtrap Creek, 2 miles southwest of Lynden, and 12 miles upstream from mouth.

Drainage area.--636 sq mi.

Records available.--October 1944 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Datum of gage is 24.4 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Average discharge.--16 years (1944-60), 3,728 cfs (2,699,000 acre-ft per year).

Extremes.--1944-60: Maximum discharge, 46,200 cfs Feb. 10, 1951 (gage height, 21.76 ft); minimum, 595 cfs Nov. 30, 1952 (gage height, 5.01 ft).

Remarks.--Slight regulation by powerplant at Excelsior. No diversion 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	4,086	4,846	7,559	4,758	7,878	2,541	3,382	4,502	3,597	2,510	1,498	1,258	4,011
1952	3,461	2,589	2,508	1,826	3,366	1,912	3,752	5,417	4,405	3,417	1,883	1,262	2,964
1953	942	952	1,808	7,277	4,746	2,456	3,244	4,649	4,348	4,075	1,991	1,859	3,189
1954	3,997	5,688	6,730	4,348	5,422	2,753	3,066	4,741	5,639	5,298	3,414	2,423	4,455
1955	2,655	7,454	3,737	2,938	2,970	1,695	3,315	4,423	7,300	5,500	2,799	1,608	3,862
1956	3,744	6,644	4,549	3,401	1,568	2,496	4,127	5,955	7,028	4,539	2,028	2,040	4,011
1957	5,556	3,544	2,347	1,922	2,879	3,710	3,424	5,486	4,016	2,685	1,675	1,358	3,546
1958	1,793	1,724	2,978	4,767	5,040	2,400	2,854	4,451	3,580	2,238	1,515	1,614	2,900
1959	3,677	5,441	6,220	6,057	2,609	3,169	5,900	5,634	5,778	4,109	2,113	4,035	4,570
1960	3,972	5,772	4,892	3,253	4,105	2,631	3,935	4,604	5,002	3,216	2,141	1,719	3,765

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	251,200	288,400	464,800	292,500	437,500	156,200	201,300	276,800	214,100	154,300	92,090	74,870	2,904,000
1952	212,800	154,000	154,200	99,970	193,600	117,500	223,300	353,100	262,100	210,100	115,800	75,110	2,152,000
1953	57,940	56,650	111,100	447,400	263,600	151,000	193,000	285,800	258,700	250,500	122,400	110,600	2,309,000
1954	245,800	358,000	413,800	267,400	301,200	169,200	182,400	291,500	353,500	325,700	209,900	144,200	3,225,000
1955	163,200	443,500	229,800	180,700	165,000	104,200	197,300	272,000	434,400	338,200	172,100	95,700	2,796,000
1956	230,200	395,300	279,700	209,100	90,210	153,500	245,600	364,900	418,200	279,100	124,700	121,400	2,912,000
1957	341,600	210,900	390,200	118,200	148,800	228,100	203,800	337,900	339,000	165,100	103,000	80,670	2,567,000
1958	110,300	102,600	183,100	293,100	279,900	147,600	169,800	273,700	213,000	137,600	93,140	96,020	2,100,000
1959	226,100	323,800	382,500	372,500	144,900	194,800	351,100	346,400	343,800	252,700	129,900	240,100	3,309,000
1960	244,200	343,500	500,800	200,000	236,100	161,800	234,100	283,100	297,600	197,800	131,600	102,300	2,733,000

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	-	-	-	-	-	-	-	-	4,636	98.95	3,556,000
1951	1216	46,200	Feb. 10, 1951	925	4,011	6.31	85.61	2,904,000	3,357	71.36	2,421,000
1952	1246	13,400	Jan. 31, 1952	720	2,964	4.66	63.43	2,152,000	2,557	54.73	1,856,000
1953	1286	24,100	Feb. 1, 1953	605	3,189	5.01	68.08	2,309,000	4,256	90.85	3,081,000
1954	1346	26,200	Oct. 31, 1953	1,550	4,455	7.00	95.08	3,225,000	4,232	90.31	3,064,000
1955	1396	25,300	Nov. 19, 1954	1,060	3,862	6.07	82.43	2,796,000	3,957	84.46	2,865,000
1956	1446	42,600	Nov. 3, 1955	1,140	4,011	6.31	85.85	2,912,000	4,063	86.95	2,949,000
1957	1516	27,200	Dec. 10, 1956	900	3,546	5.58	75.69	2,567,000	2,791	59.57	2,021,000
1958	1566	20,900	Jan. 17, 1958	780	2,900	4.56	61.91	2,100,000	3,641	77.73	2,636,000
1959	1636	37,800	Apr. 30, 1959	928	4,570	7.19	97.54	3,309,000	4,509	96.25	3,265,000
1960	1716	27,900	Nov. 23, 1959	1,210	3,765	5.92	80.58	2,733,000	-	-	-

2120. Fishtrap Creek at Lynden, Wash.

Location.--Lat 48°57'50", long 122°26'00", on north line of sec.16, T.40 N., R.3 E., on right bank on downstream side of bridge on State Highway 1A, 1 mile north of Lynden.

Drainage area.--24.1 sq mi, of which 18.5 sq mi is in Canada.

Records available.--July 1948 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 110 ft (from topographic map).

Average discharge.--12 years (1948-60), 35.8 cfs (25,920 acre-ft per year).

Extremes.--1948-60: Maximum discharge, 550 cfs Feb. 11, 1951 (gage height, 6.59 ft); minimum, 0.4 cfs Sept. 10, 1949 (gage height, 1.00 ft).

Remarks.--Small diversions for irrigation and domestic use above station. Regulation from unknown source.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	16.9	41.4	94.2	114	162	103	37.9	31.1	13.6	7.47	6.41	4.54	52.1
1952	11.4	22.1	39.3	40.3	60.8	35.5	20.7	15.7	9.78	6.62	3.85	4.51	22.4
1953	4.31	4.59	15.1	104	82.2	40.3	38.3	22.3	17.4	9.99	6.12	6.01	28.9
1954	14.3	58.4	106	80.3	92.9	50.6	40.5	18.7	11.0	8.30	7.97	41.8	
1955	7.11	74.9	46.1	48.3	61.1	38.3	52.3	29.4	18.7	11.0	7.66	5.36	33.1
1956	14.9	60.1	83.1	74.9	44.0	60.6	41.1	16.8	16.9	8.61	5.39	6.81	36.1
1957	34.0	44.1	92.0	39.7	63.5	80.7	42.5	18.5	11.2	7.93	6.26	4.96	37.0
1958	5.33	10.2	24.6	64.1	71.1	33.0	31.1	13.9	7.64	4.15	2.55	2.97	22.3
1959	7.84	37.8	66.0	91.3	57.7	55.4	70.1	47.3	20.9	10.3	6.41	11.1	40.1
1960	22.5	59.8	74.2	71.7	73.4	50.9	41.3	46.7	22.8	9.11	6.62	10.0	40.7

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,040	2,460	5,790	7,010	9,010	6,330	2,260	1,910	806	459	394	270	37,740
1952	701	1,310	2,420	2,480	3,490	2,190	1,230	963	581	407	237	268	16,280
1953	265	273	930	6,390	4,560	2,480	2,280	1,370	1,040	614	376	357	20,940
1954	880	3,480	6,510	4,940	5,160	3,110	2,410	1,150	994	677	510	474	30,300
1955	437	4,460	2,840	2,970	3,400	2,350	3,110	1,800	1,110	679	471	319	23,950
1956	918	3,570	5,110	4,610	2,530	3,720	2,440	1,030	1,010	529	332	405	26,200
1957	2,090	2,620	5,680	2,440	3,530	4,980	2,530	1,140	689	488	365	295	26,810
1958	328	608	1,510	3,940	3,950	2,030	1,850	854	454	255	157	177	18,110
1959	482	2,250	4,060	5,620	3,200	3,410	4,170	2,910	1,240	635	394	659	29,030
1960	1,380	3,560	4,560	4,410	4,220	3,130	2,460	2,870	1,360	560	407	595	29,510

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	-	-	-	-	-	-	50.4	36,502
1951	1216	550	Feb. 11, 1951	3.4	52.1	37,740	45.4	32,880
1952	1246	278	Jan. 31, 1952	3.4	22.4	16,280	18.3	13,310
1953	1286	286	Jan. 23, 1953	3.4	28.9	20,940	41.9	30,340
1954	1346	266	Dec. 20, 1953	6.4	41.8	30,300	37.5	27,160
1955	1396	354	Nov. 22, 1954	4.7	33.1	23,950	35.7	25,810
1956	1446	299	Nov. 3, 1955	3.8	36.1	26,200	37.2	26,980
1957	1516	406	Dec. 9, 1956	4.3	37.0	26,810	26.1	18,880
1958	1566	214	Jan. 24, 1958	1.9	22.3	16,110	28.3	20,460
1959	1636	366	Jan. 24, 1959	3.1	40.1	29,030	43.8	31,740
1960	1716	432	Dec. 15, 1959	4.2	40.7	29,510	-	-

2125. Bertrand Creek near Lynden, Wash.

Location.--Lat 48°55'30", long 122°31'50", in SE $\frac{1}{4}$ sec.27, T.40 N., R.2 E., on left bank 400 ft upstream from road crossing, three-quarters of a mile upstream from mouth, and 3 miles west of Lynden.

Drainage area.--40.3 sq mi, of which 23.1 sq mi is in Canada.

Records available.--July to September 1948, May to October 1954.

Gage.--Water-stage recorder. Altitude of gage is 35 ft (from topographic map). July to September 1948 at datum 0.79 ft higher.

Extremes.--1948, 1954: Maximum discharge, 198 cfs Aug. 23, 1954 (gage height, 4.49 ft); minimum, 7.6 cfs Aug. 12, 1954 (gage height, 1.83 ft).

Remarks.--No regulation. Minor diversions for domestic use above station.

Monthly mean discharge, in cubic feet per second

Year				June	July	Aug.	Sept.	Oct.				
1954				26.1	17.8	16.7	14.1	14.3				

Monthly discharge, in acre-feet

Year				June	July	Aug.	Sept.	Oct.				
1954				1,560	1,100	1,030	840	879				

2130. Tenmile Creek near Ferndale, Wash.

Location.--Lat 48°51'15", long 122°32'25", in NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.22, T.39 N., R.2 E., on right bank 100 ft downstream from county bridge and 2 miles east of Ferndale.

Drainage area.--22.7 sq mi.

Records available.--July to September 1948, May to October 1954.

Gage.--Water-stage recorder. Altitude of gage is 20 ft (from topographic map).

Extremes.--1948, 1954: Maximum discharge, 19 cfs July 2, 1954 (gage height, 3.32 ft); minimum, 3.2 cfs Aug. 2, 1954 (gage height, 1.97 ft).

Remarks.--No regulation. Small diversions for irrigation and domestic use above station.

Monthly mean discharge, in cubic feet per second

Year				June	July	Aug.	Sept.	Oct.				
1954				12.4	8.63	7.15	8.48	8.88				

Monthly discharge, in acre-feet

Year				June	July	Aug.	Sept.	Oct.				
1954				738	531	440	505	546				

CALIFORNIA CREEK BASIN

2135. California Creek near Custer, Wash.

Location.--Lat 48°55'15", long 122°39'35", in SE $\frac{1}{4}$ sec.27, T.40 N., R.1 E., on right bank 10 ft downstream from county bridge on Porter Road, 1 mile west of Custer, and 4 $\frac{1}{2}$ miles upstream from mouth.

Drainage area.--6.85 sq mi.

Records available.--May to October 1954.

Gage.--Water-stage recorder. Altitude of gage is 15 ft (from topographic map).

Extremes--May to October 1954: Maximum discharge, 4.2 cfs July 1 (gage height, 2.12 ft); minimum, 0.8 cfs Aug. 10-15 (gage height, 1.88 ft).

Remarks.--No regulation. Minor diversions for irrigation and domestic use above station.

Monthly mean discharge, in cubic feet per second

Year					June	July	Aug.	Sept.	Oct.				
1954					2.56	1.85	1.10	1.38	1.27				

Monthly discharge, in acre-feet

Year				June	July	Aug.	Sept.	Oct.				
1954				152	114	68	82	78				

DAKOTA CREEK BASIN

2140. Dakota Creek near Blaine, Wash.

Location.--Lat 48°57'25", long 122°39'30", in NW¹SW¹ sec.14, T.40 N., R.1 E., on right bank 50 ft upstream from county road crossing, 3½ miles upstream from mouth, and 4½ miles southeast of Blaine.

Drainage area.--15.2 sq mi.

Records available.--July 1948 to September 1953, May to October 1954.

Gage.--Water-stage recorder and V-notch log control. Altitude of gage is 20 ft (from topographic map).

Average discharge.--5 years (1948-53), 31.6 cfs (22,880 acre-ft per year).

Extremes.--1948-53, 1954: Maximum discharge, 669 cfs Dec. 27, 1949; maximum gage height, 9.92 ft Feb. 10, 1951; minimum discharge, 0.1 cfs Aug. 11, 1950, Sept. 22, 1952.

Remarks.--Probably some small diversions for domestic use. Some diurnal fluctuation at low flow from unknown cause.

Corrections.--In WSP 1316, the following figures in acre-feet are listed in error; they should be as follows:

Month	Acre-feet
December 1949.....	7,220
Calendar year 1949...	17,070
Water year 1949-50...	35,400

Monthly and yearly mean discharge, in cubic feet per second

[illegible]

Monthly and yearly discharge, in acre-feet

[illegible]

Yearly discharge, in cubic feet per second

[illegible]

2145. Sumas River near Sumas, Wash.

Location.--Lat 48°58'30", long 122°15'00", in NE $\frac{1}{4}$ sec.11, T.40 N., R.4 E., on left bank at Clear Brook road crossing, $1\frac{1}{2}$ miles south of Sumas and 2 miles upstream from Johnson Creek.

Drainage area.--32.1 sq mi (revised).

Records available.--July 1948 to November 1950, May to October 1954.

Gage.--Water-stage recorder. Altitude of gage is 40 ft (from topographic map).

Extremes.--1948-50, 1954: Maximum discharge, 800 cfs Dec. 28, 1949 (gage height, 8.89 ft); minimum, 13.5 cfs Sept. 27 to Oct. 4, 1949.

Remarks.--No regulation. Probably some small diversions for minor irrigation and domestic use above station.

Monthly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	35.9	-	-	-	-	-	-	-	-	-	-	-	-
1954	-	-	-	-	-	-	-	-	37.3	25.0	32.6	22.6	-
1955	22.1	-	-	-	-	-	-	-	-	-	-	-	-

Monthly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2,210	-	-	-	-	-	-	-	-	-	-	-	-
1954	-	-	-	-	-	-	-	-	2,220	1,540	2,010	1,360	-
1955	1,360	-	-	-	-	-	-	-	-	-	-	-	-

2150. Johnson Creek at Sumas, Wash.

Location.--Lat 48°59'50", long 122°15'40", in SW $\frac{1}{4}$ sec.35, T.41 N., R.4 E., near right bank on upstream side of bridge on Sumas Avenue in city park at Sumas, 1 mile upstream from mouth.

Drainage area.--23.0 sq mi, of which 6.6 sq mi is in Canada.

Records available.--May to October 1954.

Gage.--Water-stage recorder. Altitude of gage is 35 ft (from topographic map).

Extremes.--May to October 1954: Maximum discharge, 38 cfs May 31; maximum gage height, 2.14 ft Aug. 20; minimum discharge, 17 cfs Oct. 3-7; minimum gage height, 1.46 ft July 27.

Remarks.--No regulation. Small diversions for irrigation and domestic use above station.

Monthly mean discharge, in cubic feet per second

Year				June	July	Aug.	Sept.	Oct.				
1954				30.1	22.1	20.5	18.8	19.2				

Monthly discharge, in acre-feet

Year				June	July	Aug.	Sept.	Oct.				
1954				1,790	1,360	1,260	1,120	1,180				

FRAZIER RIVER BASIN

2155. Saar Creek near Sumas, Wash.

Location.--Lat 48°59'35", long 122°12'35", on north line of sec.6, T.40 N., R.5 E., on left bank 20 ft upstream from county bridge on Rock road, three-quarters of a mile south of international boundary, and 2½ miles east of Sumas.

Drainage area.--9.76 sq mi; at site prior to May 1954, 11 sq mi, approximately.

Records available.--July to September 1948, May to October 1954.

Gage.--Water-stage recorder and wooden control. Altitude of gage is 30 ft (from topographic map). July 1 to Sept. 30, 1948, at site 1 mile downstream at different datum.

Extremes.--1948, 1954: Maximum discharge, 57 cfs Aug. 23, 1954 (gage height, 5.22 ft); minimum, 0.6 cfs Aug. 12, 1954.

Remarks.--No regulation. Probably some small diversions for domestic use.

Monthly mean discharge, in cubic feet per second

Year				June	July	Aug.	Sept.	Oct.				
1954				7.92	3.58	4.90	5.00	4.93				

Monthly discharge, in acre-feet

Year				June	July	Aug.	Sept.	Oct.				
1954				471	220	301	297	303				

KOOTENAI RIVER BASIN

3000. Kootenay River at Newgate, British Columbia

(International gaging station)

Location.--Lat 49°00'52", long 115°10'27" (revised), on left bank at old highway bridge site, 0.7 mile northwest of Newgate and 0.9 mile north of international boundary.

Drainage area.--7,660 sq mi, approximately.

Records available.--October 1930 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 2,310.23 ft above mean sea level (datum of Geodetic Survey of Canada, adjustment of 1945). Prior to Oct. 1, 1940, staff gage at same site at datum 1.00 ft higher. Oct. 1, 1940, to Apr. 30, 1947, staff gage at present site and datum.

Average discharge.--30 years (1930-60), 10,320 cfs (7,471,000 acre-ft per year).

Extremes.--1930-60: Maximum discharge, 98,200 cfs May 28, 1948 (gage height, 15.02 ft); minimum observed, 994 cfs Feb. 7, 1936; minimum gage height observed, 0.21 ft Jan. 11, 1944.

Remarks.--Records give total flow of main channel and slough.

Cooperation.--This station is 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	6,650	5,940	5,300	3,800	4,710	3,410	9,720	40,000	36,700	33,200	11,700	9,150	14,300
1952	8,590	5,560	3,830	3,630	3,110	2,810	11,300	27,200	29,200	18,200	8,690	5,760	10,800
1953	4,110	2,860	2,470	2,930	2,730	2,450	4,290	20,000	42,700	25,100	9,850	5,650	10,400
1954	4,520	3,930	2,910	2,440	2,750	2,630	4,130	33,600	46,500	40,200	14,600	9,490	14,000
1955	5,780	5,040	3,630	2,710	2,480	2,390	3,510	14,800	46,400	27,600	10,300	5,950	10,900
1956	6,640	5,760	3,600	3,040	2,490	3,080	9,830	41,400	50,100	23,600	9,300	5,520	13,700
1957	4,960	3,730	2,800	2,180	2,310	2,590	4,300	37,000	29,800	12,300	6,750	4,450	9,470
1958	3,990	3,240	2,520	2,160	2,310	2,470	4,500	34,600	27,900	14,600	6,690	5,310	9,250
1959	4,780	3,600	2,990	2,670	2,140	2,480	6,810	25,700	52,400	27,500	11,300	14,500	13,100
1960	10,500	7,220	5,040	3,690	3,280	4,210	10,100	18,600	37,300	21,800	9,130	6,070	11,400

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	408.8	353.2	325.8	233.6	261.5	209.4	278.5	2,462	2,185	2,042	718.7	544.6	10,320
1952	589.7	331.1	235.7	222.9	178.7	173.1	672.8	1,671	1,737	1,117	534.4	342.6	7,806
1953	252.9	169.9	151.9	180.0	151.7	150.8	255.6	1,227	2,541	1,542	605.5	335.8	7,564
1954	278.0	233.9	178.8	150.3	152.6	161.4	245.9	2,065	2,768	2,471	896.7	564.6	10,170
1955	355.1	299.6	223.0	166.7	137.9	146.9	208.7	907.7	2,758	1,699	633.2	353.9	7,691
1956	408.6	342.4	221.5	187.0	143.0	189.5	585.1	2,544	2,983	1,453	571.6	328.2	9,957
1957	304.7	222.2	171.9	134.3	128.4	159.5	255.9	2,272	1,773	755.1	414.9	264.8	6,857
1958	245.2	192.5	154.7	132.7	128.5	151.7	267.6	2,127	1,657	897.2	423.8	316.0	6,694
1959	294.0	214.2	183.6	164.3	118.8	152.2	405.4	1,582	3,118	1,691	694.0	863.6	9,481
1960	645.6	429.6	310.0	227.1	188.5	258.9	599.8	1,146	2,219	1,337	561.6	361.3	8,284

Yearly 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		Inches	Acres-feet
1950	-	-	-	-	-	-	-	-	11,880	21.08	8,609,000
1951	1216	66,500	June 17, 1951	2,530	14,300	1.87	25.27	10,320,000	14,400	25.43	10,390,000
1952	1246	40,300	May 21, 1952	2,600	10,800	1.41	19.11	7,806,000	9,952	17.68	7,224,000
1953	1296	70,900	June 14, 1953	1,770	10,400	1.36	18.53	7,564,000	10,609	18.82	7,680,000
1954	1346	74,200	May 21, 1954	2,000	14,000	1.83	24.88	10,170,000	14,300	25.35	10,350,000
1955	1396	70,800	June 14, 1955	1,680	10,900	1.42	19.30	7,891,000	11,000	19.54	7,986,000
1956	1446	92,000	May 22, 1956	1,920	13,700	1.79	24.37	9,957,000	13,340	23.72	9,683,000
1957	1516	45,800	May 21, 1957	1,650	9,470	1.24	16.80	6,857,000	9,320	16.52	6,750,000
1958	1566	57,700	May 25, 1958	1,360	9,250	1.21	16.39	6,694,000	9,360	16.62	6,793,000
1959	1656	67,000	June 7, 1959	1,580	13,100	1.71	23.19	9,481,000	14,100	24.90	10,170,000
1960	1716	55,800	June 5, 1960	1,910	11,400	1.49	20.27	8,284,000	-	-	-

3005. Fortine Creek near Trego, Mont.

Location.--Lat 48°38'40", long 114°54'40", in NE¹/₄ sec.11, T.33 N., R.26 W., on down-stream side of private bridge, a quarter of a mile upstream from Edna Creek, 1 mile downstream from Stewart Creek, and 5 miles southwest of Trego.

Drainage area.--112 sq mi.

Records available.--December 1946 to September 1953, water years 1954, 1958, 1960 (annual maximum). Monthly discharge only for December 1946, published in WSP 1316.

Gage.--Crest-stage gage since July 1, 1959. Altitude of gage is 3,340 ft (from topographic map). Prior to Jan. 27, 1953, wire-weight gage and Jan. 27, 1953, to Sept. 30, 1953, staff gage, at same site and datum.

Average discharge.--6 years (1947-53), 84.7 cfs (61,320 acre-ft per year).

Extremes.--1946-54, 1958, 1960: Maximum discharge, 1,810 cfs May 16, 1950, May 20, 1954 (gage height, 11.8 ft, from high-water mark).

1946-53: Minimum discharge observed, 5.0 cfs Sept. 7, 1949, but may have been less during winter periods in 1946-48.

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	18.5	21.0	39.2	28.0	85.7	34.7	282	464	109	56.3	20.5	25.8	98.7
1952	51.0	51.2	39.8	27.5	19.9	20.3	338	165	71.5	26.2	11.4	9.58	69.1
1953	8.44	9.49	8.30	22.0	30.2	31.1	160	326	103	23.3	11.5	8.01	62.0

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,140	1,250	2,410	1,720	4,760	2,130	16,770	28,550	6,480	3,460	1,260	1,540	71,470
1952	5,140	3,050	2,450	1,690	1,150	1,250	20,140	10,160	4,250	1,610	701	570	50,160
1953	519	565	510	1,360	1,680	1,910	9,540	20,070	6,110	1,430	704	476	44,870

Yearly 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	-	-	-	-	-	-	-	-	104	12.62	75,450
1951	1216	875	May 7, 1951	8.8	98.7	0.881	11.97	71,470	104	12.61	75,310
1952	1246	798	Apr. 28, 1952	7.9	69.1	0.617	8.39	50,160	59.4	7.22	43,120
1953	1286	860	May 7, 1953	6	62.0	0.554	7.52	44,870	-	-	-
1954	-	1,810	May 20, 1954	-	-	-	-	-	-	-	-
1955	-	-	-	-	-	-	-	-	-	-	-
1956	-	-	-	-	-	-	-	-	-	-	-
1957	-	-	-	-	-	-	-	-	-	-	-
1958	-	*850	May 24, 1958	-	-	-	-	-	-	-	-
1959	-	-	-	-	-	-	-	-	-	-	-
1960	-	700	May 8, 1960†	-	-	-	-	-	-	-	-

† Corrected.

* Not previously published.

a About.

3013. Tobacco River near Eureka, Mont.

Location.--Lat 48°54', long 115°06', in SW¹/₄ sec.9, T.36 N., R.27 W., on right bank 2½ miles northwest of Eureka and 6 miles upstream from mouth.

Drainage area.--440 sq mi.

Records available.--September 1958 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 2,518.85 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Extremes.--1958-60: Maximum discharge, 1,700 cfs June 6, 1959 (gage height, 6.10 ft); minimum, 54 cfs Oct. 7, 1958 (gage height, 2.28 ft).

Maximum discharge known, 2,810 cfs about May 22, 1948, from slope-area measurement of peak flow at site 1 mile upstream.

Remarks.--Numerous small diversions for irrigation of hay meadows 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
1958	-	-	-	-	-	-	-	-	-	-	-	-	-
1959	85.2	110	120	124	100	106	533	956	1,195	445	165	239	348
1960	343	269	206	131	109	269	794	820	924	373	185	128	379

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1958	-	-	-	-	-	-	-	-	-	-	-	-	-
1959	5,110	6,580	7,380	7,610	5,580	6,550	31,690	58,760	71,130	27,370	10,150	14,230	252,100
1960	21,060	15,980	12,660	8,050	6,250	16,520	47,270	50,440	54,980	22,950	11,380	7,640	275,200

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
1956	1636	-	-	-	-	-	-	-	-	-	-
1959	1636	1,700	June 6, 1959	56	348	0.791	10.74	252,100	391	12.05	282,800
1960	1716	1,590	May 13, 1960†	70	379	0.861	11.72	275,200	-	-	-

† Corrected.

3020. Fisher River near Jennings, Mont.

Location.--Lat 48°14'40", long 115°17'10", in NW 1/4 SE 1/4 sec. 27, T.29 N., R.29 W., on right bank 80 ft downstream from bridge, 1 mile downstream from Wolf Creek, 9 miles upstream from mouth, and 9 miles southeast of Jennings.

Drainage area.--780 sq mi.

Records available.--December 1950 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 2,443.23 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark).

Average discharge.--9 years (1951-60), 571 cfs (413,400 acre-ft per year).

Extremes.--1950-60: Maximum discharge, 6,320 cfs Apr. 17, 1956 (gage height, 7.32 ft); minimum daily, 60 cfs Nov. 30, 1952.

Remarks.--Numerous small diversions for irrigation of hay meadows 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	-	-	-	354	956	407	1,738	2,440	784	352	172	163	-
1952	335	295	299	248	229	241	2,097	1,326	512	233	118	93.9	501
1953	84.2	83.2	92.6	372	598	308	991	1,647	984	289	131	94.1	471
1954	93.0	131	173	153	238	401	1,791	3,243	1,266	572	206	177	706
1955	194	247	197	135	149	158	496	1,922	1,387	399	152	111	464
1956	239	393	502	376	243	510	3,265	3,070	1,088	331	161	136	859
1957	157	161	251	124	169	298	1,143	2,423	687	227	125	104	491
1958	135	134	143	144	224	393	1,135	1,507	460	184	96.7	91.0	388
1959	110	308	363	487	309	386	2,145	2,117	1,335	560	162	236	693
1960	337	468	362	241	235	620	1,663	1,392	933	271	158	119	566

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	21,740	53,070	25,000	103,400	150,000	46,630	21,670	10,580	9,720	-
1952	20,620	17,530	18,410	15,240	13,170	14,790	124,800	81,520	30,470	14,330	7,270	5,590	363,700
1953	5,180	4,850	5,690	22,860	33,230	18,920	58,990	101,300	58,570	17,760	8,070	5,800	341,100
1954	5,720	7,800	10,630	9,430	13,190	24,630	106,600	199,400	75,350	35,160	12,670	10,550	511,100
1955	11,940	14,690	12,140	8,320	8,290	9,710	29,510	118,200	62,520	24,560	9,330	6,590	335,800
1956	14,700	23,400	30,850	23,100	14,000	31,360	194,300	188,700	64,610	20,350	9,880	8,070	623,300
1957	9,670	9,560	15,420	7,590	9,380	18,320	68,010	149,000	40,880	13,990	7,660	6,170	355,600
1958	8,280	7,980	8,800	8,850	12,440	24,190	67,530	92,670	27,400	11,330	5,950	5,410	280,800
1959	6,750	18,310	22,310	29,950	17,180	23,710	127,600	130,200	79,410	22,120	9,950	14,020	501,500
1960	20,700	27,860	22,250	14,800	13,510	38,150	98,980	85,580	55,540	16,870	9,710	7,060	410,800

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		Inches	Acre-feet	
1950											
1951	1216	3,520	May 7, 1951	-	-	-	-	688	11.98	498,400	
1952	1246	3,680	Apr. 27, 1952	83	501	0.642	8.73	445	7.76	323,000	
1953	1286	3,030	Apr. 29, 1953	60	471	.604	8.20	483	8.41	349,400	
1954	1345	5,710	May 20, 1954	80	706	.905	12.31	728	12.65	525,700	
1955	1396	3,400	May 22, 1955	94	464	.595	8.06	505	8.78	566,000	
1956	1446	6,320	Apr. 17, 1956	116	859	1.10	14.98	811	14.16	589,000	
1957	1516	3,900	May 6, 1957	80	491	.629	8.54	478	8.31	346,100	
1958	1566	2,540	May 10, 1958	73	388	.497	6.74	419	7.28	303,100	
1959	1636	3,260	May 1, 1959	84	693	.888	12.06	725	12.62	524,900	
1960	1716	3,360	Apr. 10, 1960	103	568	.726	9.88	-	-	-	

3030. Kootenai River at Libby, Mont.

Location.--Lat 48°24'00", long 115°33'10", in SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.34, T.31 N., R.31 W., on right bank 1,800 ft downstream from highway bridge at Libby and 1 mile downstream from Libby Creek.

Drainage area.--10,240 sq mi, approximately.

Records available.--October 1910 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Datum of gage is 2,041.54 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Apr. 28, 1931, staff, chain, and wire-weight gages 1,800 ft upstream at different datum.

Average discharge.--50 years (1910-60), 11,950 cfs (8,651,000 acre-ft per year).

Extremes.--1910-60: Maximum discharge, 121,000 cfs June 21, 1916 (gage height, 20.7 ft, present datum, derived from gage-relation study); minimum observed, 895 cfs Jan. 11, 1930 (discharge measurement).

Remarks.--Diversion for irrigation of about 14,500 acres from tributaries above station in Canada and United States.

Correction.--In WSP 812 and 1316, the monthly mean and runoff for December 1935 and the total runoff for the water year 1936 are listed in error; they should be 2,781 cfs, 171,000 acre-ft and 6,480,000 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	7,696	7,214	6,913	4,788	7,340	4,806	14,030	47,720	39,520	34,660	13,000	10,660	16,590
1952	12,020	7,139	4,847	4,774	4,309	3,822	17,980	34,010	32,580	19,900	9,465	6,086	13,090
1953	4,530	3,201	2,804	4,085	4,311	3,456	6,807	25,300	45,960	26,730	10,510	6,271	12,020
1954	5,089	4,523	3,574	2,487	3,782	4,089	8,371	42,400	51,480	43,450	15,520	10,600	16,360
1955	6,981	6,350	4,748	3,500	3,010	2,913	5,130	20,190	49,560	29,930	10,790	6,235	12,470
1956	7,440	7,331	5,250	4,458	3,285	4,622	16,960	48,080	52,210	25,550	10,580	6,234	16,020
1957	5,747	4,297	3,652	2,330	2,841	4,028	7,303	45,350	33,190	14,200	7,711	5,234	11,380
1958	4,770	4,055	3,111	2,734	3,031	3,723	7,734	39,500	29,200	15,780	7,745	6,027	10,670
1959	5,575	4,817	4,277	4,230	3,102	3,830	12,200	32,150	58,160	29,740	12,010	15,720	15,510
1960	11,830	8,765	8,629	4,005	4,502	6,370	15,710	23,840	41,960	23,810	10,090	6,760	13,690

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	473.2	429.3	425.1	294.4	407.6	295.5	835.1	2,954	2,352	2,131	799.5	634.6	12,010
1952	739.1	424.8	299.1	295.5	247.8	235.0	1,070	2,091	1,939	1,224	582.0	382.2	9,506
1953	278.6	190.5	172.4	251.2	239.4	212.5	405.0	1,556	1,939	1,643	648.5	373.2	8,703
1954	312.9	269.1	219.7	152.9	210.1	251.4	498.1	2,607	3,063	2,672	954.4	†630.8	11,841
1955	429.2	377.8	291.9	215.2	167.2	179.1	305.3	1,241	2,949	1,840	663.7	371.0	9,030
1956	457.5	436.2	322.8	274.1	188.9	284.2	1,009	2,956	3,107	1,571	650.5	370.9	11,630
1957	353.4	255.7	224.5	143.5	157.8	247.7	434.5	2,787	1,975	872.9	474.1	311.5	8,237
1958	295.3	241.3	191.3	168.1	168.3	228.9	460.2	2,429	1,757	970.1	476.2	358.6	7,722
1959	342.8	286.7	283.0	260.1	172.3	235.5	728.1	1,977	3,461	1,828	758.7	935.6	11,230
1960	727.5	521.6	407.6	246.2	259.0	391.7	934.6	1,466	2,497	1,464	620.3	402.2	9,938

† 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	-	-	-	-	-	-	-	-	14,380	19.09	10,410,000	
1951	1216	69,400	June 17, 1951	2,400	16,590	1.62	22.00	12,010,000	16,780	22.24	12,150,000	
1952	1246	48,800	(a)	2,500	13,090	1.28	17.41	9,506,000	11,960	15.91	8,686,000	
1953	1286	69,600	June 15, 1953	1,900	12,020	1.17	15.95	8,703,000	12,240	16.23	8,864,000	
1954	1346	86,800	May 21, 1954	1,000	16,360	1.60	21.68	11,841,000	16,770	22.21	12,140,000	
1955	1396	70,700	June 15, 1955	1,700	12,470	1.22	16.54	9,030,000	12,640	16.76	9,148,000	
1956	1446	96,600	May 23, 1956	2,200	16,020	1.56	21.03	11,630,000	15,490	20.60	11,250,000	
1957	1516	57,100	May 8, 1957	1,500	11,380	1.11	15.09	8,237,000	11,230	14.89	8,130,000	
1958	1566	63,100	May 25, 1958	2,120	10,670	1.04	14.15	7,722,000	10,900	14.45	7,889,000	
1959	1636	75,800	June 7, 1959	2,000	15,510	1.51	20.58	11,230,000	16,560	21.96	11,990,000	
1960	1716	64,600	June 5, 1960	2,260	13,690	1.34	18.19	9,938,000	-	-	-	

a Apr. 28 or 29, 1952.

Location.--Lat 48°26'40", long 115°52'30", in SW $\frac{1}{4}$ sec.18, T.31 N., R.33 W., on right bank a quarter of a mile downstream from powerplant, half a mile upstream from mouth, and $\frac{1}{4}$ miles southeast of Troy.

Records available.--January 1945 to September 1957.

Gage.--Water-stage recorder. Altitude of gage is 1,900 ft (from topographic map). Prior to Nov. 1, 1946, wire-weight gage at site a quarter of a mile upstream at different datum.

Extremes.--1945-57: Maximum discharge, 3,250 cfs May 30, 1948 (gage height, 8.28 ft); minimum, 2.0 cfs Sept. 1, 1947, Sept. 15, 1948; minimum daily, 55 cfs Nov. 27, 1952.

Remarks.--Some regulation by small dam at powerplant diversion; water diverted returns to stream at powerplant above station. Natural regulation by Bull and Spar Lakes.

[illegible][illegible][illegible]

3042. Yaak River near Yaak, Mont.

Location.--Lat 48°49'40", long 115°48'40", in NE $\frac{1}{4}$ sec.1, T.35 N., R.33 W., on right bank 300 ft upstream from Whitetail Creek and $\frac{1}{2}$ miles west of Yaak.

Drainage area.--493 sq mi.

Records available.--April 1957 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 2,895 ft (river-profile survey).

Extremes.--1957-60: Maximum discharge, 4,660 cfs May 5, 1957 (gage height, 10.34 ft); minimum daily, 40 cfs Jan. 2, 1958.

Flood in May 1956 reached a discharge of 6,650 cfs at site $\frac{1}{2}$ miles upstream.

Remarks.--No known 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
1957	-	-	-	-	-	-	909	2,595	613	160	83.3	61.9	-
1958	86.8	88.0	69.8	64.4	90.2	174	941	2,111	512	174	66.5	62.1	372
1959	87.8	135	147	218	145	145	1,555	2,855	1,816	353	129	251	654
1960	359	367	470	244	210	574	1,871	2,172	1,240	256	127	92.2	665

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957	-	-	-	-	-	-	54,090	159,600	36,450	9,850	5,120	3,690	-
1958	5,340	5,240	4,290	3,960	5,010	10,710	55,980	129,800	30,440	10,730	4,090	3,700	269,300
1959	5,400	8,040	9,070	13,430	8,070	8,920	92,530	175,600	108,000	21,720	7,940	14,940	473,700
1960	22,070	21,830	28,910	15,030	12,070	35,280	111,300	133,500	73,790	15,720	7,850	5,490	482,800

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
1957	1516	4,660	May 5, 1957	40	-	-	10.25	269,300	-	-	-
1958	1566	3,500	May 10, 1958	40	372	0.755	-	-	382	10.55	276,900
1959	1636	4,270	May 19, 1959	56	654	1.33	18.03	473,700	724	19.94	524,000
1960	1716	4,400	May 13, 1960	76	665	1.35	18.37	482,800	-	-	-

3045. Yaak River near Troy, Mont.

Location.--Lat 48°33'45", long 115°58'05", in N $\frac{1}{2}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.5, T.32 N., R.34 W., on right bank 400 ft upstream from bridge on U. S. Highway 2, a quarter of a mile upstream from mouth, and $\frac{1}{2}$ miles northwest of Troy.

Drainage area.--766 sq mi.

Records available.--October 1910 to September 1916 (fragmentary record), March 1956 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,850 ft (river-profile survey). Oct. 15, 1910, to Sept. 30, 1916, staff gage at several sites within 11 miles of present site at various datums.

Extremes.--1956-60: Maximum discharge, 12,100 cfs May 21, 1956 (gage height, 9.70 ft in gage well, 10.8 ft from outside gage); minimum daily, 60 cfs Jan. 19, 1957, Jan. 2, 1958. Flood in May to June 1948 reached a stage of 11.0 ft, from floodmarks (discharge, 12,500 cfs). Flood in May 1954 reached a stage of 11.4 ft, from floodmarks (discharge, 13,400 cfs).

Remarks.--No known 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
1956	-	-	-	-	-	515	3,483	6,067	2,232	475	216	134	-
1957	194	157	165	125	215	323	1,434	4,387	1,151	308	153	105	731
1958	163	173	140	138	255	451	1,618	3,809	1,008	331	125	134	699
1959	186	316	360	578	548	340	2,657	4,618	3,265	608	240	506	1,170
1960	833	769	868	457	398	1,087	3,042	3,808	2,554	424	193	151	1,215

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	-	-	-	-	-	31,690	207,300	573,100	132,800	29,220	13,310	7,980	-
1957	11,910	9,360	10,160	7,710	11,920	19,850	85,320	269,700	68,470	18,780	9,420	6,280	528,900
1958	10,040	10,270	8,630	8,480	14,170	27,710	96,300	234,200	59,990	20,340	7,700	7,860	505,800
1959	11,450	18,790	22,140	35,510	19,330	20,880	168,100	300,094	300,094	57,360	14,760	30,130	846,800
1960	51,190	45,760	53,370	28,100	22,900	66,820	181,000	234,000	151,900	26,060	11,860	8,960	881,900

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
1956	1446	12,100	May 21, 1956	80	-	-	-	-	-	-	-
1957	1516	7,930	May 6, 1957	80	731	0.954	12.95	528,900	727	12.89	526,400
1958	1566	6,270	May 10, 1958	80	699	.913	12.39	505,800	731	12.96	529,200
1959	1636	6,810	May 16, 1959	118	1,170	1.53	20.72	846,800	1,305	23.12	944,700
1960	1716	7,680	May 12, 1960	125	1,215	1.59	21.60	881,900	-	-	-

3050. Kootenai River at Leonia, Idaho

Location.--Lat 48°37', long 116°03', in NW¼NW¼ sec.20, T.33 N., R.34 W., on right bank at Leonia, 450 ft east of Montana-Idaho State line and half a mile upstream from Boulder Creek.

Drainage area.--11,740 sq mi, approximately.

Records available.--March 1928 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,700.25 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Nov. 13, 1928, chain gage on bridge 250 ft upstream at datum 0.41 ft lower.

Average discharge.--32 years (1928-60), 13,770 cfs (9,969,000 acre-ft per year).

Extremes.--1928-60: Maximum discharge, 123,000 cfs May 28, 1948 (gage height, 123.40 ft); minimum, 996 cfs Dec. 9, 1936; minimum gage height, 97.56 ft Dec. 10, 1929. Floods in June 1894 and 1916 reached stages of 124.6 and 121.6 ft, respectively, from information by Great Northern Railway.

Remarks.--No regulation. Diversions above station for irrigation of about 14,600 acres.

Corrections.--In WSP 1316, the monthly runoff in acre-feet for October 1936 and yearly runoff in acre-feet for 1941 are listed in error; they should be 217.2 and 6,126 thousands of acre-feet, 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	8,568	8,582	9,416	6,525	10,630	6,121	18,490	55,700	43,290	36,200	13,550	10,870	19,050
1952	13,000	7,815	9,082	5,200	4,954	4,553	24,160	41,460	35,460	21,540	10,430	6,587	15,120
1953	4,844	3,811	3,045	4,893	5,954	4,285	9,688	32,330	51,020	27,950	11,220	6,598	13,610
1954	5,272	4,894	3,988	2,907	4,198	4,903	11,850	54,060	59,720	47,510	16,910	11,250	19,040
1955	7,274	6,891	5,206	3,832	3,321	3,261	6,405	25,860	57,230	31,570	11,800	6,730	14,150
1956	8,508	9,115	6,790	6,206	4,082	6,034	24,320	61,770	58,980	26,630	11,380	6,756	19,240
1957	6,130	4,639	3,895	2,573	3,164	5,200	10,180	54,780	35,300	14,840	8,003	5,568	12,910
1958	4,945	4,221	3,376	3,122	3,765	4,654	10,420	47,270	30,530	16,250	7,823	6,124	11,930
1959	5,804	5,710	5,295	5,893	3,978	4,445	17,040	40,810	65,400	30,730	12,400	16,560	17,840
1960	13,580	10,460	8,275	4,871	5,396	6,326	21,230	30,230	46,950	25,180	10,560	6,329	16,000

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	526.8	510.6	579.0	401.2	590.3	376.4	1,100	3,425	2,576	2,226	833.2	646.7	13,790
1952	799.1	465.0	374.0	319.7	281.2	279.9	1,437	2,549	2,110	1,324	641.6	391.9	10,970
1953	297.9	214.9	187.2	300.9	330.7	263.4	576.5	1,988	3,036	1,719	690.1	392.6	9,997
1954	324.2	291.2	245.2	178.8	233.1	301.4	705.0	3,325	3,553	2,921	1,040	689.4	13,790
1955	447.3	410.1	320.1	235.6	184.5	200.5	381.1	1,590	3,406	1,941	725.5	400.5	10,240
1956	523.2	542.4	417.5	381.6	234.8	371.0	1,447	3,798	3,510	1,637	699.9	402.0	13,960
1957	376.9	276.0	239.5	158.2	175.7	319.7	605.9	3,368	2,100	912.6	492.1	319.4	9,344
1958	304.1	251.2	207.6	191.9	209.1	286.2	619.8	2,907	1,817	995.5	481.0	364.4	8,639
1959	356.8	339.7	325.6	350.1	220.9	273.3	1,014	2,509	3,892	1,889	762.3	985.6	12,920
1960	834.0	622.5	508.8	299.5	310.4	511.9	1,263	1,859	2,794	1,548	649.1	412.3	11,610

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year					
		Momentary		maximum	minimum	Mean	Per square mile	Runoff		Mean	Inches	Runoff	Acres
		Discharge	Date					Inches	Acres				
1950	-	-	-	-	-	-	-	-	-	13,820	16.04	10,790,000	-
1951	1216	76,300	May 13, 1951	4,500	19,050	1.62	22.01	13,790,000	19,080	22.05	13,610,000	-	-
1952	1246	63,000	Apr. 28, 1952	3,200	15,120	1.29	17.54	10,970,000	13,820	16.04	10,790,000	-	-
1953	1286	74,700	June 15, 1953	2,200	13,810	1.18	15.98	9,997,000	14,030	16.24	10,160,000	-	-
1954	1346	104,000	May 21, 1954	1,200	19,040	1.62	22.04	13,790,000	19,480	22.53	14,100,000	-	-
1955	1396	79,300	June 15, 1955	2,120	14,150	1.21	16.35	10,240,000	14,570	16.86	10,550,000	-	-
1956	1446	115,000	May 23, 1956	3,000	19,240	1.64	22.32	13,960,000	18,420	21.36	13,370,000	-	-
1957	1516	71,000	May 7, 1957	1,700	12,910	1.10	14.92	9,344,000	12,730	14.72	9,214,000	-	-
1958	1566	72,700	May 24, 1958	2,400	11,930	1.02	13.80	8,639,000	12,290	14.21	8,898,000	-	-
1959	1636	87,900	June 6, 1959	2,400	17,840	1.52	20.64	12,920,000	19,150	22.14	13,860,000	-	-
1960	1716	71,900	June 5, 1960	2,900	16,000	1.36	18.55	11,610,000	-	-	-	-	-

3055. Boulder Creek near Leonia, Idaho

Location.--Lat 48°36', long 116°06', in NE¼ sec.32, T.61 N., R.3 E., on right bank three-quarters of a mile downstream from McInty Creek, three-quarters of a mile upstream from buildings of the Idamont Lead-Zinc Mines Co., 2½ miles southwest of Leonia, and 2¼ miles upstream from mouth.

Drainage area.--53 sq mi, approximately.

Records available.--April 1928 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage (corrected).--Water-stage recorder. Altitude of gage is 2,600 ft (from topographic map). Prior to Nov. 20, 1928, staff gage at site 1 mile downstream at different datum. Nov. 20, 1928, to Nov. 29, 1933, and Oct. 13, 1934, to Sept. 27, 1946, water-stage recorder and Dec. 30, 1933, to Oct. 12, 1934, staff gage, at site a quarter of a mile upstream at different datum.

Average discharge.--32 years (1928-60), 116 cfs (83,980 acre-ft per year).

Extremes.--1928-60: Maximum discharge, 2,700 cfs Oct. 19, 1947 (gage height, 7.85 ft). From rating curve extended above 970 cfs on basis of contracted-opening measurement of peak flow; minimum, 2 cfs Aug. 25, Sept. 5, 1931.

Revisions.--The momentary maximum discharge for the water year 1936, published in WSP 1316, has been revised to 1,100 cfs during period Apr. 19-22.

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	130	159	221	119	182	67.6	248	554	230	54.7	18.9	20.7	167
1952	82.7	59.5	87.3	26.0	31.0	34.2	336	507	187	62.5	15.6	10.9	120
1953	9.57	9.70	10.1	82.3	108	52.3	199	553	300	44.3	15.5	12.0	116
1954	14.1	22.7	29.0	23.9	22.5	41.5	185	846	544	150	26.2	18.9	161
1955	28.7	75.0	42.6	23.3	18.7	18.0	67.0	490	541	126	21.9	15.1	122
1956	107	119	119	74.5	30.3	51.3	366	779	313	51.9	17.0	14.0	171
1957	34.8	30.1	32.8	20.6	30.4	67.5	204	732	165	27.5	13.1	9.92	115
1958	18.2	19.2	20.1	22.6	60.4	78.4	194	569	132	23.4	10.3	12.4	97.0
1959	17.4	73.5	67.0	94.1	44.6	42.1	314	571	406	50.1	17.6	49.6	146
1960	104	100	96.3	48.6	37.6	111	286	497	370	44.5	18.1	13.8	144

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	7,990	9,480	13,560	7,300	10,090	4,160	14,740	34,030	13,690	3,360	1,160	1,230	120,800
1952	5,080	3,540	5,370	1,600	1,780	2,100	19,970	31,180	11,130	3,840	962	651	87,200
1953	588	577	624	5,060	5,970	3,220	11,840	34,010	17,850	2,730	952	714	84,140
1954	867	1,350	1,780	1,470	1,250	2,550	11,010	52,030	32,370	9,220	1,610	1,130	116,800
1955	1,760	4,460	2,620	1,430	1,040	1,110	3,990	29,490	32,210	7,720	1,340	900	88,070
1956	6,550	7,100	7,310	4,580	1,750	3,150	21,780	47,880	18,630	3,190	1,050	831	123,800
1957	2,140	1,790	2,020	1,270	1,690	4,150	12,120	45,010	9,830	1,690	803	590	83,100
1958	1,120	1,140	1,240	1,590	3,350	4,820	11,530	34,960	7,830	1,440	635	737	70,190
1959	1,070	4,380	4,120	5,790	2,480	2,590	18,670	35,100	24,180	3,080	1,080	2,950	105,500
1960	6,420	5,960	5,920	2,990	2,160	6,840	16,990	30,590	21,990	2,740	1,110	819	104,500

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	-	-	-	-	-	-	-	-	184	47.05	133,000	-
1951	1216	1,050	Feb. 11, 1951	14	167	3.15	42.72	120,800	143	36.70	103,800	-
1952	1246	1,050	Apr. 26, 1952	9	120	2.26	30.85	87,200	103	26.53	75,000	-
1953	1286	1,220	May 19, 1953	6.5	116	2.19	29.76	84,140	119	30.55	86,340	-
1954	1346	2,040	May 19, 1954	12	161	3.04	41.26	116,600	168	42.97	121,500	-
1955	1396	1,360	May 20, 1955	11	122	2.30	31.17	88,070	138	35.46	100,200	-
1956	1446	1,660	May 20, 1956	12	171	3.23	43.81	123,800	150	38.49	108,800	-
1957	1519	1,320	May 6, 1957	8.8	115	2.17	29.40	83,100	111	28.54	80,650	-
1958	1566	950	May 8, 1958	7.8	97.0	1.83	24.84	70,190	105	26.99	76,260	-
1959	1636	1,320	Apr. 30, 1959	10	146	2.75	37.31	105,500	158	40.39	114,200	-
1960	1716	1,140	May 11, 1960	11	144	2.72	36.96	104,500	-	-	-	-

3065. Moyie River at Eastport, Idaho

(International gaging station)

Location.--Lat 49°00', long 116°11', in SE $\frac{1}{4}$ sec. 10, T. 65 N., R. 2 E., on left bank at Eastport, 1,000 ft downstream from international boundary.

Drainage area.--570 sq. approximately.

Records available.--March to December 1915, April to December 1916, August 1929 to September 1960. Published as "at Kingsgate, B. C." 1915-17. Discharge measurements 1914 and 1917 in reports of Water Resources Division, Department of Northern Affairs and National Resources, Canada.

Gage.--Water-stage recorder. Datum of gage is 2,620.06 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. January 1915 to December 1916 staff gage at site 0.2 mile upstream at different datum.

Average discharge.--31 years (1929-60), 701 cfs (507,500 acre-ft per year).

Extremes.--1915-16, 1929-60: Maximum discharge observed, 10,600 cfs June 19, 1916; maximum gage height, 10.55 ft May 20, 1954; minimum discharge, 23 cfs Nov. 7, 1936 (gage height, 3.20 ft).

Remarks.--No regulation or diversion above station.

Cooperation.--This station is one of the international gaging stations maintained by the United States under agreement with Canada. Records for 1915-17, not previously published by Geological Survey, furnished by Water Resources Division of 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
1915	-	-	-	-	-	262	1,460	1,850	858	404	214	147	-
1916	181	229	219	-	-	-	1,770	3,050	5,460	1,550	290	177	-
1917	109	158	110	-	-	-	-	-	-	-	-	-	-
1951	323	570	755	519	926	436	1,953	4,270	1,972	695	167	169	1,063
1952	374	262	302	180	167	186	2,176	3,031	1,494	446	126	78.4	735
1953	60.3	54.9	60.4	151	217	197	900	3,258	2,491	486	127	79.5	675
1954	75.5	146	132	117	131	183	932	4,915	2,996	1,204	234	184	943
1955	218	342	276	167	128	111	470	2,799	3,398	893	192	76.4	758
1956	324	617	320	239	191	283	2,341	5,130	2,401	463	128	73.6	1,044
1957	108	105	112	70.4	95.9	206	994	3,969	1,130	213	92.6	53.8	690
1958	68.5	61.1	74.9	79.8	114	192	732	3,318	875	207	61.7	47.0	481
1959	63.9	127	149	154	158	156	1,471	3,786	3,009	570	159	382	847
1960	622	540	469	244	202	565	1,875	2,980	2,105	359	129	98.4	849

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1915	-	-	-	-	-	16,100	86,900	114,000	51,100	24,800	13,200	8,750	-
1916	11,100	13,600	13,500	-	-	-	105,300	187,500	324,900	95,310	17,830	10,530	-
1917	6,700	9,400	6,760	-	-	-	-	-	-	-	-	-	-
1951	19,850	33,900	46,440	31,930	51,410	26,790	116,200	262,600	117,400	42,740	10,280	10,080	769,600
1952	23,000	15,600	18,580	11,050	9,630	11,430	129,500	186,400	88,890	27,440	7,750	4,670	533,900
1953	5,710	3,270	3,710	9,260	12,030	12,130	53,520	300,480	209,870	7,790	4,730	488,500	533,900
1954	4,640	8,690	8,110	7,180	7,260	11,280	55,470	302,400	78,300	74,060	14,360	10,950	682,700
1955	13,570	20,330	16,970	10,290	7,110	6,840	27,950	172,100	202,200	54,890	11,780	4,540	548,400
1956	19,940	36,690	19,700	14,710	10,990	17,400	39,300	315,400	142,900	28,470	5,900	4,580	757,800
1957	6,650	6,220	6,860	4,330	5,220	12,660	59,160	244,000	67,220	13,070	5,690	3,200	434,300
1958	4,210	4,830	4,610	4,910	6,350	11,800	43,550	203,900	50,520	12,750	3,800	2,800	355,600
1959	5,930	7,550	9,150	9,470	7,650	9,580	87,510	32,800	79,100	35,040	8,550	22,710	613,000
1960	38,250	32,120	28,830	14,980	11,650	34,750	111,600	183,200	25,200	22,080	7,920	5,860	616,400

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
1915	(a)	b2,620	Apr. 19, 1915	-	-	-	-	-	-	-	-
1916	(a)	b10,600	June 19, 1916	-	-	-	-	-	-	-	-
1950	-	-	-	-	-	-	-	-	1,049	24.98	759,200
1951	1216	6,450	May 12, 1951	99	1,063	1.86	25.32	769,600	1,004	23.90	726,600
1952	1248	5,760	Apr. 28, 1952	62	735	1.29	17.56	533,900	671	16.03	487,400
1953	1268	4,850	May 19, 1953	38	675	1.18	16.08	488,500	690	16.44	449,300
1954	1346	9,400	May 20, 1954	70	943	1.65	22.46	682,700	985	23.42	711,900
1955	1396	5,540	May 21, 1955	56	758	1.33	18.05	548,400	793	18.90	574,000
1956	1446	9,310	May 20, 1956	62	1,044	1.83	24.93	757,800	966	23.06	701,200
1957	1516	6,200	May 6, 1957	48	600	1.05	14.50	434,300	591	14.10	428,200
1958	1566	4,560	May 12, 1958	36	491	.861	11.69	355,600	501	11.92	362,500
1959	1636	5,410	June 6, 1959	42	847	1.49	20.17	613,000	955	22.76	691,600
1960	1716	6,120	May 13, 1960	79	849	1.49	20.28	616,400	-	-	-

a Reports of Water Resources Division, Department of Northern Affairs and National Resources, Canada.

b Maximum observed.

3075. Moyie River at Eileen, Idaho

Location.--Lat 48°46', long 116°10', in NE $\frac{1}{4}$ sec.35, T.63 N., R.2 E., on right bank an eighth of a mile downstream from Skin Creek, a quarter of a mile southeast of Eileen, and 4 miles upstream from mouth.

Drainage area.--755 sq mi.

Records available.--October 1925 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 2,124.5 ft above mean sea level (river-profile survey). Prior to June 1, 1928, staff gage and June 1, 1928, to Sept. 30, 1944, water-stage recorder, at same site at datum 1.0 ft higher.

Average discharge.--35 years (1925-60), 868 cfs (628,400 acre-ft per year).

Extremes.--1925-60: Maximum discharge, 11,000 cfs May 20, 1954 (gage height, 6.99 ft); minimum, 40 cfs Nov. 27, 1936; minimum gage height, 0.50 ft Feb. 22, 1944, present datum.

A major flood occurred June 19, 1916, discharge, about 12,000 cfs.

Remarks.--No regulation or diversion 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	421	790	1,032	732	1,189	575	2,325	4,901	2,280	833	233	230	1,295
1952	516	388	477	284	266	288	2,748	3,645	1,809	600	190	120	945
1953	97.8	94.5	100	247	348	318	1,181	3,821	2,940	594	177	118	837
1954	109	189	182	170	199	327	1,305	5,481	3,566	1,454	310	245	1,134
1955	263	403	344	222	189	165	654	3,190	3,892	1,161	265	138	908
1956	418	741	509	429	315	499	3,030	6,089	2,886	620	195	122	1,323
1957	164	156	164	99.0	141	318	1,343	4,889	1,423	313	147	93.9	776
1958	110	135	138	136	201	335	1,069	3,998	1,061	279	105	91.1	642
1959	113	207	236	253	248	293	2,000	4,630	3,733	733	191	490	1,100
1960	822	723	639	336	283	798	2,559	3,661	2,630	471	191	144	1,105

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	25,890	46,990	63,450	44,980	66,040	35,370	138,300	501,300	35,700	51,190	14,350	13,690	937,200
1952	31,720	23,100	29,330	17,470	15,320	17,710	163,500	224,100	87,700	36,900	11,700	7,150	685,700
1953	6,010	5,620	6,150	15,190	19,340	19,460	70,260	234,900	74,900	36,510	10,900	6,880	606,100
1954	6,680	11,270	11,200	10,460	11,070	20,130	77,660	537,000	212,200	89,410	19,050	14,570	820,700
1955	16,160	24,000	21,170	13,660	10,460	10,160	38,930	196,100	231,000	71,360	16,280	8,200	657,500
1956	25,680	44,070	31,300	26,410	18,130	30,710	180,300	574,400	171,700	38,100	11,990	7,290	960,100
1957	10,100	9,280	10,110	6,090	7,840	19,460	79,930	300,600	84,660	19,260	9,030	5,590	562,000
1958	6,790	8,040	8,480	8,340	11,170	20,600	65,580	245,800	63,130	17,150	6,460	5,420	465,000
1959	6,970	12,340	14,510	15,590	13,790	18,010	119,100	284,700	222,100	45,100	11,740	29,180	733,100
1960	50,530	43,030	39,280	20,660	16,280	49,080	152,300	225,100	156,500	28,950	11,720	8,570	802,000

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	-	-	-	-	-	-	-	1,314	23.63	951,200	-	-	
1951	1216	7,150	May 21, 1951	131	1,295	1.72	23.29	937,200	1,223	21.99	885,100	-	-
1952	1248	7,030	Apr. 28, 1952	100	945	1.25	17.03	685,700	853	15.38	619,500	-	-
1953	1286	5,540	May 7, 1953	60	837	1.11	15.04	605,100	853	15.33	617,500	-	-
1954	1346	11,000	May 20, 1954	100	1,134	1.50	20.38	820,700	1,178	21.18	852,900	-	-
1955	1396	6,550	May 21, 1955	114	908	1.20	16.33	657,500	963	17.31	697,200	-	-
1956	1446	10,300	May 21, 1956	108	1,323	1.75	23.86	960,100	1,224	22.08	888,500	-	-
1957	1516	7,710	May 6-7, 1957	75	776	1.03	13.94	562,000	768	13.79	555,800	-	-
1958	1568	5,900	May 11, 1958	74	642	.850	11.55	465,000	657	11.81	475,500	-	-
1959	1636	7,140	June 6, 1959	58	1,100	1.46	19.70	793,100	1,232	22.16	892,100	-	-
1960	1716	8,020	May 12, 1960	118	1,105	1.46	19.91	802,000	-	-	-	-	-

3085. Kootenai River at Boom Camp, near Bonners Ferry, Idaho

Location.--Lat 48°42'05", long 116°14'30", in NW¼ sec.29, T.62 N., R.2 E., on left bank 600 ft east of Boom Camp, 3½ miles upstream from Bonners Ferry, and 4 miles downstream from Moyie River.

Drainage area.--12,950 sq mi, approximately.

Records available.--October 1927 to September 1960 (elevations only) in reports of Geological Survey. April 1925 to September 1927 (gage heights only) in reports of Department of Northern Affairs and National Resources, Canada.

Gage.--Water-stage recorder. Datum of gage is 1,700.00 ft above mean sea level, levels by Topographic Division in 1928. Gage readings have been reduced to elevations above mean sea level. Datum of 1929, supplementary adjustment of 1947, is 0.04 ft higher. Prior to Aug. 23, 1934, staff gage at same site. Datum of gage was 54.08 ft higher prior to Oct. 8, 1934.

Extremes.--1927-60: Maximum elevation recorded, 1,781.38 ft May 24, 1956; minimum, 1,755.53 ft Dec. 9, 1936.

Remarks.--Elevations affected by backwater from Kootenay Lake during high lake stages and occasionally by dike failures during floods. Maximum yearly elevations are shown with record for Kootenai River at Porthill (see p. 226, 227).

Monthly mean elevation, in feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	59.48	59.62	59.62	58.92	60.60	58.63	62.25	71.60	67.95	65.91	60.61	60.16
1952	60.61	59.30	60.16	61.55	60.16	-	63.23	67.38	65.88	62.59	59.83	58.65
1953	57.68	-	-	58.02	58.45	57.77	59.56	65.33	69.68	63.93	60.09	58.58
1954	58.07	57.94	57.56	57.42	57.97	58.02	60.49	70.63	72.18	68.89	61.50	60.09
1955	58.93	58.83	58.21	57.57	57.31	57.23	58.70	63.60	71.50	65.06	60.29	58.76
1956	59.42	60.60	61.42	61.13	58.06	58.56	63.35	71.32	72.40	63.77	60.25	58.79
1957	58.67	58.13	57.99	-	-	58.50	60.43	70.55	65.87	61.20	59.32	58.34
1958	58.21	57.89	57.50	57.37	-	-	60.35	68.49	64.82	61.43	59.16	58.58
1959	58.50	58.53	58.45	58.80	57.89	58.01	62.01	66.74	72.65	64.66	60.56	61.57
1960	61.02	61.02	59.66	58.70	58.39	59.10	62.86	64.71	68.07	63.22	59.93	58.83

Note.--Add 1,700 ft to obtain elevation above mean sea level.

3095. Kootenai River at Bonners Ferry, Idaho

Location.--Lat 48°42'00", long 116°18'45", in NE¼ sec.27, T.62 N., R.1 E., near right bank on downstream side of highway bridge at Bonners Ferry.

Drainage area.--13,000 sq mi, approximately.

Records available.--May to October 1904, October 1927 to September 1960 (elevations only prior to March 1928). Gage heights collected in this vicinity since 1904 are contained in reports of U. S. Weather Bureau.

Gage.--Wire-weight gage. Water-stage recorder with pressure recording bubbler system 800 ft across channel from wire-weight gage at same datum, used as supplementary gage since Mar. 23, 1960. Datum of gage is 1,743.00 ft above mean sea level with respect to Geological Survey bench mark V-3-1929 at elevation 1,777.08 ft. Gage readings have been reduced to elevations above mean sea level. Datum of 1929, supplementary adjustment of 1947, is 0.02 ft higher. May 1 to Oct. 15, 1904, staff gage on railroad bridge three-quarters of a mile downstream at different datum. Oct. 1, 1927, to Nov. 30, 1929, staff gage near left bank. Dec. 1, 1929, to June 12, 1933, chain or wire-weight gages on old highway bridge 40 ft downstream. Datum of gages Oct. 1, 1927, to Sept. 30, 1930, was about 0.23 ft lower.

Average discharge.--32 years (1928-60), 14,870 cfs (10,770,000 acre-ft per year).

Extremes.--1927-60: Maximum discharge, 139,000 cfs May 27, 1948 (affected by dike break-age downstream); maximum elevation, 1,780.09 ft May 24, 1956; minimum daily discharge, 1,300 cfs Feb. 8, 1936; minimum elevation, 1,741.14 ft Dec. 5, 1929, Dec. 29, 1930, datum then in use.

Flood in June 1894 reached a stage of 1,777.2 ft, present datum.

Remarks.--No regulation. Diversions above station for irrigation of about 14,600 acres. Elevations and discharge are occasionally affected by failure of dikes during floods. Station in backwater from Kootenay Lake except at times of extreme low lake stages. Maximum yearly elevations are shown with record for Kootenai River at Porthill (see p. 226, 227).

Monthly mean elevation, in feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	49.85	50.00	50.59	49.06	51.49	45.48	51.43	68.56	64.65	61.67	50.84	50.44
1952	51.38	49.61	49.74	49.53	47.14	44.25	53.23	63.47	61.94	54.84	49.38	48.93
1953	48.07	46.54	45.44	45.53	46.19	43.85	45.82	59.35	66.92	58.00	49.67	48.89
1954	48.54	48.20	47.09	46.64	45.56	44.03	47.55	65.65	70.07	65.83	51.45	48.73
1955	47.54	47.39	46.85	46.50	44.88	43.50	44.33	54.75	68.87	60.56	49.04	47.02
1956	48.07	50.17	50.11	49.86	48.11	45.88	53.92	67.07	70.66	57.54	48.37	46.97
1957	47.12	46.80	47.04	46.46	46.71	44.49	46.52	67.81	61.34	50.28	46.49	46.23
1958	46.80	46.36	46.31	45.72	44.51	43.49	46.69	63.50	59.84	51.06	46.24	46.35
1959	46.87	47.17	48.32	47.62	45.16	43.22	50.02	61.63	70.51	59.27	49.38	50.77
1960	50.03	50.78	49.98	49.01	47.52	46.97	53.34	57.78	64.75	56.26	48.14	47.10

Note.--Add 1,700 ft to obtain elevation above mean sea level.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	9,128	9,671	10,660	7,515	12,570	6,867	21,060	62,110	46,450	37,270	13,900	11,240	20,750
1952	13,650	9,357	6,662	5,529	5,217	4,874	27,500	45,920	38,290	22,910	10,670	6,802	16,380
1953	5,025	3,783	3,194	5,471	6,547	4,770	11,180	37,390	54,270	28,870	11,470	6,709	14,910
1954	5,384	5,127	4,229	3,133	4,438	5,329	13,630	60,090	64,490	49,660	17,310	11,500	20,450
1955	7,614	7,384	6,833	4,077	3,575	3,494	7,201	30,170	62,450	33,530	12,110	6,968	15,380
1956	9,217	10,140	7,548	6,813	4,536	6,653	28,000	68,650	63,130	28,510	11,630	6,958	21,010
1957	6,423	4,785	4,210	2,765	3,343	5,680	11,480	60,000	37,780	15,300	8,153	5,461	13,860
1958	5,105	4,366	3,504	3,222	3,983	5,064	12,120	50,530	32,180	16,630	7,869	6,212	12,620
1959	5,989	6,005	5,617	6,149	4,229	4,738	19,450	44,360	68,350	32,730	12,640	17,150	18,980
1960	14,220	11,390	9,117	5,263	5,791	8,980	23,620	33,610	49,390	25,600	10,790	7,053	17,070

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	561.2	575.5	655.5	482.1	698.1	422.2	1,253	3,819	2,764	2,292	854.5	668.6	15,030
1952	859.0	497.5	409.6	340.0	300.1	299.7	1,637	2,823	2,279	1,409	658.3	404.7	11,890
1953	309.0	225.1	195.4	336.4	363.6	293.5	665.1	2,299	3,229	1,775	705.5	399.2	10,800
1954	331.0	305.1	260.1	192.6	245.5	327.7	811.0	3,695	3,837	3,054	1,064	684.2	14,810
1955	468.2	439.4	346.4	250.7	198.6	214.8	428.5	1,855	3,715	2,061	744.9	414.6	11,140
1956	566.7	603.4	464.1	418.9	260.9	409.1	1,666	4,221	3,757	1,753	715.2	414.0	15,250
1957	394.9	284.7	258.9	170.0	185.7	349.2	682.9	3,689	2,248	940.8	501.3	325.0	10,030
1958	313.9	259.8	215.5	198.1	221.2	311.4	721.3	3,107	1,915	1,022	483.8	369.6	9,139
1959	368.3	357.3	345.4	378.1	234.9	291.4	1,158	2,728	4,067	2,013	777.3	1,020	13,740
1960	844.3	678.0	580.6	323.6	333.1	552.1	1,405	2,067	2,939	1,574	665.6	419.7	12,390

Yearly discharge, in cubic feet per second, of Kootenai River at Bonners Ferry, Idaho

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	-	-	-	-	-	-	-	-	18,920	19.77	13,700,000
1951	1216	83,800	May 13, 1951	5,100	20,750	1.60	21.69	15,030,000	20,690	21.62	14,980,000
1952	1246	69,700	Apr. 29, 1952	4,050	16,380	1.26	17.15	11,890,000	14,990	15.68	10,880,000
1953	1286	76,700	June 15, 1953	2,300	14,910	1.15	15.58	10,800,000	15,140	15.83	10,960,000
1954	1346	132,000	May 21, 1954	1,400	20,450	1.57	21.37	14,810,000	20,950	21.88	15,170,000
1955	1396	86,200	June 15, 1955	2,400	15,380	1.18	16.07	11,140,000	15,910	16.62	11,520,000
1956	1446	127,000	May 22, 1956	3,400	21,010	1.62	22.00	15,250,000	20,050	20.99	14,550,000
1957	1516	78,300	May 8, 1957	1,900	13,860	1.07	14.47	10,030,000	13,650	14.25	9,881,000
1958	1566	74,600	May 26, 1958	2,500	12,620	.971	13.17	9,139,000	13,010	13.59	9,420,000
1959	1636	93,800	June 7, 1959	2,700	16,980	1.46	19.82	13,740,000	20,420	21.32	14,780,000
1960	1716	75,700	June 5, 1960	3,100	17,070	1.31	17.89	12,390,000	-	-	-

3100. Kootenai River near Bonners Ferry, Idaho

Location.--Lat 48°41'55", long 116°20'40", in NW¼ sec.28, T.62 N., R.1 E., on left bank 1.6 miles downstream from highway bridge at Bonners Ferry.

Drainage area.--13,000 sq mi, approximately.

Records available.--May 1928 to September 1960 (elevations only, fragmentary prior to May 1929).

Gage.--Water-stage recorder. Datum of gage is 1,700.00 ft above mean sea level, levels by Topographic Division in 1928. Gage readings have been reduced to elevations above mean sea level. Datum of 1929, supplementary adjustment of 1947, is 0.02 ft higher at Bonners Ferry. May 17 to July 20, 1928, water-stage recorder at same site at datum 43.42 ft higher. July 21 to Oct. 22, 1928, and for elevations below 1,742 ft prior to Jan. 2, 1931, staff gage at same site and datum.

Extremes.--1928-60: Maximum elevation, 1,778.94 ft May 24, 1956, from graph based on gage readings; minimum, 1,740.16 ft Mar. 29, 1944.

Remarks.--Elevations affected by backwater from Kootenay Lake and occasionally by dike failures during floods. Maximum yearly elevations are shown with record for Kootenai River at Porthill (see p. 226, 227).

Monthly mean elevation, in feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	49.69	49.84	50.30	48.72	49.67	44.12	50.72	68.01	64.21	61.27	50.51	50.22
1952	51.12	49.45	49.02	47.79	46.05	43.43	52.38	62.98	61.52	54.48	49.16	48.86
1953	48.04	46.47	45.22	45.22	45.96	43.08	44.58	58.84	66.46	57.69	49.43	48.83
1954	48.52	48.18	47.07	45.59	44.68	43.26	46.61	64.99	69.57	65.40	51.07	48.43
1955	47.36	47.22	46.62	46.01	44.25	42.36	43.14	54.05	68.36	60.23	48.84	46.89
1956	47.92	48.46	47.93	47.74	45.75	45.02	53.27	66.40	70.19	57.22	48.12	46.85
1957	47.01	46.65	46.53	45.71	44.44	43.55	45.81	67.28	60.94	49.95	46.23	46.10
1958	46.53	46.32	46.30	45.68	44.38	42.92	45.92	62.94	59.50	50.74	45.96	46.22
1959	46.78	46.79	46.83	46.71	44.74	42.84	49.37	61.10	70.02	58.92	49.06	50.34
1960	49.70	48.93	48.49	46.56	45.64	45.50	52.57	57.19	64.21	55.91	47.86	46.92

Note.--Add 1,700 ft to obtain elevation above mean sea level.

3110. Deep Creek at Moravia, Idaho

Location.--Lat 48°38', long 116°24', in sec.18, T.61 N., R.1 E., on left bank 50 ft downstream from highway bridge, 1 mile downstream from Ruby Creek, and 1 mile southwest of Moravia.

Drainage area.--133 sq mi.

Records available.--May 1928 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Altitude of gage is 1,800 ft (from topographic map). May 1928 to Sept. 19, 1959, staff gages 50 ft upstream. Prior to Aug. 2, 1949, at datum 2.00 ft higher.

Average discharge.--32 years (1928-60), 143 cfs (103,500 acre-ft per year).

Extremes.--1928-60: Maximum discharge, 1,670 cfs May 18, 1954 (gage height, 7.40 ft, from graph based on gage readings); minimum observed, 5 cfs Aug. 14, 22, 1940.

Remarks.--Small diversions above station for irrigation. Occasional regulation above station at migratory waterfowl refuge near Elmira.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	85.8	138	321	234	337	160	512	537	167	60.0	20.6	27.4	216
1952	94.2	94.6	154	81.3	103	118	624	549	169	63.7	19.4	17.8	174
1953	18.4	23.8	35.7	134	166	118	330	582	274	57.5	23.3	18.0	148
1954	22.7	36.9	49.9	57.1	88.1	165	524	923	358	108	33.4	30.0	200
1955	33.2	58.7	60.9	47.7	54.4	54.8	256	518	388	110	26.5	22.7	136
1956	73.9	126	242	203	109	174	732	758	233	52.5	22.3	22.0	229
1957	43.4	37.0	56.9	31.9	55.3	151	473	667	137	35.9	19.0	19.0	144
1958	32.4	37.0	56.7	63.5	188	196	435	447	110	28.6	11.0	12.3	134
1959	18.9	60.8	65.8	171	99.9	144	513	525	258	41.9	17.8	31.8	162
1960	61.3	98.8	119	90.2	94.0	245	548	534	255	38.3	20.0	21.3	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	5,270	8,200	19,730	14,390	18,720	9,830	30,490	32,990	9,960	3,690	1,270	1,630	156,200
1952	5,790	5,630	9,460	5,000	5,920	7,260	37,140	33,760	10,080	3,920	1,190	1,060	126,200
1953	1,130	1,420	2,190	8,250	9,250	7,240	19,640	35,790	16,320	3,530	1,430	1,070	107,300
1954	1,400	2,200	3,070	3,510	4,900	10,130	31,190	56,780	21,320	8,660	2,050	1,790	145,000
1955	2,040	3,490	3,740	2,940	3,020	3,370	15,220	31,860	23,090	6,770	1,630	1,350	98,520
1956	4,540	7,500	14,870	12,500	6,280	10,710	43,560	46,620	13,890	3,230	1,370	1,310	166,400
1957	2,670	2,200	3,500	1,960	3,070	9,270	28,150	41,030	8,140	2,210	1,170	1,130	104,500
1958	1,990	2,200	3,480	3,910	10,440	12,020	25,860	27,460	6,550	1,770	675	730	97,090
1959	1,160	3,620	4,050	10,500	5,550	8,820	30,540	32,280	15,330	2,580	1,090	1,890	117,400
1960	3,770	5,880	7,320	5,550	5,410	15,090	32,580	32,810	15,170	2,350	1,230	1,270	128,400

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year		
		Momentary maximum		Minimum day	Runoff			Mean	Runoff		
		Discharge	Date		Mean	Per square mile	Inches		Inches	Acre-feet	
1950	-	-	-	-	-	-	-	-	227	23.21	164,600
1951	1216	1,200	Feb. 11, 1951	14	216	1.62	22.02	156,200	199	20.28	143,800
1952	1246	1,400	Apr. 27, 1952	16	174	1.31	17.78	126,200	152	15.51	110,100
1953	1286	1,150	Apr. 28, 1953	11	148	1.11	15.11	107,300	151	15.38	109,200
1954	1346	1,670	May 18, 1954	20	200	1.50	20.44	145,000	204	20.81	147,600
1955	1396	804	May 20, 1955	14	136	1.02	13.88	98,520	160	16.37	116,200
1956	1446	1,180	Apr. 22, 1956	16	229	1.72	23.45	166,400	204	20.83	147,800
1957	1516	1,110	May 6, 1957	14	144	1.08	14.73	104,500	143	14.63	103,800
1958	1566	886	Feb. 25, 1958	6.5	134	1.00	13.68	97,090	136	13.84	98,240
1959	1636	1,060	May 2, 1959	13	162	1.22	16.54	117,400	173	17.69	125,600
1960	1716	1,240	Mar. 30, 1960	14	177	1.33	18.10	128,400	-	-	-

3140. Kootenai River at Klockmann Ranch, near Bonners Ferry, Idaho

Location.--Lat 48°47'40", long 116°22'50", in SE $\frac{1}{4}$ sec.19, T.63 N., R.1 E., on right bank 0.3 mile downstream from dike of drainage district No. 5 and 8 miles north of Bonners Ferry.

Drainage area.--13,300 sq mi, approximately.

Records available.--May to July, September to November 1928, April to September, December 1929, April 1930 to September 1960 (elevations only, fragmentary prior to April 1930).

Gage.--Water-stage recorder. Datum of gage is 1,700.00 ft above mean sea level, levels by Topographic Division in 1928. Gage readings have been reduced to elevations above mean sea level. Datum of 1929, supplementary adjustment of 1947, is about 0.03 ft higher. Prior to Sept. 12, 1928, several staff gages within 300 ft at different datums.

Extremes.--1928-60: Maximum elevation, 1,775.89 ft May 24, 1956; minimum 1,738.76 ft Apr. 1, 1944.

Remarks.--Elevations affected by backwater from Kootenay Lake and occasionally by dike failures during floods. Maximum yearly elevations are shown with record for Kootenai River at Porthill (see p. 226, 227).

Monthly mean elevation, in feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	49.20	49.29	49.69	-	48.61	43.12	49.01	65.78	62.53	61.71	-	-
1952	50.28	48.98	48.62	47.35	45.47	42.78	50.56	61.23	59.97	53.23	48.48	48.54
1953	47.80	48.27	44.99	44.78	45.42	42.47	43.18	57.00	64.60	56.34	48.68	48.52
1954	48.28	47.95	46.87	45.36	44.18	42.66	45.17	62.74	67.62	63.80	49.90	47.55
1955	46.84	46.74	46.25	45.70	43.93	41.90	42.10	52.27	66.38	58.94	47.99	46.44
1956	47.31	47.63	47.16	46.47	44.36	43.49	51.49	64.19	68.44	55.83	47.12	46.39
1957	46.60	46.32	46.18	45.48	43.92	42.60	44.33	65.19	59.45	48.83	45.51	45.72
1958	46.24	46.07	46.12	45.48	44.06	42.29	44.47	60.93	58.26	49.67	45.32	45.81
1959	46.44	46.43	46.43	46.21	44.32	42.30	47.62	59.20	67.90	57.57	48.17	49.11
1960	48.59	47.89	47.55	45.99	44.63	44.15	50.84	55.41	62.42	54.62	46.98	46.41

Note.--Add 1,700 ft to obtain elevation above mean sea level.

3168. Mission Creek near Copeland, Idaho

Location.--Lat 48°56'40", long 116°19'30", in NW $\frac{1}{4}$ sec.34, T.65 N., R.1 E., on left bank 0.1 mile upstream from bridge crossing, 4 miles northeast of Copeland, and 17 miles north of Bonners Ferry.

Drainage area.--23 sq mi, approximately.

Records available.--September 1958 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 2,800 ft (from topographic map).

Extremes.--1958-60: Maximum discharge, 371 cfs May 11, 1960 (gage height, 4.86 ft); minimum, 2.2 cfs Sept. 2, 1958 (gage height, 1.95 ft).

Remarks.--No regulation or diversion 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	-	-	-	-	-	-	-	-	-	-	-	3.63	-
1959	5.11	5.77	6.20	11.1	7.43	8.34	71.2	180	133	19.9	7.68	11.3	39.0
1960	22.2	27.7	18.4	17.8	11.4	33.6	88.6	169	105	16.1	7.38	5.52	43.6

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1958	-	-	-	-	-	-	-	-	-	-	-	216	-
1959	314	343	381	683	413	513	4,230	11,070	7,900	1,210	472	673	28,200
1960	1,360	1,650	1,130	1,100	657	2,070	5,270	10,370	6,240	993	455	328	31,620

Yearly 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	Mean	Runoff
		Discharge	Date										
1958	1636	-	-	-	-	-	-	-	-	-	-	-	-
1959	1656	310	May 18, 1959	4.2	39.0	1.70	23.01	43.3	28,200	25.54	31,300	-	-
1960	1716	371	May 11, 1960	4.2	43.6	1.90	25.79	-	31,620	-	-	-	-

3185. Kootenai River near Copeland, Idaho

(International gaging station)

Location.--Lat 48°54'45", long 116°25'00", in NW¼NW¼ sec.12, T.64 N., R.1 W., on right bank at Andrews Ranch, three-quarters of a mile downstream from Mission Creek and 1½ miles northwest of Copeland.

Drainage area.--13,400 sq mi, approximately.

Records available.--October 1927 to September 1960 (elevation record only prior to May 1929). Published as "at Copeland" 1927-29. April 1925 to September 1927 (gage heights only) in reports of Department of Northern Affairs and National Resources, Canada.

Gage.--Water-stage recorder. Datum of gage is 1,700.00 ft above mean sea level, referred to bench mark T-10-1914, elevation, 1,791.49 ft (datum of 1929, supplementary adjustment of 1947, is about 0.04 ft higher). Prior to Nov. 20, 1929, staff or recording gage at site three-quarters of a mile upstream; datum 40.77 ft higher prior to Apr. 18, 1929. Gage readings have been reduced to elevations above mean sea level.

Average discharge.--31 years (1929-60), 15,490 cfs (11,210,000 acre-ft per year).

Extremes.--1929-60: Maximum daily discharge, 124,000 cfs May 30, 1948; maximum elevation, 1,771.78 ft May 28, 1956; minimum daily discharge, 1,350 cfs Feb. 8, 1936; minimum elevation, 1,738.52 ft Apr. 2, 3, 1944.

Remarks.--Stage-discharge relation affected by backwater from Kootenay Lake and occasionally by dike failures during floods. Maximum yearly elevations are shown with record for Kootenai River at Porthill (see p. 226, 227).

Cooperation.--This station is maintained by the United States under agreement with Canada.

Monthly mean elevation, in feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	48.74	48.76	49.05	47.76	47.46	42.30	46.68	62.24	59.88	57.39	48.57	48.87
1952	49.32	48.55	48.29	47.06	45.05	42.29	47.95	58.32	57.64	51.57	47.80	48.31
1953	47.68	46.20	44.87	44.40	44.96	42.07	41.69	54.25	61.77	54.56	48.00	48.30
1954	48.15	47.62	46.77	45.27	43.87	42.21	43.53	59.44	64.53	61.33	48.49	46.69
1955	46.44	46.58	46.01	45.54	43.75	41.60	41.13	49.68	63.22	57.03	47.08	46.11
1956	46.79	46.91	46.57	45.89	44.00	42.57	48.94	60.81	65.58	53.85	46.11	46.03
1957	46.31	46.14	45.99	45.36	43.62	41.81	42.72	61.86	57.24	47.59	44.97	45.54
1958	46.07	45.96	46.06	45.39	43.86	41.77	42.84	57.83	56.47	48.48	44.82	45.56
1959	46.23	46.21	46.17	45.79	44.04	41.90	45.46	56.25	64.61	55.71	47.32	47.76
1960	47.48	47.02	46.84	45.70	44.21	43.38	48.83	52.92	59.62	53.00	46.19	46.09

Note.--Add 1,700 ft to obtain elevation above mean sea level.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	9,458	10,200	11,500	8,134	13,630	7,266	22,050	64,760	47,760	39,520	14,110	11,360	21,700
1952	14,050	8,609	7,075	5,811	5,738	5,243	27,640	48,180	40,270	23,900	10,750	6,915	17,040
1953	5,148	3,896	3,419	5,722	6,918	5,012	11,330	38,920	56,070	30,120	11,560	6,839	15,430
1954	5,479	5,241	4,226	3,296	4,633	5,725	14,440	60,920	66,270	51,880	17,750	11,660	21,070
1955	7,715	7,567	5,824	4,235	3,771	3,668	7,651	30,400	64,460	35,530	12,580	6,978	15,900
1956	9,326	10,390	7,877	7,234	4,793	7,089	29,540	66,180	69,060	30,390	11,990	7,010	21,750
1957	6,603	4,969	4,397	2,913	3,475	6,135	11,990	62,470	39,810	15,570	8,231	5,458	14,410
1958	5,224	4,447	3,644	3,398	4,252	5,464	12,160	51,990	34,050	16,720	7,858	6,253	13,010
1959	6,122	6,165	5,795	6,529	4,496	5,073	19,860	46,150	69,640	33,590	12,760	17,270	19,480
1960	14,810	12,120	9,681	5,639	6,159	9,824	26,330	36,170	52,330	26,760	11,050	7,101	18,160

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	581.6	606.8	707.2	500.1	756.9	446.8	1,512	3,982	2,842	2,430	867.6	675.8	15,710
1952	864.2	512.3	435.1	357.1	330.0	322.4	1,645	2,963	2,396	1,470	661.0	411.5	12,370
1953	316.6	231.8	204.1	351.8	384.2	308.2	674.1	2,393	3,337	1,852	710.6	406.9	11,170
1954	336.9	311.9	272.2	202.7	257.3	352.0	859.1	3,746	3,943	3,190	1,092	693.9	15,260
1955	474.4	450.3	358.1	260.4	209.5	225.5	455.3	1,869	3,856	2,185	773.7	415.2	11,510
1956	573.4	618.4	484.4	444.8	275.7	435.9	1,758	4,069	4,109	1,869.0	737.3	417.1	15,790
1957	406.0	295.7	270.3	179.1	193.0	377.2	713.7	3,841	2,369	957.4	506.1	324.8	10,430
1958	321.2	264.6	224.0	209.0	236.2	336.0	725.8	3,197	2,026	1,028	483.2	372.1	9,421
1959	376.4	366.8	356.3	401.5	249.7	311.9	1,182	2,837	4,144	2,066	784.9	1,028	14,100
1960	910.6	721.4	595.2	346.7	354.2	604.1	1,567	2,224	3,114	1,645	679.4	422.6	13,180

Yearly 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	-	-	-	-	-	-	-	19,800	20.05	14,330,000	-
1951	1216	86,900	May 14, 1951	5,400	21,700	1.62	21.99	15,710,000	21,580	21.88	15,620,000
1952	1246	70,700	Apr. 29, 1952	4,400	17,040	1.27	17.31	12,370,000	15,580	15.82	11,310,000
1953	1286	77,500	June 15, 1953	2,400	15,430	1.15	15.62	11,170,000	15,660	15.86	11,340,000
1954	1346	99,900	May 23, 1954	1,600	21,070	1.57	21.34	15,260,000	21,570	21.84	15,620,000
1955	1396	86,500	June 15, 1955	2,600	15,900	1.19	16.11	11,510,000	16,440	16.17	11,910,000
1956	1446	112,000	May 26, 1956	3,750	21,750	1.62	22.09	15,790,000	20,780	21.60	15,090,000
1957	1516	79,500	May 8, 1957	2,050	14,410	1.08	14.60	10,430,000	14,190	14.37	10,270,000
1958	1566	78,000	May 25, 1958	2,700	13,010	.971	13.17	9,421,000	13,410	13.58	9,711,000
1959	1636	91,300	June 7, 1959	2,900	19,480	1.45	19.74	14,100,000	21,040	21.30	15,230,000
1960	1716	76,000	June 5, 1960	3,500	18,160	1.36	18.45	13,180,000	-	-	-

Location.--Lat 48°56'50", long 116°32'15", in NW 1/4 sec.36, T.65 N., R.2 W., on downstream side of U. S. Forest Service bridge at mouth of canyon, 4 miles southwest of Porthill.

Drainage area.--29 sq mi, approximately.

Records available.--May 1928 to September 1959 (no winter records prior to 1931). Monthly discharge only for some periods, published in WSP 1316.

Gage.--Wire-weight gage. Altitude of gage is 1,830 ft (by barometer). Prior to Mar. 20, 1930, staff gages, and Mar. 20, 1930, to Apr. 30, 1956, water-stage recorders at several nearby sites at various datums. May 1, 1956, to Oct. 27, 1957, staff gages at sites within 200 ft at different datums.

Average discharge.--29 years (1930-59), 63.8 cfs (46,190 acre-ft per year), corrected.

Extremes.--1928-59: Maximum discharge, 1,300 cfs May 27, 1948 (gage height, 6.75 ft, site and datum then in use), by slope-area measurement of peak flow; maximum gage height, 8.55 ft June 14, 15, 1933 (datum used Sept. 4, 1941, to Aug. 23, 1948), backwater from drift; minimum discharge, 1 cfs Nov. 29, 30, 1952, and possibly other days during period of no gage-height record in that year.

Remarks.--No regulation or diversion above station.

Revisions.--A period for the water year 1942 was revised in WSP 1396; the resulting revised records are summarized herewith, and supersede those published in WSP 1316:

Month	Mean	Per square mile	Runoff	
			Inches	Acre-feet
June 1942.....	179	-	-	10,620
Water year 1941-42....	68.2	2.35	31.90	49,340
Calendar year 1942....	52.1	-	24.37	37,680

Corrections.--In WSP 1316, several figures are listed in error; the corrected figures are summarized herewith:

Month	Mean	Per square mile	Acre-feet	Month	Mean	Per square mile	Acre-feet
February 1931.....	11.6	-	-	March 1933....	12.4	-	-
Water year 1930-31....	-	-	742	Water year 1933-34....	83.1	2.87	-
November.....	-	-	-	Water year 1938-39..	-	-	-
Calendar year 1931....	-	-	27,150				
Water year 1931-32...	66.2	2.28	48,130				

[illegible][illegible][illegible]

KOOTENAI RIVER BASIN

3210. Smith Creek near Porthill, Idaho

Location.--Lat 48°57'40", long 116°33'20", in NE $\frac{1}{4}$ sec.26, T.65 N., R.2 W., on right bank at U. S. Forest Service bridge, 1 mile south of Smith Creek ranger station and 4 miles southwest of Porthill.

Drainage area.--70 sq mi, approximately.

Records available.--May 1928 to November 1960; no winter records 1928-30. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Altitude of gage is 1,770 ft (from topographic map). Prior to Apr. 20, 1929, staff gage at site 40 ft downstream at datum 0.98 ft lower. Apr. 20, 1929, to Sept. 30, 1956, water-stage recorder at present site at datum 1.69 ft higher.

Average discharge.--30 years (1930-60), 191 cfs (138,300 acre-ft per year).

Extremes.--1928-60: Maximum discharge, 3,810 cfs June 23, 1955 (gage height, 9.34 ft, present datum), from rating curve extended above 1,600 cfs by logarithmic plotting; minimum daily, 3 cfs Nov. 29, 30, 1952.

Remarks.--No regulation or diversion above station.

Monthly and yearly mean discharge, in cubic feet per second

[illegible]

Monthly and yearly discharge, in acre-feet

[illegible]

Yearly discharge, in cubic feet per second

[illegible]

3215. Boundary Creek near Porthill, Idaho

(International gaging station)

Location.--Lat 48°59'50", long 116°34'05", in SW $\frac{1}{4}$ sec.11, T.65 N., R.2 W., on left bank near mouth of canyon, 0.2 mile south of international boundary and 3 miles west of Porthill.

Drainage area.--97 sq mi, approximately.

Records available.--May 1928 to September 1960 (no winter records 1929-30).

Gage.--Water-stage recorder. Altitude of gage is 1,770 ft (from topographic map). Prior to Apr. 24, 1929, staff gage at site 140 ft upstream at different datum.

Average discharge.--30 years (1930-60), 191 cfs (138,300 acre-ft per year).

Extremes.--1928-60: Maximum discharge, 3,280 cfs June 23, 1955 (gage height, 5.80 ft), from rating curve extended above 2,000 cfs; minimum, 5 cfs sometime between Nov. 10 and Dec. 3, 1936; minimum gage height, 0.24 ft Nov. 22, 1952.

Revisions.--The momentary maximum discharges for the water year 1930 and the water years 1943, 1945, and 1950 were revised in WSP 1446 and 1396, respectively; the revised records are summarized herewith and supersede those published in WSP 1316.

Water year	Date	Discharge (cfs)
1930	May 20, 1930	1,820
1943	June 17, 1943	2,400
1945	May 31, 1945	1,840
1950	June 22, 1950	2,250

Remarks.--No regulation or diversion above station.

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	190	200	195	128	206	96.2	286	967	619	172	53.8	55.5	264
1952	136	78.4	119	55.0	44.5	44.5	360	906	557	115	34.4	23.6	206
1953	17.1	15.1	18.8	42.7	48.1	40.3	156	861	863	235	47.3	30.3	198
1954	34.2	61.1	42.7	37.9	37.8	55.2	152	990	1,014	427	65.5	50.0	248
1955	54.3	119	74.7	43.7	34.6	29.9	80.8	493	1,265	589	72.9	40.4	225
1956	165	184	84.1	62.9	43.9	55.4	368	1,233	964	213	39.5	26.3	287
1957	57.7	40.7	34.4	28.4	27.5	54.9	166	1,182	429	65.6	30.7	21.0	180
1958	42.4	38.9	30.5	28.7	53.3	75.9	188	1,100	325	68.5	21.4	25.5	168
1959	34.1	55.4	58.8	75.8	46.7	41.7	243	796	915	161	39.5	146	218
1960	172	134	99.2	66.1	44.3	94.6	286	695	702	120	36.7	31.6	207

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	11,690	11,890	11,980	7,900	11,430	5,910	17,030	59,440	36,820	10,590	3,310	3,300	191,300
1952	8,370	4,660	7,290	3,380	2,560	2,740	21,440	55,710	33,130	7,060	2,110	1,400	149,800
1953	1,050	899	1,160	2,620	2,670	2,480	9,310	52,950	51,330	14,450	2,910	1,800	143,600
1954	2,100	3,640	2,630	2,330	2,100	3,390	9,060	60,890	60,360	26,230	4,030	2,980	179,700
1955	3,340	7,100	4,590	2,690	1,920	1,840	4,810	30,290	75,260	23,930	4,480	2,400	162,600
1956	10,120	10,930	5,170	3,870	2,520	3,410	21,900	75,790	57,340	13,100	2,430	1,560	208,100
1957	3,550	2,420	2,120	1,740	1,530	3,370	9,900	72,710	25,540	4,030	1,890	1,250	130,000
1958	2,600	2,320	1,880	1,760	2,960	4,670	11,210	67,670	19,330	4,210	1,320	1,520	121,400
1959	2,100	3,300	3,620	4,660	2,590	2,570	14,480	48,910	54,450	9,880	2,430	8,670	186,400
1960	10,580	7,940	6,100	4,060	2,550	5,820	17,020	42,720	41,780	7,390	2,260	1,880	150,100

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	-	-	-	-	-	-	-	-	258	36.11	186,800	
1951	1216	1,620	May 12, 1951	30	264	2.72	36.99	191,300	243	34.04	176,000	
1952	1246	1,540	May 20, 1952	18	206	2.12	28.95	149,800	183	25.61	132,600	
1953	1286	2,270	June 13, 1953	6	198	2.04	27.76	143,600	206	28.79	148,900	
1954	1346	2,350	May 19, 1954	23	248	2.56	34.76	179,700	247	36.05	186,400	
1955	1396	3,280	June 23, 1955	27	225	2.32	31.45	162,600	250	33.61	173,800	
1956	1446	2,610	May 20, 1956	21	287	2.96	40.23	208,100	262	36.73	190,000	
1957	1516	1,810	May 5, 1957	18	180	1.86	25.15	130,000	178	24.89	128,800	
1958	1566	1,910	May 20, 1958	16	168	1.73	23.48	121,400	171	23.92	123,700	
1959	1636	1,900	June 6, 1959	19	218	2.25	30.47	157,700	239	33.49	173,300	
1960	1716	1,730	May 12, 1960	19	207	2.13	29.03	150,100	-	-	-	

3220. Kootenai River at Porthill, Idaho

(International gaging station)

Location.--Lat 49°00'00", long 116°30'10", in SW $\frac{1}{4}$ sec. 8, T. 65 N., R. 1 W., on right bank 300 ft south of international boundary at Porthill.

Drainage area.--13,700 sq mi, approximately.

Records available.--May to July 1904 and October 1927 to March 1928 (elevations only) and April 1928 to September 1960 in reports of Geological Survey. October 1924 to September 1927 (gage heights only) in reports of Department of Northern Affairs and National Resources, Canada.

Gage.--Water-stage recorder. Datum of gage is 1,700.00 ft above mean sea level referred to bench mark "10-M-1928" at elevation 1,767.68 ft. Gage readings have been reduced to elevations above mean sea level. Datum of 1929, supplementary adjustment of 1947, and datum of Geodetic Survey of Canada, Pub. 24, 1951 edition, are 0.03 ft higher. Prior to May 17, 1928, staff gages at approximately same site. Datum of gages prior to July 28, 1928, 38.34 ft higher, except in 1904 when different datum was used.

Average discharge.--32 years (1928-60), 15,810 cfs (11,450,000 acre-ft per year).

Extremes.--1928-60: Maximum daily discharge, 125,000 cfs June 1, 1948; maximum elevation, 1,767.53 ft June 5, 1956; minimum daily discharge, 1,380 cfs Feb. 8, 1936; minimum elevation, 1,738.21 ft Apr. 3, 1944.
Maximum elevation known, 1,772.7 ft in June 1894, present datum.

Remarks.--Elevations affected by backwater from Kootenay Lake and occasionally by dike failures during floods. Discharge represents entire flow passing international boundary, and is computed by adding tributary inflow for intervening area to flow at station near Copeland and correcting for channel storage between stations near Copeland and at Porthill.

Cooperation.--This station is maintained by the United States under agreement with Canada.

Monthly mean elevation, in feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	48.34	48.34	48.51	47.39	46.58	41.85	44.88	58.69	57.50	55.49	47.88	48.38
1952	48.68	48.20	47.98	46.77	44.72	41.94	46.04	55.74	55.64	50.37	47.30	48.02
1953	47.45	45.98	44.66	44.10	44.61	41.76	40.78	51.84	58.97	53.10	47.51	48.05
1954	47.95	47.62	46.56	45.06	43.59	41.87	42.50	56.09	61.35	58.95	47.58	46.13
1955	46.13	46.06	45.76	45.31	43.49	41.32	40.62	47.71	59.99	55.44	46.49	45.79
1956	46.34	46.38	46.12	45.45	43.70	42.00	47.02	57.43	62.56	52.34	45.51	45.72
1957	46.03	45.92	45.73	45.14	43.34	41.36	41.87	58.52	55.28	46.76	44.54	45.25
1958	45.81	45.72	45.84	45.21	43.64	41.45	41.92	54.90	54.97	47.67	44.45	45.30
1959	45.97	45.94	45.88	45.42	43.76	41.57	44.05	53.59	61.16	54.15	46.69	46.83
1960	46.75	46.41	46.32	45.40	43.88	42.73	47.19	50.84	57.01	51.72	45.64	45.74

Note.--Add 1,700 ft to obtain elevation above mean sea level.

Maximum yearly elevation, in feet, at stations on Kootenai River

Water year	Boom Camp		At Bonners Ferry		Near Bonners Ferry		Klockmann Ranch		Copeland		Porthill	
	Elev.	Date	Elev.	Date	Elev.	Date	Elev.	Date	Elev.	Date	Elev.	Date
1951	76.56	May 14	74.86	May 14	74.22	May 14	71.35	May 14	67.17	May 26	63.11	May 26
1952	72.01	Apr. 29	69.30	Apr. 29	68.68	Apr. 29	66.21	Apr. 29	62.11	May 22	58.86	May 22
1953	74.99	June 15	73.21	June 15	72.64	June 16	70.19	June 16	66.56	June 16	62.59	June 16
1954	80.06	May 21	78.55	May 21	77.63	May 21	74.54	May 23	70.47	May 23	65.17	(a)
1955	76.60	June 15	74.80	June 15	74.25	June 15	71.69	June 15	67.93	June 27	64.13	June 27
1956	81.38	May 24	80.09	May 24	78.94	May 24	75.89	May 24	71.78	May 28	67.53	June 5
1957	73.86	May 9	71.81	May 9	71.19	May 9	68.66	May 9	64.77	May 21	61.19	May 21
1958	74.52	May 26	72.68	May 26	72.09	May 26	69.75	May 26	66.24	May 27	62.28	May 27
1959	77.33	June 7	75.69	June 7	75.02	June 7	72.31	June 7	68.24	June 7	63.59	June 8
1960	72.99	June 5	70.69	June 5	70.06	June 6	67.60	June 6	63.70	June 6	59.65	June 6

a May 23-24.

Note.--Add 1,700 ft to obtain elevation above mean sea level.

Monthly and yearly mean discharge, in cubic-feet per second, of Kootenai River at Porthill, Idaho

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	9,991	10,740	11,960	8,488	14,130	7,536	22,540	66,710	49,460	40,150	14,270	11,490	22,350
1952	14,440	8,816	7,376	5,974	5,872	5,388	28,060	50,340	41,740	24,330	10,800	6,963	17,530
1953	5,201	3,951	3,374	5,820	7,070	5,178	11,570	40,790	58,280	30,900	11,670	6,911	15,920
1954	5,561	5,429	4,565	3,418	4,741	5,926	14,740	62,790	68,800	53,430	18,020	11,790	21,700
1955	7,884	7,881	6,015	4,357	3,893	3,769	7,842	31,270	67,250	36,820	12,840	7,033	16,440
1956	9,785	10,900	8,095	7,417	4,918	7,217	30,150	67,760	72,340	31,200	12,180	7,040	22,430
1957	6,763	5,078	4,497	3,002	3,575	6,331	12,300	65,090	41,280	15,820	6,321	5,472	14,870
1958	5,320	4,545	3,715	3,488	4,408	5,699	12,550	54,180	35,220	16,970	7,918	6,278	13,420
1959	6,211	6,318	5,971	6,774	4,656	5,229	20,370	47,820	71,860	34,330	12,930	17,640	20,040
1960	15,280	12,490	9,966	5,634	6,304	9,964	27,140	37,820	54,050	27,250	11,190	7,151	18,700

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	614.3	639.3	736.6	521.9	784.9	463.4	1,341	4,102	2,944	2,468	877.7	683.7	16,180
1952	887.6	524.6	453.5	367.3	337.7	331.3	1,870	3,095	2,484	1,496	664.3	414.3	12,730
1953	319.8	235.1	207.5	357.9	392.7	318.4	688.5	2,508	3,468	1,900	717.6	411.3	11,520
1954	342.0	323.1	280.7	210.2	263.3	364.4	877.1	3,661	4,094	5,285	1,106	701.7	15,710
1955	484.7	468.9	369.3	267.9	216.2	231.7	466.7	1,923	4,001	2,264	789.2	418.5	11,900
1956	601.7	648.4	497.7	456.0	282.9	443.8	1,794	4,167	4,305	1,919	748.6	418.9	16,280
1957	415.9	302.2	276.5	184.6	198.5	369.3	732.0	4,002	2,456	972.9	511.7	325.6	10,770
1958	327.1	270.4	228.4	214.5	244.9	350.4	746.8	3,331	2,096	1,044	486.9	373.4	9,714
1959	381.9	375.9	367.2	416.5	258.6	321.5	1,212	2,940	4,276	2,111	794.8	1,050	14,500
1960	939.8	743.1	612.8	358.7	362.6	613.9	1,615	2,326	3,216	1,675	688.3	425.5	13,580

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	Mean	Runoff		
		Discharge	Date						Inches	Acre-feet	
1950	-	-	-	-	-	-	-	20,450	20.25	14,810,000	
1951	1216	88,600	May 14, 1951	5,590	22,350	1.63	22.13	16,180,000	22,170	21.96	16,050,000
1952	1246	71,200	Apr. 29, 1952	4,570	17,530	1.28	17.42	12,730,000	16,010	15.91	11,620,000
1953	1286	79,200	June 16, 1953	2,460	15,920	1.16	15.77	11,520,000	16,170	16.02	11,710,000
1954	1346	102,000	May 22, 1954	1,730	21,700	1.58	21.50	15,710,000	22,220	22.02	16,090,000
1955	1396	88,700	June 15, 1955	2,720	16,440	1.20	16.30	11,900,000	17,030	16.88	12,330,000
1956	1446	114,000	May 28, 1956	3,880	22,430	1.64	22.28	16,280,000	21,390	21.25	15,530,000
1957	1516	82,300	May 9, 1957	2,140	14,870	1.09	14.73	10,770,000	14,640	14.50	10,600,000
1958	1566	81,100	May 26, 1958	2,780	13,420	.98	13.30	9,714,000	13,830	13.70	10,010,000
1959	1636	95,200	June 7, 1959	3,040	20,040	1.46	19.85	14,500,000	21,650	21.46	15,660,000
1960	1716	77,500	June 6, 1960	3,620	18,700	1.36	18.58	13,580,000	-	-	-

3230. Columbia River at Birchbank, British Columbia

(International gaging station)

Location.--Lat 49°11', long 117°43', on right bank at Birchbank, British Columbia, 7 miles upstream from Trail, 11 miles downstream from Kootenay River, and 17 miles upstream from international boundary.

Drainage area.--34,000 sq mi, approximately.

Records available.--April 1913 to September 1960. Published as "at Trail, British Columbia" 1913-37.

Gage.--Water-stage recorder. Datum of gage is 1,329.90 ft above mean sea level, 1947 international joint adjustment, published as 1,338.00 ft prior to October 1948. Prior to Oct. Oct. 1, 1937, chain or wire-weight gage on highway bridge at site 7 miles downstream at datum 16.27 ft lower.

Average discharge.--47 years (1913-60), 70,700 cfs (51,180,000 acre-ft per year).

Extremes.--1913-60: Maximum discharge, 370,000 cfs June 11, 1948 (gage height, 50.62 ft); minimum observed, 8,940 cfs Feb. 3, 1937 (gage height, 6.27 ft, site and datum then in use).

Remarks.--Many small diversions above station for irrigation of about 25,000 acres. Fluctuation at low flow caused by powerplant on Kootenay River. Flow affected by internationally controlled storage in Kootenay Lake, as well as by natural and controlled regulation in other lakes.

Cooperation.--This station is 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	44,600	37,200	33,100	30,000	35,200	25,800	40,700	54,000	191,000	202,000	98,700	53,700	79,200
1952	48,600	29,700	23,900	21,200	19,800	21,600	39,300	42,000	196,000	159,000	87,900	46,100	69,800
1953	35,800	21,800	16,900	17,100	20,000	22,600	22,300	101,000	207,000	178,000	91,700	58,200	66,300
1954	40,200	36,300	28,800	22,600	19,900	26,000	27,200	116,000	242,000	277,000	139,000	84,600	88,700
1955	45,100	38,200	33,100	23,600	21,800	18,900	24,800	60,200	214,000	242,000	115,000	54,100	74,600
1956	39,400	39,600	26,200	24,200	19,100	22,800	48,200	151,000	282,000	180,000	98,800	50,000	81,900
1957	43,400	27,000	21,400	17,900	19,400	20,900	27,500	189,000	221,000	124,000	76,500	44,800	69,700
1958	35,600	24,200	18,900	18,700	21,000	25,100	33,800	42,000	238,000	131,000	82,800	53,300	68,900
1959	44,300	32,000	22,800	24,200	20,200	22,500	36,200	117,000	246,000	228,000	114,000	90,400	83,400
1960	66,300	49,000	33,500	23,800	22,800	25,300	60,500	97,600	192,000	204,000	104,000	53,800	77,900

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	2,740	2,213	2,038	1,846	1,956	1,589	2,424	9,466	11,380	12,410	6,068	3,195	57,320
1952	2,986	1,769	1,471	1,302	1,141	1,329	2,341	8,744	11,640	9,784	5,406	2,742	50,660
1953	2,202	1,298	1,042	1,050	1,110	1,383	1,329	6,208	12,340	10,960	5,637	3,461	48,020
1954	2,475	2,161	1,769	1,387	1,104	1,600	1,620	7,119	14,400	17,010	8,589	5,034	84,250
1955	2,772	2,271	2,034	1,450	1,208	1,162	1,478	3,704	12,750	14,870	7,064	3,222	53,980
1956	2,423	2,355	1,611	1,485	1,101	1,386	2,865	9,310	16,810	11,070	6,074	2,975	59,470
1957	2,669	1,658	1,314	1,102	1,078	1,285	1,637	11,610	13,140	7,598	4,702	2,666	50,440
1958	2,190	1,443	1,163	1,151	1,164	1,545	2,008	8,740	14,184	8,047	5,090	3,170	49,900
1959	2,723	1,903	1,400	1,489	1,122	1,383	2,155	7,171	14,640	14,040	7,017	5,380	60,420
1960	4,076	2,914	2,058	1,461	1,313	1,556	3,599	6,001	11,430	12,550	6,408	3,201	56,570

Yearly 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	1216	229,000	May 27, 1951	20,700	79,200	2.33	31.61	57,320,000	78,600	31.38	56,870,000
1952	1246	221,000	June 10, 1952	18,300	69,800	2.05	27.97	50,660,000	78,100	31.19	56,560,000
1953	1286	250,000	June 17, 1953	16,000	66,300	1.95	26.47	48,020,000	67,500	27.04	48,970,000
1954	1346	328,000	July 12, 1954	17,400	88,700	2.61	35.45	64,250,000	68,900	27.50	49,880,000
1955	1396	324,000	June 29, 1955	16,900	74,600	2.19	29.77	53,980,000	89,700	35.82	64,920,000
									73,600	29.39	53,500,000
1956	1446	334,000	June 7, 1956	17,000	81,900	2.41	32.75	59,470,000	80,900	32.34	58,700,000
1957	1516	260,000	May 24, 1957	15,800	69,700	2.05	27.84	50,440,000	70,800	27.18	49,610,000
1958	1566	290,000	June 1, 1958	15,100	68,900	2.03	27.51	49,900,000	68,500	28.38	51,120,000
1959	1636	300,000	June 26, 1959	17,800	83,400	2.45	33.31	60,420,000	78,600	34.99	63,440,000
1960	1716	237,000	July 4, 1960	18,300	77,900	2.29	31.20	56,570,000	-	-	-

3235. German Gulch Creek near Ramsay, Mont.

Location.--Lat 46°00'50", long 112°47'30", in SE¼NW¼ sec.13, T.3 N., R.10 W., half a mile upstream from mouth and 6½ miles west of Ramsay.

Drainage area.--41 sq mi, approximately.

Records available.--April 1955 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 5,200 ft (by barometer). Prior to July 13, 1956, staff gage at site 300 ft upstream from mouth at different datum.

Average discharge.--5 years (1955-60), 18.7 cfs (13,540 acre-ft per year).

Extremes.--1955-60: Maximum discharge observed, about 195 cfs (revised) May 28, 1956, result of discharge measurement; minimum (revised), 2.6 cfs Mar. 15, 1959 (gage height, 1.53 ft).

Remarks.--Some small diversions for irrigation of hay meadows 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
1955	-	-	-	-	-	-	9.78	*48	*85	*45	*16	*10	-
1956	*9	7.03	8.1	6.9	5.4	15.2	26.1	93.1	75.0	20.2	12.2	9.2	*24.0
1957	7.6	8	7	5	5	6	15.5	59.5	45.0	15.4	7.33	7.45	15.8
1958	8.25	7.2	5.5	4.9	5.3	5.5	13.3	90.2	49.4	26.3	11.9	7.66	19.7
1959	7.43	8.07	7.81	6.56	5.56	6.36	16.2	40.0	66.2	18.5	9.21	9.37	16.8
1960	10.3	6.66	6.12	5.23	5.51	9.55	17.3	55.9	59.7	14.1	9.39	8.08	17.3

* Only monthly figures revised; revised daily figures not available.

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1955	-	-	-	-	-	-	582	*2,950	*5,060	*2,770	*984	*595	-
1956	*553	419	498	426	309	936	1,550	5,720	4,460	1,240	751	547	*17,410
1957	468	476	430	307	278	369	923	3,660	2,680	949	450	444	11,430
1958	507	428	337	303	293	338	789	5,540	2,940	1,620	730	456	14,280
1959	457	480	480	403	309	391	965	2,460	3,940	1,140	566	557	12,150
1960	635	396	376	322	317	587	1,030	3,440	3,550	864	578	481	12,580

* Revised.

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							
1955	1396	*a126	June 8, 1955	(*b)	-	-	-	-	-	-
1956	1446	*a195	May 28, 1956	(*b)	*24.0	*17,410	23.9	17,310		
1957	1516	131	May 19, 1957	-	15.8	11,430	15.6	11,330		
1958	1566	185	May 20, 1958	-	19.7	14,280	19.9	14,430		
1959	1636	144	June 7, 1959	4.0	16.8	12,150	16.8	12,140		
1960	1716	135	May 12, 1960	3.5	17.3	12,580	-	-		

* Revised.

a Maximum observed, about.

b Not determined.

3241. Racetrack Creek below Granite Creek, near Anaconda, Mont.

Location.--Lat 46°16'40", long 112°55'00", in NW¼NE¼ sec.13, T.6 N., R.11 W., on right bank 30 ft upstream from bridge, 2 miles downstream from Granite Creek, 9½ miles upstream from mouth, and 10 miles north of Anaconda.

Drainage area.--39.5 sq mi.

Records available.--April 1914 to September 1917 (gage heights only, published as "near Anaconda"), July 1957 to September 1960. Records for July 1911 to November 1912 at site 3 miles upstream, published as "near Anaconda," not equivalent owing to inflow.

Gage.--Water-stage recorder. Altitude of gage is 5,420 ft (from topographic map). April 1914 to September 1917 at site about a quarter of a mile downstream at different datum.

Extremes.--1957-60: Maximum discharge, 452 cfs June 15, 1959 (gage height, 5.35 ft); minimum, 9.3 cfs Jan. 19, 1958 (gage height, 2.05 ft).

Remarks.--No diversion above station. Some regulation by Racetrack and Fisher 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
1957	-	-	-	-	-	-	-	-	-	-	50.8	33.8	-
1958	24.8	17.7	15.9	15.6	17.2	17.5	20.3	168	193	89.3	62.9	43.6	57.4
1959	26.7	24.9	22.5	19.6	19.6	19.4	27.8	67.4	250	97.8	61.5	49.7	57.2
1960	52.5	37.2	30.0	23.7	22.3	24.6	39.5	79.6	215	89.2	61.1	37.2	59.3

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957	-	-	-	-	-	-	-	-	-	-	3,130	2,000	-
1958	1,530	1,050	980	958	958	1,080	1,210	10,320	11,490	5,490	3,870	2,590	41,530
1959	1,640	1,480	1,380	1,210	1,090	1,190	1,650	4,140	14,900	6,010	3,780	2,960	41,430
1960	3,230	2,220	1,840	1,460	1,280	1,510	2,350	4,890	12,780	5,490	3,750	2,220	43,020

Yearly 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	Inches	Acre-feet
		Discharge	Date				Inches	Acre-feet			
1957	1566	-	-	-	-	-	-	-	-	-	-
1958	1566	413	June 4, 1958	12	57.4	1.45	19.71	41,530	58.7	20.16	42,470
1959	1636	452	June 15, 1959	10	57.2	1.45	19.66	41,430	61.1	20.98	44,220
1960	1716	349	June 17, 1960	18	59.3	1.50	20.41	43,020	-	-	-

3250. Georgetown Lake near Southern Cross, Mont.

Location.--Lat 46°12'50", long 113°16'40" in SW $\frac{1}{4}$ sec.6, T.5 N., R.13 W., at dam on Flint Creek, 2 miles west of Southern Cross and 8 miles south of Philipsburg.

Drainage area.--50.1 sq mi.

Records available.--October 1939 to September 1960. May to July 1948 daily elevations and contents, published in WSP 1080.

Gage.--Staff gage. Datum of gage is at mean sea level (levels by The Montana Power Co.).

Extremes.--1939-60: Maximum contents observed, 29,790 acre-ft July 26, 1955 (elevation, 6,429.08 ft); minimum observed, 15,990 acre-ft Apr. 28, 29, 1957 (elevation, 6,424.15 ft).

Remarks.--Reservoir formed by masonry and concrete dam. Storage began about 1905 to store water for pumpage into Warm Springs Creek for use of reduction works of Anaconda Copper Mining Co. at Anaconda, or for release through Flint Creek for irrigation and power development. Usable capacity, 31,040 acre-ft (corrected) at elevation 6,429.5 ft. Dead storage unknown. Figures given herein represent usable contents.

Cooperation.--Records furnished by The Montana Power Co.

Correction.--In WSP 1316, the symbol "a" should be removed from July and November 1946 as they are month-end figures.

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

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	24,860	25,300	25,330	25,160	22,970	19,920	21,410	26,360	28,630	29,050	29,020	28,810
1952	28,810	28,960	28,100	24,610	22,360	20,910	21,580	25,380	28,660	28,780	28,360	27,500
1953	26,610	25,360	22,890	21,660	22,890	23,800	23,800	25,360	28,630	28,870	29,260	28,720
1954	28,270	27,860	24,770	22,770	21,110	20,450	21,470	22,640	25,020	24,970	24,220	24,020
1955	24,360	25,160	26,050	24,360	22,190	20,140	21,580	24,410	27,110	29,670	28,630	27,800
1956	27,800	27,500	25,880	23,770	21,690	19,150	18,050	21,050	23,050	23,770	22,940	21,800
1957	22,140	22,440	22,750	21,080	19,150	17,280	16,020	20,110	23,720	24,300	23,080	22,270
1958	23,160	24,380	23,160	21,470	19,920	19,670	21,550	26,130	29,230	29,380	29,110	28,780
1959	28,570	29,170	29,200	28,330	26,130	23,160	21,390	22,360	26,380	27,980	28,010	28,690
1960	29,170	28,810	28,390	28,630	28,210	28,750	24,330	25,800	29,170	28,990	28,360	27,770

3255. Flint Creek near Southern Cross, Mont.

Location.--Lat 46°14'00", long 113°17'40", in SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.36, T.6 N., R.14 W., on left wing of weir, half a mile downstream from powerplant, 2 miles downstream from Georgetown Lake, 3 miles northwest of Southern Cross, and 6 miles south of Philipsburg.

Drainage area.--52.6 sq mi.

Records available.--October 1940 to September 1960.

Gage.--Staff gage and Cippoletti weir. Altitude of gage is 5,630 ft (from topographic map).

Average discharge.--20 years (1940-60), 29.8 cfs (21,570 acre-ft per year).

Extremes.--1940-60: Maximum discharge, 174 cfs June 13, 1942 (gage height, 1.86 ft); probably no flow for parts of Aug. 20, 1943, May 23, 1952, Oct. 6, 1954, when generator was shut down.

Remarks.--Flow regulated by Georgetown Lake (see preceding station). Flow may be augmented by transbasin diversion from Silver Lake to Georgetown Lake or reduced by pumping from Georgetown Lake to Silver 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	31.0	31.0	31.0	31.0	31.0	25.7	16.4	22.6	66.5	59.2	32.6	33.2	34.3
1952	33.7	30.0	31.1	28.6	41.3	48.9	28.1	28.9	31.5	38.7	21.7	25.0	32.5
1953	25.8	17.6	13.0	7.66	4.11	10.4	31.3	33.3	89.6	49.3	26.1	26.0	27.9
1954	26.0	26.8	26.4	15.2	15.9	16.0	15.1	21.5	31.1	27.4	26.7	15.3	22.0
1955	13.6	6.02	4.85	4.60	5.69	6.64	6.66	12.8	25.9	35.1	32.0	31.7	15.5
1956	25.1	16.4	16.4	16.0	13.5	13.5	16.9	17.9	31.2	28.3	26.6	28.9	20.7
1957	16.0	15.0	15.0	7.20	6.91	7.39	7.79	18.1	31.6	30.0	30.4	30.3	18.0
1958	10.3	4.19	3.95	4.37	5.25	5.34	5.41	14.3	70.5	58.7	28.4	26.2	19.8
1959	27.1	23.1	23.7	23.5	23.8	26.1	27.9	27.4	26.8	26.7	26.1	28.2	25.9
1960	32.2	35.8	24.2	18.5	26.3	26.0	28.0	29.0	30.2	35.9	26.5	21.4	27.8

Monthly and yearly discharge, in acre-feet, of Flint Creek near Southern Cross, Mont.

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,910	1,840	1,910	1,910	1,720	1,580	974	1,390	3,960	3,640	2,010	1,970	24,810
1952	2,190	1,790	1,910	1,760	2,370	2,010	1,670	1,780	1,870	2,580	1,350	1,490	23,550
1953	1,590	1,050	799	471	228	859	1,860	2,050	5,330	3,030	1,610	1,550	20,210
1954	1,600	1,600	1,620	934	881	984	897	1,320	1,850	1,690	1,640	910	15,950
1955	836	358	298	283	316	408	398	789	1,540	2,160	1,970	1,890	11,240
1956	1,540	974	1,010	984	774	828	1,010	1,100	1,860	1,740	1,640	1,600	15,060
1957	982	893	922	443	384	455	464	1,110	1,880	1,840	1,870	1,800	113,040
1958	836	249	243	289	292	328	322	879	4,200	3,610	1,750	1,560	14,340
1959	1,670	1,390	1,460	1,450	1,320	1,610	1,680	1,690	1,600	1,640	1,610	1,680	18,770
1960	1,980	2,130	1,490	1,140	1,510	1,600	1,670	1,790	1,800	2,210	1,650	1,270	20,220

† 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	-	-	-	-	-	-	27.3	19,750
1951	1216	168	July 11, 1951	16	34.3	24,810	34.6	25,040
1952	1246	116	July 14, 1952	17	32.5	23,550	29.1	21,100
1953	1286	130	June 17-19, 1953	3.8	27.9	20,210	29.8	21,590
1954	1346	34	June 12, 1954	12	22.0	15,930	17.4	12,600
1955	1396	43	July 25-30, 1955	4.6	15.5	11,240	18.3	13,280
1956	1446	32	June 2-17, 1956	6.0	20.7	15,060	19.7	114,330
1957	1516	38	May 28-30, 1957	6.8	18.0	113,040	15.7	11,370
1958	1566	153	June 28, 1958	3.8	19.8	14,340	24.4	17,720
1959	1636	30	Sept. 26-30, 1959	12	25.9	18,770	27.4	19,860
1960	1716	54	(a)	9.1	27.8	20,220	-	-

† Corrected.

a Oct. 30, 31, 1959, to July 8, 1960.

3265. Trout Creek near Southern Cross, Mont.

Location.--Lat 46°16'40", long 113°20'50", in W $\frac{1}{2}$ NW $\frac{1}{4}$ sec.15, T.6 N., R.14 W., on right bank a quarter of a mile upstream from mouth, $\frac{4}{5}$ miles southwest of Philipsburg, and $\frac{6}{10}$ miles northwest of Southern Cross.

Drainage area.--34.8 sq mi.

Records available.--October 1945 to September 1951. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Altitude of gage is 5,270 ft (from topographic map).

Average discharge.--6 years (1945-51), 36.6 cfs (26,500 acre-ft per year).

Extremes.--1945-51: Maximum discharge, 331 cfs Apr. 16, 1948 (gage height, 5.67 ft), from rating curve extended above 80 cfs by logarithmic plotting; minimum, 7.1 cfs Mar. 14, 1949 (gage height, 2.54 ft).

Remarks.--Diversion for irrigation of about 4,000 acres, of which 1,500 acres lies below station. During irrigation season, flow is supplemented by water from East Fork Rock Creek which is diverted in sec.5, T.4 N., R.14 W., 500 ft below Rock Creek Dam, through a canal into Trout Creek.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	34.6	25.4	19.1	14.0	22.2	19.3	27.1	38.8	53.5	87.5	105	44.2	41.0

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2,130	1,510	1,170	861	1,230	1,190	1,610	2,390	3,180	5,380	6,440	2,630	29,720

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	-	-	-	-	-	-	36.1	26,150
1951	1216	196	Feb. 10, 1951	11	41.0	29,720	-	-

3295. Flint Creek at Maxville, Mont.

Location.--Lat 46°28'00", long 113°14'30", in NW $\frac{1}{4}$ sec.9, T.8 N., R.13 W., on right bank 0.4 mile west of Maxville and 1 mile upstream from Boulder Creek.

Drainage area.--208 sq mi.

Records available.--August 1941 to September 1960. April 1939 to September 1941 at site half a mile upstream (above Maxville siding), records not equivalent owing to diversions.

Gage.--Water-stage recorder. Datum of gage is 4,828.44 ft above mean sea level, datum of 1929.

Average discharge.--19 years (1941-60), 99.3 cfs (71,890 acre-ft per year).

Extremes.--1941-60: Maximum discharge, 1,680 cfs Mar. 28, 1943 (gage height, 6.79 ft), from rating curve extended above 600 cfs; minimum daily, 18 cfs Jan. 2, 3, 4, 1958.

Remarks.--Diversions for irrigation of about 8,200 acres above station. During irrigation season, flow is supplemented by water from East Fork Rock Creek which is diverted in sec.5, T.4 N., R.14 W., 500 ft below Rock Creek Dam, through a canal into Trout Creek, thence into Flint Creek. Some regulation by Georgetown Lake (see p. 230).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	79.6	86.3	77.2	57.2	85.2	82.1	107	189	202	162	132	84.6	112
1952	92.3	79.7	74.4	69.9	74.5	93.5	176	187	145	119	99.8	64.0	106
1953	57.6	62.8	48.3	60.4	41.2	46.5	69.1	119	331	141	94.8	84.1	96.3
1954	72.1	77.1	66.6	48.0	77.2	76.3	74.9	71.5	150	95.0	120	79.0	83.8
1955	74.5	51.6	38.5	27.0	28.9	35.5	86.3	106	171	210	114	104	87.3
1956	88.5	67.2	78.1	49.1	50.4	98.2	132	156	138	109	126	76.8	97.7
1957	73.7	59.1	48.9	36.5	53.5	58.7	62.5	155	170	99.8	111	94.9	85.4
1958	77.1	48.1	34.4	29.5	39.8	50.0	72.9	159	222	171	123	103	94.3
1959	78.6	79.4	70.9	60.9	50.5	90.3	114	90.7	165	100	98.2	105	91.9
1960	110	103	74.8	44.9	56.3	117	105	117	101	91.5	99.5	75.5	91.5

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	4,890	5,140	4,750	3,520	4,730	5,050	6,390	11,600	12,000	9,980	8,120	5,040	81,210
1952	5,670	4,740	4,570	4,300	4,280	5,750	10,470	11,480	8,600	7,330	8,140	3,810	77,140
1953	3,540	3,740	2,970	3,720	2,290	2,860	4,110	7,320	19,700	8,650	5,830	5,010	69,740
1954	4,430	4,590	4,090	2,950	4,290	4,690	4,450	4,400	8,900	5,840	7,350	4,700	60,680
1955	4,580	3,070	2,370	1,660	1,610	2,060	5,130	6,490	10,160	12,900	7,020	6,180	63,230
1956	5,440	4,000	4,600	3,020	2,900	6,040	7,850	9,620	8,240	6,680	7,750	4,570	70,910
1957	4,530	3,510	3,010	2,240	2,970	3,610	3,720	9,550	10,120	6,140	6,800	5,650	61,850
1958	4,740	2,860	2,110	1,810	2,210	3,070	4,340	9,790	13,190	10,490	7,550	6,130	68,290
1959	4,830	4,730	4,360	3,740	2,800	5,550	6,780	5,580	9,670	6,180	6,040	6,250	66,510
1960	6,790	6,130	4,600	2,760	3,240	7,180	6,280	7,200	6,020	5,630	6,120	4,490	66,440

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	-	-	-	-	-	-	97.1	70,320
1951	1216	480	Feb. 10, 1951	36	112	81,210	112	81,410
1952	1246	438	May 16, 1952	43	106	77,140	99.8	72,410
1953	1286	649	June 3, 1953	25	96.3	69,740	100	72,600
1954	1346	226	June 5, 1954	30	83.8	60,680	79.6	57,590
1955	1396	569	June 30, 1955	25	87.3	63,230	93.2	67,450
1956	1446	638	Mar. 24, 1956	35	97.7	70,910	93.3	67,720
1957	1516	426	May 20, 1957	20	85.4	61,850	83.6	60,510
1958	1566	468	June 25, 1958	18	94.3	68,290	100	72,500
1959	1636	381	Mar. 21, 1959	30	91.9	66,510	96.8	70,110
1960	1716	495	Mar. 23, 1960	30	91.5	66,440	-	-

3300. Boulder Creek at Maxville, Mont.

Location.--Lat 46°28'30", long 113°14'00", in SW $\frac{1}{4}$ (revised) sec.4, T.8 N., R.13 W., on right bank an eighth of a mile upstream from mouth and three-quarters of a mile north of Maxville.

Drainage area.--71.3 sq mi.

Records available.--April 1939 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Altitude of gage is 4,750 ft (from topographic map). Apr. 15, 1939, to July 7, 1941, wire-weight gage at site 75 ft upstream at different datum. July 8-20, 1941, staff gage at site 175 ft upstream at datum 1.03 ft higher.

Average discharge.--21 years (1939-60), 46.6 cfs (33,740 acre-ft per year).

Extremes.--1939-60: Maximum discharge, 764 cfs June 13, 1953; maximum gage height, 4.24 ft June 3, 1948; minimum discharge, 4.2 cfs Sept. 12, 13, 1954 (gage height, 0.74 ft).

Remarks.--Diversions for irrigation of about 350 acres, all of which lies 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	31.7	30.1	26.5	19.1	30.5	16.9	27.7	174	198	93.9	24.8	23.2	58.2
1952	28.0	25.5	24.2	20.3	19.3	19.5	47.6	148	121	43.4	14.9	14.8	43.9
1953	14.5	17.9	17.7	19.7	16.0	17.1	23.1	72.8	337	103	24.8	13.6	56.3
1954	17.0	19.6	19.4	17.1	19.2	19.1	23.5	98.3	114	50.1	15.4	10.8	35.3
1955	15.1	17.7	17.9	12.1	12.5	14.0	17.4	59.5	190	132	30.6	16.0	44.6
1956	24.2	17.5	17.6	15.6	14.5	16.5	48.6	166	135	42.1	15.8	6.7	43.4
1957	16.2	22.6	28.4	15.9	15.1	15.5	17.2	172	185	38.4	11.3	13.6	46.0
1958	24.4	22.0	18.4	16.6	18.6	17.5	23.8	180	141	61.3	22.6	12.8	46.8
1959	21.6	27.0	22.6	19.5	17.6	18.3	22.2	60.7	207	51.9	11.4	22.4	41.8
1960	51.1	36.0	26.6	17.5	19.0	19.4	34.3	75.4	131	28.3	14.9	12.6	38.8

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,950	1,790	1,630	1,180	1,690	1,040	1,650	10,720	11,780	5,780	1,520	1,380	42,110
1952	1,720	1,520	1,490	1,250	1,110	1,200	2,830	9,100	7,210	2,670	918	883	31,900
1953	889	1,070	1,090	1,210	887	1,050	1,370	4,480	20,080	6,330	1,530	807	40,790
1954	1,050	1,160	1,180	1,050	1,070	1,180	1,400	6,040	6,780	3,080	948	644	25,590
1955	926	1,050	1,100	742	694	861	1,030	3,660	11,300	8,090	1,880	950	32,280
1956	1,490	1,040	1,080	972	833	1,010	2,890	10,200	8,020	2,590	970	397	31,490
1957	999	1,360	1,740	978	837	950	1,020	10,560	10,990	2,360	674	811	33,280
1958	1,500	1,510	1,130	1,020	1,040	1,070	1,420	11,050	8,390	3,770	1,390	761	33,850
1959	1,330	1,610	1,390	1,200	980	1,160	1,320	3,730	12,290	5,190	700	1,330	30,230
1960	3,140	2,140	1,630	1,080	1,090	1,190	2,040	4,640	7,790	1,740	914	750	28,140

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	-	-	-	-	-	-	51.1	37,010
1951	1216	410	June 16, 1951	8	58.2	42,110	57.3	41,470
1952	1246	231	June 6, 1952	9.5	43.9	31,900	41.6	30,220
1953	1286	764	June 13, 1953	9.5	56.3	40,790	56.8	41,140
1954	1346	275	May 20, 1954	4.4	35.3	25,590	34.9	25,270
1955	1396	325	June 12, 16, 1955	10	44.6	32,280	45.3	32,820
1956	1446	388	May 22, 1956	-	43.4	31,490	44.0	31,980
1957	1516	429	May 31, 1957	-	46.0	33,280	45.8	33,120
1958	1566	433	May 21, 22, 1958	8.6	46.8	33,850	47.3	34,240
1959	1636	437	June 7, 1959	8.6	41.8	30,230	45.3	32,810
1960	1716	325	June 4, 1960	10	38.8	28,140	-	-

3320. Middle Fork Rock Creek near Philipsburg, Mont.

Location (revised).--Lat 46°12', long 113°30', in SE¹/₄ sec. 8, T.5 N., R.15 W., on right bank a quarter of a mile upstream from East Fork, 2½ miles upstream from West Fork, and 14 miles southwest of Philipsburg.

Drainage area.--123 sq mi.

Records available.--September 1937 to September 1960. Monthly discharge only January to March 1938, published in WSP 1316.

Gage.--Water-stage recorder. Altitude of gage is 5,380 ft, revised (from topographic map). Sept. 21, 1937, to May 10, 1942, wire-weight gage at site 600 ft upstream at different datum. May 11, 1942, to May 11, 1954, staff or wire-weight gages at site 400 ft downstream at different datum. May 12, 1954, to Sept. 30, 1955, at site 300 ft upstream at datum 5.74 ft higher.

Average discharge.--23 years (1937-60), 120 cfs (86,880 acre-ft per year).

Extremes.--1937-60: Maximum discharge, 1,430 cfs June 13, 1953 (gage height, 3.92 ft, site and datum then in use); minimum observed, 4.5 cfs Dec. 9, 10, 23, 24, 1944 (gage height, 0.02 ft, site and datum then in use).

Remarks.--A few small 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	63.1	65.5	48.6	30.0	36.0	32.5	81.4	538	516	229	96.6	60.5	150
1952	49.7	39.7	24.2	30.2	23.1	27.4	91.2	477	415	112	54.7	38.9	115
1953	32.5	29.1	35.3	39.3	22.4	25.6	39.8	137	618	222	62.8	41.0	109
1954	35.3	34.3	32.5	27.1	25.5	23.8	60.9	419	447	234	73.3	44.4	122
1955	41.7	38.0	30.5	22.1	21.7	22.7	37.5	194	574	325	104	57.2	123
1956	46.0	32.8	37.6	29.9	33.1	64.4	115	540	497	147	74.0	49.1	139
1957	42.5	38.9	38.5	24.7	26.9	26.4	30.8	405	468	137	60.3	42.6	112
1958	41.5	30.4	28.5	25.4	27.6	27.0	43.2	504	369	154	70.5	46.8	115
1959	44.4	46.1	33.8	22.8	16.5	23.5	59.1	193	522	162	65.9	54.9	104
1960	74.5	61.0	47.1	23.2	30.2	43.2	95.5	223	411	116	56.7	41.4	102

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	3,880	3,900	2,990	1,850	2,000	2,000	4,840	33,090	30,680	14,050	5,940	3,600	108,800
1952	3,080	2,360	1,490	1,860	1,350	1,690	5,420	29,350	24,680	6,910	3,360	2,310	83,820
1953	2,000	1,750	2,170	2,420	1,250	1,570	2,370	8,400	36,800	13,600	3,860	2,440	78,670
1954	2,170	2,040	2,000	1,660	1,420	1,460	3,620	25,790	26,600	14,370	4,510	2,640	88,280
1955	2,560	2,260	1,880	1,360	1,210	1,390	2,230	11,910	34,170	20,000	6,390	3,400	88,760
1956	2,830	1,950	2,310	1,840	1,900	3,960	6,830	33,230	29,560	9,060	4,550	2,920	100,900
1957	2,610	2,310	2,370	1,520	1,490	1,620	1,830	24,910	27,830	8,450	3,710	2,540	81,190
1958	2,550	1,810	1,750	1,560	1,530	1,660	2,570	30,990	21,950	9,480	4,330	2,790	82,970
1959	2,730	2,750	2,080	1,400	918	1,450	3,510	11,890	31,040	9,960	4,050	3,270	75,050
1960	4,580	3,630	2,900	1,430	1,740	2,660	5,680	13,730	24,440	7,140	3,480	2,460	73,870

Yearly 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	-	-	-	-	-	-	-	-	162	17.90	117,500
1951	1216	1,180	May 28, 1951	15	150	1.22	16.59	108,800	145	16.01	105,000
1952	1246	884	June 6, 1952	8.0	115	.935	12.77	83,820	114	12.61	82,810
1953	1268	1,430	June 13, 1953	5.3	109	.886	11.99	78,670	109	12.03	78,960
1954	1346	998	May 21, 1954	10	122	.992	13.44	88,280	123	13.52	86,770
1955	1396	824	June 12, 1955	10	123	1.00	13.53	88,760	123	13.59	89,150
1956	1446	1,220	May 25, 1956	10	139	1.13	15.39	100,900	139	15.42	101,100
1957	1516	999	June 3, 1957	13	112	.911	12.39	81,190	111	12.22	80,010
1958	1566	1,220	May 25, 1958	18	115	.935	12.65	82,970	117	12.87	84,420
1959	1636	870	June 15, 1959	10	104	.846	11.45	75,050	109	11.98	76,600
1960	1716	836	June 4, 1960	10	102	.829	11.27	73,870	-	-	-

3325. East Fork Rock Creek Reservoir near Philipsburg, Mont.

Location.--Lat 46°08'00", long 113°23'00", in NE $\frac{1}{4}$ sec.6, T.4 N., R.14 W., at dam on East Fork Rock Creek, 14 miles southwest of Philipsburg.

Drainage area.--30.3 sq mi.

Records available.--October 1939 to April 1960 (records fragmentary and incomplete after 1946). Records for October 1955 to April 1956, published in WSP 1446, have been found to be in error and should not be used.

Gage.--Elevations determined by hand levels from reference points. Datum is at mean sea level (levels by Montana Water Conservation Board).

Extremes.--1938-60: Maximum contents observed, in excess of 16,000 acre-ft when reservoir was full and spilling at times in several years; no storage Sept. 1, 1955.

Remarks.--Reservoir is formed by earthfill dam with concrete spillway completed in 1937. Usable contents, 16,000 acre-ft at elevation 6,055.5 ft. Dead storage unknown. Water is used for irrigation and recreation. Figures given herein represent usable contents.

Cooperation.--Records furnished by Montana Water Conservation Board.

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

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	-	-	-	-	-	-	-	16,000	16,000	15,800	11,750	8,900
1952	-	-	-	-	-	-	-	14,710	13,350	9,530	6,290	4,250
1953	-	-	-	-	-	-	-	7,660	13,710	11,280	6,640	4,320
1954	-	-	-	-	-	-	-	10,530	11,480	9,680	-	-
1955	-	-	-	-	-	-	16,000	-	-	-	0	2,620
1956	-	-	-	-	-	-	-	14,460	14,520	12,220	6,090	3,830
1957	-	-	-	-	-	-	-	14,900	11,120	5,780	1,690	-
1958	-	-	-	-	-	-	-	214,100	16,040	15,630	10,860	5,100
1959	-	-	-	-	-	-	-	-	-	-	-	-
1960	-	-	-	-	-	610,300	610,800	-	-	-	-	-

a Contents June 3.

b Contents Mar. 22.

c Contents Apr. 28.

3350. Blackfoot River near Helmville, Mont.

Location.--Lat 46°56'10", long 112°56'30", in NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.25, T.14 N., R.11 W., on right bank 50 ft downstream from highway bridge, 2 miles downstream from Arrastre Creek, and 5 miles northeast of Helmville.

Drainage area.--481 sq mi.

Records available.--September 1940 to October 1953.

Gage.--Water-stage recorder. Datum of gage is 4,301.29 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark).

Average discharge.--13 years (1940-53), 352 cfs (254,800 acre-ft per year).

Extremes.--1940-53: Maximum discharge, 6,040 cfs June 5, 1953 (gage height, 9.10 ft); minimum daily, 50 cfs Jan. 3, 1950.

Remarks.--Flow includes natural overflow channel on left bank, but does not include unnamed diversions past station. Diversions above station for irrigation of about 2,000 acres, of which 500 acres lies 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	199	191	180	156	166	150	382	1,865	1,502	782	330	236	512
1952	212	180	148	141	137	138	476	1,532	748	324	199	166	369
1953	145	154	124	127	119	117	141	793	2,732	765	270	168	471
1954	169	-	-	-	-	-	-	-	-	-	-	-	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	12,220	11,590	11,090	9,590	9,200	9,250	22,750	114,700	89,360	46,840	20,270	14,020	370,700
1952	13,030	10,690	9,110	8,660	7,900	8,510	28,320	94,210	44,530	19,900	12,220	9,900	267,000
1953	8,920	7,980	7,640	7,820	6,630	7,180	8,390	48,740	162,500	47,020	16,610	11,200	340,600
1954	10,390	-	-	-	-	-	-	-	-	-	-	-	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year					
		Momentary maximum			Minimum			Runoff			Runoff		
		Discharge	Date		day	Mean	Per square mile	Inches	Acre-feet	Mean	Inches	Acre-feet	
1950	-	-	May 25, 1951		110	-	-	-	-	412	11.63	298,400	
1951	1218	2,540	May 17, 1952		130	512	1.06	14.44	370,700	509	14.38	388,800	
1952	1248	2,480	June 5, 1953		100	368	.765	10.43	267,000	356	10.10	258,700	
1953	1286	6,040	-		-	471	.979	13.29	340,600	-	-	-	
1954	1286	-	-		-	-	-	-	-	-	-	-	

3355. Nevada Creek above reservoir, near Finn, Mont.

Location.--Lat 46°46'30", long 112°45'20", near south line of sec.20, T.12 N., R.9 W., on right bank a quarter of a mile downstream from Gallagher Creek, 2 miles upstream from Buffalo Creek, and 3 miles west of Finn.

Drainage area.--116 sq mi.

Records available.--April 1939 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 4,660 ft (river-profile survey). Prior to Apr. 30, 1942, wire-weight gage at site seven-eighths of a mile downstream at different datum. Apr. 30, 1942, to July 26, 1953, water-stage recorder at site 1 mile downstream at different datum.

Average discharge.--21 years (1939-60), 36.4 cfs (26,350 acre-ft per year).

Extremes.--1939-60: Maximum discharge, 1,800 cfs June 2, 1953 (gage height, 6.00 ft, site and datum then in use), from rating curve extended above 400 cfs on basis of inflow-outflow study of Nevada Creek Reservoir; maximum gage height, 7.40 ft May 29, 1953, site and datum then in use (backwater from diversion dam); minimum discharge, probably less than 2 cfs at times in 1944 and 1957.

Remarks.--Diversions for irrigation of about 2,900 acres (corrected) 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	17.5	17.7	16.7	11.6	26.1	35.6	154	227	126	39.7	20.1	19.2	59.4
1952	23.5	21.7	14.0	12.3	11.5	10.9	196	202	44.7	18.7	11.2	10.4	48.1
1953	11.6	12.7	11.8	19.4	15.4	20.0	31.0	125	294	21.0	11.5	6.99	48.2
1954	11.3	13.7	11.3	9.8	13.4	17.5	57.1	101	105	27.9	14.3	7.55	32.5
1955	14.5	14.0	9.8	5.9	6.42	9.65	26.8	60.6	75.5	96.5	27.6	6.39	29.8
1956	14.2	13.0	20.2	11.5	10.7	26.9	73.7	134	48.7	29.1	12.1	9.68	33.8
1957	13.3	14.9	15.7	4.2	21.2	29.1	49.3	143	46.6	11.5	9.08	6.75	30.6
1958	8.79	8.26	6.92	4.7	9.1	22.5	47.8	139	103	22.6	9.87	6.21	32.5
1959	10.6	13.1	13.3	10.0	10.7	22.6	112	116	167	25.0	15.2	14.9	44.1
1960	32.2	22.8	18.4	17.5	14.6	112	77.6	116	66.2	14.2	9.76	9.27	42.7

† 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	1,070	1,060	1,030	714	1,450	2,190	9,180	13,970	7,510	2,440	1,240	1,140	42,990
1952	1,450	1,290	859	758	662	668	11,660	12,440	2,660	1,150	687	618	34,900
1953	713	754	728	1,190	854	1,230	1,840	7,700	17,470	1,290	708	416	34,890
1954	695	817	692	601	742	1,070	3,400	6,220	6,240	1,710	881	449	23,520
1955	890	831	601	365	468	594	1,600	3,730	4,490	5,930	1,700	380	21,580
1956	873	776	1,240	710	617	1,660	4,380	8,270	2,900	1,790	745	576	24,540
1957	818	885	969	256	1,180	1,790	2,930	8,770	2,890	708	559	402	22,150
1958	540	491	419	290	506	1,380	2,840	8,570	6,150	1,390	607	369	23,550
1959	654	780	817	617	595	1,390	6,670	7,140	9,910	1,540	935	886	31,930
1960	1,980	1,360	1,130	1,070	837	6,860	4,620	7,140	3,940	874	600	552	30,960

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	-	-	-	-	-	-	41.3	29,870	
1951	1216	-	-	4	59.4	42,990	60.0	43,450	
1952	1246	610	Apr. 14, 1952	7.8	48.1	34,900	46.2	33,500	
1953	1286	1,800	June 2, 1953	4.8	48.2	34,890	48.2	34,900	
1954	1346	280	May 20, 1954	4	32.5	23,520	32.6	23,640	
1955	1396	416	July 12, 1955	3	29.8	21,580	30.6	22,150	
1956	1446	297	May 22, 1956	4	33.8	24,540	33.5	24,320	
1957	1516	346	May 21, 1957	2	30.6	22,150	28.9	20,930	
1958	1566	477	June 10, 1958	3	32.5	23,550	33.6	24,350	
1959	1636	690	Apr. 1, 1959	5	44.1	31,930	47.2	34,150	
1960	1716	806	Mar. 25, 1960	5.9	42.7	30,960	-	-	

3365. Nevada Creek Reservoir near Finn, Mont.

Location.--Lat 46°48', long 112°49', in NE $\frac{1}{4}$ sec.14, T.12 N., R.10 W., at dam on Nevada Creek, 7 miles west of Finn.

Drainage area.--145 sq mi.

Records available.--October 1939 to September 1960 (incomplete in 1948, 1950-58).

Gage.--Elevations determined by hand levels from spillway. Datum is at mean sea level (levels by Montana Water Conservation Board).

Extremes.--1939-60: Maximum contents observed, 13,520 acre-ft June 3, 1953 (elevation, 4,618.3 ft); minimum, 1,680 acre-ft Sept. 30, 1941 (elevation, 4,576.1 ft).

Remarks.--Reservoir is formed by earthfill dam with concrete spillway completed in 1938. Usable capacity, 12,640 acre-ft (corrected) at elevation 4,616.0 ft. Dead storage, 12 acre-ft below elevation 4,551.5 ft. Water is used for irrigation and recreation. Figures given herein represent usable contents.

Cooperation.--Records furnished by Montana Water Conservation Board.

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

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	-	-	-	-	-	-	-	12,900	12,000	11,900	11,150	6,750
1952	2,810	-	2,550	2,200	-	-	10,800	11,200	9,620	9,260	8,680	6,570
1953	-	-	-	4,840	5,100	5,500	6,000	11,500	12,000	-	-	4,500
1954	-	-	-	-	-	-	-	-	a10,140	-	-	-
1955	-	-	-	-	-	-	b7,000	-	c13,000	-	-	7,500
1956	-	-	-	-	-	-	-	12,740	10,000	10,050	6,600	3,500
1957	3,500	3,500	3,500	3,500	3,500	3,500	3,500	10,430	10,630	9,810	5,870	-
1958	-	-	-	-	-	-	-	12,640	11,800	10,660	7,880	4,590
1959	4,590	4,590	4,590	3,420	3,420	3,200	3,420	10,480	10,480	11,520	8,500	7,840
1960	6,000	6,000	6,000	6,000	7,290	12,260	11,160	12,640	10,480	10,480	7,290	7,290

a June 22.

b Apr. 22.

c June 7.

3385. Blackfoot River near Ovando, Mont.

Location.--Lat 47°01'10", long 113°13'40", in SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.34, T.15 N., R.13 W., on left bank a quarter of a mile upstream from Monture Creek and 5 miles west of Ovando.

Drainage area.--1,274 sq mi.

Records available.--September 1940 to September 1960. Monthly discharge only for September 1940, published in WSP 1316.

Gage.--Water-stage recorder. Datum of gage is 3,917.27 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark).

Average discharge.--20 years (1940-60), 871 cfs (630,600 acre-ft per year).

Extremes.--1940-60: Maximum discharge, 14,600 cfs June 4, 1953 (gage height, 8.45 ft); minimum daily, 100 cfs Jan. 20, 1954.

Floodmarks indicate stage of 10 ft reached in recent years, prior to 1940.

Remarks.--Diversions for irrigation of about 15,000 acres above station.

Monthly and yearly mean discharge, in cubic feet per second, of Blackfoot River near Ovando, Mont.

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	464	510	454	562	413	383	1,148	4,372	3,467	1,838	732	585	1,232
1952	589	451	355	311	298	299	1,330	3,621	1,776	738	421	362	881
1953	325	276	247	276	274	283	315	1,756	6,604	1,725	599	416	1,089
1954	370	345	312	241	279	284	560	3,123	3,654	1,995	623	441	1,022
1955	393	370	302	273	241	227	384	1,336	3,134	1,718	687	395	790
1956	364	318	288	292	255	382	751	3,294	3,147	1,013	546	389	921
1957	372	344	321	222	262	558	453	3,404	2,472	716	401	355	810
1958	348	318	279	222	254	291	476	3,053	2,762	879	464	369	814
1959	360	386	405	340	305	435	1,153	2,568	4,917	1,475	623	565	1,111
1960	785	760	573	364	331	555	1,120	1,902	2,312	715	467	399	857

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	28,550	30,370	27,930	22,250	22,940	23,550	68,310	268,800	206,300	113,000	45,010	34,820	891,800
1952	36,200	26,830	21,850	19,120	17,120	18,410	79,160	222,700	105,700	45,400	25,860	21,540	639,900
1953	19,960	16,440	15,200	17,000	15,220	17,430	18,770	108,000	393,000	106,100	36,840	24,730	788,700
1954	22,730	20,550	19,170	14,820	15,490	17,480	33,350	192,000	217,400	122,700	38,310	26,230	740,200
1955	24,190	22,040	18,590	16,760	13,390	13,950	22,820	82,160	186,500	105,700	42,270	23,490	571,900
1956	22,360	18,890	17,730	17,950	14,680	23,510	44,700	202,500	187,300	62,270	33,570	23,130	668,600
1957	22,890	20,450	19,710	13,650	14,540	22,030	26,960	209,300	147,100	44,030	24,670	21,110	586,400
1958	21,380	18,950	17,150	13,640	14,100	17,880	28,330	187,700	165,500	54,020	28,550	21,930	589,100
1959	22,150	22,980	24,890	20,890	16,920	26,760	68,630	145,600	292,600	90,700	36,300	33,630	804,000
1960	48,240	45,220	35,250	22,390	19,060	34,120	66,630	116,900	137,600	43,960	28,700	23,740	621,800

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		Mean	Inches	Acre-feet
		Discharge	Date										
1950	-	-	-	-	-	-	-	-	-	-	1,026	10.93	742,400
1951	1216	6,080	May 24, 1951	200	1,232	0.967	13.13	891,800	1,229	13.10	889,900	836	8.90
1952	1246	4,790	May 18, 1952	253	881	.692	9.40	639,900	836	8.90	606,600	836	8.90
1953	1286	14,600	June 4, 1953	219	1,089	.855	11.59	788,700	1,104	11.75	799,500	836	8.90
1954	1346	7,040	May 21, 1954	100	1,022	.802	10.90	740,200	1,026	10.94	742,600	836	8.90
1955	1396	4,450	June 14, 1955	160	790	.620	8.43	517,900	782	8.35	566,000	836	8.90
1956	1446	6,340	May 24, 1956	160	921	.723	9.85	668,600	927	9.91	672,700	836	8.90
1957	1516	5,530	May 21, 1957	130	810	.636	8.63	586,400	802	8.54	580,900	836	8.90
1958	1566	5,290	June 12, 1958	170	814	.639	8.67	589,100	831	8.67	601,700	836	8.90
1959	1636	6,850	June 7, 1959	200	1,111	.872	11.83	804,000	1,192	12.69	882,700	836	8.90
1960	1716	4,300	June 4, 1960	200	857	.673	9.15	621,800	-	-	-	-	-

3398. Blackfoot River near Potomoc, Mont.

Location.--Lat 46°57'10", long 113°34'00", in NE 1/4 sec. 24, T.14 N., R.16 W., on right bank an eighth of a mile upstream from Belmont Creek and 5 miles north of Potomac.

Drainage area.--2,046 sq mi.

Records available.--October 1956 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 3,533.36 ft above mean sea level, datum of 1929 (levels by Bureau of Reclamation).

Extremes.--1956-60: Maximum discharge, 10,900 cfs June 15, 1959 (gage height, 8.54 ft); minimum daily, 300 cfs Jan. 4, 1958.

Flood in June 1953 reached a stage of about 12.5 ft, from floodmarks (discharge, about 17,000 cfs).

Remarks.--Diversion for irrigation of about 18,000 acres 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
1957	557	543	529	404	394	538	1,095	6,198	3,972	1,107	602	514	1,378
1958	512	457	419	346	390	463	1,228	5,650	4,561	1,446	667	544	1,397
1959	579	667	715	601	526	692	2,223	4,146	7,958	2,375	934	854	1,655
1960	1,379	1,275	954	609	598	817	2,680	3,087	3,905	1,156	682	556	1,473

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957	34,260	32,330	32,550	24,850	21,890	33,090	65,180	381,100	236,300	68,100	37,000	30,610	997,300
1958	31,470	27,180	25,786	21,250	21,630	28,500	73,080	347,400	272,600	88,910	41,020	32,390	1,011,000
1959	35,670	39,690	43,940	36,950	29,200	42,550	132,300	265,000	447,500	146,000	57,430	49,620	1,342,000
1960	84,780	75,860	58,680	37,470	34,370	50,230	159,500	189,800	32,400	71,060	41,960	33,080	1,069,000

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		Mean	Inches	Acre-feet
		Discharge	Date										
1957	1516	8,430	May 23, 1957	340	1,378	0.674	9.14	997,300	1,357	9.01	982,600	836	8.90
1958	1566	8,560	May 23, 1958	300	1,397	.683	9.27	1,011,000	1,445	9.58	1,046,000	836	8.90
1959	1636	10,900	June 15, 1959	350	1,853	.906	12.30	1,342,000	1,992	13.23	1,442,000	836	8.90
1960	1716	6,330	June 4, 1960	400	1,473	.720	9.79	1,069,000	-	-	-	-	-

3400. Blackfoot River near Bonner, Mont.

Location.--Lat 46°53'50", long 113°45'20", near center of sec.9, T.13 N., R.17 W., on right bank 5 miles northeast of Bonner, 5 miles downstream from Union Creek, and 7 miles upstream from mouth.

Drainage area.--2,290 sq mi; at site used prior to October 1939, 2,316 sq mi; at site used October 1939 to September 1955, 2,294 sq mi.

Records available.--July to November 1898, March 1899 to September 1901, May 1903 to January 1905, March to October 1905, October 1939 to September 1960. Monthly discharge only for some periods, published in WSP 1316. Published as "at Bonner" 1898-99 and as Big Blackfoot River near Bonner 1903-5.

Gage.--Water-stage recorder. Datum of gage is 3,344.76 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. July 7, 1898, to June 30, 1901, and May 16, 1903, to Oct. 31, 1905, chain gage at site 7 miles downstream at different datum. Oct. 4, 1939, to Sept. 30, 1955, staff gage at site 1.3 miles downstream at datum 21.82 ft lower.

Average discharge.--24 years (1899-1901, 1903-4, 1939-60), 1,609 cfs (1,165,000 acre-ft per year).

Extremes.--1898-1901, 1903-5, 1939-60: Maximum discharge, 18,300 cfs June 4, 1953 (gage height, 11.65 ft, from graph based on gage readings, site and datum then in use); minimum daily determined, 200 cfs Jan. 4, 5, 1950.

Remarks.--Diversions for irrigation of about 20,000 acres above station. Records of water temperatures for the period October 1955 to September 1959 are published in reports of 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	756	989	858	747	921	804	2,907	7,981	5,634	2,759	1,151	943	2,210
1952	959	788	619	542	560	536	3,227	6,772	3,130	1,215	748	558	1,641
1953	510	516	478	569	591	585	899	3,580	9,114	2,626	956	707	1,759
1954	607	590	557	502	527	593	1,516	6,178	5,878	3,209	1,006	792	1,836
1955	718	647	595	535	491	469	797	3,307	5,306	2,849	1,101	694	1,463
1956	621	607	617	661	539	840	2,840	6,870	5,633	1,796	924	644	1,884
1957	619	609	645	521	516	692	1,241	7,166	4,681	1,222	677	603	1,574
1958	604	557	547	411	483	591	1,460	5,995	4,730	1,447	739	636	1,522
1959	692	828	871	709	696	891	3,118	5,572	8,780	2,656	1,079	965	2,238
1960	1,547	1,480	1,233	764	664	1,115	3,067	3,655	4,162	1,312	749	616	1,696

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	46,490	58,860	52,740	45,950	51,150	49,480	175,000	490,700	335,200	169,600	70,740	56,130	1,600,000
1952	58,990	46,870	38,060	33,320	32,210	32,950	192,000	416,400	186,200	74,720	46,010	33,210	1,191,000
1953	31,350	30,750	29,400	34,990	32,840	35,980	53,470	220,100	542,500	161,500	58,810	42,060	1,274,000
1954	37,310	35,110	34,220	30,850	29,270	36,480	90,240	379,900	349,800	197,300	61,840	47,160	1,329,000
1955	44,160	38,520	36,560	32,910	27,290	28,810	47,430	203,400	351,700	175,200	67,710	41,270	1,059,000
1956	38,200	36,100	37,940	40,620	31,020	51,670	169,000	422,400	335,200	110,400	56,830	38,310	1,368,000
1957	38,040	36,270	39,660	32,050	28,640	42,580	73,870	440,600	255,000	75,130	41,620	35,890	1,139,000
1958	37,120	33,140	33,630	25,290	26,850	36,360	86,880	568,600	281,500	88,970	45,430	37,620	1,102,000
1959	42,560	49,260	53,560	43,560	38,670	54,760	185,500	342,600	522,400	163,300	66,540	57,400	1,620,000
1960	35,110	68,050	75,790	46,990	38,180	68,530	182,500	224,800	247,700	80,680	46,080	36,640	1,231,000

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	1216	11,000	May 13, 1951	400	2,210	0.963	13.08	1,600,000	1,910	11.31	1,383,000	
1952	1246	8,820	Apr. 29, 1952	360	1,641	.715	9.72	1,191,000	2,191	12.96	1,586,000	
1953	1268	18,300	June 4, 1953	450	1,759	.767	10.41	1,274,000	1,568	9.30	1,138,000	
1954	1346	13,300	May 21, 1954	300	1,836	.800	10.88	1,328,000	1,780	10.53	1,289,000	
1955	1396	7,060	June 14, 1955	420	1,463	.638	8.65	1,059,000	1,854	10.98	1,342,000	
1956	1446	12,100	May 22, 1956	412	1,884	.823	11.18	1,368,000	1,453	8.60	1,052,000	
1957	1516	10,100	May 12, 1957	377	1,574	.687	9.32	1,139,000	1,886	11.19	1,369,000	
1958	1566	9,110	May 23, 1958	370	1,522	.665	9.02	1,102,000	1,560	9.24	1,129,000	
1959	1636	12,200	June 7, 1959	400	2,238	.977	13.28	1,620,000	1,579	9.36	1,143,000	
1960	1716	6,880	June 4, 1960	448	1,696	.741	10.07	1,231,000	2,395	14.21	1,735,000	

3405. Clark Fork above Missoula, Mont.

Location.--Lat 46°52'40", long 113°55'40", in NW¼ sec.19, T.13 N., R.18 W., on right bank 3 miles downstream from Blackfoot River and 3 miles east of Missoula.

Drainage area.--5,999 sq mi.

Records available.--March 1929 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Altitude of gage is 3,230 ft (from topographic map). Prior to May 27, 1929, staff gage at same site and datum.

Average discharge.--31 years (1929-60), 2,827 cfs (2,047,000 acre-ft per year).

Extremes.--1929-60: Maximum discharge, 31,500 cfs May 23, 1948 (gage height, 13.07 ft); minimum, 115 cfs Oct. 25, 1943 (gage height, 0.64 ft, powerplant shutdown); minimum daily, 340 cfs Sept. 27, 1937.

Remarks.--Diurnal fluctuation caused by powerplant at Bonner. Diversions for irrigation of about 120,000 acres 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	1,956	2,111	1,928	1,616	2,239	2,073	5,250	14,060	10,430	5,069	2,205	2,078	4,260
1952	2,218	1,928	1,579	1,347	1,461	1,644	6,193	12,210	5,849	2,461	1,377	1,312	3,303
1953	1,319	1,331	1,257	1,568	1,436	1,470	1,947	5,692	16,290	4,224	1,717	1,447	3,302
1954	1,392	1,447	1,386	1,190	1,525	1,561	2,871	8,970	8,841	4,668	1,811	1,515	3,106
1955	1,556	1,478	1,184	1,163	1,119	1,133	1,988	5,550	9,989	6,374	2,012	1,342	2,831
1956	1,552	1,519	2,060	1,458	1,174	2,691	5,685	12,050	9,127	3,177	1,765	1,444	3,646
1957	1,535	1,576	1,562	1,046	1,401	1,802	2,502	11,160	7,677	2,158	1,233	1,285	2,920
1958	1,563	1,468	1,340	1,163	1,318	1,527	2,660	10,600	8,450	3,246	1,438	1,445	3,043
1959	1,621	1,674	1,979	1,745	1,554	2,278	5,154	8,222	13,090	3,862	1,705	1,855	3,744
1960	2,987	2,852	2,298	1,573	1,578	2,812	5,279	6,618	7,082	2,140	1,499	1,443	3,178

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	120,300	125,600	118,600	99,350	124,300	127,500	312,400	864,800	620,500	311,700	135,600	123,700	3,084,000
1952	136,400	114,700	97,080	82,810	84,040	101,100	368,500	751,000	348,000	151,300	84,690	78,050	2,398,000
1953	81,080	79,220	77,280	96,420	79,780	90,390	115,900	350,000	969,400	259,700	105,600	86,120	2,391,000
1954	85,610	86,120	85,230	73,180	84,670	97,230	170,800	551,000	526,100	287,000	111,300	90,170	2,249,000
1955	95,680	87,950	72,790	71,500	62,130	69,660	118,300	341,300	334,900	591,900	123,700	79,850	2,050,000
1956	95,420	90,390	126,700	89,650	67,540	165,500	338,300	740,600	543,100	195,300	108,500	85,940	2,647,000
1957	94,410	93,760	96,070	64,320	77,810	110,800	148,900	586,200	456,800	132,700	75,840	76,440	2,114,000
1958	96,120	87,370	82,370	71,500	73,070	93,900	170,200	551,900	502,800	99,600	88,420	86,000	2,203,000
1959	99,650	111,500	121,700	107,300	86,280	140,100	306,700	505,500	778,900	237,500	104,800	110,400	2,710,000
1960	163,600	169,700	141,300	96,710	90,850	172,900	314,100	407,000	421,400	131,600	92,170	85,860	2,307,000

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30				Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean
		Discharge	Date				
1950	-	-	-	-	-	-	3,673
1951	1216	20,400	May 15, 1951	800	4,260	3,084,000	4,238
1952	1246	15,500	May 16, 1952	950	3,303	2,398,000	3,151
1953	1286	26,900	June 4, 1953	500	3,302	2,391,000	3,329
1954	1346	17,900	May 21, 1954	655	3,106	2,249,000	3,106
1955	1396	13,900	May 23, 1955	850	2,831	2,050,000	2,908
1956	1446	21,200	May 23, 1956	600	3,646	2,647,000	3,607
1957	1516	18,900	May 21, 1957	600	2,920	2,114,000	2,895
1958	1566	16,800	May 22, 1958	700	3,043	2,203,000	3,136
1959	1636	20,300	June 7, 1959	850	3,744	2,710,000	3,967
1960	1716	12,100	May 14, 1960	750	3,178	2,307,000	-

3410. Rattlesnake Creek at Missoula, Mont.

Location.--Lat 46°52'20", long 113°59'00", in SW 1/4 sec. 22, T.13 N., R.19 W., on upstream side of Vine Street Bridge in Missoula, half a mile upstream from mouth.

Drainage area.--79.7 sq mi.

Records available.--June to December 1899, January to November 1900 (gage heights and discharge measurements only), April 1958 to September 1960. Monthly discharge only for December 1899, published in WSP 1316.

Gage.--Wire-weight gage. Altitude of gage is 3,220 ft (from topographic map). June 1899 to November 1900 at or near present site at different datum.

Extremes.--1899, 1958-60: Maximum discharge observed, 2,050 cfs June 18, 1899 (gage height, 6.25 ft, site and datum then in use); minimum observed, 3.2 cfs Aug. 30, 1958 (gage height, 6.73 ft).

Maximum discharge known, 2,400 cfs June 6, 1948, by computation of flow over dam 4 miles upstream.

Remarks.--Many small diversions above station for irrigation of about 300 acres. Diversion above station of about 16,000 acre-ft per year for municipal water supply for Missoula.

Monthly and 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	-	-	-	-	-	-	-	725	250	43.5	6.44	7.05	-
1959	10.6	36.7	38.7	28.6	22.6	27.3	128	357	578	123	20.3	36.9	118
1960	161	76.0	45.6	16.5	16.9	52.9	181	265	365	40.1	16.1	7.00	104

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1958	-	-	-	-	-	-	-	44,610	14,870	2,680	396	420	-
1959	655	2,180	2,380	1,760	1,250	1,680	7,620	21,930	34,410	7,870	1,250	2,200	85,180
1960	9,920	4,520	2,800	1,010	974	3,250	10,760	16,280	21,740	2,460	991	417	75,120

Yearly 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
1958	1566	1,770	May 13, 1958	-	-	-	-	-	-	-	-
1959	1656	21,200	June 14, 1959	3.5	118	*1.48	20.01	85,180	134	*22.84	97,210
1960	1716	2720	June 4, 1960	3.8	104	*1.30	17.67	75,120	-	-	-

* Not previously published.
a Maximum observed.

PEND OREILLE RIVER BASIN

3420. Painted Rocks Lake near Conner, Mont.
(Formerly published as West Fork Bitterroot River Reservoir near Conner)

Location.--Lat 45°43', long 114°17', in SW¼ sec.26, T.1 S., R.22 W., at dam on West Fork Bitterroot River, 7 miles upstream from Nez Perce Creek and 23 miles south of Darby.

Drainage area.--317 sq mi.

Records available.--June 1940 to September 1960 (incomplete 1956-58, 1960). Prior to October 1959, published as West Fork Bitterroot River Reservoir near Conner.

Gage.--Elevations determined by hand levels from spillway or from markings painted on wall above spillway. Datum of gage is at mean sea level (levels by Montana Water Conservation Board).

Extremes.--1940-60: Maximum contents observed, 33,580 acre-ft May 13, 1960 (elevation, 4,728.20 ft); no storage October 1940 to January 1941, March 1952, March, April 1954.

Remarks.--Reservoir is formed by earthfill dam with concrete spillway completed in 1940.

Usable capacity, 31,700 acre-ft at elevation 4,725.5 ft. Dead storage, 656 acre-ft below elevation 4,625.5 ft. Water is used for irrigation and recreation. Figures given herein represent usable contents, except some contents prior to September 1958 may be total.

Cooperation.--Records and capacity table furnished by Montana Water Conservation Board prior to December 1958. Monthly readings made by Geological Survey personnel thereafter.

Correction.--In WSP 1316, the contents for September 1949 is listed in error; it should be 24,480 acre-ft.

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

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	17,640	10,000	10,000	10,000	10,000	10,360	21,100	32,000	32,000	32,000	32,000	31,060
1952	11,360	12,500	13,500	15,000	12,000	0	15,790	32,490	32,400	32,140	32,000	27,710
1953	14,000	10,000	10,000	10,000	10,000	10,000	19,690	32,920	32,630	32,090	31,920	31,860
1954	31,860	30,000	20,000	12,000	6,000	0	0	32,690	32,530	32,000	32,000	27,000
1955	26,000	25,000	25,000	25,000	25,000	25,000	25,000	32,630	31,700	31,700	31,700	31,700
1956	-	-	-	-	20,000	20,000	20,000	31,700	31,700	31,700	31,700	31,700
1957	-	-	-	-	-	31,700	31,700	31,700	31,700	29,000	28,000	28,000
1958	-	-	-	-	-	-	-	32,800	32,230	31,700	29,000	24,600
1959	24,600	26,140	28,980	25,290	22,550	23,880	32,360	32,740	32,350	31,960	27,700	24,810
1960	-	b29,280	-	-	-	13,720	32,820	31,840	32,250	31,970	26,890	24,830

* Not previously published.

a Contents June 29.

b Contents Dec. 2.

Note.--Prior to December 1958, figures may be usable or total contents.

3425. West Fork Bitterroot River near Conner, Mont.

Location.--Lat 45°44', long 114°17', in NE¼ sec.26, T.1 S., R.22 W., on right bank half a mile downstream from Painted Rocks Lake (formerly West Fork Bitterroot River Reservoir), 6 miles upstream from Nez Perce Creek, and 16 miles southwest of Conner.

Drainage area.--317 sq mi.

Records available.--April 1941 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 4,560 ft (by barometer).

Average discharge.--19 years (1941-60), 294 cfs (212,800 acre-ft per year).

Extremes.--1941-60: Maximum discharge, 4,060 cfs May 9, 1947 (gage height, 6.18 ft); minimum, 0.2 cfs Nov. 25, 1942; minimum daily, 0.6 cfs May 3-7, 1954.

Remarks.--Flow regulated by Painted Rocks Lake (see above station). Diversions for irrigation of about 200 acres 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	258	209	98.7	86.0	85.6	87.8	310	1,285	875	285	114	114	317
1952	365	66.5	57.2	57.5	90.6	277	377	1,159	790	215	106	258	319
1953	312	123	55.3	62.1	63.6	79.0	73.7	451	1,549	373	110	69.7	277
1954	64.2	91.4	215	198	177	179	265	562	603	300	117	146	243
1955	90.9	81.0	77.3	75.9	76.6	72.7	118	554	1,210	478	149	124	259
1956	137	79.1	82.0	82.0	84.4	84.5	719	1,743	902	223	125	102	364
1957	204	88.9	104	24.5	215	65.8	25.1	1,065	769	173	133	87.6	267
1958	177	139	27.8	112	123	99.4	95.5	1,319	594	203	188	98.1	266
1959	72.2	72.0	80.7	122	119	79.9	270	969	1,332	250	159	161	307
1960	87.3	179	270	171	71.7	74.4	235	960	1,048	178	169	104	296

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	14,650	12,460	6,070	5,280	4,750	5,400	18,440	79,030	52,090	17,510	6,980	6,790	229,400
1952	22,440	3,960	3,510	3,540	5,210	17,060	22,460	71,280	47,030	13,240	6,520	15,370	231,600
1953	19,190	7,510	3,400	3,820	3,530	4,860	4,390	27,710	32,150	22,950	6,750	4,150	200,200
1954	3,950	5,440	13,240	12,160	9,840	11,000	15,790	34,540	35,880	18,440	7,220	6,860	176,200
1955	5,590	4,820	4,750	4,670	4,250	4,470	7,040	34,070	72,000	29,400	9,170	7,400	187,600
1956	8,400	4,710	5,040	5,040	4,860	5,200	42,770	107,200	53,690	13,720	7,670	6,080	264,400
1957	12,520	5,290	6,420	14,920	11,940	5,150	1,490	65,490	45,780	10,580	8,290	5,210	193,100
1958	10,890	8,240	1,710	6,910	6,840	6,110	5,680	81,120	35,360	12,500	11,570	5,840	192,800
1959	4,440	4,280	4,960	7,500	6,610	4,910	16,060	59,580	79,270	15,350	9,790	9,550	222,300
1960	5,370	10,640	16,610	10,530	4,120	4,570	14,010	59,010	62,330	10,930	10,580	6,210	214,700

Yearly discharge, in cubic feet per second, of West Fork Bitterroot River near Conner, Mont.

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	291	210,500
1951	1216	2,020	May 25, 1951	1.2	317	229,400	312	228,200
1952	1246	1,670	May 27, 1952	43	319	231,600	319	231,600
1953	1286	2,390	June 14, 1953	.7	277	200,200	267	192,900
1954	1346	1,850	May 21, 1954	.6	243	176,200	233	168,700
1955	1396	2,090	June 15, 1955	50	259	187,600	263	190,600
1956	1446	3,260	May 23, 1956	65	364	264,400	373	270,500
1957	1516	2,860	May 10, 1957	16	267	193,100	262	189,700
1958	1566	2,440	May 22, 1958	25	266	192,800	256	185,600
1959	1636	2,330	June 6, 1959	65	307	222,300	333	241,200
1960	1716	2,280	May 13, 1960	24	296	214,700	-	-

3434. East Fork Bitterroot River near Conner, Mont.

Location.--Lat 45°53'00", long 114°03'50", in NE $\frac{1}{4}$ sec.34, T.2 N., R.20 W., on right bank 10 ft below private bridge, $4\frac{1}{2}$ miles southeast of Conner, and 5 miles upstream from confluence with West Fork.

Drainage area.--381 sq mi.

Records available.--April 1956 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 4,191.81 ft above mean sea level, datum of 1929, Pacific Northwest supplementary adjustment of 1947.

Extremes.--1956-60: Maximum discharge, 3,000 cfs May 25, 1956 (gage height, 6.44 ft); minimum daily, 30 cfs Jan. 4, 1959.

Remarks.--Diversions for irrigation of about 2,200 acres 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
1956	-	-	-	-	-	-	412	1,439	1,009	283	139	102	-
1957	101	90.4	84.5	70.7	85.6	86.0	157	1,157	992	258	100	96.2	273
1958	103	81.1	86.1	80.6	86.1	83.5	152	1,258	744	253	121	91.6	263
1959	84.1	112	109	95.4	77.9	102	252	679	1,283	323	130	132	282
1960	167	137	110	89.0	78.1	165	270	687	908	188	108	95.7	250

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	-	-	-	-	-	-	24,510	88,450	60,060	17,420	8,540	6,070	-
1957	6,220	5,380	5,200	4,350	4,750	5,900	9,330	71,120	59,010	14,630	6,160	5,720	197,800
1958	6,330	4,830	5,290	4,960	4,780	5,130	9,040	77,560	44,270	15,570	7,460	5,450	190,500
1959	5,170	6,660	6,730	5,870	4,330	6,300	14,970	41,720	76,350	19,880	8,010	7,880	203,900
1960	10,260	8,140	6,740	5,470	4,490	10,160	16,060	42,210	54,000	11,560	6,670	5,690	181,400

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		Runoff
		Discharge	Date				Inches	Acre-feet	
1956	1446	3,000	May 25, 1956	-	-	-	-	-	-
1957	1516	2,040	June 3, 1957	58	273	0.717	9.72	197,800	273 9.70
1958	1566	2,560	May 25, 1958	50	263	.690	9.39	190,500	266 9.49
1959	1636	2,090	June 7, 1959	30	282	.740	10.03	203,900	291 10.35
1960	1716	1,730	June 4, 1960	45	250	.656	8.93	181,400	- -

3440. Bitterroot River near Darby, Mont.

Location.--Lat 45°58'20", long 114°08'20", in E½ sec.36, T.3 N., R.21 W., on left bank 25 ft downstream from bridge on U. S. Highway 93, a quarter of a mile downstream from Chaffin Creek, and 4 miles southeast of Darby.

Drainage area.--1,049 sq mi.

Records available.--April 1937 to September 1960. Monthly discharge only for April 1937, published in WSP 1316.

Gage.--Water-stage recorder. Datum of gage is 3,943.14 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Aug. 2, 1939, wire-weight gage at highway bridge 25 ft upstream at same datum.

Average discharge.--23 years (1937-60), 905 cfs (655,200 acre-ft per year).

Extremes.--1937-60: Maximum discharge, 11,500 cfs May 9, 1947 (gage height, 8.18 ft); minimum observed, about 71 cfs Feb. 9, 1939; minimum gage height, 0.96 ft Dec. 11, 1957.

Remarks.--Some regulation by Painted Rocks Lake (formerly West Fork Bitterroot River Reservoir), see page 242. Diversions for irrigation of about 5,000 acres above station. Ditch bypassing station irrigates about 500 acres below.

Correction.--In WSP 1316, the monthly runoff for October 1948 was listed in error; it should be 22,540 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	578	515	346	275	397	303	1,442	4,328	3,141	1,279	428	315	1,116
1952	600	273	221	213	248	457	1,532	4,159	2,858	821	299	376	1,006
1953	446	240	183	239	257	274	685	1,797	4,682	1,496	359	214	905
1954	200	250	365	329	345	364	1,018	3,022	2,544	1,344	384	317	878
1955	269	246	208	209	204	210	400	2,182	3,974	1,717	392	270	858
1956	326	336	377	304	249	419	2,210	5,241	3,278	848	375	268	1,187
1957	362	266	233	370	402	365	511	5,897	2,885	678	292	229	880
1958	346	281	178	255	297	281	578	4,457	2,311	736	338	259	869
1959	283	419	454	334	293	318	1,138	2,638	4,195	1,058	384	420	994
1960	743	610	528	353	224	426	1,132	2,674	3,406	733	400	279	959

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	35,520	30,670	21,290	16,880	22,070	18,620	85,830	266,200	186,900	78,670	26,350	18,760	807,800
1952	36,900	16,220	13,560	13,110	14,280	28,090	91,160	255,700	170,100	50,470	18,400	22,340	730,300
1953	27,390	14,290	11,270	14,700	14,260	16,860	40,730	110,500	278,600	92,010	22,060	12,750	655,400
1954	12,310	14,860	22,430	20,200	19,160	23,580	60,600	185,800	151,400	82,640	23,620	18,850	635,400
1955	16,550	14,650	12,780	12,820	11,340	12,910	23,790	134,200	236,500	105,600	24,100	16,070	621,300
1956	20,020	20,010	23,160	18,670	14,340	25,760	31,500	522,300	195,000	52,150	23,070	15,960	861,900
1957	22,280	15,830	18,000	22,730	22,330	21,200	30,390	239,600	171,500	41,580	17,950	13,650	637,000
1958	21,270	16,750	10,800	15,680	16,490	17,250	34,440	274,100	37,500	45,270	23,850	15,400	628,800
1959	17,370	24,920	27,940	20,550	18,250	19,540	67,790	162,200	249,600	65,060	23,610	24,970	719,800
1960	45,680	36,330	32,460	21,720	12,900	26,200	67,370	164,400	202,700	45,080	24,580	16,600	696,000

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		-	-	-	-	-	1,059	766,300
1951	1216	7,080	May 24, 1951	160	1,116	807,800	1,087	787,000
1952	1246	5,520	June 7, 1952	170	1,006	730,300	987	716,600
1953	1286	8,200	June 13, 1953†	90	905	655,400	901	652,100
1954	1346	7,420	May 21, 1954	180	878	635,400	870	629,800
1955	1396	6,770	June 15, 1955	155	858	621,300	885	640,500
1956	1446	10,500	May 24, 1956	200	1,187	861,900	1,178	854,900
1957	1516	6,030	May 11, 1957	188	880	637,000	870	629,800
1958	1566	7,870	May 23, 1958	115	869	628,800	898	650,200
1959	1636	6,850	June 7, 1959	200	994	719,800	1,055	764,000
1960	1716	6,780	June 4, 1960	160	959	696,000	-	-

† Corrected.

3445. Como Lake near Darby, Mont.

Location.--Lat 46°03'50", long 114°14'00", in NW $\frac{1}{4}$ sec.32, T.4 N., R.21 W., at dam on Rock Creek 4 miles northwest of Darby.

Drainage area.--54.6 sq mi.

Records available.--October 1939 to September 1960. April to August 1948 scattered daily gage-heights and contents, published in WSP 1080.

Gage.--Staff gage. Datum of gage is 4,188.5 ft above mean sea level (U. S. Coast and Geodetic Survey datum).

Extremes.--1940-60: Maximum month-end contents observed, 37,050 acre-ft June 30, 1957, June 30, 1960 (elevation, 4,244.5 ft); no storage at times in several years.

Remarks.--Reservoir is formed by an earthfill dam with concrete spillway completed in 1909. Usable capacity, 34,890 acre-ft at elevation 4,242.5 ft (gage height, 54.0 ft). Dead storage negligible. Water is used for irrigation and recreation. Figures given herein represent usable contents.

Cooperation.--Records furnished by Bitterroot Irrigation District.

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

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	9,220	19,020	21,630	22,500	19,890	19,890	16,570	29,440	+32,080	32,200	19,890	7,600
1952	3,760	8,730	10,200	11,000	12,600	13,560	20,760	30,320	+34,890	27,680	8,250	800
1953	600	1,000	1,280	2,160	2,760	5,650	8,550	6,630	+34,890	26,910	16,040	4,910
1954	2,920	2,400	4,080	4,350	5,430	5,910	11,940	32,240	32,980	32,200	13,540	3,940
1955	0	+1,830	3,030	3,970	4,960	6,000	7,960	25,920	36,150	+35,250	13,410	2,320
1956	1,830	3,060	10,000	13,350	15,350	17,380	20,290	+34,890	+36,690	28,850	8,300	1,200
1957	840	2,580	4,510	5,870	8,750	11,800	14,150	35,430	+37,050	25,340	6,740	1,660
1958	513	1,640	2,720	5,740	7,570	8,300	12,110	35,970	36,510	24,460	6,530	673
1959	429	5,820	7,960	16,560	19,170	21,800	24,180	27,970	35,790	32,980	11,990	1,500
1960	5,310	11,440	14,150	16,150	17,790	20,080	31,350	31,860	37,050	25,410	5,000	0

+ Corrected.

3450. Rock Creek near Darby, Mont.

Location.--Lat 46°04'10", long 114°13'20", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.29, T.4 N., R.21 W., on left bank 0.6 mile downstream from Como Lake, 0.7 mile upstream from Rock Creek Canal, and 4 miles northwest of Darby.

Drainage area.--55.4 sq mi.

Records available.--April 1946 to September 1948 (fragmentary), December 1948 to September 1953, August 1957 to September 1959. Monthly discharge only for November 1946, published in WSP 1316.

Gage.--Water-stage recorder. Altitude of gage is 4,070 ft (from topographic map). Prior to Dec. 2, 1948, staff gage 0.6 mile downstream at different datum.

Average discharge.--6 years (1949-53, 1957-59), 149 cfs (107,900 acre-ft per year).

Extremes.--1946, 1948-53, 1957-59: Maximum discharge, 1,580 cfs June 17, 1950 (gage height, 5.19 ft); no flow at times owing to regulation.

Remarks.--Flow regulated to limit of capacity of Como Lake (see preceding station). Several small diversions above station for irrigation below station. Greater part of flow diverted by Rock Creek Canal, 0.7 mile 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	61.7	3.65	36.6	108	107	101	47.6	305	396	365	249	236	169
1952	52.8	1.80	1.85	2.00	2.22	1.99	51.2	399	402	312	332	115	140
1953	12.7	.03	0	0	0	0	58.1	265	205	372	343	146	118
1957	-	-	-	-	-	-	-	-	-	-	-	126	-
1958	45.5	.20	0	0	0	0	17.0	365	482	270	300	115	134
1959	28.0	.5	.5	.5	.5	6.89	73.0	278	716	309	407	239	172

Monthly and yearly discharge, in acre-feet, of Como Lake near Darby, Mont.

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	3,790	217	2,250	6,620	5,940	6,190	2,830	18,770	23,590	22,420	15,310	14,180	122,100
1952	3,240	107	114	123	128	128	3,050	24,560	23,920	19,170	20,400	6,850	101,800
1953	783	2.0	0	0	0	0	3,450	16,270	12,210	22,850	21,090	8,690	85,340
1957	-	-	-	-	-	-	-	-	-	-	-	7,500	-
1958	2,790	12	0	0	0	0	1,010	22,670	28,680	16,610	18,460	6,820	97,050
1959	1,720	30	31	31	28	423	4,350	17,180	42,620	18,610	25,010	14,230	124,500

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30				Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean
		Discharge	Date				
1950	-	-	-	-	-	-	166
1951	1216	764	June 18, 1951	3.0	169	122,100	165
1952	1246	802	June 9, 1952	1.8	140	101,800	137
1953	1286	692	July 6, 1953	0	118	85,340	-
1957	1566	-	-	-	-	-	-
1958	1566	1,180	May 27, 1958	0	134	97,050	133
1959	1636	1,440	June 14, 1959	-	172	124,300	-

3455. Rock Creek Canal near Darby, Mont.

Location.--Lat 46°04'40", long 114°12'40", in SW $\frac{1}{4}$ (revised) sec.28, T.4 N., R.21 W., on downstream side of footbridge, a quarter of a mile downstream from diversion dam, $\frac{1}{2}$ miles downstream from Como Lake, and 4 miles northwest of Darby.

Records available.--April to September 1946, May 1948 to September 1953 (irrigation season only).

Gage.--Water-stage recorder. Altitude of gage is 3,950 ft (from topographic map). Apr. 8 to May 13, 1946, staff gage on wingwall at headgate at different datum. May 14, 1946, to May 27, 1950, staff gage on footbridge at approximately present datum. May 28 to Sept. 30, 1950, staff gage 80 ft below footbridge at present datum.

Extremes.--1946, 1948-53: Maximum daily discharge, 407 cfs Aug. 3, 1952; no flow at times.

Remarks.--Canal diverts from left bank of Rock Creek in sec.28, T.4 N., R.21 W. for irrigation of land in vicinity of Hamilton. During irrigation season water may be diverted from Lost Horse Creek into canal below station near southwest corner of sec.22, T.4 N., R.21 W.

Monthly and yearly mean diversion, in cubic feet per second

Water year			Apr.	May	June	July	Aug.	Sept.	Oct.			
1951			158	14,340	12,070	16,860	14,730	13,940	3,100			
1952			2,240	9,100	15,700	17,820	20,260	6,670				
1953			2,890	15,450	7,620	13,680	20,720	8,360				

3465. Skalkaho Creek near Hamilton, Mont.

Location (revised).--Lat 46°09'50", long 113°57'00" in NE¼ sec.27, T.5 N., R.19 W., on right bank 2 miles downstream from Daly Creek and 12 miles southeast of Hamilton.

Drainage area.--87.8 sq mi.

Records available.--December 1948 to September 1953, August 1957 to September 1960. April 1920 to September 1924 at site 3 miles downstream; records not equivalent owing to inflow.

Gage.--Water-stage recorder. Altitude of gage is 4,490 ft, revised (from topographic map).

Average discharge.--7 years (1949-53, 1957-60), 94.1 cfs (68,130 acre-ft per year).

Extremes.--1948-53, 1957-60: Maximum discharge, 812 cfs June 21, 1950 (gage height, 4.40 ft); maximum gage height recorded, 5.18 ft Feb. 29, 1960 (backwater from ice); minimum discharge recorded, 10 cfs Apr. 2, 1953 (gage height, 1.26 ft, backwater from ice). Flood of May 20, 1954, reached a stage of 4.65 ft, present site and datum, from floodmarks (discharge, 935 cfs).

Remarks.--No diversion above station. During irrigation season, flow is supplemented by releases from Kent Lake and Dam Creek Lake (combined capacity, 200 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	46.2	42.7	35.3	29.7	28.9	25.7	75.7	383	421	230	79.8	51.9	121
1952	44.9	34.9	28.7	24.7	24.1	22.5	71.0	351	294	102	57.6	41.3	91.5
1953	28.5	23.7	23.1	25.3	25.2	23.1	32.1	95.2	410	169	58.1	37.2	79.1
1954													
1955													
1956													
1957													
1958	36.4	30.6	28.6	22.6	20.0	19.4	32.6	358	313	108	57.1	41.2	89.1
1959	31.5	29.4	26.5	22.2	19.6	23.3	47.2	153	465	126	61.0	50.8	87.8
1960	52.3	39.5	35.4	31.6	24.6	28.5	72.6	175	358	105	57.9	40.2	84.9

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2,840	2,540	2,170	1,830	1,610	1,580	4,500	23,550	25,030	14,160	4,910	3,090	87,810
1952	2,760	2,080	1,770	1,520	1,390	1,380	4,220	21,590	17,500	6,240	3,540	2,460	66,450
1953	1,760	1,410	1,420	1,550	1,400	1,420	1,910	5,860	24,380	10,390	3,570	2,210	57,280
1954													
1955													
1956													
1957													
1958	2,240	1,820	1,760	1,390	1,110	1,190	1,940	21,980	18,610	6,630	3,510	2,280	64,460
1959	1,940	1,750	1,630	1,360	1,090	1,420	2,810	9,420	27,650	7,760	3,750	3,020	63,600
1960	3,220	2,350	2,170	1,940	1,410	1,750	4,320	10,770	21,290	6,450	3,560	2,390	61,620

† 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	-	-	-	-	-	-	-	-	108	16.73	78,380
1951	1216	665	May 28, 1951	20	121	1.38	18.74	87,810	120	18.54	86,870
1952	1246	516	June 5, 1952	21	91.5	1.04	14.20	66,450	88.7	13.76	64,430
1953	1286	725	June 13, 1953	18	79.1	.901	12.21	57,280	-	-	-
1954	-	-	-	-	-	-	-	-	-	-	-
1955	-	-	-	-	-	-	-	-	-	-	-
1956	-	-	-	-	-	-	-	-	-	-	-
1957	1566	-	-	-	-	-	-	-	-	-	-
1958	1566	705	May 25, 1958	17	89.1	1.01	13.77	64,460	88.4	13.65	63,960
1959	1636	725	June 14, 1959	16	87.8	1.00	13.57	63,600	91.2	14.09	66,020
1960	1716	600	June 3, 1960	20	84.9	.867	13.15	61,620	-	-	-

3475. Blodgett Creek near Corvallis, Mont.

Location.--Lat 46°16'10", long 114°14'10", in NW¼NW¼ sec.21, T.6 N., R.21 W., on right bank 4½ miles upstream from mouth and 7 miles southwest of Corvallis.

Drainage area.--26.4 sq mi.

Records available.--December 1946 to September 1960. Monthly discharge only for December 1946, published in WSP 1316.

Gage.--Water-stage recorder. Altitude of gage is 4,050 ft (from topographic map).

Average discharge.--13 years (1947-60), 72.2 cfs (52,270 acre-ft per year).

Extremes.--1946-60: Maximum discharge, 836 cfs May 16, 1949 (gage height, 6.42 ft); minimum, 1.2 cfs Nov. 9, 10, 23, 25, 1952; minimum gage height, 1.93 ft Nov. 9, 10, 1952.

Remarks.--Some regulation for irrigation at low flow by Blodgett Lake (capacity, 160 acre-ft); prior to 1959 by High and Blodgett Lakes (combined capacity, 900 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	68.2	62.2	34.2	21.3	26.4	15.8	101	258	229	137	21.6	19.4	83.0
1952	26.8	18.5	14.1	9.01	8.67	7.91	115	269	213	66.4	21.6	6.42	64.7
1953	2.21	2.39	2.51	11.2	15.6	13.0	62.9	158	272	131	24.6	8.43	58.7
1954	2.25	4.59	6.53	5.75	14.0	17.0	76.9	312	244	177	29.2	18.4	76.1
1955	16.1	13.5	12.0	8.10	6.68	6.26	20.1	191	367	135	26.5	11.1	67.9
1956	11.0	26.1	38.2	23.2	11.6	19.9	126	336	263	80.6	22.2	10.9	80.8
1957	8.61	11.6	16.3	8.15	7.45	17.6	42.3	353	238	20.6	6.42	64.1	64.1
1958	7.32	5.70	5.68	6.37	9.17	13.2	47.9	368	200	85.4	9.44	9.33	62.5
1959	17.9	51.8	49.2	22.2	17.1	17.1	81.7	188	347	106	13.7	33.9	78.8
1960	110	44.8	24.3	9.61	8.50	24.8	85.1	157	277	55.9	10.0	5.04	67.6

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	4,190	3,700	2,100	1,310	1,480	974	5,980	15,860	13,600	8,440	1,330	1,150	60,090
1952	1,650	1,100	865	554	499	486	6,850	16,510	12,660	4,080	1,330	382	46,970
1953	136	142	155	690	866	801	3,740	9,720	16,190	8,060	1,520	502	42,510
1954	138	273	401	353	778	1,050	4,580	19,180	14,530	10,890	1,800	1,100	55,070
1955	992	801	739	498	371	385	1,190	11,740	21,850	8,320	1,630	682	49,180
1956	677	1,550	2,350	1,420	670	1,220	7,500	20,670	15,640	4,960	1,370	648	58,680
1957	530	689	1,000	501	414	1,080	2,520	20,470	14,150	3,440	1,260	382	46,440
1958	450	339	349	392	509	811	2,850	22,490	11,900	4,020	580	555	45,240
1959	1,100	3,080	3,020	1,360	948	1,050	4,860	11,590	20,670	6,520	841	2,020	57,060
1960	6,750	2,670	1,490	591	489	1,530	5,060	9,660	16,460	3,440	616	300	49,060

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year			
		Momentary maximum		Minimum day	Mean	Per square mile	Runoff Acres-foot	Mean	Runoff		
		Discharge	Date						Inches	Acre-foot	
1950	-	-	-	-	-	-	-	88.9	45.73	64,330	
1951	1216	518	June 16, 1951	7.8	83.0	3.14	42.70	60,090	74.2	38.18	53,720
1952	1246	445	Apr. 28, 1952	2.7	64.7	2.45	33.40	46,970	60.3	31.13	43,780
1953	1286	520	June 13, 1953	1.4	58.7	2.22	30.18	42,510	59.2	30.44	42,890
1954	1346	724	May 20, 1954	1.6	76.1	2.88	39.09	55,070	78.4	40.31	56,790
1955	1396	652	June 12, 1955	5.5	67.9	2.57	34.92	49,180	70.8	36.38	51,220
1956	1446	813	May 24, 1956	4.0	80.8	3.06	41.68	58,680	77.6	40.01	56,320
1957	1516	544	June 4, 1957	3.1	64.1	2.43	33.00	46,440	62.6	32.23	45,360
1958	1566	678	May 21, 1958	3.1	62.5	2.37	32.14	45,240	70.9	36.45	51,310
1959	1636	688	June 6, 1959	7.1	78.8	2.98	40.53	57,060	83.9	43.15	60,770
1960	1716	672	June 17, 1960	3.3	67.6	2.56	34.83	49,060	-	-	-

3482. Bitterroot River near Corvallis, Mont.

Location.--Lat 46°18'40", long 114°08'40", on center of south line of sec.31, T.7 N., R.20 W., on right abutment of old bridge, 20 ft downstream from present highway bridge, 1 1/4 miles downstream from Blodgett Creek, and 1 1/2 miles west of Corvallis.

Drainage area.--1,711 sq mi.

Records available.--July 1959 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 3,420 ft (from topographic map). Prior to Nov. 12, 1959, wire-weight gage at same site and datum.

Extremes.--1959-60: Maximum discharge, 12,800 cfs June 4, 1960 (gage height, 6.90 ft); minimum, 186 cfs Sept. 23, 1960 (gage height, 2.23 ft).

Remarks.--Some regulation by Painted Rocks and Como Lakes (see elsewhere in this report) and numerous small reservoirs on headwaters of tributary streams. Diversions for irrigation of about 60,000 acres above station. Records of water temperatures for the period August 1959 to September 1960 are given in reports of 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
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	1,819	1,043	827	578	355	685	1,959	4,032	6,468	935	347	627	1,598

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	118,000	62,050	50,850	35,550	20,430	42,130	116,500	247,900	384,900	57,510	21,320	37,310	1,160,000

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30				Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean
		Discharge	Date				
1959	1716	-	-	-	-	-	-
1960	1716	12,800	June 4, 1960	186	1,598	1,160,000	-

3485. Willow Creek near Corvallis, Mont.

Location.--Lat 46°17'40", long 113°59'40", in SW 1/4 sec.8, T.6 N., R.19 W., on right bank 800 ft downstream from Butterfly ranger station, half a mile downstream from Horn ditch, and 6 miles southeast of Corvallis.

Drainage area.--22.4 sq mi.

Records available.--April 1920 to May 1924 (no winter records), September 1957 to September 1960.

Gage.--Wire-weight gage. Crest-stage gage since July 20, 1959. Altitude of gage is 4,130 ft (from topographic map). Apr. 20, 1920, to May 3, 1924, staff gage at site 200 ft downstream at different datum.

Extremes.--1920-24, 1957-60: Maximum discharge, 130 cfs June 15, 1922 (gage height, 2.20 ft, site and datum then in use); minimum observed, 2.5 cfs Mar. 1, 1958.

Remarks.--One small diversion for irrigation above station. Natural flow is supplemented by releases from Gleason Lake (capacity, 160 acre-ft) during irrigation season.

Monthly and 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	8.28	6.13	6.35	5.88	5.13	3.58	7.57	55.2	55.0	23.0	14.8	9.53	16.8
1959	7.28	6.38	6.42	5.25	4.50	5.13	6.98	10.9	58.2	26.0	11.1	8.86	13.1
1960	8.63	6.50	5.37	4.39	5.03	5.82	8.27	24.4	58.6	18.0	10.7	6.82	13.5

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	508	365	391	362	285	220	450	3,400	3,270	1,410	908	567	12,140
1959	448	380	395	323	250	316	416	670	3,470	1,800	685	527	9,480
1960	530	387	330	270	289	358	492	1,500	3,490	1,100	657	406	9,810

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30				Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean
		Discharge	Date				
1957	1566	-	-	-	-	-	-
1958	1566	103	May 28, 1958	2.5	16.8	12,140	16.7
1959	1636	84	June 21, 1959	3.0	13.1	9,480	13.1
1960	1716	99	June 3, 1960	2.7	13.5	9,810	-

3495. Fred Burr Creek near Victor, Mont.

Location--Lat 46°21'20", long 114°15'10", in NE¼NW¼ sec.20, T.7 N., R.21 W., on right bank 5 miles upstream from mouth and 7 miles southwest of Victor.

Drainage area--18.4 sq mi.

Records available--December 1946 to September 1951. Monthly discharge only for some periods, published in WSP 1316.

Gage--Water-stage recorder: Altitude of gage is 4,150 ft (from topographic map). Prior to Apr. 4, 1948, water-stage recorder at same site at datum 1.74 ft higher. July 30 to Sept. 30, 1948, staff gage at same site at datum 0.22 ft lower.

Extremes--1946-51: Maximum discharge, 23,100 cfs May 28, 1948 (failure of dam above station), by slope-area measurement of peak flow at site 3 miles upstream; minimum observed, 2.7 cfs Sept. 20-22, 1948.

Remarks--Flow partly regulated by Fred Burr Lake (capacity, 200 acre-ft), and prior to May 28, 1948, by Fred Burr Reservoir (capacity, 515 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	35.5	31.4	21.0	12.0	15.1	9.35	65.4	173	180	93.8	16.5	10.8	53.8

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2,180	1,870	1,290	736	841	575	3,890	10,840	9,490	5,770	1,010	642	38,930

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	-	-	-	-	-	-	57.5
1951	1216	424	June 16, 1951	5	53.8	38,930	-

3500. Bear Creek near Victor, Mont.

Location--Lat 46°23', long 114°13', in NW¼ sec.9, T.7 N., R.21 W., on left bank 4 miles upstream from mouth and 5 miles southwest of Victor.

Drainage area--26.8 sq mi.

Records available--April 1938 to December 1954, August 1957 to September 1959.

Gage--Water-stage recorder and timber control. Altitude of gage is 3,770 ft (from topographic map). Apr. 15, 1938, to Aug. 26, 1941, staff gage and Aug. 27, 1941, to Sept. 30, 1952, water-stage recorder, at same site at datum 1.00 ft higher.

Average discharge--18 years (1938-54, 1957-59), 66.0 cfs (47,780 acre-ft per year).

Extremes--1938-54, 1957-59: Maximum discharge, 1,340 cfs June 16, 1950 (gage height, 5.04 ft present datum), from rating curve extended above 710 cfs; minimum, 0.6 cfs Dec. 1, 1952; minimum gage height, 0.36 ft Sept. 17, 1957.

Remarks--No diversion above station. Natural flow is supplemented by stored water from Bear Lake (capacity, 375 acre-ft) during irrigation season.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	70.4	61.3	38.3	21.5	26.3	15.1	96.5	257	236	138	18.6	9.89	82.7
1952	29.2	17.1	11.6	7.92	7.43	7.36	121	274	220	61.2	11.0	4.06	64.4
1953	2.50	5.60	3.48	12.7	14.9	13.1	54.0	146	295	144	13.8	5.24	59.0
1954	2.75	6.00	7.54	6.47	15.2	17.6	68.1	322	264	164	21.9	11.9	76.0
1955	15.4	14.6	9.21	-	-	-	-	-	-	-	-	-	-
1956	-	-	-	-	-	-	-	-	-	-	-	-	-
1957	-	-	-	-	-	-	-	-	-	-	-	3.63	-
1958	7.75	6.14	6.17	4.93	8.83	12.5	47.8	374	188	35.4	8.15	9.14	59.4
1959	21.6	48.8	41.7	20.2	15.4	13.6	73.5	181	407	101	13.0	36.4	80.9
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	4,330	3,850	2,350	1,320	1,460	930	5,740	15,820	14,060	8,510	1,140	588	59,900
1952	1,800	1,020	712	487	428	453	7,200	16,870	13,120	3,760	677	242	46,770
1953	154	214	213	782	827	804	3,210	8,960	17,540	8,860	846	312	42,720
1954	169	357	464	398	843	1,080	4,050	19,770	15,710	10,110	1,350	706	155,010
1955	945	867	566	-	-	-	-	-	-	-	-	-	-
1956	-	-	-	-	-	-	-	-	-	-	-	-	-
1957	-	-	-	-	-	-	-	-	-	-	-	216	-
1958	476	365	379	303	491	771	2,840	22,970	11,200	2,170	501	544	43,010
1959	1,330	2,900	2,570	1,240	857	839	4,370	11,100	24,190	6,200	799	2,170	58,560
1960	-	-	-	-	-	-	-	-	-	-	-	-	-

† Corrected.

PEND OREILLE RIVER BASIN

Yearly discharge, in cubic feet per second, of Bear Creek near Victor, Mont.

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	-	-	-	-	-	-	-	-	91.1	46.19	65,940
1951	1216	654	June 15, 1951	6.8	82.7	3.09	41.89	59,900	73.4	37.12	53,100
1952	1246	525	Apr. 27, 1952	2.6	64.4	2.40	32.65	46,770	60.4	30.59	43,820
1953	1286	609	June 13, 1953	.7	59.0	2.20	29.89	42,720	59.6	30.17	43,130
1954	1346	893	May 19, 1954	1.7	76.0	2.84	38.48	155,010	77.9	39.46	56,400
1955	1346	-	-	-	-	-	-	-	-	-	-
1956	-	-	-	-	-	-	-	-	-	-	-
1957	1566	-	-	-	-	-	-	-	-	-	-
1958	1566	754	May 21, 1958	3.0	59.4	2.22	30.10	43,010	67.1	34.00	48,590
1959	1636	845	June 13, 1959	7.8	80.9	3.02	41.00	58,560	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	-

† Corrected.

3505. Kootenai Creek near Stevensville, Mont.

Location.--Lat 46°32'30", long 114°10'00", in SW¼NW¼ sec.18, T.9 N., R.20 W., on left bank 3 miles upstream from mouth and 4 miles northwest of Stevensville.

Drainage area.--28.9 sq mi.

Records available.--December 1948 to September 1953, August 1957 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 3,780 ft (from topographic map).

Average discharge.--7 years (1949-53, 1957-60), 79.8 cfs (57,770 acre-ft per year).

Extremes.--1948-53, 1957-60: Maximum discharge, 1,300 cfs June 17, 1950 (gage height, 5.85 ft), from rating curve extended above 500 cfs; minimum daily, 2.0 cfs Nov. 30, 1952. Flood in May-June 1948 reached a discharge of 1,250 cfs, by slope-area measurement of peak flow at a point a quarter of a mile downstream.

Remarks.--No regulation or diversion 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	70.1	53.8	35.9	22.5	30.1	18.3	110	272	255	191	32.4	19.5	92.9
1952	40.0	24.1	14.6	10.2	9.00	7.16	115	237	220	92.8	20.3	6.90	66.5
1953	3.65	3.49	4.12	13.3	19.5	15.7	56.4	131	268	170	24.5	8.10	59.9
1954	-	-	-	-	-	-	-	-	-	-	-	-	-
1955	-	-	-	-	-	-	-	-	-	-	-	-	-
1956	-	-	-	-	-	-	-	-	-	-	-	6.90	-
1957	-	-	-	-	-	-	-	-	-	-	-	-	-
1958	13.7	10.6	7.93	6.81	12.6	18.5	42.8	375	220	59.6	17.3	19.6	67.4
1959	33.4	70.7	43.3	18.7	14.4	24.2	85.8	181	472	141	21.7	63.6	97.3
1960	121	52.9	29.9	12.1	10.8	30.4	89.8	177	341	103	19.5	13.1	83.3

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	4,310	3,200	2,210	1,380	1,670	1,120	6,560	16,730	15,150	11,770	1,990	1,160	67,250
1952	2,460	1,440	900	628	517	440	6,840	14,570	13,090	5,710	1,250	411	48,250
1953	225	207	253	817	1,080	966	3,360	8,040	15,950	10,450	1,510	482	43,340
1954	-	-	-	-	-	-	-	-	-	-	-	-	-
1955	-	-	-	-	-	-	-	-	-	-	-	-	-
1956	-	-	-	-	-	-	-	-	-	-	-	410	-
1957	-	-	-	-	-	-	-	-	-	-	-	-	-
1958	844	634	488	419	700	1,140	2,550	23,050	13,080	3,670	1,060	1,170	48,800
1959	2,050	4,210	2,660	1,150	797	1,490	5,110	11,110	28,100	8,660	1,330	3,790	70,460
1960	7,460	3,150	1,840	744	618	1,870	5,340	10,860	20,280	6,310	1,200	778	60,450

Yearly 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	-	-	-	-	-	-	-	-	97.9	46.02	70,900
1951	1216	654	June 15, 1951	12	92.9	3.21	43.62	67,250	86.1	40.41	62,330
1952	1246	381	June 6, 1952	4.5	66.5	2.30	31.30	48,250	60.8	28.64	44,140
1953	1286	490	June 13, 1953	2.0	59.9	2.07	28.11	43,340	-	-	-
1954	-	-	-	-	-	-	-	-	-	-	-
1955	-	-	-	-	-	-	-	-	-	-	-
1956	-	-	-	-	-	-	-	-	-	-	-
1957	1566	-	-	-	-	-	-	-	-	-	-
1958	1566	1,080	May 24, 1958	5.5	67.4	2.33	31.66	48,800	77.0	36.17	55,760
1959	1636	1,020	June 13, 1959	8	97.3	3.37	45.73	70,460	102	48.01	73,990
1960	1716	998	June 16, 1960	7	85.3	2.88	39.21	60,450	-	-	-

3510. Burnt Fork Creek near Stevensville, Mont.

Location.--Lat 46°27'50", long 113°56'40", in NW¼SW¼ sec.11, T.8 N., R.19 W., on right bank 150 ft upstream from county road bridge and 8 miles southeast of Stevensville.

Drainage area.--74.0 sq mi.

Records available.--May to November 1920, April 1922 to September 1924 (no winter records), April to June 1938, October 1938 to September 1960. Monthly discharge only for some periods, published in WSP 1316. Records for December 1922, published in WSP 572 and 916, have been found to be unreliable and should not be used.

Gage.--Staff gage. Crest-stage gage since July 20, 1959. Altitude of gage is 4,270 ft (from topographic map). May 8, 1920, to Aug. 23, 1924, staff gage at site 150 ft downstream at different datum. April 1938 to Mar. 18, 1953, staff gage and Mar. 19, 1953, to Mar. 15, 1955, wire-weight gage, at site 150 ft downstream at datum 2.00 ft lower.

Average discharge.--22 years (1938-60), 48.9 cfs (35,400 acre-ft per year).

Extremes.--1920, 1922-24, 1958-60: Maximum discharge observed, 641 cfs May 28, 1938 (gage height, 2.92 ft, site and datum then in use); maximum gage height observed, 5.10 ft Jan. 15, 16, 1960 (backwater from ice); minimum daily discharge, 2 cfs Mar. 11, 1948.

Remarks.--Figures do not include average seasonal diversion of about 5,000 acre-ft by Sunset Highland ditch which diverts half a mile above station for irrigation of about 2,000 acres below. During irrigation season natural flow of stream is augmented by release from Burnt Fork Lake (capacity, 510 acre-ft).

Corrections.--In WSP 1316, the annual maximums were shown in error as "momentary"; they should be "maximum observed."

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	24.4	32.2	30.4	25.7	27.0	22.9	67.4	258	204	104	37.5	26.0	70.2
1952	32.0	28.9	21.3	17.7	18.2	15.6	57.7	183	154	44.6	20.4	18.6	49.4
1953	16.8	19.6	18.3	19.5	17.3	14.6	26.2	61.4	212	70.0	31.6	21.9	44.1
1954	16.2	17.3	18.4	15.6	16.0	14.1	27.1	94.0	146	98.0	34.9	20.6	45.1
1955	22.8	17.5	16.5	15.3	14.6	15.0	19.0	97.5	205	146	41.9	25.3	55.2
1956	18.3	21.7	23.6	21.8	17.7	22.8	76.0	212	202	65.7	35.2	22.6	61.7
1957	19.4	22.4	20.7	14.8	15.8	15.5	22.3	180	164	45.6	28.6	19.4	47.5
1958	17.3	20.5	20.5	15.8	16.4	16.3	24.6	196	157	50.3	29.5	20.2	47.3
1959	16.6	19.7	18.1	13.9	11.9	15.0	30.0	74.7	209	54.5	31.1	24.9	43.2
1960	28.4	24.8	23.9	15.4	18.8	21.8	39.3	89.4	173	50.0	31.8	17.9	44.3

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,500	1,920	1,870	1,580	1,500	1,410	4,010	14,650	12,140	6,390	2,300	1,550	50,820
1952	1,970	1,720	1,310	1,090	1,050	958	3,430	11,280	7,950	2,750	1,250	1,100	35,860
1953	1,030	1,160	1,120	1,200	960	899	1,560	3,770	12,630	4,300	1,940	1,300	31,870
1954	996	1,030	1,130	835	891	887	1,610	5,780	8,680	6,030	2,150	1,250	31,230
1955	1,400	1,040	1,020	938	809	922	1,130	6,000	12,210	8,960	2,580	1,500	38,510
1956	1,120	1,290	1,450	1,340	1,020	1,400	4,520	13,060	12,020	4,040	2,160	1,340	44,760
1957	1,190	1,330	1,270	910	877	954	1,330	11,070	9,750	2,800	1,760	1,150	34,370
1958	1,060	1,220	1,260	974	912	1,000	1,470	12,080	8,130	3,090	1,810	1,200	34,210
1959	1,020	1,170	1,110	857	660	922	1,790	4,590	12,420	3,350	1,910	1,480	31,280
1960	1,750	1,480	1,470	823	1,080	1,340	2,340	5,500	10,290	3,070	1,960	1,060	32,160

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Maximum observed		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	54.2	39,250
1951	1216	361	May 24, 1951	15	70.2	50,820	69.8	50,530
1952	1246	233	May 26, 1952	14	49.4	35,860	47.1	34,170
1953	1286	351	June 13, 1953	13	44.1	31,870	43.8	31,720
1954	1346	300	June 28, 1954	10	43.1	31,230	43.6	31,530
1955	1396	284	June 15, 1955	12	53.2	38,510	53.7	36,910
1956	1446	414	May 24, 1956	13	61.7	44,760	61.6	44,690
1957	1516	320	June 3, 1957	13	47.5	34,370	47.1	34,120
1958	1566	371	May 21, 22, 1958	9	47.3	34,210	46.9	33,970
1959	1636	-	-	7	43.2	31,280	45.1	32,680
1960	1716	as 17	June 4 or 5, 1960	6	44.3	32,160	-	-

a Momentary maximum.

PEND OREILLE RIVER BASIN

3512. Bitterroot River near Florence, Mont.

Location.--Lat 46°38'00", long 114°03'00", on south line of SE $\frac{1}{4}$ sec.12, T.10 N., R.20 W., on downstream side of bridge on State Secondary Highway 269, 1.3 miles east of Florence.

Drainage area.--2,354 sq mi.

Records available.--September 1957 to September 1960.

Gage.--Wire-weight gage. Altitude of gage is 3,200 ft (from topographic map).

Extremes.--1957-60: Maximum discharge observed, 16,700 cfs May 26, 1958 (gage height, 9.93 ft); minimum observed, 438 cfs Sept. 17, 1960.

Remarks.--Some regulation by Painted Rocks and Como Lakes (see elsewhere in this report) and numerous small reservoirs on headwaters of tributary streams. Diversions for irrigation of about 105,000 acres 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
1957	-	-	-	-	-	-	-	-	-	-	-	-	-
1958	907	796	648	614	750	713	1,335	9,886	5,936	1,478	664	654	2,041
1959	911	1,510	1,604	1,067	870	1,086	2,404	5,105	11,040	2,653	659	1,393	2,522
1960	3,025	2,019	1,344	921	729	1,287	2,787	4,321	8,011	1,494	608	593	2,258

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	55,790	47,340	39,840	37,720	41,630	43,860	79,420	507,900	353,200	90,880	40,820	38,910	1,477,000
1959	56,040	89,880	98,620	65,630	48,320	66,760	143,000	313,900	656,800	63,100	40,540	82,900	1,825,000
1960	186,000	120,200	82,660	56,660	41,910	79,150	165,800	265,700	476,700	91,850	37,360	35,260	1,639,000

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	Mean	Acre-feet	
		Discharge	Date								
1957	1566	-	-	-	-	-	-	-	-	-	-
1958	1566	16,700	May 26, 1958	440	2,041	1,477,000	2,181	1,579,000	-	-	-
1959	1636	15,900	June 15, 1959	488	2,522	1,825,000	2,721	1,970,000	-	-	-
1960	1716	14,700	June 4, 1960	438	2,258	1,639,000	-	-	-	-	-

3514. Eightmile Creek near Florence, Mont.

Location.--Lat 46°39'10", long 113°57'30", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.2, T.10 N., R.19 W., on right bank 0.6 mile upstream from Granite Creek, 5 miles upstream from mouth, and 6 miles east of Florence.

Drainage area.--20.6 sq mi.

Records available.--September 1957 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 3,800 ft (from topographic map).

Extremes.--1957-60: Maximum discharge, 62 cfs May 12 or 13, 1958 (gage height, 2.72 ft, from high-water mark on outside staff gage); minimum daily, 1.5 cfs Jan. 2, 1958, Jan. 20, 1960.

Remarks.--No known regulation or diversion 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
1957	-	-	-	-	-	-	-	-	-	-	-	-	-
1958	3.46	3.35	3.32	3.21	3.75	3.68	6.96	†34.2	14.3	6.14	3.74	3.24	7.48
1959	3.72	3.93	3.42	2.27	2.34	3.44	9.40	17.6	19.0	5.12	3.35	3.62	6.48
1960	4.16	3.28	2.88	2.47	3.08	5.17	14.2	15.4	15.0	5.26	4.31	3.03	6.51

† Corrected.

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	213	199	204	198	208	226	414	2,100	850	378	230	193	5,410
1959	228	234	210	187	130	212	559	1,080	1,130	315	206	216	4,690
1960	256	195	177	152	177	318	845	946	895	324	265	180	4,730

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	Mean	Acre-feet	
		Discharge	Date								
1957	1566	-	-	-	-	-	-	-	-	-	-
1958	1566	62	(a)	1.5	7.48	5,410	7.56	5,470	-	-	-
1959	1636	33	June 6, 1959	1.9	6.48	4,690	6.42	4,640	-	-	-
1960	1716	30	Apr. 10, 1960	1.5	6.51	4,730	-	-	-	-	-

a May 12 or 13, 1958.

3520. Lolo Creek above Sleeman Creek, near Lolo, Mont.

Location.--Lat 46°45', long 114°09', in NW $\frac{1}{4}$ sec. 5, T.11 N., R.20 W., on left bank 2 miles upstream from Sleeman Creek, 3 miles west of Lolo, and 4 miles upstream from mouth.

Drainage area.--250 sq mi.

Records available.--November 1950 to September 1960. Prior to October 1954, published as "near Lolo." April 1911 to November 1914 at site $3\frac{1}{2}$ miles upstream, published as "near Lolo"; records not equivalent owing to diversion and tributary inflow.

Gage.--Water-stage recorder. Altitude of gage is 3,290 ft (from topographic map).

Average discharge.--9 years (1951-60), 215 cfs (155,700 acre-ft per year).

Extremes.--1950-60: Maximum discharge, 2,430 cfs May 24, 1956 (gage height, 6.24 ft); minimum, 6.3 cfs Nov. 9, 1952 (gage height, 1.01 ft).

Remarks.--Numerous small diversions mainly for irrigation of hay meadows 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	-	155	148	132	232	135	528	1,007	686	305	74.8	57.5	-
1952	98.5	85.9	77.3	60.3	66.9	67.0	477	903	479	135	28.6	24.3	209
1953	15.7	19.8	37.9	70.5	68.9	68.8	185	427	663	202	27.4	16.6	150
1954	14.8	41.7	50.8	45.8	101	113	402	1,055	710	333	79.7	69.3	252
1955	65.6	67.1	62.7	58.0	55.0	47.7	116	625	881	365	58.6	38.9	204
1956	47.4	89.6	147	111	80.3	144	731	1,251	725	203	71.4	46.4	304
1957	53.9	79.3	64.0	56.3	69.4	101	232	957	558	127	36.0	17.8	197
1958	48.9	41.4	41.3	45.6	66.5	66.7	220	804	383	107	19.3	24.3	156
1959	52.8	162	156	151	113	128	446	746	896	221	62.4	100	269
1960	188	147	87.8	37.3	55.2	143	380	599	543	114	38.8	33.3	197

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	9,240	9,100	8,100	12,900	8,310	31,410	61,920	40,800	18,750	4,600	3,420	-
1952	6,060	5,110	4,750	3,710	3,850	4,120	28,390	55,540	28,470	8,320	1,760	1,440	151,500
1953	964	1,180	2,330	4,340	3,830	4,230	11,000	26,230	39,460	12,400	1,690	988	108,600
1954	908	2,480	3,120	2,820	5,610	6,960	23,940	64,890	42,260	20,450	4,900	4,120	182,500
1955	4,030	3,990	3,860	3,560	3,060	2,950	6,900	38,420	52,440	22,410	3,610	2,320	147,500
1956	2,920	5,330	9,050	6,850	4,620	8,850	43,490	76,930	43,130	12,490	4,390	2,760	220,800
1957	3,310	4,700	3,930	3,460	3,850	6,230	13,830	58,860	33,210	7,800	2,210	1,060	142,400
1958	3,000	2,460	2,540	2,800	3,690	4,100	13,080	49,440	22,770	6,590	1,180	1,450	113,100
1959	3,240	9,650	9,610	9,300	6,290	7,860	26,550	45,880	53,320	13,580	3,840	5,950	195,100
1960	11,560	8,760	5,400	2,290	3,180	8,800	22,580	36,850	32,330	7,020	2,380	1,980	143,100

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								
1951	1216	1,500	May 12, 1951	-	-	-	285	206,100
1952	1246	1,320	Apr. 28, 1952	14	209	151,500	193	140,100
1953	1286	1,060	June 13, 1953	9.5	150	108,600	153	110,700
1954	1346	1,980	May 20, 1954	8.8	252	182,500	259	187,800
1955	1396	1,480	June 13, 1955	24	204	147,500	211	153,000
1956	1446	2,430	May 24, 1956	34	304	220,800	297	215,400
1957	1516	1,330	May 20, 1957	14	197	142,400	191	138,500
1958	1586	1,620	May 24, 1958	10	156	113,100	176	127,600
1959	1636	1,430	June 6, 1959	22	269	195,100	274	198,300
1960	1716	1,340	May 13, 1960	18	197	143,100	-	-

3530. Clark Fork below Missoula, Mont.

Location.--Lat 46°52'10", long 114°07'30", in NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.21, T.13 N., R.20 W., on right bank 1 mile (revised) downstream from Bitterroot River and 5 miles west of Missoula.

Drainage area.--9,003 sq mi.

Records available.--October 1929 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 3,090 ft (from topographic map).

Average discharge.--31 years (1929-60), 5,186 cfs (3,755,000 acre-ft per year).

Extremes.--1929-60: Maximum discharge, 52,800 cfs May 23, 1948 (gage height, 12.08 ft); minimum, 388 cfs Jan. 18, 1933; minimum gage height, 0.30 ft about Jan. 16, 1954.

Remarks.--Some diurnal fluctuation at low flow caused by powerplant at Bonner. Diversions for irrigation of about 235,000 acres above station. Records of water temperatures for the period October 1959 to September 1960 are published in reports of 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	4,019	4,331	3,662	2,880	4,058	3,526	9,397	23,860	18,730	9,380	3,365	3,247	7,551
1952	3,978	3,252	2,564	2,341	2,569	2,907	9,945	21,880	13,190	4,700	2,154	2,090	5,970
1953	2,266	2,169	1,939	2,508	2,374	2,316	3,494	9,467	26,560	8,275	2,513	2,088	5,469
1954	2,102	2,374	2,477	2,155	2,668	2,821	5,374	17,250	16,870	9,662	2,858	2,592	5,783
1955	2,791	2,564	2,049	1,908	1,822	1,880	3,318	11,040	20,040	11,950	2,733	2,035	5,356
1956	2,609	2,893	3,944	2,843	2,209	4,244	10,920	24,060	19,510	5,931	2,746	2,295	7,023
1957	2,676	2,689	2,639	1,876	2,549	3,181	4,127	21,310	16,270	3,920	1,704	1,837	5,412
1958	2,585	2,438	2,121	1,908	2,217	2,591	4,584	21,600	15,240	5,018	2,044	2,023	5,382
1959	2,663	3,756	3,961	3,085	2,687	3,608	8,035	14,330	25,640	7,251	2,634	3,621	6,766
1960	6,617	5,110	4,025	2,702	2,802	4,273	8,608	12,240	15,840	3,954	2,209	2,115	5,653

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	247,100	257,700	225,200	177,100	225,400	216,800	559,100	1,461,000	1,114,000	576,800	206,900	193,200	5,466,000
1952	244,600	193,500	157,600	143,900	147,700	178,800	591,800	1,345,000	765,100	269,000	132,500	124,300	4,334,000
1953	139,400	129,000	119,200	154,200	131,900	142,400	207,900	582,100	580,000	508,800	154,500	124,200	3,974,000
1954	129,200	141,200	152,300	132,500	149,300	173,500	319,800	1,061,000	1,004,000	594,100	175,700	154,200	4,187,000
1955	171,600	152,600	126,000	117,300	101,200	115,600	197,400	679,100	1,135,000	734,800	168,100	121,100	3,878,000
1956	160,400	172,200	242,500	174,800	127,000	260,900	649,800	1,473,000	1,161,000	364,700	168,900	136,500	5,098,000
1957	164,500	160,000	162,300	115,400	141,500	196,600	245,600	1,104,000	867,900	241,000	104,800	109,300	3,918,000
1958	156,900	145,100	130,400	117,300	123,100	159,300	272,800	524,000	806,800	508,500	125,700	120,400	3,896,000
1959	163,800	222,300	243,800	189,700	149,200	221,800	478,100	881,300	1,523,000	445,800	161,900	135,500	4,899,000
1960	406,800	304,000	247,500	166,100	149,700	262,700	512,200	752,600	842,400	243,100	135,800	125,600	4,249,000

† 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	Acre-feet	
		Discharge	Date						
1950	-	-	-	-	-	-	6,957	5,037,000	
1951	1216	32,500	May 25, 1951	1,200	7,551	5,466,000	7,355	5,332,000	
1952	1246	27,100	May 16, 1952	1,610	5,970	4,334,000	5,684	4,126,000	
1953	1286	40,100	June 4, 1953	953	5,469	3,974,000	5,538	4,009,000	
1954	1346	34,200	May 21, 1954	1,500	5,783	4,187,000	5,820	4,214,000	
1955	1396	27,500	June 16, 1955	1,200	5,356	3,878,000	5,528	4,003,000	
1956	1446	44,600	May 25, 1956	1,100	7,023	5,098,000	6,901	5,009,000	
1957	1516	31,500	May 21, 1957	1,100	5,412	3,918,000	5,340	3,866,000	
1958	1566	32,900	May 23, 1958	1,400	5,382	3,896,000	5,652	4,092,000	
1959	1636	35,500	June 7, 1959	1,500	6,766	4,899,000	7,221	5,226,000	
1960	1716	27,100	June 5, 1960	1,400	5,653	4,249,000	-	-	

3533. Clark Fork near Alberton, Mont.

Location.--Lat 46°59'40", long 114°26'20", near southeast corner of sec.1, T.14 N., R.23 W., on right bank a quarter of a mile upstream from Petty Creek and 1½ miles east of Alberton.

Drainage area.--9,272 sq mi.

Records available.--May 1959 to September 1960.

Gage.--Water-stage recorder with pressure recording bubbler system. Altitude of gage is 2,944 ft (river-profile survey).

Extremes.--1959-60: Maximum discharge, 34,900 cfs June 16, 1959 (gage height, 14.90 ft); minimum recorded, 1,560 cfs Mar. 1, 1960 (gage height, 4.30 ft).

Remarks.--Some diurnal fluctuation at low flow caused by powerplant at Bonner. Diversions for irrigation of about 243,000 acres 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
1959	-	-	-	-	-	-	-	-	25,440	7,467	2,926	4,022	-
1960	6,595	5,516	4,457	3,051	2,932	4,482	9,151	12,880	16,210	4,305	2,448	2,322	6,191

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1959	-	-	-	-	-	-	-	-	1,514,000	459,200	179,900	239,300	-
1960	405,500	328,200	274,100	187,600	168,700	275,600	44,500	792,000	964,700	264,700	150,500	138,200	4,494,000

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						
1959	1716	34,900	June 16, 1959	-	-	-	-	-	-
1960	1716	27,600	June 5, 1960	1,700	6,191	4,494,000	-	-	-

3540. St. Regis River near St. Regis, Mont.

Location.--Lat 47°17'50", long 115°07'20", in NE¼ sec.26, T.18 N., R.28 W., on left bank at county road bridge, 500 ft upstream from Little Joe Creek, 1¼ miles west of St. Regis, and 1½ miles upstream from mouth.

Drainage area.--303 sq mi; at site 1910-17, 300 sq mi.

Records available.--September 1910 to September 1917 (no winter records in most years). September 1958 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Altitude of gage is 2,645.00 ft above mean sea level, datum of 1929. September 1910 to September 1917, staff gage at site 2 miles upstream at different datum.

Extremes.--1910-17, 1958-60: Maximum discharge observed, 7,740 cfs May 28, 1917 (gage height, 8.65 ft, site and datum then in use); minimum observed, 85 cfs Aug. 30 to Sept. 2, 1915 (gage height, 1.75 ft, site and datum then in use).

Flood of about Dec. 20, 1933, reached a stage of about 14.5 ft, from information by local residents (discharge unknown). Flood of May 19, 1954, reached a discharge of about 11,000 cfs (gage height, 9.4 ft), from rating curve extended above 5,100 cfs.

Remarks.--Minor diversions for irrigation of hay meadows 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	-	-	-	-	-	-	-	-	-	-	-	+104	-
1959	129	463	555	510	340	334	1,601	2,270	1,792	422	169	181	731
1960	350	448	343	178	183	408	1,458	1,620	1,205	300	174	114	564

* Not previously published.

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1958	-	-	-	-	-	-	-	-	-	-	-	+6,170	-
1959	7,960	27,540	34,150	31,330	18,910	20,570	95,290	139,600	106,600	25,960	10,580	10,800	529,100
1960	21,490	26,640	21,090	10,950	10,540	25,120	86,740	99,610	71,680	18,470	10,850	6,770	409,800

* 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		Mean	Runoff	
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1958	1636	-	-	-	-	-	-	-	-	-	-
1959	1636	4,050	May 1, 1959	96	731	2.41	32.74	529,100	730	32.73	528,700
1960	1716	3,610	May 12, 1960	98	564	1.86	25.36	409,800	-	-	-

3545. Clark Fork at St. Regis, Mont.

Location.--Lat 47°18'05", long 115°05'15", in center of SW $\frac{1}{4}$ sec.19, T.18 N., R.27 W., on left bank at St. Regis, half a mile downstream from St. Regis River.

Drainage area.--10,709 sq mi.

Records available.--October 1910 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Altitude of gage is 2,600 ft (by barometer). Prior to Nov. 29, 1933, staff gage at same site and datum.

Average discharge.--50 years (1910-60), 7,396 cfs (5,354,000 acre-ft per year).

Extremes.--1910-60: Maximum discharge observed, 68,900 cfs May 24, 1948 (gage height, 19.96 ft); minimum, 1,000 cfs Dec. 17, 1940 (gage height, 3.36 ft), but may have been less during period of ice effect Feb. 19-22, 1929.

Remarks.--Some diurnal fluctuation at low flow caused by powerplant at Bonner. Diversions for irrigation of about 244,000 acres 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	5,099	5,985	5,244	4,266	6,591	4,855	13,650	31,850	24,700	12,000	4,425	4,067	10,240
1952	4,957	4,138	3,340	3,011	3,229	3,459	13,410	28,670	16,990	6,508	3,043	2,844	7,807
1953	2,845	2,751	2,522	3,337	3,502	3,154	5,295	13,470	32,070	10,520	3,319	2,787	7,122
1954	2,670	2,920	3,046	2,668	3,524	4,049	8,860	26,970	23,470	13,550	4,104	3,387	8,291
1955	3,524	3,465	2,940	2,541	2,488	2,442	4,499	15,990	26,750	15,160	4,104	2,920	7,250
1956	3,529	3,954	5,350	4,324	3,158	5,466	17,630	35,460	26,690	8,269	3,808	3,176	10,070
1957	3,473	3,456	3,461	2,498	3,303	4,315	6,429	29,410	21,180	5,475	2,678	2,621	7,378
1958	3,314	3,110	2,732	2,447	2,857	3,261	6,819	29,700	19,810	6,725	2,872	2,699	7,136
1959	3,359	5,296	5,697	4,662	4,015	5,047	12,600	21,200	32,900	9,641	3,860	4,814	9,887
1960	8,042	7,056	5,383	3,496	3,366	5,315	12,010	16,650	20,360	5,444	3,073	2,871	7,749

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	313.5	356.2	322.5	262.3	366.0	298.5	812.5	1,957	1,470	737.9	272.1	242.0	7,410
1952	304.8	246.2	205.4	185.2	185.7	212.7	798.1	1,763	1,011	400.1	187.1	169.2	5,668
1953	174.9	163.7	155.1	205.2	194.5	193.9	315.1	828.2	1,908	647.1	204.1	165.8	5,156
1954	164.2	173.7	187.3	164.1	195.7	248.9	527.2	1,658	1,396	835.2	252.3	201.6	6,002
1955	216.7	206.2	180.8	156.2	138.1	150.1	267.7	985.0	1,592	931.9	252.3	173.7	5,249
1956	217.0	235.3	328.9	265.8	181.7	336.1	1,049	2,180	1,588	508.5	234.2	189.0	7,314
1957	213.6	204.5	212.8	153.6	183.5	265.3	382.6	1,808	1,260	336.7	164.5	156.0	5,341
1958	203.8	185.0	168.0	150.4	158.7	200.5	405.8	1,765	1,179	413.5	176.6	160.6	5,167
1959	206.5	315.2	350.3	286.6	223.0	310.3	749.7	1,304	1,958	592.8	225.0	274.6	6,796
1960	494.5	418.7	331.0	214.9	194.8	326.8	714.8	1,024	1,212	354.7	188.9	170.9	5,626

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	-	-	-	-	-	-	9,779	7,080,000	
1951	1216	41,700	May 26, 1951	2,200	10,240	7,410,000	9,911	7,175,000	
1952	1246	34,400	May 17, 1952	2,200	7,807	5,668,000	7,446	5,406,000	
1953	1286	45,800	June 5, 1953	1,890	7,122	5,156,000	7,166	5,187,000	
1954	1346	49,000	May 22, 1954	1,960	8,291	6,002,000	8,400	6,081,000	
1955	1396	36,400	June 14, 1955	2,030	7,250	5,249,000	7,495	5,426,000	
1956	1446	62,000	May 24, 1956	2,000	10,070	7,314,000	9,868	7,163,000	
1957	1516	39,300	May 21, 1957	1,800	7,378	5,341,000	7,276	5,287,000	
1958	1566	44,800	May 24, 1958	1,890	7,136	5,167,000	7,571	5,482,000	
1959	1656	43,000	June 8, 1959	2,400	9,587	6,796,000	9,901	7,168,000	
1960	1716	33,600	June 5, 1960	1,810	7,749	5,626,000	-	-	

3550. Flathead River at Flathead, British Columbia

(International gaging station)

Location.--Lat 49°00'14", long 114°28'45", on left bank at highway bridge, 0.2 mile north of international boundary, 0.2 mile northwest of Flathead, British Columbia, and 7 miles northwest of Trail Creek, Mont.

Drainage area.--450 sq mi, approximately.

Records available.--March 1929 to September 1960 (no winter records prior to 1952). Prior to October 1934, published as "near Trail Creek, Mont."

Gage.--Water-stage recorder. Altitude of gage is 3,980 ft (from topographic map). Prior to Sept. 1, 1949, staff gage at same site and datum.

Average discharge.--9 years (1951-60), 1,001 cfs (724,700 acre-ft per year).

Extremes.--1929-60: Maximum discharge, 14,600 cfs May 23, 1948 (gage height, 9.1 ft, from floodmark), from rating curve extended above 8,000 cfs; minimum observed, 65 cfs Apr. 9, 1929, but may have been less during periods of no winter record.

Remarks.--No regulation or diversion above station.

Cooperation.--This station is 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	619	-	-	-	-	-	-	5,080	3,590	1,870	596	785	-
1952	1,140	466	330	230	210	190	1,470	3,150	1,790	811	354	229	866
1953	174	153	181	276	195	173	597	3,450	4,980	1,410	466	279	1,030
1954	219	315	215	181	190	177	407	5,050	6,000	2,420	654	439	1,240
1955	387	378	279	198	151	159	284	2,370	4,670	1,360	424	245	909
1956	608	509	271	210	150	186	930	5,310	4,100	1,130	383	246	1,170
1957	290	228	180	124	113	142	506	4,950	2,300	565	266	181	825
1958	189	199	164	154	161	160	478	4,770	1,760	612	268	224	768
1959	267	263	273	268	190	182	1,040	3,490	5,440	1,420	450	714	1,170
1960	963	621	328	212	190	287	1,250	2,910	3,950	1,020	414	274	1,030

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	38,080	-	-	-	-	-	-	312,200	213,600	114,800	36,820	46,730	-
1952	69,940	27,740	20,290	14,140	12,080	11,680	87,470	35,900	106,300	49,890	21,790	13,600	628,800
1953	10,700	9,090	11,120	16,980	10,810	10,630	35,530	211,100	296,400	86,550	28,680	16,590	744,200
1954	13,470	18,770	13,250	11,130	9,980	10,910	24,220	510,400	273,600	148,700	40,240	26,110	900,800
1955	23,800	22,460	17,130	12,150	8,410	9,800	16,880	145,800	277,900	83,390	26,070	14,460	658,200
1956	37,400	30,260	16,680	12,910	8,650	11,430	55,360	326,200	243,800	69,540	23,570	14,660	850,500
1957	17,850	13,560	11,080	7,620	6,260	8,750	30,140	303,100	137,000	34,720	16,370	10,780	597,200
1958	11,600	11,850	10,090	9,480	8,950	9,830	28,460	293,400	105,000	37,630	16,450	13,310	558,000
1959	16,420	15,650	16,800	16,480	10,570	11,190	62,090	214,600	324,000	87,550	27,700	42,500	845,600
1960	59,180	36,970	20,150	13,020	10,910	17,660	74,290	179,000	234,900	62,660	25,440	16,270	750,400

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	1216	8,100	May 12, 1951	-	-	-	-	-	-	-	-
1952	1246	4,400	May 21, 1952	-	866	1.92	26.22	628,800	746	22.59	541,800
1953	1286	8,900	June 13, 1953	100	1,030	2.29	31.03	744,200	1,048	31.60	758,800
1954	1346	11,700	May 20, 1954	100	1,240	2.78	37.53	900,800	1,289	38.28	919,700
1955	1396	8,260	June 12, 1955	116	909	2.02	27.53	658,200	938	26.40	679,200
1956	1446	13,300	May 21, 1956	101	1,170	2.60	35.45	850,500	1,114	33.71	808,600
1957	1516	8,320	May 5, 1957	79	825	1.83	24.89	597,200	812	24.51	588,300
1958	1566	7,420	May 13, 1958	119	768	1.71	23.15	556,000	789	23.79	571,400
1959	1636	9,550	June 5, 1959	83	1,170	2.60	35.20	845,600	1,260	36.02	913,000
1960	1716	9,610	June 3, 1960	136	1,030	2.29	31.30	750,400	-	-	-

3555. Flathead River near Columbia Falls, Mont.

Location.--Lat 48°28'20", long 114°05'20", in NE¹/₄NE¹/₄ sec.12, T.31 N., R.20 W., on right bank 1 mile upstream from Middle Fork and 8 miles northeast of Columbia Falls.

Drainage area.--1,553 sq mi.

Records available.--September 1910 to September 1917 (no winter records in some years), April 1929 to February 1935 (incomplete), June 1935 to September 1960. Monthly discharge only for some periods, published in WSP 1316. Published as North Fork Flathead River near Columbia Falls 1910-14.

Gage.--Water-stage recorder. Datum of gage is 3,109.70 ft above mean sea level, datum of 1929 (levels by Bureau of Reclamation). September 1910 to September 1917, staff gage at site 1,000 ft downstream at different datum.

Average discharge.--29 years (1910-12, 1913-15, 1935-60), 2,915 cfs (2,110,000 acre-ft per year).

Extremes.--1910-17, 1929-60: Maximum discharge, 31,500 cfs May 21, 1954 (gage height, 12.25 ft); minimum, 198 cfs Jan. 8, 1953 (gage height, 0.86 ft).

Remarks.--No regulation. A few small diversions from tributaries for irrigation of hay meadows 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	1,970	1,948	1,812	1,541	1,813	1,117	4,020	14,520	10,060	6,525	2,121	2,275	4,141
1952	3,650	1,705	1,184	816	765	668	6,075	10,790	6,548	3,089	1,421	891	3,139
1953	649	506	505	864	871	661	2,218	9,325	14,030	5,455	1,829	1,034	3,167
1954	725	880	763	635	663	665	1,610	15,160	14,230	9,262	2,850	2,048	4,146
1955	1,662	1,508	1,072	772	581	573	1,104	6,438	12,960	5,587	1,790	984	2,925
1956	2,027	1,914	1,225	954	673	833	4,047	13,860	12,960	4,473	1,731	1,042	3,816
1957	1,195	868	742	532	500	668	1,963	15,010	8,119	2,565	1,195	740	2,860
1958	787	781	591	475	591	777	2,470	13,430	6,177	2,111	1,109	945	2,535
1959	1,159	1,067	1,135	1,142	798	717	4,031	9,574	15,760	5,467	1,813	2,653	3,788
1960	3,312	2,263	1,608	1,003	807	1,313	4,830	7,807	11,800	4,318	1,715	1,078	3,486

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	121,100	115,900	111,400	82,440	100,700	68,680	239,200	892,700	598,600	401,200	130,400	135,400	2,998,000
1952	224,400	101,500	72,790	50,180	44,010	41,070	561,500	863,700	589,500	189,900	87,370	53,000	2,279,000
1953	39,920	30,110	31,030	53,120	48,390	40,650	132,000	573,300	834,700	335,400	112,500	61,500	2,293,000
1954	44,570	52,380	48,910	39,010	36,800	40,880	95,800	332,200	486,500	569,500	175,200	121,900	3,002,000
1955	102,200	89,750	65,890	47,500	32,280	35,200	65,700	395,800	771,000	435,600	110,000	58,520	2,117,000
1956	124,600	113,900	75,320	58,650	38,730	51,240	240,600	852,200	771,200	275,000	106,400	61,980	2,770,000
1957	73,470	51,660	45,630	32,720	27,770	41,060	116,800	233,100	483,100	157,700	73,500	44,020	2,071,000
1958	48,370	46,460	36,330	29,200	32,640	47,750	147,000	235,900	367,600	129,800	68,170	56,220	1,836,000
1959	71,260	64,700	69,770	70,190	44,330	44,060	239,900	588,700	837,900	536,200	177,600	157,900	2,743,000
1960	203,600	134,700	98,900	61,650	46,420	80,720	287,400	480,100	702,000	265,500	105,500	64,140	2,531,000

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year		
		Momentary		maximum Date	Minimum day	Mean	Per square mile	Runoff Inches	Mean	Runoff Inches	Calendar year Acre-feet
		Discharge									
1950	-	-	-	-	-	-	-	-	3,836	33.53	2,777,000
1951	1216	20,800	May 12, 1951	600	4,141	2.67	36.20	2,998,000	4,210	36.81	3,048,000
1952	1246	18,100	Apr. 28, 1952	590	3,139	2.02	27.52	2,279,000	2,729	23.91	1,981,000
1953	1286	23,800	June 14, 1953	264	3,167	2.04	27.69	2,293,000	3,226	28.22	2,335,000
1954	1346	31,500	May 21, 1954	350	4,146	2.67	36.23	3,002,000	4,304	37.60	3,116,000
1955	1396	18,700	June 14, 1955	350	2,925	1.88	25.57	2,117,000	3,002	26.25	2,173,000
1956	1446	29,700	May 22, 1956	450	3,816	2.46	33.46	2,770,000	3,619	31.73	2,627,000
1957	1516	23,000	May 7, 1957	330	2,860	1.84	25.01	2,071,000	2,805	24.53	2,031,000
1958	1566	20,400	May 13, 1958	320	2,535	1.63	22.16	1,836,000	2,638	23.06	1,910,000
1959	1636	25,200	June 6, 1959	347	3,788	2.44	33.12	2,743,000	4,108	35.92	2,974,000
1960	1716	20,700	June 4, 1960	518	3,486	2.24	30.54	2,531,000	-	-	-

3557. Middle Fork Flathead River near Essex, Mont.

Location.--Lat 48°10'20", long 113°32'40", near center of sec.19, T.28 N., R.15 W., on right bank a quarter of a mile downstream from Spruce Park cabin, 1 mile downstream from Charlie Creek, and 7½ miles southeast of Essex.

Drainage area.--408 sq mi.

Records available.--April 1957 to September 1960 (no winter records after 1958).

Gage.--Water-stage recorder with pressure recording bubbler system. Altitude of gage is 4,070 ft (from topographic map).

Extremes.--1957-60: Maximum discharge, 10,500 cfs June 6, 1959 (gage height, 11.32 ft); minimum daily determined, 85 cfs Jan. 1, 1958.

Remarks.--No regulation or diversion 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
1957	-	-	-	-	-	-	553	5,042	2,400	543	235	160	-
1958	158	125	111	107	115	137	385	4,075	1,794	461	210	196	659
1959	376	576	-	-	-	-	1,097	3,100	6,233	1,473	379	343	-
1960	868	-	-	-	-	-	1,186	2,292	3,523	893	304	202	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957	-	-	-	-	-	-	32,920	310,000	142,800	33,390	14,470	9,520	-
1958	8,500	7,450	6,800	6,600	6,410	8,440	22,900	250,600	106,700	28,350	12,900	11,630	477,300
1959	23,130	34,270	-	-	-	-	65,300	190,600	370,900	90,580	23,320	20,440	-
1960	53,350	-	-	-	-	-	70,590	140,900	209,700	54,930	18,710	12,030	-

Yearly 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
1957	1516,1636	8,700	May 5, 1957	-	-	-	-	-	-	-	-
1958	1566	6,330	May 12, 1958	85	659	1.62	21.91	477,300	-	-	-
1959	1636	10,500	June 6, 1959	-	-	-	-	-	-	-	-
1960	1716	7,690	June 4, 1960	-	-	-	-	-	-	-	-

3560. Skyland Creek near Essex, Mont.

Location.--Lat 48°17'30", long 113°23'10", in SE¼NW¼ sec.9, T.29 N., R.14 W., on left bank 150 ft upstream from mouth and 10 miles east of Essex.

Drainage area.--8.09 sq mi.

Records available.--January 1946 to September 1952, water years 1954, 1959-60 (annual maximum).

Gage.--Water-stage recorder and concrete control. Datum of gage is 4,835.83 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark).

Average discharge.--6 years (1946-52), 19.2 cfs (13,900 acre-ft per year).

Extremes.--1946-52, 1954, 1959-60: Maximum discharge, 284 cfs May 22, 1948 (gage height, 2.15 ft); maximum gage height recorded, 3.27 ft Dec. 5, 1950 (backwater from ice); minimum discharge, 0.1 cfs Nov. 15, 1946 (gage height, 0.12 ft, ice jam upstream).

Remarks.--No regulation or diversion 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	8.54	8.52	8.53	6.78	6.38	4.69	10.2	80.7	83.8	42.4	13.8	11.6	23.9
1952	11.8	7.69	6.60	5.78	4.71	3.82	19.7	79.3	26.4	12.3	7.94	5.79	16.1

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	525	507	524	417	355	288	605	4,960	4,980	2,610	849	689	17,310
1952	726	458	406	353	271	235	1,170	4,870	1,570	758	488	345	11,650

Yearly 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	-	-	-	-	-	-	-	-	26.0	43.64	18,790
1951	1216	179	June 15, 1951	4	23.9	2.95	40.19	17,310	24.0	40.27	17,340
1952	1246	148	May 15, 1952	3	16.1	1.99	27.01	11,650	-	-	-
1954	-	#230	May 19, 1954	-	-	-	-	-	-	-	-
1959	-	189	June 5, 1959	-	-	-	-	-	-	-	-
1960	-	169	June 3, 1960	-	-	-	-	-	-	-	-

* Not previously published.

3565. Bear Creek near Essex, Mont.

Location.--Lat 48°16'50", long 113°25'30", in SE¹/₄ NW¹/₄ sec.18, T.29 N., R.14 W., on right bank 1 mile downstream from Autumn Creek and 8¹/₂ miles east of Essex.

Drainage area.--20.7 sq mi.

Records available.--January 1946 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 4,484.14 ft above mean sea level (Corps of Engineers bench mark).

Average discharge.--6 years (1946-52), 46.0 cfs (33,300 acre-ft per year).

Extremes.--1946-52: Maximum discharge, 696 cfs May 22, 1948 (gage height, 3.01 ft); minimum daily, 5.5 cfs Jan. 21 to Mar. 4, Mar. 8-16, 1949.

Remarks.--A few small diversions 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	26.5	28.6	37.8	20.0	18.4	10.5	66.4	213	146	73.4	23.4	21.5	57.3
1952	32.9	22.0	13.0	10.4	8.86	8.64	87.8	169	61.0	24.5	13.7	10.5	38.5

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,630	1,700	2,320	1,230	1,020	645	3,950	13,080	8,700	4,510	1,440	1,280	41,500
1952	2,030	1,310	797	640	510	531	5,220	10,310	3,630	1,510	843	627	27,960

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	-	-	-	-	-	-	-	-	58.9	38.59	42,610
1951	1216	352	May 11, 1951	9	57.3	2.77	37.62	41,500	55.2	36.22	39,990
1952	1246	340	Apr. 27, 1952	8	38.5	1.86	25.33	27,960	-	-	-

3570. Middle Fork Flathead River at Essex, Mont.

Location.--Lat 48°16'50", long 113°36'10", in NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.14, T.29 N., R.16 W., on right bank 0.6 mile upstream from Ole Creek, 0.7 mile southeast of Essex, and 4 miles downstream from Bear Creek.

Drainage area.--510 sq mi.

Records available.--October 1939 to September 1953, June 1956 to September 1960. Monthly discharge only for October 1939, published in WSP 1316.

Gage.--Water-stage recorder. Altitude of gage is 3,730 ft (from river-profile map).

Average discharge.--18 years (1939-53, 1956-60), 1,064 cfs (770,300 acre-ft per year).

Extremes.--1939-53, 1956-60: Maximum discharge, 14,500 cfs May 22, 1948 (gage height, 10.95 ft, from partly estimated gage-height record); minimum daily, 30 cfs Jan. 22, 1940.

Flood in May 1954 reached a stage of 12.7 ft (discharge, 18,000 cfs, from rating curve extended above 12,000 cfs). Flood of May 21 or 22, 1956, reached a stage of 11.7 ft, from floodmark (discharge, 15,400 cfs, from rating curve extended above 12,000 cfs).

Remarks.--No regulation or diversion 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	717	809	884	474	602	318	1,516	5,351	3,818	2,140	531	427	1,471
1952	627	459	361	243	212	189	2,271	4,972	2,171	689	297	197	1,051
1953	141	108	103	260	289	220	1,100	4,120	6,301	1,654	376	222	1,241
1954													
1955													
1956	-	-	-	-	-	-	-	-	4,889	1,121	376	245	-
1957	290	308	268	202	209	234	757	6,720	5,119	689	288	203	1,115
1958	175	147	135	150	147	172	571	5,380	2,105	517	230	218	834
1959	491	786	674	489	327	308	1,553	4,053	7,537	1,846	451	422	1,577
1960	1,079	812	604	304	284	490	1,623	3,014	4,402	1,061	349	236	1,187

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	44,060	48,130	54,350	29,170	33,420	19,560	90,230	529,000	227,200	131,600	32,660	25,430	1,065,000
1952	38,520	27,340	22,170	14,940	12,220	11,590	135,200	299,600	129,200	42,300	18,290	11,740	763,100
1953	8,650	6,440	6,310	16,010	16,030	13,500	65,440	253,300	374,900	101,700	23,140	13,210	898,600
1954													
1955													
1956	-	-	-	-	-	-	-	-	290,900	68,940	23,140	14,590	-
1957	17,830	18,310	16,450	12,400	11,630	14,400	45,030	413,200	185,600	42,350	17,590	12,050	806,900
1958	10,790	8,770	8,310	7,970	8,160	10,550	33,970	330,800	125,300	31,790	14,170	12,940	603,500
1959	30,170	46,750	41,450	30,090	18,180	18,820	92,400	249,200	448,500	113,500	27,740	25,090	1,142,000
1960	66,330	48,320	37,140	18,660	16,360	30,150	96,600	185,300	261,900	65,250	21,470	14,060	861,500

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	
1950	-	-	-	-	-	-	-	1,641	43.65	1,188,000	
1951	1216	9,180	May 12, 1951	175	1,471	2.88	39.16	1,065,000	1,390	37.01	1,006,000
1952	1246	8,550	Apr. 28, 1952	158	1,051	2.06	28.05	763,100	959	25.60	696,500
1953	1286	12,600	June 4, 1953	50	1,241	2.43	33.11	898,600	-	-	-
1954	-	-	-	-	-	-	-	-	-	-	-
1955	-	-	-	-	-	-	-	-	-	-	-
1956	1446	-	-	-	-	-	-	-	-	-	-
1957	1516	11,200	May 5, 1957	160	1,115	2.19	29.67	806,900	1,080	28.77	782,200
1958	1566	8,970	May 12, 1958	105	834	1.64	22.20	603,500	959	25.52	694,000
1959	1636	12,500	June 6, 1959	264	1,577	3.09	41.98	1,142,000	1,623	43.22	1,175,000
1960	1716	10,100	June 3, 1960	100	1,187	2.33	31.69	861,500	-	-	-

3585. Middle Fork Flathead River near West Glacier, Mont.

Location.--Lat 48°29'50", long 114°00'30", in SW 1/4 sec. 34, T. 32 N., R. 19 W., on left bank three-quarters of a mile downstream from McDonald Creek, 1 1/4 miles west of West Glacier (formerly Belton), and 3 1/2 miles upstream from mouth.

Drainage area.--1,128 sq mi.

Records available.--October 1939 to September 1960. Prior to October 1947, published as "near Belton."

Gage.--Water-stage recorder. Altitude of gage is 3,130 ft (from river-profile map). Prior to Nov. 22, 1950, staff gage at same site and datum.

Average discharge.--21 years (1939-60), 2,881 cfs (2,086,000 acre-ft per year).

Extremes.--1939-60: Maximum discharge, 34,500 cfs May 20, 1954 (gage height, 13.01 ft); minimum, less than 173 cfs Nov. 27, 1952 (stage below intake pipe).

Remarks.--No regulation or diversion 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	2,287	2,191	2,184	1,346	1,679	934	3,626	12,560	9,135	6,481	1,748	1,670	3,834
1952	2,738	1,353	1,029	859	562	465	5,442	11,060	6,805	2,718	1,137	622	2,887
1953	407	279	262	853	1,070	700	2,809	9,415	14,030	5,607	1,585	727	3,148
1954	424	442	503	424	524	630	1,814	14,080	12,940	8,162	2,065	1,248	3,623
1955	1,384	1,413	995	553	415	390	1,022	6,777	12,550	5,318	1,449	703	2,753
1956	1,996	1,858	1,215	978	556	653	3,654	12,680	12,020	3,968	1,421	845	3,491
1957	1,078	845	747	499	500	650	2,105	14,670	8,359	2,599	965	551	2,797
1958	441	407	344	319	375	598	2,210	12,880	5,992	1,701	851	810	2,257
1959	1,438	1,618	1,662	1,587	843	781	3,978	9,032	16,620	5,695	1,589	1,827	3,987
1960	3,004	2,186	1,553	784	619	1,232	4,256	6,856	11,480	4,156	1,309	786	3,183

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	140,600	130,400	134,300	82,750	93,220	57,440	215,800	772,400	543,600	598,500	107,500	99,350	2,776,000
1952	168,300	80,490	63,280	40,500	32,330	28,610	323,800	1,007,500	604,900	167,100	69,900	37,010	2,096,000
1953	25,060	16,620	16,110	52,440	59,450	43,030	167,200	578,900	834,900	344,800	97,470	43,250	2,279,000
1954	28,060	26,330	30,930	26,090	29,130	38,710	108,000	365,500	769,900	501,900	126,400	74,280	2,623,000
1955	85,090	84,060	61,150	34,030	23,070	23,960	60,840	116,700	746,600	327,000	89,080	41,930	1,993,000
1956	122,700	110,600	74,710	60,120	31,980	40,170	217,400	779,400	715,500	244,000	87,370	50,280	2,534,000
1957	66,260	50,270	45,960	30,660	27,750	39,960	125,200	301,900	497,400	147,500	59,340	32,810	2,025,000
1958	27,130	24,230	21,140	19,640	20,710	36,760	131,500	792,100	356,500	104,600	51,090	48,220	1,634,000
1959	88,400	108,200	102,200	85,310	46,830	44,960	236,800	555,400	889,200	550,100	97,710	108,700	2,814,000
1960	194,700	130,100	95,500	48,180	35,630	75,750	253,200	421,600	685,200	255,500	80,510	46,700	2,311,000

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year			
		Momentary maximum		Minimum	Mean	Per square mile	Runoff	Mean	Runoff		
		Discharge	Date	day					Inches	Acre-feet	
1950	-	-	-	-	-	-	-	3,994	48.04	2,891,000	
1951	1216	20,100	May 12, 1951	500	3,834	3.40	46.10	2,776,000	3,705	44.55	2,683,000
1952	1246	18,100	Apr. 28, 1952	410	2,887	2.56	34.84	2,096,000	2,537	30.62	1,841,000
1953	1286	24,800	June 13, 1953	189	3,148	2.79	37.87	2,279,000	3,184	38.29	2,305,000
1954	1346	34,500	May 20, 1954	270	3,623	3.21	43.66	2,623,000	3,826	46.11	2,770,000
1955	1396	17,500	June 14, 1955	232	2,753	2.44	33.15	1,993,000	2,861	34.44	2,071,000
1956	1416	28,300	May 22, 1956	386	3,491	3.09	42.12	2,534,000	3,290	39.70	2,389,000
1957	1516	24,200	May 5, 1957	395	2,797	2.48	33.66	2,025,000	2,673	32.16	1,935,000
1958	1566	19,400	May 13, 1958	245	2,257	2.00	27.16	1,634,000	2,569	50.93	1,880,000
1959	1636	25,800	June 6, 1959	650	3,887	3.45	46.78	2,814,000	4,041	48.63	2,925,000
1960	1716	21,500	June 4, 1960	418	3,183	2.82	38.42	2,311,000	-	-	-

3590. South Fork Flathead River at Spotted Bear ranger station, near Hungry Horse, Mont.

Location.--Lat 47°55'20", long 113°31'25", in SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.17, T.25 N., R.15 W., on left bank 600 ft south of Spotted Bear ranger station, 1,000 ft upstream from Spotted Bear River, and 40 miles southeast of Hungry Horse.

Drainage area.--958 sq mi.

Records available.--August 1948 to September 1957, August 1959 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 3,670 ft (from river-profile map).

Average discharge.--10 years (1948-57, 1959-60), 1,954 cfs (1,415,000 acre-ft per year).

Extremes.--1948-57, 1959-60: Maximum discharge, 21,200 cfs June 2, 1956; maximum gage height, 12.75 ft May 20, 1954; minimum discharge, less than 121 cfs Dec. 26, 1952 (stage below intake pipes).

Flood in May to June 1948 reached a stage of 14.00 ft about May 22 (discharge, 22,000 cfs, by slope-area measurement of peak flow).

Remarks.--No regulation or diversion 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	977	1,175	1,011	672	883	488	2,473	7,996	6,210	3,993	961	682	2,284
1952	956	635	464	352	323	320	3,331	7,469	4,732	1,450	558	337	1,746
1953	237	197	202	393	385	354	1,598	5,510	9,776	3,466	773	390	1,925
1954	271	282	290	241	303	390	1,505	9,171	8,535	5,562	962	594	2,521
1955	739	628	598	282	235	236	610	4,405	8,862	3,125	743	374	1,722
1956	489	427	459	382	284	390	2,484	8,878	8,716	2,027	678	394	2,135
1957	386	369	401	262	271	303	926	8,817	5,356	1,243	482	294	1,602
1958	-	-	-	-	-	-	-	-	-	-	-	-	-
1959	-	-	-	-	-	-	-	-	-	-	-	941	-
1960	2,217	1,365	863	485	383	760	2,560	4,271	7,617	2,167	655	399	1,976

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	60,070	69,930	62,180	41,350	49,020	28,890	147,100	491,700	369,500	23,260	59,070	40,600	1,654,000
1952	58,770	37,770	28,530	21,640	16,600	19,680	198,200	459,300	281,600	89,150	34,330	20,050	1,268,000
1953	14,560	11,730	12,430	24,170	21,390	21,790	83,170	338,800	581,700	213,100	47,550	23,200	1,394,000
1954	16,670	16,780	17,840	14,790	16,850	24,000	77,670	563,900	507,900	329,700	59,150	35,370	1,661,000
1955	45,470	37,350	24,460	17,320	13,040	14,530	36,270	270,800	527,300	192,200	45,680	22,240	1,247,000
1956	30,090	25,410	28,220	23,500	16,340	23,980	147,800	545,900	518,700	124,700	41,680	23,410	1,550,000
1957	23,700	21,930	24,680	16,110	15,070	18,630	55,110	542,100	318,700	76,450	29,650	17,470	1,160,000
1958	-	-	-	-	-	-	-	-	-	-	-	-	-
1959	-	-	-	-	-	-	-	-	-	-	-	55,970	-
1960	136,300	81,220	53,040	29,820	22,040	46,760	152,300	262,600	453,200	133,200	40,250	23,730	1,434,000

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		Mean	Runoff	
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet		Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	2,502	35.43	1,811,000	-	-	-
1951	1216	14,200	May 12, 1951	280	2,284	2.38	32.37	1,654,000	2,192	31.05	1,587,000	-	-	-
1952	1246	12,000	Apr. 28, 1952	240	1,746	1.82	24.80	1,268,000	1,627	23.10	1,181,000	-	-	-
1953	1286	17,700	June 13, 1953	130	1,925	2.01	27.26	1,394,000	1,942	27.52	1,406,000	-	-	-
1954	1346	21,000	May 20, 1954	150	2,321	2.42	32.90	1,661,000	2,399	33.99	1,737,000	-	-	-
1955	1396	13,800	June 14, 1955	170	1,722	1.80	24.40	1,247,000	1,689	23.94	1,223,000	-	-	-
1956	1446	21,200	June 2, 1956	170	2,135	2.23	30.33	1,550,000	2,116	30.06	1,536,000	-	-	-
1957	1516	13,200	May 5, 1957	220	1,602	1.67	22.70	1,160,000	-	-	1,536,000	-	-	-
1958	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1959	1716	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	1716	16,200	June 4, 1960	250	1,976	2.06	28.08	1,434,000	-	-	-	-	-	-

3595. Spotted Bear River near Hungry Horse, Mont.

Location.--Lat 47°55'40", long 113°31'10", near center of sec.17, T.25 N., R.15 W., on left bank a third of a mile upstream from mouth and 40 miles southeast of Hungry Horse.

Drainage area.--184 sq mi.

Records available.--October 1948 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 3,690 ft (from river-profile map).

Average discharge.--8 years (1948-56), 380 cfs (275,100 acre-ft per year).

Extremes.--1948-56: Maximum discharge, 5,480 cfs May 20, 1954 (gage height, 7.40 ft); minimum, 20 cfs Jan. 5, 1953 (gage height, 0.67 ft), but may have been less during periods of ice effect.

Remarks.--No regulation or diversion 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	166	184	170	117	156	67.4	490	1,757	1,249	591	138	123	437
1952	163	113	88.1	60.6	55.5	53.1	760	1,488	664	179	78.9	54.3	313
1953	42.4	35.0	33.2	52.1	55.8	57.6	302	1,226	1,929	542	112	65.9	371
1954	47.9	52.3	49.8	39.6	48.1	67.3	226	2,124	1,683	763	147	92.9	446
1955	142	122	79.2	57.1	42.9	47.3	118	1,099	1,648	501	122	65.4	358
1956	82.2	95.8	103	72.8	40.6	63.6	495	1,889	1,417	315	123	70.6	398

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	10,240	10,960	10,470	7,220	8,670	5,380	29,150	108,100	74,350	36,360	8,490	7,290	316,700
1952	10,030	6,750	5,290	3,730	3,190	3,270	45,210	91,490	39,480	11,010	4,850	3,230	227,500
1953	2,600	2,080	2,040	3,200	3,100	3,540	17,980	75,410	114,800	33,340	6,890	3,920	268,900
1954	2,940	3,110	3,060	2,430	2,670	4,140	13,420	30,600	100,200	46,900	9,060	5,530	324,100
1955	8,730	7,250	4,870	3,510	2,380	2,910	7,050	67,580	98,070	30,800	7,530	3,890	244,600
1956	5,050	5,700	6,350	4,480	2,340	3,910	29,480	116,200	84,310	19,580	7,580	4,200	289,000

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	-	-	-	-	-	-	-	-	470	34.67	340,100	-
1951	1216	3,280	May 12, 1951	50	437	2.38	32.26	316,700	424	31.27	307,100	-
1952	1246	2,770	Apr. 28, 1952	45	313	1.70	23.19	227,500	292	21.64	212,800	-
1953	1296	3,720	June 13, 1953	22	371	2.02	27.42	268,900	375	27.66	271,300	-
1954	1346	5,480	May 20, 1954	25	448	2.43	33.01	324,100	464	34.21	335,800	-
1955	1396	3,400	May 21, 1955	30	358	1.84	24.94	244,600	333	24.55	240,800	-
1956	1446	4,690	May 21, 1956	28	398	2.16	29.44	289,000	-	-	-	-

3600. Twin Creek near Hungry Horse, Mont.

Location.--Lat 47°59'10", long 113°33'30", in E $\frac{1}{2}$ sec.25, T.26 N., R.16 W., on left bank 300 ft upstream from road bridge, 0.1 mile upstream from mouth, and 36 miles southeast of Hungry Horse.

Drainage area.--47.0 sq mi.

Records available.--August 1948 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 3,610 ft (from river-profile map).

Average discharge.--8 years (1948-56), 119 cfs (86,150 acre-ft per year).

Extremes.--1948-56: Maximum discharge, 2,790 cfs May 19, 1954 (gage height, 8.33 ft), from rating curve extended above 1,000 cfs on basis of slope-area measurement at gage height 8.1 ft; minimum, 3.9 cfs Mar. 8, Nov. 26, 1952 (gage height, 1.77 ft), but may have been less during periods of ice effect.

Remarks.--No regulation or diversion 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	64.5	76.1	112	44.5	80.4	36.7	269	558	293	103	25.7	21.3	141
1952	46.3	39.3	29.2	18.4	18.7	18.6	347	423	139	40.5	16.0	10.7	96.1
1953	8.09	7.02	6.69	20.7	29.4	30.0	202	471	478	86.4	20.4	11.5	114
1954	9.22	11.4	12.5	11.2	16.1	28.1	129	744	430	134	26.8	17.6	132
1955	46.3	54.8	36.5	21.5	17.1	15.4	82.3	447	422	109	23.2	11.6	108
1956	31.2	51.6	43.0	33.3	18.3	34.8	240	609	313	61.2	22.3	14.8	123

Monthly and yearly discharge, in acre-feet, of Twin Creek near Hungry Horse, Mont.

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	3,970	4,530	6,900	2,740	4,460	2,260	16,010	34,320	17,460	6,310	1,580	1,270	101,800
1952	2,850	2,340	1,800	1,130	1,080	1,140	20,860	26,410	8,250	2,490	986	836	69,770
1953	496	418	412	1,270	1,630	1,840	12,040	28,990	28,440	5,310	1,250	684	82,780
1954	567	678	772	687	895	1,730	7,700	45,740	25,580	8,250	1,650	1,050	95,300
1955	2,850	3,260	2,250	1,320	948	948	4,900	27,490	25,130	6,710	1,430	692	77,930
1956	1,920	3,070	2,650	2,050	1,060	2,140	14,260	37,430	18,630	3,760	1,370	885	89,220

Yearly 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	-	-	-	-	-	-	-	-	156	44.96	112,700
1951	1216	1,270	May 12, 1951	13	141	3.00	40.61	101,800	129	37.27	93,400
1952	1246	1,250	Apr. 27, 1952	8.6	96.1	2.04	27.82	69,770	88.3	25.56	64,110
1953	1286	920	May 29, 1953	4	114	2.43	33.03	82,780	115	33.56	85,470
1954	1346	2,790	May 19, 1954	7.5	132	2.81	38.02	95,300	140	40.55	101,800
1955	1396	1,260	May 21, 1955	10	108	2.30	31.10	77,930	107	30.82	77,210
1956	1446	1,560	May 21, 1956	12	123	2.62	35.60	89,220	-	-	-

3605. Lower Twin Creek near Hungry Horse, Mont.

Location.--Lat 47°59'40", long 113°33'20", in SE $\frac{1}{4}$ sec.24, T.26 N., R.16 W., on left bank half a mile upstream from mouth and 35 miles southeast of Hungry Horse.

Drainage area.--22.4 sq mi.

Records available.--August 1948 to September 1956.

Gage.--Water-stage recorder. Altitude of gage is 3,630 ft (from river-profile map).

Average discharge.--8 years (1948-56), 69.4 cfs (50,240 acre-ft per year).

Extremes.--1948-56: Maximum discharge, 909 cfs May 21, 1956, from rating curve extended above 550 cfs on basis of slope-area measurement at gage height 5.25 ft; maximum gage height, 4.49 ft June 2, 1956 (from gage-relation curve); minimum discharge, 0.8 cfs Jan. 28, 1952 (gage height, 0.79 ft, caused by temporary storage behind ice jam upstream).

Flood in May to June 1948 reached a stage of 5.25 ft (from outside gage) about May 22 (discharge, 1,200 cfs, by slope-area measurement of peak flow).

Remarks.--No regulation or diversion 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	38.3	46.6	59.3	27.3	40.1	19.2	121	256	154	69.0	19.4	15.3	72.3
1952	31.0	25.0	18.9	11.1	11.1	9.62	166	279	116	33.1	15.6	8.95	60.3
1953	6.65	5.06	4.25	12.2	20.7	16.6	108	265	252	59.0	17.1	9.54	64.5
1954	7.08	7.14	9.06	7.50	10.0	18.6	73.4	329	244	101	20.9	16.4	70.7
1955	38.2	39.3	26.6	14.0	11.1	9.50	55.1	233	301	84.9	20.4	9.19	70.3
1956	32.8	45.3	35.5	24.3	13.3	19.4	128	343	234	52.6	16.7	12.1	79.8

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2,350	2,770	3,640	1,680	2,230	1,180	7,220	15,730	9,170	4,240	1,190	912	52,310
1952	1,900	1,490	1,160	682	640	592	9,880	17,140	6,910	2,030	839	532	43,800
1953	409	301	261	747	1,150	1,020	6,290	16,280	15,010	3,630	1,050	568	46,720
1954	436	425	557	461	556	1,140	4,370	20,240	14,510	6,180	1,290	978	51,140
1955	2,350	2,540	1,630	859	619	584	3,280	14,340	17,890	5,220	1,250	547	50,910
1956	2,020	2,700	2,190	1,490	768	1,190	7,590	21,090	13,930	3,230	1,030	720	57,950

Yearly discharge, in cubic feet per second

Water year ending Sept. 30												Calendar year		
Year	WSP	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff				
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet			
1950	-	-	-	-	-	-	-	-	87.2	52.92	63,140			
1951	1216	457	May 12, 1951	9.6	72.3	3.23	43.74	52,310	66.5	40.20	48,100			
1952	1246	482	Apr. 28, 1952	7.6	60.3	2.69	36.72	43,800	55.4	33.72	40,220			
1953	1286	503	June 3, 1953	2.5	64.5	2.88	39.14	46,720	65.2	39.52	47,160			
1954	1346	868	May 20, 1954	5	70.7	3.16	42.82	51,140	77.4	46.93	56,040			
1955	1396	645	May 21, 1955	7.8	70.3	3.14	42.64	50,910	71.1	43.12	51,500			
1956	1446	909	May 21, 1956	8.0	79.8	3.56	48.50	57,950	-	-	-			

3610. Sullivan Creek near Hungry Horse, Mont.

* Location.--Lat 48°01'45", long 113°42'10", in W $\frac{1}{2}$ sec.12, T.26 N., R.17 W., on left bank a quarter of a mile downstream from Quintonkon Creek, 1 mile upstream from Hungry Horse Reservoir flow line, and 30 miles southeast of Hungry Horse.

Drainage area.--71.3 sq mi.

Records available.--September 1948 to September 1956, August 1959 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 3,740 ft (from topographic map).

Average discharge.--9 years (1948-56, 1959-60), 220 cfs (159,300 acre-ft per year).

Extremes.--1948-56, 1959-60: Maximum discharge, 2,750 cfs May 19, 1954 (gage height, 5.29 ft); minimum daily, 10 cfs Nov. 26, 1952.

Remarks.--No regulation or diversion 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	142	170	236	102	153	585.65	318	831	528	199	55.5	53.7	237
1952	167	104	75.5	42.5	38.9	35.6	461	859	472	128	45.4	31.3	205
1953	20.5	17.7	17.3	54.9	65.8	46.9	252	636	778	176	45.7	27.4	178
1954	20.0	29.2	30.7	25.6	38.1	62.5	189	954	747	318	77.0	61.4	214
1955	93.7	105	71.8	38.7	30.9	30.7	111	612	823	239	61.3	34.8	188
1956	163	177	145	77.6	42.7	59.6	349	983	706	136	48.3	37.2	244
1957	-	-	-	-	-	-	-	-	-	-	-	-	-
1958	-	-	-	-	-	-	-	-	-	-	-	-	-
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	406	224	123	66.6	46.4	138	390	660	938	209	70.8	38.6	276

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	8,760	10,120	14,500	6,240	8,490	3,600	18,910	51,110	31,390	12,210	3,410	3,200	171,900
1952	10,290	6,190	4,650	2,620	2,240	2,190	27,460	52,850	28,060	7,890	2,790	1,860	149,100
1953	1,260	1,060	1,060	3,380	3,650	2,890	15,000	39,130	46,290	10,830	2,810	1,630	129,000
1954	1,230	1,740	1,890	1,580	2,120	3,840	11,240	58,680	44,460	19,530	4,730	3,660	154,700
1955	5,760	6,250	4,420	2,380	1,720	1,690	6,590	37,620	48,940	14,680	3,770	2,070	136,100
1956	10,010	10,560	8,820	4,770	2,460	3,670	20,740	60,430	41,990	8,340	2,970	2,220	177,100
1957	-	-	-	-	-	-	-	-	-	-	-	-	-
1958	-	-	-	-	-	-	-	-	-	-	-	7,310	-
1959	-	-	-	-	-	-	-	-	-	-	-	-	-
1960	24,960	13,330	7,540	4,100	2,670	8,510	23,210	40,590	55,830	12,870	4,350	2,300	200,300

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	-	-	-	-	-	-	-	-	285	54.27	206,500
1951	1216	1,400	May 12, 1951	30	237	3.32	45.31	171,900	221	42.09	159,700
1952	1246	1,410	Apr. 28, 1952	23	205	2.88	39.15	149,100	181	34.49	131,300
1953	1286	1,380	June 3, 1953	10	178	2.50	33.90	129,000	180	34.29	130,500
1954	1346	2,750	May 19, 1954	18	214	3.00	40.67	154,700	230	43.71	166,300
1955	1386	1,540	May 21, 1955	26	188	2.64	35.78	136,100	206	39.21	149,200
1956	1446	2,250	June 2, 1956	25	244	3.42	46.54	177,100	-	-	-
1957	-	-	-	-	-	-	-	-	-	-	-
1958	-	-	-	-	-	-	-	-	-	-	-
1959	1716	-	-	-	-	-	-	-	-	-	-
1960	1716	1,870	June 3, 1960	25	276	3.87	52.64	200,300	-	-	-

3620. Hungry Horse Reservoir near Hungry Horse, Mont.

Location.--Lat 48°20'30", long 114°00'50", in NE 1/4 sec. 27, T.30 N., R.19 W., in block 14 of Hungry Horse Dam, 3 miles southeast of Hungry Horse.

Drainage area.--1,654 sq mi.

Records available.--September 1951 to September 1960.

Gage.--Water-stage recorder equipped with remote indicator in powerhouse. Datum of gage is at mean sea level (levels by Bureau of Reclamation). During construction and prior to May 1, 1953, various types of nonrecording gages were used.

Extremes.--1951-60: Maximum contents observed, 3,461,000 acre-ft July 3, 4, 1955, Aug. 6, 1956; maximum elevation observed, 3,561.40 ft July 3, 4, 1955; minimum contents observed since normal low operating level reached in May 1952, 607,700 acre-ft Jan. 13, 1953 (elevation, 3,362.50 ft).

Remarks.--Reservoir is formed by concrete dam; construction of dam began in 1948, completed in 1952. Storage began Sept. 21, 1951. Usable capacity, 3,428,000 acre-ft between elevations 3,560 (controlled spillway elevation) and 3,196 ft. Dead storage, 40,140 acre-ft below elevation 3,196 ft. Minimum operating level, 3,336 ft for on-site power generation (usable contents, 445,900 acre-ft). Water is used for power production, flood control, irrigation, and recreation. Figures given herein represent usable contents.

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	-	-	-	-	-	-	-	-	-	-	-	-
1952	81.94	24.36	17.18	18.91	25.64	25.28	161.7	613.3	982.8	992.4	997.6	994.6
1953	996.1	905.2	672.4	621.2	855.5	679.5	858.3	1,481	2,449	2,741	2,787	2,802
1954	2,750	2,572	2,477	2,326	2,021	1,946	1,635	2,537	3,298	3,426	3,425	3,440
1955	3,428	3,436	3,106	2,701	2,489	2,155	2,107	2,631	3,444	3,432	3,426	3,427
1956	3,411	3,404	3,331	3,029	2,595	2,084	1,942	2,850	3,425	3,455	3,457	3,409
1957	3,261	3,007	2,538	1,983	1,802	1,810	1,970	2,961	3,432	3,443	3,437	3,143
1958	2,888	2,393	2,091	2,061	2,088	2,115	2,276	3,049	3,425	3,425	3,425	3,426
1959	3,427	3,370	3,255	2,956	2,623	2,286	1,904	2,465	3,436	3,452	3,451	3,451
1960	3,452	3,445	3,381	3,281	2,962	2,841	2,507	2,899	3,439	3,440	3,440	3,439

3625. South Fork Flathead River near Columbia Falls, Mont.

Location.--Lat 48°21'30", long 114°02'15", in SW 1/4 sec. 16, T.30 N., R 19 W., on right bank 1 1/2 miles downstream from Hungry Horse Dam, 3 1/2 miles upstream from mouth, and 7 miles east of Columbia Falls.

Drainage area.--1,663 sq mi; at site prior to October 1952, 1,667 sq mi.

Records available.--September 1910 to January 1911 (discharge measurements only), February 1911 to September 1913 (no winter records), October 1913 to August 1916 (scattered daily discharge only), April 1923 to November 1924 (no winter records), July to October 1925, May to November 1927, May 1928 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Datum of gage is 3,040.0 ft above mean sea level (levels by Bureau of Reclamation). September 1910 to September 1916 chain gage and Apr. 23, 1923, to Sept. 30, 1928, water-stage recorder, at site 3 miles downstream at different datum. Oct. 1, 1928, to Sept. 30, 1952, water-stage recorder at site 1 1/2 miles downstream at different datums.

Average discharge.--32 years (1928-60), 3,456 cfs (2,502,000 acre-ft per year), adjusted for storage.

Extremes.--1910-16, 1923-60: Maximum discharge observed, 46,200 cfs June 19, 1916 (gage height, 16.6 ft, site and datum then in use), from rating curve extended above 20,000 cfs; minimum observed, 7.3 cfs Sept. 24, 1951 (gage height, 0.52 ft, dam closure), site and datum then in use; minimum daily, 7.3 cfs Sept. 24, 1951.

Remarks.--Flow regulated since Sept. 21, 1951, by Hungry Horse 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	1,945	2,367	2,671	1,634	2,210	1,107	5,387	15,250	11,060	6,218	1,548	764	4,359
1952	686	2,629	1,210	768	585	624	5,083	6,817	2,437	2,365	791	622	2,052
1953	387	1,912	4,384	1,907	428	468	561	358	366	535	395	355	1,012
1954	1,293	3,722	2,267	3,177	6,417	2,217	8,545	3,239	1,986	6,290	1,632	763	3,435
1955	1,620	1,341	6,584	7,565	4,650	6,189	2,552	903	2,240	5,840	1,234	625	3,455
1956	1,843	1,896	2,850	6,220	8,616	9,660	8,370	2,216	5,097	2,920	1,030	1,477	4,335
1957	3,341	5,285	8,985	10,030	3,967	671	202	1,140	1,237	1,787	784	5,540	3,583
1958	4,772	9,092	5,601	1,001	208	359	289	4,468	2,090	1,995	710	798	2,630
1959	1,500	3,790	4,375	7,024	7,497	6,849	12,590	2,920	7,345	6,914	1,569	1,890	5,326
1960	4,571	3,628	3,002	2,756	6,476	3,906	11,360	2,869	5,749	3,991	1,143	653	4,150

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	119,600	140,800	164,200	100,500	122,800	68,060	320,500	938,000	658,400	382,400	95,170	45,460	3,156,000
1952	42,160	156,500	74,400	47,220	33,650	38,350	302,500	19,200	145,000	145,400	48,660	37,040	1,490,000
1953	23,830	113,800	269,600	117,500	23,750	28,770	33,390	22,000	21,800	32,930	24,290	21,130	732,600
1954	79,510	221,500	139,400	195,300	356,400	136,300	508,500	199,200	118,200	386,800	100,400	45,390	2,487,000
1955	99,610	79,780	404,800	465,100	258,300	380,500	151,900	55,530	133,300	359,100	75,860	37,200	2,501,000
1956	113,300	112,900	180,200	382,500	495,600	594,000	498,000	136,300	303,300	179,600	63,340	87,880	3,147,000
1957	205,400	313,300	552,500	616,800	221,400	41,270	12,040	70,110	73,630	109,900	48,220	329,600	2,594,000
1958	293,400	541,000	344,400	61,580	11,540	22,100	17,190	274,700	124,400	122,600	43,670	47,470	1,904,000
1959	92,210	225,500	269,000	431,800	416,400	421,200	749,300	179,500	437,000	425,100	96,470	112,500	3,856,000
1960	281,100	215,900	184,600	169,500	372,500	240,200	675,800	176,400	342,100	245,400	70,250	38,830	3,013,000

† Corrected.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30										Calendar year			
		Observed					Adjusted					Observed		Adjusted	
		Momentary maximum		Minimum		Runoff in acre-feet	Mean		Runoff in acre-feet	Mean		Mean	Runoff in acre-feet	Mean	Runoff in inches
		Discharge	Date	Mean	day		Mean	square mile		square mile	inches				
1950	-	-	-	-	-	-	-	-	-	-	-	4,905	3,552,000	4,905	39.98
1951	1216	25,500	May 12, 1951	7.3	4,359	3,156,000	4,389	2.83	35.72	150,300	4,000	4,229	3,140	25.66	34.42
1952	1246	10,000	May 18, 1952	12	2,052	1,490,000	3,448	2.07	28.15	2,237	1,624,000	3,140	25.66	25.66	28.97
1953	1286	4,870	Dec. 3, 1953	260	1,012	732,600	508	2.11	28.63	1,058	765,800	3,550	28.97	28.97	36.77
1954	1346	32,500	July 13, 1954	266	3,435	2,487,000	4,316	2.60	35.25	3,634	2,631,000	4,503	36.77	36.77	28.72
1955	1396	13,200	July 15, 1955	152	3,455	2,501,000	4,337	2.07	28.04	3,209	2,323,000	3,520	28.72	28.72	34.03
1956	1446	11,700	June 21, 1956	152	4,335	3,147,000	4,310	2.59	35.27	5,250	3,812,000	4,158	34.03	34.03	25.43
1957	1516	11,100	Feb. 19, 1957	175	5,582	2,594,000	3,216	1.93	26.26	3,732	2,702,000	3,114	25.43	25.43	27.91
1958	(4)	12,100	May 8, 1958	153	2,630	1,904,000	3,021	1.82	24.85	1,812	1,312,000	3,420	27.91	27.91	45.97
1959	1636	24,300	June 22, 1959	196	5,326	3,856,000	3,611	3.22	43.76	5,457	3,951,000	5,631	45.97	45.97	-
1960	1716	21,300	Feb. 26, 1960	151	4,150	3,013,000	4,133	2.49	33.83	-	-	-	-	-	-

† Corrected.
‡ 1566, 1636.

3630. Flathead River at Columbia Falls, Mont.

Location.--Lat 48°21'50", long 114°11'10", in NW¼SE¼ sec.17, T.30 N., R.20 W., on right bank 200 ft downstream from county bridge at Columbia Falls and 5 miles downstream from South Fork.

Drainage area.--4,464 sq mi.

Records available.--May 1922 to September 1923 (fragmentary), June 1928 to September 1960. Monthly discharge only for some periods, published in WSP 1816.

Gage.--Water-stage recorder. Datum of gage is 2,978.00 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Nov. 12, 1928, wire-weight gage on bridge 200 ft upstream at datum 0.19 ft higher.

Average discharge.--32 years (1928-60), 9,530 cfs (6,899,000 acre-ft per year), adjusted for change in contents in Hungry Horse Reservoir since Oct. 1, 1951.

Extremes.--1922-23, 1928-60: Maximum discharge, 102,000 cfs May 23, 1948 (gage height, 19.08 ft); minimum, 798 cfs Dec. 8, 1929 (gage height, -0.08 ft). Maximum stage known, 22.7 ft in June 1894, from floodmarks (discharge, 135,000 cfs, from rating curve extended above 85,000 cfs by logarithmic plotting).

Remarks.--South Fork Flathead River, which contributes about one-third of flow, completely regulated by Hungry Horse Reservoir since Sept. 21, 1951 (see p. 270).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	6,376	6,781	6,938	4,601	5,955	3,276	13,260	43,850	31,180	19,860	5,855	5,093	12,790
1952	7,564	5,994	3,712	2,432	2,012	1,906	17,260	29,900	16,490	8,917	3,729	2,351	8,536
1953	1,561	2,855	5,205	3,776	2,565	1,949	5,817	19,550	29,010	12,010	4,303	2,276	7,571
1954	2,503	5,177	3,685	4,273	7,667	3,658	12,050	33,670	29,970	24,530	6,900	4,535	11,570
1955	4,903	4,419	8,797	9,122	5,920	7,344	4,832	14,670	29,060	17,450	4,797	2,519	9,506
1956	6,191	6,000	5,498	8,247	9,892	11,020	16,130	29,580	30,900	11,890	4,486	3,591	11,940
1957	5,864	7,037	10,560	11,210	5,181	2,175	4,561	31,940	18,560	7,116	3,151	6,916	9,561
1958	6,043	10,260	6,822	1,987	1,299	1,841	5,258	30,580	14,410	5,928	2,774	2,633	7,513
1959	4,244	6,764	7,260	9,791	9,371	8,572	21,130	22,080	40,400	18,540	5,406	6,672	13,330
1960	11,210	8,304	6,400	4,700	8,281	6,939	21,300	17,900	29,050	12,500	4,555	2,625	11,100

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	392.0	403.5	426.6	282.9	330.7	201.4	789.0	2,696	1,856	1,221	360.0	303.1	9,262
1952	465.1	356.7	228.2	149.6	115.7	117.2	1,027	1,838	981.4	548.3	229.3	139.9	6,196
1953	95.98	169.9	320.1	232.2	142.4	119.8	346.2	1,202	1,726	738.7	252.3	135.4	5,481
1954	153.9	308.1	226.6	262.8	425.8	224.9	717.2	2,070	1,784	1,508	424.3	269.9	18,376
1955	301.4	263.0	540.9	560.9	328.8	451.6	287.5	902.2	1,729	1,072	295.0	149.9	6,882
1956	380.7	357.0	338.0	507.1	569.0	677.6	959.8	1,819	1,839	731.4	275.9	213.7	8,668
1957	360.5	418.8	649.2	689.4	287.7	133.8	271.4	1,964	1,105	437.6	193.7	411.5	6,923
1958	371.5	610.6	407.2	122.2	72.16	113.2	312.9	1,880	857.5	364.5	170.6	156.7	5,439
1959	260.9	402.5	446.4	602.0	520.5	527.1	1,257	1,358	2,404	1,140	332.4	397.0	9,648
1960	689.2	494.1	393.5	289.0	476.3	426.6	1,267	1,101	1,729	768.6	267.8	156.2	8,058

† Corrected.

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	Runoff in acre-feet	Mean	Per square mile	Runoff in inches	Mean	Runoff in acre-feet	Mean	Runoff in inches				
		Discharge	Date														
1950	-	-	-	-	-	-	-	-	13,060	9,453,000	13,060	39.74	-	-			
1951	1216	69,000	May 12, 1951	1,900	12,790	9,262,000	12,820	2.87	38.98	12,560	9,090,000	12,540	38.41	-	-		
1952	1246	47,200	Apr. 28, 1952	1,640	8,536	6,196,000	9,351	2.22	30.29	7,897	5,732,000	8,799	26.83	-	-		
1953	1286	48,900	June 13, 1953	1,360	7,571	5,481,000	10,070	2.26	30.61	7,713	5,584,000	10,210	31.03	-	-		
1954	1346	69,600	May 20, 1954	1,490	11,570	18,376,000	12,450	2.79	37.87	12,140	8,792,000	13,010	39.59	-	-		
1955	1396	42,100	June 14, 1955	1,730	9,506	6,882,000	9,488	2.13	28.85	9,465	6,853,000	9,776	29.71	-	-		
1956	1446	66,200	May 21, 1956	1,990	11,940	8,668,000	11,920	2.67	36.33	12,430	9,021,000	11,330	34.56	-	-		
1957	1516	50,500	May 6, 1957	1,300	9,561	6,923,000	9,195	2.06	27.95	9,507	6,863,000	8,890	27.03	-	-		
1958	1566	44,600	May 11, 1958	1,050	7,513	5,439,000	7,904	1.77	24.04	7,127	5,160,000	8,735	26.56	-	-		
1959	1636	58,000	June 21, 1959	2,510	13,330	9,648,000	13,360	2.99	40.64	13,970	10,110,000	14,150	43.03	-	-		
1960	1716	46,400	June 4, 1960	1,410	11,100	8,058,000	11,090	2.48	33.78	-	-	-	-	-	-		

† Corrected.

3700. Swan River near Bigfork, Mont.

Location.--Lat 48°01'30", long 113°58'40", in SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.11, T.26 N., R.19 W., on left bank at outlet of Swan Lake, 1,000 ft downstream from Johnson Creek and 5 miles southeast of Bigfork.

Drainage area.--671 sq mi.

Records available.--October 1910 to May 1911 (gage heights only), April 1922 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Datum of gage is 3,062.6 ft above mean sea level (river-profile survey). Oct. 10, 1910, to May 22, 1911, staff gage at site 10 miles upstream at different datum. Apr. 28, 1922, to Oct. 14, 1930, staff gage at site 800 ft upstream at datum 1.9 ft higher.

Average discharge.--38 years (1922-60), 1,123 cfs (813,000 acre-ft per year).

Extremes.--1922-60: Maximum discharge, 8,400 cfs May 24, 1948 (gage height, 7.12 ft, from graph based on gage readings); minimum observed, 193 cfs Jan. 26-29, 1930 (gage height, 0.04 ft, site and datum then in use).

Remarks.--Diversions for irrigation of about 360 acres 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	687	878	895	757	885	608	1,562	3,472	2,709	2,045	860	667	1,330
1952	911	716	609	507	456	406	2,026	3,332	2,612	1,218	508	439	1,154
1953	347	341	333	508	522	462	883	2,045	3,988	1,919	705	462	1,043
1954	378	392	427	390	413	511	1,237	3,052	2,857	2,563	838	592	1,142
1955	578	568	489	425	397	369	716	2,016	3,544	1,963	713	445	1,022
1956	559	636	630	534	420	495	2,141	3,602	3,893	1,545	713	505	1,306
1957	514	523	532	405	388	473	1,062	3,601	2,800	1,120	520	381	1,030
1958	363	393	390	344	382	468	1,203	3,460	2,820	962	496	443	979
1959	574	910	919	786	726	649	2,284	3,227	5,677	3,112	1,168	1,039	1,757
1960	1,682	1,422	1,021	661	596	742	2,293	2,237	4,024	1,966	869	615	1,509

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	42,220	52,240	55,020	46,550	49,150	37,380	92,830	213,500	161,200	125,800	52,910	39,700	968,600
1952	56,020	42,590	37,470	31,160	26,240	24,960	120,500	204,900	155,400	74,900	37,370	26,110	837,600
1953	21,360	20,270	20,460	31,260	29,020	28,390	52,540	125,800	237,300	118,000	43,350	27,470	755,200
1954	23,230	23,340	26,240	23,950	22,950	31,400	73,590	187,700	170,000	157,600	51,530	35,220	826,800
1955	35,520	33,780	30,060	26,150	22,050	22,690	42,600	124,000	210,900	121,900	43,840	26,650	740,100
1956	34,390	37,830	38,730	32,830	24,150	30,460	127,400	221,500	231,700	95,010	43,870	30,070	947,900
1957	31,610	31,140	32,720	24,930	21,550	29,060	63,210	221,400	186,600	68,860	32,000	22,700	745,800
1958	22,330	23,390	23,980	21,150	21,190	28,750	71,590	212,800	167,800	59,160	30,480	26,380	709,000
1959	35,290	54,180	56,510	48,350	40,320	39,940	135,900	198,400	337,800	191,400	71,800	61,820	1,272,000
1960	103,400	84,600	62,800	40,630	34,270	45,650	136,500	137,500	239,400	120,900	53,420	36,600	1,095,000

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	-	-	-	-	-	-	-	-	1,439	29.11	1,042,000	-
1951	1216	4,750	May 14, 1951	428	1,338	1.99	27.07	968,600	1,519	26.71	955,200	-
1952	1246	4,590	Apr. 30, 1952	364	1,154	1.72	25.42	837,600	1,052	21.35	763,600	-
1953	1286	5,610	June 5, 1953	280	1,043	1.55	21.11	755,200	1,058	21.40	765,900	-
1954	1346	5,630	May 22, 1954	326	1,142	1.70	23.09	826,800	1,179	23.83	853,300	-
1955	1396	5,060	June 16, 1955	332	1,022	1.52	20.67	740,100	1,038	21.00	751,700	-
1956	1446	6,790	June 4, 1956	377	1,306	1.95	26.48	947,900	1,284	26.04	932,500	-
1957	1518	4,960	May 8, 1957	332	1,030	1.54	20.83	745,800	995	20.11	720,000	-
1958	1566	5,920	May 27, 1958	326	979	1.46	19.80	709,000	1,085	21.94	785,300	-
1959	1636	7,520	June 22, 1959	477	1,757	2.62	35.55	1,272,000	1,901	38.47	1,377,000	-
1960	1716	5,500	June 6, 1960	470	1,509	2.25	30.61	1,095,000	-	-	-	-

PEND OREILLE RIVER BASIN

3710. Flathead Lake at Somers, Mont.

Location.--Lat 48°04'30", long 114°13'30", in SE¹/₄NE¹/₄ sec.26, T.27 N., R.21 W., at steam-boat dock at Somers.

Drainage area.--7,086 sq mi.

Records available.--April to August 1900, daily lake elevations only, at site near Holt, 6 miles east of Somers (datum unknown), August 1908 to November 1909 (fragmentary), January 1919 to September 1960. Month-end contents only for some periods, published in WSP 1316. Published as "at Poison" prior to April 1923, Oct. 1, 1941 to Sept. 30, 1960, unpublished daily lake elevations at Poison are available in files of Helena District Office.

Gage.--Water-stage recorder. Datum of gage is at mean sea level (Somers datum). July 1 to Dec. 12, 1923, staff gage at same site and datum.

Extremes.--1908-60: Maximum contents, 2,208,000 acre-ft June 19, 1933 (elevation, 2,896.26 ft); minimum, 347,000 acre-ft Dec. 5, 1936 (elevation, 2,881.07 ft). Lake reached an elevation of 2,900 ft, during flood in June 1894.

Remarks.--Natural storage in Flathead Lake increased by construction of Kerr Dam 4 miles downstream from natural lake outlet; storage began Apr. 11, 1938. Usable capacity, 1,791,000 acre-ft at controlled spillway elevation (2,893 ft). Dead storage unknown below 2,878 ft (elevation of natural outlet). Minimum operating level, 2,883 ft for on-site power generation (usable contents, 572,300 acre-ft). Figures given herein represent usable contents. Water is used for power production, flood control, irrigation, and recreation.

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	1,785	1,766	1,617	1,112	909.9	651.6	990.6	1,683	1,758	1,768	1,766	1,773
1952	1,772	1,694	1,501	1,182	730.1	572.3	1,212	1,594	1,772	1,776	1,766	1,630
1953	1,362	1,145	1,064	961.7	828.1	641.0	777.9	1,413	1,757	1,772	1,776	1,495
1954	1,222	1,125	929.1	877.4	836.5	616.1	909.9	1,563	1,751	1,788	1,796	1,773
1955	1,688	1,468	1,283	1,109	788.6	709.8	675.3	1,145	1,804	1,785	1,758	1,458
1956	1,407	1,306	1,037	925.5	858.2	871.4	1,079	1,661	1,770	1,743	1,794	1,576
1957	1,431	1,244	1,126	996.7	849.8	592.4	678.9	1,684	1,792	1,790	1,747	1,781
1958	1,643	1,539	1,267	1,032	872.6	583.0	721.7	1,743	1,778	1,751	1,775	1,602
1959	1,578	1,720	1,478	1,194	920.7	863.4	1,174	1,276	1,724	1,768	1,782	1,782
1960	1,772	1,715	1,535	1,324	1,209	867.8	1,118	1,316	1,795	1,753	1,772	1,718

† Corrected.

3720. Flathead River near Polson, Mont.

Location.--Lat 47°40'50", long 114°15'10", in NW 1/4 sec. 11, T. 22 N., R. 21 W., on left bank half a mile downstream from Kerr Dam, 4 miles west of Polson, and 5 miles downstream from Flathead Lake.

Drainage area.--7,096 sq mi.

Records available.--July 1907 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 2,693.70 ft above mean sea level (levels by The Montana Power Co.). Prior to Oct. 1, 1941, staff and chain gages or water-stage recorder at several sites near highway bridge at old site of Mitchell's ferry 6 miles downstream, all at datum 2,629.20 ft above mean sea level (river-profile survey).

Average discharge.--53 years (1907-60), 11,600 cfs (8,398,000 acre-ft per year), adjusted since Oct. 1, 1952, for change in contents in Hungry Horse Reservoir and Flathead Lake.

Extremes.--1907-60: Maximum discharge, 82,800 cfs May 29, 1928 (gage height, 17.2 ft, site and datum then in use); minimum, probably less than 5 cfs Apr. 13, 1938; minimum daily, 32 cfs Apr. 12, 1938.

Flood in June 1894 reached a stage of about 21 ft, present datum (discharge, about 110,000 cfs), from lake elevation-discharge study.

Remarks.--Diversion above station for irrigation of about 10,000 acres. Flathead project pumps can divert up to 12,000 acre-ft per month when required for irrigation of lands downstream from station. Flow regulated by Flathead Lake (Kerr Dam) (see p. 274) since April 1938 and Hungry Horse Reservoir (see p. 270) since September 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	7,132	8,556	11,460	14,840	12,010	8,962	11,500	41,820	36,710	24,510	6,862	6,076	15,890
1952	9,503	8,891	7,993	9,115	11,820	5,973	10,580	31,780	19,850	10,910	4,205	5,029	11,500
1953	6,380	6,769	7,019	6,704	5,865	6,094	5,219	13,590	31,060	14,540	4,542	7,068	9,569
1954	7,502	7,579	7,648	6,123	9,655	8,688	9,206	29,850	33,820	29,880	8,335	5,792	13,680
1955	6,818	9,215	12,350	12,710	12,950	8,784	6,906	10,430	23,900	20,890	5,694	7,809	11,520
1956	7,654	8,794	11,280	11,150	12,090	11,900	17,030	27,170	37,210	15,300	4,407	7,813	14,290
1957	8,682	11,030	13,640	14,030	9,234	7,867	5,089	21,480	21,340	8,381	3,822	6,038	10,900
1958	8,939	12,920	11,980	7,044	5,573	7,467	5,534	19,940	18,600	7,820	2,356	5,650	9,500
1959	5,245	5,621	13,360	16,500	16,500	10,260	20,570	28,410	43,140	22,750	6,322	8,216	16,370
1960	15,980	11,900	11,130	9,788	11,410	14,600	22,110	20,600	29,140	16,790	5,356	4,247	14,240

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	438.5	509.1	706.1	912.4	668.8	551.0	672.62	571	2,185	1,507	421.9	361.5	11,500
1952	584.3	529.1	491.8	560.5	680.2	367.3	629.51	954	1,181	670.9	258.6	299.3	8,206
1953	392.5	402.8	451.6	412.2	325.7	374.7	310.6	835.6	1,848	894.0	279.3	420.6	6,927
1954	449.0	451.0	470.3	376.5	536.2	534.2	547.81	835	2,013	1,637	512.5	344.7	9,908
1955	419.2	546.4	759.5	781.8	719.1	540.1	410.9	641.4	1,422	1,285	350.1	464.7	8,342
1956	470.6	525.3	693.8	685.8	695.6	731.71	1,013	1,670	2,214	940.5	271.0	464.9	10,370
1957	533.8	656.4	838.8	862.4	512.8	483.7	302.81	321	+1,270	515.3	235.0	359.3	7,891
1958	549.7	768.8	736.3	433.1	309.5	459.1	329.31	226	1,107	480.8	143.7	335.0	6,878
1959	322.5	334.5	821.4	1,015	916.4	630.61	1,224	1,747	2,567	1,399	388.7	488.9	11,860
1960	859.5	708.0	684.3	601.7	656.3	897.91	1,516	1,266	1,734	1,032	328.1	252.7	10,340

† Corrected.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year					
		Observed				Adjusted			Observed		Adjusted			
		Momentary maximum		Minimum	Mean	Runoff in acre-feet	Mean	Per square mile	Runoff in inches	Mean	Runoff in acre-feet	Mean	Runoff in inches	
		Discharge	Date	day										
1950	-	-	-	-	-	-	-	-	-	15,560	11,260,000	15,960	30.53	
1951	1216	66,800	June 16,	1951	1,410	15,890	11,500,000	15,940	2.25	30.50	15,820	11,450,000	15,740	30.12
1952	1246	41,800	May 23,	1952	1,540	11,300	8,206,000	12,300	1.76	23.98	10,780	7,828,000	11,080	21.25
1953	1288	58,100	June 4,	1953	1,590	9,569	6,827,000	11,890	1.67	22.71	9,757	7,071,000	12,070	23.09
1954	1346	59,300	July 3,	1954	1,820	13,680	8,908,000	14,950	2.11	28.61	14,180	10,260,000	15,540	29.73
1955	1396	49,300	June 16,	1955	1,670	11,520	8,342,000	11,070	1.56	21.19	11,470	8,303,000	11,440	21.90
1956	1446	58,200	June 7,	1956	2,080	14,290	10,370,000	14,430	2.03	27.69	14,760	10,720,000	13,790	26.47
1957	1516	48,800	May 22,	1957	2,100	10,900	7,891,000	10,820	1.52	20.70	10,930	7,917,000	10,510	20.11
1958	1566	61,600	May 26,	1958	829	5,000	6,878,000	9,645	1.36	18.44	8,704	6,302,000	10,800	20.28
1959	1636	55,700	June 26,	1959	1,620	16,370	11,880,000	16,680	2.35	31.87	17,440	12,630,000	17,700	33.85
1960	1716	55,000	June 18,	1960	2,150	14,240	10,340,000	14,130	1.99	27.11	-	-	-	-

3725. Little Bitterroot Lake near Marion, Mont.

Location.--Lat 48°05'30", long 114°41'50", in NW $\frac{1}{4}$ sec.21, T.27 N., R.24 W., at dam on Little Bitterroot River, 2 miles southwest of Marion.

Drainage area.--31.8 sq mi.

Records available.--December 1939, April 1940, September 1940 to September 1960. May to July 1948 scattered daily contents, published in WSP 1080.

Gage.--Staff gage. Datum of gage is at mean sea level (levels by Bureau of Indian Affairs).

Extremes.--1940-60: Maximum month-end contents, 26,880 acre-ft May 31, 1959 (elevation, 3,906.60 ft); no storage at times in 1939-46.

Remarks.--Lake is formed by an earthfill dam; storage began in 1918. Usable capacity, 26,400 acre-ft (24,000 acre-ft prior to 1960) at elevation 3,906.48 ft. No dead storage. Water is used for irrigation and recreation. Figures given herein represent usable contents.

Cooperation.--Records furnished by Bureau of Indian Affairs.

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

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000
1952	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000
1953	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	23,220	21,660
1954	22,030	22,030	22,050	10,800	22,050	11,400	18,000	24,000	24,000	24,000	24,000	24,000
1955	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000
1956	24,000	24,000	24,000	24,000	24,000	24,000	24,220	25,180	25,180	23,300	21,300	21,000
1957	20,620	20,620	19,450	19,450	19,450	19,450	21,750	24,800	23,300	21,750	19,450	18,700
1958	18,300	17,900	17,500	17,180	17,180	20,620	21,300	24,000	24,000	24,000	24,000	22,550
1959	22,150	19,450	19,450	18,660	19,450	19,450	22,320	26,880	24,420	21,000	20,220	20,220
1960	20,220	23,300	22,900	22,500	22,100	22,500	23,300	20,300	21,400	20,000	16,000	15,600

3735. Hubbard Reservoir near Niarada, Mont.

Location.--Lat 47°55'40", long 114°43'50", in NE¼ sec.18, T.25 N., R.24 W., at dam on Little Bitterroot River, 9 miles northwest of Niarada.

Drainage area.--114 sq mi.

Records available.--December 1939, April 1940, September 1940 to September 1960. May to July 1948 scattered daily contents, published in WSP 1080.

Gage.--Elevations determined by measuring from crest of dam. Datum of gage is at mean sea level (levels by Bureau of Indian Affairs).

Extremes.--1940-60: Maximum month-end contents, 13,050 acre-ft May 31, 1959; no storage September to December 1958.

Remarks.--Reservoir is formed by concrete variable-radius dam; storage began in 1924. Usable capacity, 12,120 acre-ft at elevation 3,219.0 ft. No dead storage. Water is used for irrigation and recreation. Figures given herein represent usable contents.

Cooperation.--Records furnished by Bureau of Indian Affairs.

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

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	7,830	8,560	9,140	9,300	10,790	11,660	12,120	12,120	12,120	11,350	10,180	10,380
1952	10,380	10,790	11,220	11,660	12,120	12,120	12,120	12,120	9,790	7,750	4,280	3,580
1953	3,800	3,800	4,030	4,540	5,400	6,840	7,640	7,820	8,370	5,710	3,460	5,100
1954	5,100	5,710	6,230	6,360	6,360	8,110	10,790	12,120	11,900	11,220	7,750	7,820
1955	7,820	9,220	9,600	9,980	10,580	10,950	12,100	12,600	12,120	11,580	9,030	6,360
1956	6,360	6,520	6,700	7,040	7,400	9,220	12,120	12,120	12,120	11,000	8,110	6,350
1957	6,700	6,360	7,400	7,570	7,750	9,040	12,120	12,120	12,120	9,790	7,220	5,400
1958	5,710	6,700	6,870	7,040	7,400	9,030	10,580	11,440	9,980	7,040	3,690	0
1959	0	0	0	790	1,900	4,280	11,000	13,050	12,350	10,380	6,700	4,810
1960	5,490	6,360	7,930	8,660	9,600	10,960	11,220	11,660	9,410	5,710	4,540	3,580

3750. Upper Dry Fork Reservoir near Lonepine, Mont.

Location.--Lat 47°45', long 114°41', in sec.16, T.23 N., R.24 W., at outlet works on Dry Fork Creek, 4 miles northwest of Lonepine.

Drainage area.--8.53 sq mi.

Records available.--April 1940, September 1940 to September 1960. May to July 1948 scattered daily contents, published in WSP 1080.

Gage.--Elevations determined from reference points. Datum of gage is at mean sea level (levels by Bureau of Indian Affairs).

Extremes.--1940-60: Maximum month-end contents, 2,660 acre-ft at times in 1948, 1950-53, 1957-58; no storage at times in 1940, 1942, 1943.

Remarks.--Reservoir is formed by earthfill dam; storage began in 1940. Usable capacity, 2,810 acre-ft (2,700 acre-ft prior to 1960) at elevation 2,928.5 ft. No dead storage. Natural flow of Alder Creek in Thompson River basin is diverted in SW¼ sec.16, T.23 N., R.25 W., and carried by interbasin canal to Upper Dry Fork Reservoir. Figures given herein represent usable contents.

Cooperation.--Records furnished by Bureau of Indian Affairs.

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

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	1,570	1,580	1,680	1,710	1,740	2,580	2,580	2,520	2,660	2,510	2,120	1,870
1952	1,870	2,000	2,000	2,000	2,000	2,300	2,660	2,660	2,810	1,650	1,650	1,650
1953	1,650	1,120	1,120	1,260	1,260	1,680	1,760	2,660	2,660	2,000	1,260	1,180
1954	1,180	1,260	1,260	1,260	1,260	1,880	1,880	2,120	2,510	2,120	1,650	1,700
1955	1,700	1,880	1,980	2,000	2,120	2,210	2,240	2,380	2,510	2,250	1,260	1,090
1956	1,880	2,260	1,450	1,650	1,760	2,070	2,250	2,380	1,880	1,760	1,450	1,450
1957	1,450	1,450	1,450	1,450	1,650	1,880	2,380	2,660	2,660	1,650	943	811
1958	691	691	692	692	811	1,360	1,650	2,380	2,660	1,880	1,550	1,090
1959	1,090	1,090	1,090	1,300	1,450	2,120	2,120	2,510	2,250	1,880	1,090	1,090
1960	1,090	1,300	1,260	1,260	1,260	1,550	2,540	1,880	1,450	1,350	1,260	1,180

3755. Dry Fork Reservoir near Lonepine, Mont.

Location.--Lat 47°42', long 114°40', in NW¼ sec.3, T.22 N., R.24 W., at dam on Dry Fork Creek, 1 mile west of Lonepine.

Drainage area.--17.8 sq mi.

Records available.--December 1939, April 1940, September 1940 to September 1960. May to July 1948 scattered daily contents, published in WSP 1080. Records published in WSP 1316 were listed in error and should not be used.

Gage.--Staff gage. Datum of gage is at mean sea level (levels by Bureau of Indian Affairs).

Extremes.--1940-60: Maximum month-end contents, 4,080 acre-ft Apr. 30, 1942; no storage Aug. 31, 1944, Aug. 31, 1946, Sept. 30, 1946, Oct. 31, 1951.

Remarks.--Reservoir is formed by earthfill dam; storage began in 1921. Usable capacity, 3,860 acre-ft (4,000 acre-ft prior to 1960) at elevation 2,856.3 ft. No dead storage. Water is used for irrigation and recreation. Figures given herein represent usable contents.

Cooperation.--Records furnished by Bureau of Indian Affairs.

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

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1940	-	-	392	-	-	-	2,510	-	-	-	-	162
1941	239	315	315	315	440	815	1,210	643	191	40	175	175
1942	175	376	306	950	1,020	1,880	4,080	3,990	3,880	2,340	1,650	1,410
1943	1,550	1,980	2,000	2,000	2,000	3,400	3,520	4,000	4,040	2,510	636	150
1944	230	315	315	315	315	752	1,180	2,310	2,560	1,240	0	112
1945	112	175	240	340	570	1,260	1,940	3,210	2,060	215	135	135
1946	135	160	160	370	530	1,070	2,570	1,760	1,980	660	0	0
1947	315	515	1,140	1,360	1,500	3,570	3,600	2,970	3,540	2,400	1,460	1,230
1948	1,470	1,690	1,690	1,860	2,240	2,570	3,490	3,550	3,750	2,940	2,240	1,100
1949	1,150	1,530	1,620	1,620	2,240	2,460	3,500	3,470	2,420	950	880	1,020
1950	1,260	1,590	1,630	1,820	1,950	2,800	3,500	3,150	3,840	3,440	2,860	1,960
1951	1,930	1,960	2,070	2,250	2,690	2,560	3,240	3,680	3,860	3,090	1,360	55
1952	0	2,120	2,120	2,130	2,130	2,510	3,750	3,090	3,500	1,880	1,550	1,360
1953	1,360	2,120	2,120	2,560	2,850	3,340	3,820	3,750	3,160	2,000	1,260	1,180
1954	1,180	1,180	1,260	1,180	1,180	2,000	3,090	3,750	3,750	3,240	2,750	2,000
1955	2,000	2,120	2,120	2,120	2,240	2,380	2,800	3,400	2,650	2,940	880	752
1956	880	950	1,020	1,100	1,180	2,300	3,240	3,090	2,800	2,380	950	815
1957	752	752	752	752	1,070	1,100	3,400	3,750	3,750	1,650	815	393
1958	315	435	460	460	582	1,180	3,400	3,090	3,750	2,240	880	1,100
1959	1,650	22,650	2,650	2,940	3,090	3,090	3,090	3,400	3,090	2,240	752	1,650
1960	1,550	1,880	2,000	2,000	2,000	2,240	2,800	2,800	1,880	1,020	1,020	636

Note.--Records prior to October 1950 were listed in error in WSP 1316.

Mission Valley Reservoirs, Mont.

A group of eight reservoirs in an area east of and tributary to Flathead River and between Flathead Lake and Jocko River is operated for irrigation. Records furnished by Bureau of Indian Affairs. Gages are nonrecording set to approximate sea level datum. Figures given herein represent usable contents.

3704. Twin Reservoir.--Lat 47°40', long 114°05', in sec.18, T.22 N., R.19 W., at outlet works 4 miles southeast of Polson, fed entirely by various canals; storage began in 1932. Usable capacity, 899 acre-ft at elevation 3,090.5 ft. No dead storage below elevation 3,061 ft.

Extremes.--1940-60: Maximum month-end contents observed, 899 acre-ft June 30, 1956; no storage at times in July 1941, August, September 1944, October 1957.

3759. Pablo Reservoir.--Lat 47°38', long 114°08', in sec.27, T.22 N., R.20 W., at outlet works 3 miles south of Polson, fed entirely by various canals, some water supplied by Flathead pumping plant; storage began in 1914. Usable capacity, 27,100 acre-ft (corrected) at elevation 3,210.3 ft. No dead storage below elevation 3,179 ft, gate sill.

Extremes.--1940-60: Maximum month-end contents observed, 27,440 acre-ft June 30, 1959; no storage Nov. 30, 1956, drained for gate repair.

3767. Lower Crow Reservoir.--Lat 47°30'00", long 114°14'10", in S½ sec.11, T.20 N., R.21 W., at outlet works on Crow Creek, 6 miles west of Ronan; storage began in 1933. Usable capacity, 10,350 acre-ft at elevation 2,877 ft. No dead storage below elevation 2,800 ft.

Extremes.--1940-60: Maximum contents observed, 10,770 acre-ft May 21, 22, 1948; minimum month-end, 607 acre-ft Sept. 30, 1960.

3772. Mission Reservoir.--Lat 47°18'50", long 114°01'20", in S½ sec.16, T.18 N., R.19 W., at outlet works on Mission Creek, 4 miles east of St. Ignatius; storage began in 1935. Usable capacity, 7,250 acre-ft at elevation 3,406 ft. No dead storage below elevation 3,340.7 ft.

Extremes.--1940-60: Maximum contents observed, 7,720 acre-ft May 29, June 11, 1948; no storage at times during September 1949.

3773. Tabor Reservoir.--Lat 47°15'50", long 113°56'10", in N½ sec.6, T.17 N., R.18 W., at outlet works on Dry Creek, 8 miles southeast of St. Ignatius, fed by water diverted from Jocko River; storage began in 1919. Usable capacity, 23,300 acre-ft (corrected) at elevation 4,025 ft. No dead storage below elevation 3,911.5 ft.

Extremes.--1940-60: Maximum contents observed, 23,310 acre-ft July 8, 1948; minimum month-end, 137 acre-ft Dec. 31, 1952, to Feb. 28, 1953.

3782. McDonald Reservoir.--Lat 47°26'00", long 113°59'30", in NE¼ sec.10, T.19 N., R.19 W., at outlet works on Post Creek, 9 miles east of Charlo; storage began in 1919. Usable capacity, 8,220 acre-ft at elevation 3,598 ft. No dead storage below 3,545 ft.

Extremes.--1940-60: Maximum month-end contents observed, 8,220 acre-ft June 30, 1959; minimum, 135 acre-ft Sept. 30, Oct. 31, 1953.

3797. Kicking Horse Reservoir.--Lat 47°27'10", long 114°04'40", in sec.31, T.20 N., R.19 W., at outlet works 5 miles south of Ronan, fed entirely by various canals; storage began in 1930. Usable capacity, 8,350 acre-ft at elevation 3,061.94 ft. Dead storage, 70 acre-ft below elevation 3,042 ft.

Extremes.--1940-60: Maximum month-end contents observed, 9,200 acre-ft June 30, 1957; minimum, 440 acre-ft Sept. 30, 1953.

3800. Ninepipe Reservoir.--Lat 47°28', long 114°08', in sec.27, T.20 N., R.20 W., at outlet works 2 miles northeast of Charlo, fed entirely by various canals; storage began in 1911. Usable capacity, 14,870 acre-ft at elevation 3,010 ft. No dead storage below elevation 2,895.4 ft.

Extremes.--1940-60: Maximum month-end contents observed, 16,610 acre-ft June 30, 1959; minimum, 231 acre-ft Sept. 30, 1947.

Combined contents, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	28,680	33,720	41,180	44,090	49,780	52,490	58,840	92,680	92,330	69,910	29,160	23,250
1952	37,860	35,370	39,500	43,860	45,020	49,870	67,180	84,190	88,860	48,180	21,520	9,590
1953	12,910	14,080	16,550	24,300	33,590	36,620	43,460	53,450	63,320	49,480	20,940	7,290
1954	9,800	11,300	14,600	17,000	19,060	20,560	25,150	33,880	42,380	75,740	44,410	39,020
1955	49,800	50,920	51,850	54,550	55,680	57,170	60,170	69,090	74,640	92,760	30,850	11,870
1956	16,470	21,780	26,810	28,640	27,180	29,240	47,280	86,800	101,100	81,530	38,320	16,750
1957	21,070	21,810	24,150	27,940	28,520	30,690	35,030	89,850	101,400	58,510	22,420	6,290
1958	9,440	12,760	16,310	18,080	19,660	22,660	24,130	77,920	98,750	58,330	19,190	8,370
1959	16,400	21,320	25,710	26,720	28,450	34,180	44,520	70,470	100,700	86,290	44,700	43,510
1960	57,820	56,210	54,050	50,800	49,600	52,980	59,010	63,260	86,150	54,640	34,520	13,850

† Corrected.

PEND OREILLE RIVER BASIN

3805. Lower Jocko Lake near Arlee, Mont.

Location.--Lat 47°12'20", long 113°45'40", in NE $\frac{1}{4}$ sec.28, T.17 N., R.17 W., at dam on Middle Fork Jocko River, 15 miles east of Arlee.

Drainage area.--7.39 sq mi.

Records available.--December 1939, April 1940, September 1940 to September 1960 (no winter records since 1947). May to July 1948 scattered daily gage heights, published in WSP 1080.

Gage.--Staff gage. Datum of gage is at mean sea level (levels by Bureau of Indian Affairs).

Extremes.--1940-60: Maximum contents observed, 6,700 acre-ft June 8, 1948; no storage at times.

Remarks.--Lake is formed by earthfill dam; storage began in 1937. Usable capacity, 6,380 acre-ft (corrected) at elevation 4,340 ft. No dead storage below elevation 4,267 ft. Water is used for irrigation and recreation. Transmountain diversion takes water from Placid Creek in SE $\frac{1}{4}$ sec.29, T 17 N., R.16 W., to Upper Jocko Lake, thence to Lower Jocko Lake. Figures given herein represent usable contents.

Cooperation.--Records furnished by Bureau of Indian Affairs.

Water year	Contents, in acre-feet, on last day of month										
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Sept.
1951	1,670	1,440	-	-	-	-	-	4,900	5,370	4,000	2,190
1952	1,640	1,440	-	990	-	410	2,580	6,130	4,610	2,650	640
1953	280	280	70	-	-	-	240	4,170	5,640	3,500	180
1954	182	78	78	-	-	-	280	4,860	5,630	4,120	1,170
1955	1,030	813	-	-	-	-	-	5,230	5,710	4,150	286
1956	245	-	-	-	-	-	-	5,810	5,120	2,650	572
1957	722	552	505	-	-	-	1,400	5,850	4,120	195	0
1958	0	40	-	-	-	-	245	6,150	4,760	695	0
1959	0	361	-	-	-	-	-	6,050	6,300	4,630	1,500
1960	3,420	-	-	-	-	1,440	3,090	4,300	5,620	1,710	0

* Not previously published.

3890. Clark Fork near Plains, Mont.

Location.--Lat 47°25'50", long 114°51'20", in SW $\frac{1}{4}$ sec.1, T.19 N., R.26 W., on right bank 2 miles southeast of Plains and 6 miles downstream from Flathead River.

Drainage area.--19,958 sq mi.

Records available.--October 1910 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Datum of gage is 2,449.34 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Nov. 28, 1911, wire-weight gage at site 50 ft upstream at same datum.

Average discharge.--50 years (1910-60), 19,570 cfs (14,170,000 acre-ft per year).

Extremes.--1910-60: Maximum discharge, 134,000 cfs June 5, 1948 (gage height, 19.17 ft); minimum, 3,200 cfs Feb. 8, 1936, Dec. 10, 1940; minimum gage height, 2.70 ft (from partly estimated gage-height record) Sept. 2, 1958.

Remarks.--Flow partly regulated by Flathead Lake (see p. 274) and by Hungry Horse Reservoir (see p. 270). Diversions for irrigation of about 335,000 acres 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	12,710	15,340	16,630	19,150	19,010	14,880	25,090	75,850	61,100	36,080	12,360	10,980	26,470
1952	14,860	15,910	11,560	12,640	15,410	10,120	23,810	56,600	17,890	7,970	7,980	19,500	19,500
1953	9,493	9,835	9,898	10,750	9,940	9,833	10,920	27,110	64,870	25,760	8,778	10,160	17,270
1954	10,690	10,890	11,140	8,756	13,250	13,270	17,990	55,890	57,630	43,690	13,260	10,210	22,270
1955	11,020	13,260	16,070	15,960	16,310	12,270	12,640	27,170	50,490	36,420	10,790	11,570	19,500
1956	12,220	13,120	17,230	15,910	16,440	19,350	37,390	66,350	66,990	24,980	9,451	11,780	25,920
1957	13,080	15,130	17,770	16,160	13,850	13,780	12,450	53,070	45,410	15,010	7,496	9,199	19,400
1958	12,890	16,610	15,350	10,290	9,044	11,550	12,980	50,270	42,520	18,280	6,309	8,471	17,950
1959	9,204	11,520	19,480	21,230	20,700	15,970	33,340	50,940	79,860	35,270	10,560	13,440	26,590
1960	23,550	20,050	18,060	14,650	15,300	20,750	35,100	38,430	50,260	22,490	9,397	7,911	22,980

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	781.7	913.0	1,022	1,178	1,056	914.8	1,493	4,541	3,658	2,219	759.7	653.4	19,170
1952	911.1	827.7	710.8	776.9	886.6	622.4	1,417	3,765	2,178	1,100	484.4	475.3	14,160
1953	583.7	591.0	608.6	660.7	552.1	604.6	650.0	1,667	3,860	1,584	539.6	604.5	12,510
1954	657.4	647.9	685.1	538.4	735.9	815.9	1,070	3,437	3,429	2,686	815.2	607.3	16,130
1955	677.8	789.2	988.2	981.2	905.7	754.3	752.3	1,671	3,004	2,339	663.5	688.4	14,110
1956	751.3	780.8	1,059	978.2	945.7	1,190	2,225	4,080	3,986	1,536	581.1	700.7	18,810
1957	804.3	900.6	1,092	993.5	769.0	847.5	740.8	3,263	2,702	923.0	460.9	547.4	14,040
1958	792.7	988.4	944.0	632.8	502.3	710.2	772.6	3,091	2,530	1,124	387.9	504.0	12,980
1959	565.9	685.2	1,199	1,305	1,149	961.6	1,984	3,132	4,752	2,046	649.4	799.7	19,250
1960	1,448	1,193	1,111	901.1	880.0	1,274	2,089	2,363	2,992	1,383	577.8	470.7	16,680

PEND OREILLE RIVER BASIN

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Yearly discharge, in cubic feet per second, of Clark Fork near Plains, Mont.

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	25,960	18,800,000
1951	-	-	-	-	-	-	26,110	18,900,000
1952	1216	96,100	May 26, 1951	6,880	26,470	19,170,000	18,580	13,490,000
1953	1246	72,500	May 17, 1952	4,590	19,500	14,160,000	17,560	12,710,000
1954	1286	95,700	June 15, 1953	5,210	17,270	12,510,000	22,920	16,590,000
1955	1346	90,600	May 23, 1954	5,700	22,270	16,130,000	19,680	14,250,000
1956	1396	74,800	June 17, 1955	6,150	19,500	14,110,000	26,200	19,020,000
1957	1446	106,000	May 26, 1956	6,700	25,920	18,810,000	19,300	13,970,000
1958	1516	86,900	May 22, 1957	5,080	19,400	14,040,000	17,550	12,700,000
1959	1566	95,200	May 26, 1958	3,650	17,930	12,980,000	28,390	20,550,000
1960	1636	92,800	June 17, 1959	6,320	26,590	19,250,000	-	-
1960	1716	76,100	June 19, 1960	5,800	22,980	16,680,000	-	-

3895. Thompson River near Thompson Falls, Mont.

Location.--Lat 47°35'35", long 115°13'40", in NE¹/₄ sec.7, T.21 N., R.28 W., on right bank 1 mile upstream from mouth and 6 miles east of Thompson Falls.

Drainage area.--642 sq mi.

Records available.--March to September 1911, October 1911 to September 1916 (occasional gage heights, discharges, and discharge measurements), April 1956 to September 1960.

Records for January and February 1911, published in WSP 916, have been found to be in error and should not be used.

Gage.--Water-stage recorder. Altitude of gage is 2,410 ft (from topographic map). October 1911 to September 1916 staff gage at site a quarter of a mile upstream at different datum.

Extremes.--1956-60: Maximum discharge, 4,960 cfs May 21, 1956 (gage height, 7.77 ft); minimum, 89 cfs Jan. 1, 1958; minimum gage height, 1.29 ft Jan. 17, 1957.

Flood in May to June 1948 reached a discharge of 6,190 cfs, by slope-area measurement at site a quarter of a mile downstream.

Remarks.--Minor diversions above station for irrigation, acreage unknown. Diversion from headwaters of Alder Creek in SW¹/₄ sec.16, T.23 N., R.25 W., to supplement water supply for storage in Upper Dry Fork Reservoir in Little Bitterroot 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
1956	-	-	-	-	-	-	1,831	2,788	1,404	512	287	248	-
1957	211	193	218	156	176	261	636	2,157	956	369	242	190	483
1958	181	176	170	157	182	211	455	1,356	525	265	172	147	334
1959	149	291	326	368	310	346	1,258	1,789	1,866	581	301	271	654
1960	343	358	317	221	219	383	1,090	1,343	1,079	408	297	225	523

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	-	-	-	-	-	-	109,000	171,500	83,550	31,500	17,660	14,780	-
1957	12,980	11,510	13,370	9,620	9,780	16,070	37,820	32,600	56,900	22,700	14,900	11,290	349,500
1958	11,120	10,480	10,440	9,670	10,130	12,960	27,080	83,380	31,260	16,500	10,560	8,760	242,100
1959	9,130	17,290	20,060	22,650	17,230	21,280	74,710	110,000	111,000	35,750	18,500	16,150	473,800
1960	21,070	21,310	19,520	13,610	12,580	23,580	64,870	82,610	64,190	25,060	18,240	13,370	580,000

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
1956	1446	4,960	May 21, 1956	-	-	-	-	-	-	-	-
1957	1516	3,160	May 20, 1957	110	483	0.752	10.21	349,500	475	10.03	343,700
1958	1566	2,090	May 13, 1958	100	334	.520	7.08	242,100	354	7.51	256,600
1959	1636	2,960	June 6, 1959	135	654	1.02	13.82	473,800	676	14.27	489,200
1960	1716	2,670	May 13, 1960	155	523	.815	11.09	380,000	-	-	-

3900. Thompson Falls Reservoir at Thompson Falls, Mont.

Location.--Lat 47°35'30", long 115°21'10", near east line of sec.7, T.21 N., R.29 W., at dam on Clark Fork at Thompson Falls.

Drainage area.--20,968 sq mi.

Records available.--October 1939 to September 1960.

Gage.--Staff gage. Datum of gage is at mean sea level (levels by The Montana Power Co.).

Extremes.--1939-60: Maximum month-end contents observed, 16,060 acre-ft (corrected)

Nov. 30, 1949; no storage July 31, 1958.

Remarks.--Reservoir is formed by 2 concrete dams; first generator installed July 1915.

Usable capacity, 15,000 acre-ft at elevation 2,396 ft. Dead storage unknown. Water is used for recreation and power development. Figures given herein represent usable contents.

Cooperation.--Records furnished by The Montana Power Co.

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

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	14,390	15,750	13,520	11,650	13,810	13,960	3,990	7,360	3,900	8,530	14,250	14,390
1952	14,970	15,120	13,960	15,280	14,530	14,390	4,070	3,520	6,080	14,680	12,840	13,670
1953	14,530	13,110	14,390	15,280	14,250	13,520	9,910	5,340	2,700	13,520	13,810	15,120
1954	14,390	10,390	13,520	14,820	14,390	14,820	3,900	6,080	5,520	7,790	14,100	14,970
1955	13,960	12,980	14,390	15,590	12,030	14,530	14,250	2,630	4,560	5,130	14,100	13,520
1956	11,130	13,810	13,250	13,110	13,810	4,640	4,230	8,430	2,700	15,120	11,780	14,390
1957	13,960	12,570	14,250	14,250	13,250	13,810	4,910	5,430	2,080	11,650	12,430	11,260
1958	14,680	14,890	12,980	10,150	13,960	13,520	1,760	7,360	2,560	0	2,280	12,840
1959	13,590	13,670	12,160	15,390	12,430	12,160	3,670	4,230	4,310	11,520	13,520	11,130
1960	12,160	13,670	10,150	9,560	14,970	13,960	2,630	3,210	2,630	14,390	11,900	14,250

† Corrected.

3907. Prospect Creek at Thompson Falls, Mont.

Location.--Lat 47°35'15", long 115°21'20", in lot 12, SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.7, T.21 N., R.29 W., on right bank 500 ft downstream from Dry Creek, half a mile upstream from mouth, and half a mile south of Thompson Falls.

Drainage area.--182 sq mi.

Records available.--April 1956 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 2,400 ft (from topographic map).

Extremes.--1956-60: Maximum discharge, 2,860 cfs May 21, 1956 (gage height, 7.60 ft); minimum, 36 cfs Jan. 1, 1958 (gage height, 0.69 ft).

Remarks.--No regulation or diversion 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
1956	-	-	-	-	-	-	1,330	1,595	661	174	92.9	71.7	-
1957	62.9	53.4	73.7	76.5	63.6	182	475	1,290	441	135	86.0	63.5	252
1958	52.5	44.9	43.6	44.5	81.5	153	357	960	272	124	75.2	54.8	189
1959	45.8	154	255	323	184	181	738	980	792	190	99.8	79.9	335
1960	168	282	196	118	102	236	627	694	586	152	91.5	69.8	275

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	-	-	-	-	-	-	79,150	98,080	39,340	10,710	5,710	4,270	-
1957	3,870	3,180	4,530	4,700	3,530	11,220	28,280	79,300	26,270	8,320	5,290	3,780	182,200
1958	3,230	2,670	2,680	2,740	4,820	9,410	21,250	59,040	18,160	7,800	4,820	3,260	137,200
1959	2,820	9,170	15,660	19,880	10,200	11,110	43,910	60,240	47,150	11,700	6,140	4,750	242,700
1960	10,350	15,560	12,070	7,070	5,850	14,510	37,290	42,660	34,860	9,320	5,630	4,150	199,300

Yearly discharge, in cubic feet per second

Water year ending Sept. 30												Calendar year		
Year	WSP	Momentary maximum		Minimum day	Mean	Per square mile	Runoff		Mean	Runoff				
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet			
1956	1446	2,860	May 21, 1956	-	-	-	-	-	-	-	-	-		
1957	1516	1,920	May 5, 1957	50	252	1.38	18.78	182,200	248	18.47	179,200	-		
1958	1566	1,530	May 10, 1958	40	189	1.04	14.15	137,200	216	16.11	156,200	-		
1959	1636	1,900	May 1, 1959	43	335	1.84	25.00	242,700	350	26.06	253,100	-		
1960	1716	1,490	May 13, 1960	64	275	1.51	20.52	199,300	-	-	-	-		

3910. Clark Fork at Thompson Falls, Mont.

Location.--Lat 47°35'50", long 115°21'50", in SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.7, T.21 N., R.29 W., on right bank a quarter of a mile downstream from The Montana Power Co. dam, a quarter of a mile downstream from The Montana Power Co. dam, a quarter of a mile downstream from Prospect Creek, and half a mile west of Thompson Falls.

Drainage area.--21,113 sq mi.

Records available.--October 1951 to September 1959.

Gage.--Water-stage recorder. Altitude of gage is 2,340 ft (from topographic map).

Average discharge.--8 years (1951-59), 21,920 cfs (15,870,000 acre-ft per year).

Extremes.--1951-59: Maximum discharge, 109,000 cfs May 26, 1956 (gage height, 53.21 ft); minimum, 495 cfs Sept. 1, 2, 1958 (gage height, 29.03 ft, by levels, powerplant shutdown, stage below intake pipe).
Flood of May 31, 1948, reached a stage of 58.4 ft, from floodmarks (discharge, 150,000 cfs).

Remarks.--Flow regulated by Flathead Lake, Hungry Horse Reservoir, Thompson Falls Reservoir and numerous smaller reservoirs (see elsewhere in this report). Diversions for irrigation of about 340,000 acres above station.

Monthly and yearly mean discharge, in cubic feet per second, of Clark Fork at Thompson Falls, Mont.

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951													
1952	15,520	14,380	12,180	13,140	15,890	10,530	25,870	63,350	38,410	18,740	8,188	8,062	20,370
1953	9,871	10,190	10,120	10,980	10,510	10,140	11,830	29,490	67,230	26,560	9,255	10,310	18,030
1954	10,850	11,070	11,350	9,118	13,660	14,310	20,210	60,520	59,990	44,960	13,610	10,480	23,400
1955	11,300	13,450	15,970	15,820	16,300	12,280	13,180	30,370	55,230	38,840	10,850	11,620	20,440
1956	12,380	13,570	18,140	16,630	17,000	20,260	41,320	70,640	69,670	26,320	9,903	12,020	27,300
1957	13,110	15,120	18,000	16,440	14,070	14,220	13,530	55,970	46,690	15,390	7,739	9,217	19,990
1958	12,820	16,620	15,550	10,420	9,050	11,800	13,960	51,670	42,560	16,400	6,574	8,629	18,050
1959	9,312	11,820	20,010	22,020	21,280	16,780	36,640	54,280	81,520	35,450	11,300	13,720	27,610
1960													

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													
1952	954.3	855.7	749.2	808.1	914.2	647.3	1,540	3,895	2,286	1,152	503.4	479.7	14,780
1953	606.9	606.3	622.0	675.1	583.4	623.7	703.9	1,813	4,000	1,633	569.1	613.7	13,050
1954	687.4	658.9	697.9	560.5	758.8	879.9	1,203	3,721	3,570	2,765	836.6	623.3	16,940
1955	694.7	800.1	982.2	972.7	905.3	754.9	784.3	1,868	3,286	2,368	687.4	691.5	14,800
1956	761.0	807.6	1,116	1,022	977.7	1,246	2,459	4,343	4,146	1,618	608.9	715.0	19,820
1957	808.0	899.5	1,107	1,011	781.3	874.3	805.1	3,442	2,778	946.4	475.9	548.4	14,470
1958	788.0	988.8	952.9	640.9	502.6	725.6	830.5	3,177	2,532	1,008	404.2	513.5	13,060
1959	572.6	703.4	1,231	1,354	1,182	1,032	2,180	3,338	4,851	2,180	694.9	816.6	20,140
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								
1952	1246	73,300	May 17, 1952	4,020	20,370	14,780,000	19,370	14,060,000
1953	1286	96,300	June 15, 1953	5,040	18,030	13,050,000	18,290	13,240,000
1954	1346	97,600	May 22, 1954	5,410	23,400	16,940,000	24,030	17,400,000
1955	1396	79,500	June 17, 1955	6,460	20,440	14,800,000	20,720	15,000,000
1956	1446	109,000	May 26, 1956	6,560	27,300	19,820,000	27,460	19,950,000
1957	1516	87,200	May 22, 1957	5,150	19,990	14,470,000	19,680	14,390,000
1958	1566	95,400	May 25, 1958	610	18,050	13,060,000	17,740	12,840,000
1959	1636	94,400	June 17, 1959	6,350	27,810	20,140,000	-	-
1960								

3913. Noxon Reservoir near Noxon, Mont.

Location.--Lat 47°57'40", long 115°44'00", in SW $\frac{1}{4}$ sec.33, T.26 N., R.32 W., at dam on Clark Fork, 3 miles southeast of Noxon, and $7\frac{1}{2}$ miles upstream from Bull River.

Drainage area.--21,833 sq mi.

Records available.--April 1959 to September 1960.

Gage.--Water-stage recorder. Datum of gage is at mean sea level (levels by The Washington Water Power Co.).

Extremes.--1959-60: Maximum contents, 335,400 acre-ft Apr. 7, 1960 (elevation, 2,331.10 ft); minimum since first filling, 273,700 acre-ft Sept. 30, 1960 (elevation, 2,322.94 ft).

Remarks.--Reservoir is formed by concrete and earthfill dam; construction began in 1955; completed in 1959. Storage began Apr. 3, 1959. Usable capacity, 334,600 acre-ft at controlled spillway elevation (2,331 ft). Dead storage, 161,000 acre-ft below elevation 2,270 ft, minimum operating level. Figures given herein represent usable contents. Water is used for power production, flood control, and recreation.

Cooperation.--Records furnished by The Washington Water Power Co.

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.
1959	-	-	-	-	-	-	177.3	222.1	291.3	321.1	332.2	319.7
1960	307.5	326.9	314.0	326.8	322.9	313.4	320.1	327.5	330.6	330.0	331.7	275.2

PEND OREILLE RIVER BASIN

3920. Clark Fork at Whitehorse Rapids, near Cabinet, Idaho
(Formerly published as Clark Fork near Heron, Mont.)

Location.--Lat 48°05'10" (revised), long 116°03'50", in NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 27, T.55 N., R.3 E., on left bank at Cabinet, 0.4 mile downstream from Cabinet Gorge Dam, 1.7 miles downstream from Blue Creek, and 6.5 miles southeast of Clark Fork. Measuring cableway 0.4 mile downstream. Discharge computed at Whitehorse Rapids, 2.7 miles downstream.

Drainage area.--22,067 sq mi, based on revised area of 22,006 sq mi for site near Heron.

Records available.--September 1928 to September 1960. Prior to October 1952, published as Clark Fork near Heron, Mont.

Gage.--Water-stage recorder. Datum of gage is 2,000.00 ft above mean sea level, datum of 1929, supplementary adjustment of 1947, levels by Washington Water Power Co. Prior to Oct. 30, 1928, staff gage and Oct. 30, 1928, to Apr. 8, 1952, water-stage recorder, at site near Heron 4 miles upstream at datum 88.00 ft higher prior to Jan. 2, 1931, and 78.00 ft higher thereafter. Apr. 9 to Sept. 30, 1952, staff gage just upstream from present site at approximately same datum.

Average discharge.--32 years (1928-60), 21,420 cfs (15,510,000 acre-ft per year).

Extremes.--1928-60: Maximum discharge, 153,000 cfs May 29 to June 1, 1948; maximum gage height, 50.97 ft May 31, 1948, site and datum then in use; minimum discharge observed, 270 cfs Aug. 12, 1952 (discharge measurement), at present site during filling of Cabinet Gorge reservoir; minimum daily since reservoir filled, 969 cfs Sept. 1, 1957. Maximum discharge known; 195,000 cfs June 1894 (elevation of floodmark at site about 4 miles upstream and an eighth of a mile below site "near Heron", 2,137.1 ft).

Remarks.--Flow regulated by Hungry Horse Reservoir (see p. 270) and Flathead Lake (see p. 274). Extreme diurnal fluctuation caused by powerplant at Cabinet Gorge Dam. Diversions above station for irrigation of about 354,000 acres. Discharge measurements indicate approximately 1,000 cfs ground-water inflow between Cabinet Gorge Dam and Whitehorse Rapids, with approximately 600 cfs of this inflow occurring in the 2.3-mile reach from the measuring cableway to Whitehorse Rapids. Records given herein represent flow at Whitehorse Rapids, computed by adding 600 cfs to observed flows at the measuring cableway, and are considered comparable to records at former site near Heron, except for minor surface inflow from additional drainage area. To determine flow at Cabinet Gorge Dam, 1,000 cfs should be deducted from discharge published herein.

Corrections.--In WSP 1316, the yearly runoff in acre-feet for 1931, the momentary minimum discharge for the water year 1936, and the monthly mean discharge and runoff in acre-feet for December 1936 are listed in error; they should be 9,430,000 acre-ft, 1,190 cfs, 4,859 cfs, and 298,800 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	13,500	17,430	19,440	21,770	23,540	17,510	30,860	83,270	69,300	40,980	13,800	12,110	30,330
1952	15,980	14,680	13,090	13,750	16,310	11,660	28,870	66,930	41,090	20,540	9,313	8,617	21,750
1953	10,080	10,510	10,470	11,870	11,970	11,430	13,760	34,250	69,540	28,790	10,590	10,820	19,500
1954	11,220	11,440	12,550	9,424	14,500	16,500	23,110	66,350	63,900	48,370	15,520	11,640	25,430
1955	12,320	14,970	17,190	16,770	17,670	12,960	15,140	34,450	59,700	41,350	12,520	12,770	22,320
1956	13,620	15,190	21,080	18,500	18,160	21,760	46,800	78,280	74,960	29,140	11,580	12,890	30,130
1957	14,030	16,000	19,500	17,020	15,380	15,500	17,210	63,270	50,750	17,220	9,162	9,568	22,070
1958	13,720	17,500	16,600	11,030	10,270	13,420	17,160	56,250	45,830	18,480	7,501	9,456	19,820
1959	10,580	13,290	12,650	23,840	24,120	18,720	30,410	57,450	84,610	36,540	12,230	15,440	29,040
1960	25,670	21,730	20,510	15,180	16,500	23,930	41,520	46,080	56,310	25,780	10,810	10,130	26,170

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	830.3	1,037	1,195	1,339	1,307	1,077	1,836	5,120	4,124	2,520	848.8	720.7	21,950
1952	982.8	873.7	804.9	845.8	938.2	716.7	718	4,116	2,445	1,263	572.6	512.7	15,790
1953	619.7	625.4	643.7	730.1	664.9	702.7	818.9	2,106	4,138	1,770	651.4	643.7	14,110
1954	689.8	680.6	771.4	579.4	805.2	1,014	1,375	4,080	3,802	2,974	942.0	692.6	18,410
1955	757.2	890.8	1,057	1,031	881.2	796.7	900.9	2,119	3,553	2,542	769.6	759.9	16,160
1956	837.5	903.6	1,296	1,137	1,045	1,338	2,785	4,813	4,460	1,792	699.5	767.2	21,870
1957	862.7	952.1	1,187	1,046	853.9	953.1	1,024	3,980	3,020	1,053	563.4	569.4	15,980
1958	845.3	1,041	1,021	678.2	570.1	825.0	1,021	3,452	2,727	1,137	461.2	562.3	14,350
1959	650.6	781.1	1,331	1,466	1,340	1,151	1,809	3,533	5,035	2,247	752.1	918.8	21,020
1960	1,578	1,295	1,261	933.5	949.3	1,472	1,471	2,833	3,351	1,585	665.0	603.0	18,990

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	-	-	-	-	-	-	29,730	21,520,000	-
1951	1216	106,000	May 26, 1951	3,260	30,330	21,950,000	29,770	21,550,000	-
1952	1246	79,000	May 21, 1952	4,900	21,750	15,790,000	20,680	15,020,000	-
1953	1396	97,400	June 16, 1953	1,140	19,500	14,110,000	19,850	14,370,000	-
1954	1396	105,000	May 22, 1954	980	25,430	18,410,000	26,200	18,970,000	-
1955	1396	85,700	June 18, 1955	3,250	22,320	16,160,000	22,780	16,490,000	-
1956	1446	121,000	May 26, 1956	4,510	30,130	21,870,000	30,080	21,840,000	-
1957	1516	97,000	May 22, 1957	969	22,070	15,980,000	21,940	15,880,000	-
1958	1566	102,000	May 26, 1958	2,110	19,820	14,550,000	19,650	14,210,000	-
1959	1536	101,000	June 20, 1959	1,020	29,040	21,020,000	30,920	22,580,000	-
1960	1716	87,800	June 19, 1960	3,190	26,170	18,990,000	-	-	-

3923. Pack River near Colburn, Idaho

Location.--Lat 48°25'10", long 116°30'10", in SW $\frac{1}{4}$ sec.32, T.59 N., R.1 W., on left bank 50 ft downstream from bridge on U. S. Highway 95, 2.2 miles northeast of Colburn, and 10 miles north of Sandpoint.

Drainage area.--124 sq mi.

Records available.--September 1958 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 2,130 ft (from topographic map).

Extremes.--1958-60: Maximum discharge, 2,380 cfs May 12, 1960 (gage height, 11.04 ft); minimum, 18 cfs Sept. 12, 13, 1958 (gage height, 0.93 ft).

Remarks.--No regulation or diversion 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	-	-	-	-	-	-	-	-	-	-	-	33.0	-
1959	55.6	141	156	344	160	154	711	1,058	1,090	217	48.4	142	356
1960	264	249	245	164	131	251	703	1,042	1,026	189	43.9	43.7	362

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1958	-	-	-	-	-	-	-	-	-	-	-	1,970	-
1959	3,420	8,390	9,610	21,130	8,890	9,460	42,320	65,080	64,840	13,320	2,970	8,480	257,900
1960	16,260	14,800	15,070	10,110	7,540	15,430	41,820	64,100	61,020	11,630	2,700	2,600	263,100

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	
1958	1636	-	-	-	-	-	-	-	-	-	-
1959	1636	1,880	June 5, 1959	30	356	2.87	38.98	257,900	390	42.72	282,600
1960	1716	2,380	May 12, 1960	27	362	2.92	39.78	263,100	-	-	-

3925. Pend Oreille Lake at Hope, Idaho

Location.--Lat 48°15', long 116°18', in lot 2, sec.35, T.57 N., R.1 E., at floating dock near Northern Pacific Railway station at Hope.

Drainage area.--22,900 sq mi, approximately.

Records available.--March 1914 to September 1960. Published as "at Sandpoint" 1914-22. Records published for both sites September 1921 to September 1922.

Gage.--Water-stage recorder. Datum of gage is 2,000.00 ft above mean sea level, datum of 1929, supplementary adjustment of 1947; gage readings have been reduced to elevations above mean sea level. Prior to Oct. 1, 1921, staff gage at Sandpoint at datum 42.18 ft higher. Oct. 1, 1921, to Sept. 30, 1929, staff gage at present site at datum 45.47 ft higher than present datum. Oct. 1, 1929, to Sept. 30, 1950, water-stage recorder at present site at datum 0.20 ft lower than present datum.

Extremes.--1914-60: Maximum elevation, 2,071.62 ft, present datum, June 9, 1948 (contents, 2,462,000 acre-ft); minimum, 2,046.27 ft, present datum, Feb. 17, 1936 (contents, 117,700 acre-ft).

Maximum elevation known, 2,075.88 ft, present datum, June 1894 (contents, 2,905,000 acre-ft).

Remarks.--Regulation at Albeni Falls Dam beginning June 4, 1952. Contents shown is that above elevation 2,044.8 ft but does not include storage in Pend Oreille River above Albeni Falls Dam.

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	440.6	420.8	606.7	485.5	626.0	449.2	811.0	1,715	1,272	662.1	323.2	302.0
1952	431.1	457.2	373.5	370.9	406.2	337.7	1,024	1,255	1,459	1,547	1,492	1,372
1953	1,231	463.0	283.3	394.2	334.5	343.6	518.6	913.8	1,543	1,560	1,556	1,366
1954	763.8	347.9	338.6	313.0	431.1	383.0	685.8	1,475	1,285	1,495	1,566	1,564
1955	1,550	1,330	1,351	1,335	1,322	939.0	587.5	976.8	1,529	1,526	1,559	1,443
1956	1,382	1,302	1,461	1,497	1,316	1,237	1,267	1,770	1,536	1,542	1,552	1,331
1957	1,306	988.5	995.7	936.3	907.5	866.3	875.2	1,534	1,558	1,555	1,570	1,292
1958	1,086	870.9	521.2	532.5	737.1	522.1	650.7	1,499	1,534	1,540	1,554	1,539
1959	1,455	1,322	1,342	1,327	1,138	1,152	1,141	1,188	1,443	1,542	1,547	1,556
1960	1,409	1,017	1,017	1,011	1,010	1,056	1,064	1,035	1,539	1,554	1,555	1,572

3930. Priest Lake at outlet, near Coolin, Idaho

Location.--Lat 48°29'30", long 116°53'00", in SE $\frac{1}{4}$ sec.5, T.59 N., R.4 W., half a mile east of outlet and $\frac{1}{4}$ miles northwest of Coolin.

Drainage area.--572 sq mi.

Records available.--June 1911 to September 1913 (fragmentary gage-height records at Coolin, published as part of records for Priest River at outlet of Priest Lake, at Coolin), April 1928 to July 1950 (gage-height records only), August 1950 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 2,434.64 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. June 18, 1911, to Sept. 30, 1913, staff gages at Coolin at different datums. Apr. 21, 1928, to Oct. 18, 1939, staff gage at site 400 ft north of lake outlet at present datum.

Extremes.--1928-60: Maximum gage height, 6.46 ft May 29, 30, 1948 (contents, 202,200 acre-ft); minimum, -0.19 ft Feb. 7, 21, 22, 1957 (contents, 43,840 acre-ft).

Remarks.--Flow from Priest Lake is regulated to hold lake at heights desirable for recreation interests during summer months and storage is released for power use downstream during winter months. Storage began Aug. 9, 1950. Prior to Aug. 9, 1950, some regulation resulted from logging operations in the outlet channel. Figures given herein represent contents above gage height of about -2 ft. Capacity table is based on area measured from Priest Lake quadrangle (scale 1:250,000) and reconnaissance survey of marginal areas and is only approximate. Contents prior to October 1956 not previously published.

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

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1950	-	-	-	-	-	-	-	-	-	-	80,850	79,200
1951	123,100	114,300	137,400	112,800	85,340	65,740	106,900	141,700	119,300	119,000	125,000	121,400
1952	117,800	93,870	70,460	61,020	53,480	53,010	142,400	151,200	122,600	118,100	116,900	120,000
1953	84,860	49,480	46,660	56,070	53,240	55,830	117,100	152,400	124,700	122,600	119,300	119,500
1954	82,970	57,480	51,130	51,600	52,070	53,480	84,860	165,100	134,000	115,900	122,400	117,100
1955	116,200	74,950	59,370	50,660	47,840	45,960	73,770	138,800	148,800	118,600	118,800	122,400
1956	113,300	70,700	67,160	59,610	57,010	58,660	135,000	191,300	121,600	117,800	121,400	120,500
1957	119,700	58,660	49,960	44,550	50,660	53,720	94,340	149,100	120,200	119,500	119,500	120,900
1958	60,550	47,140	48,310	48,310	69,280	73,530	94,580	154,100	120,000	119,700	118,600	122,600
1959	115,900	66,450	54,420	62,200	54,420	53,950	103,100	140,000	121,900	120,200	119,300	94,110
1960	73,530	65,980	63,660	57,960	52,300	74,240	97,660	140,250	120,460	120,460	121,890	115,940

3940. Priest River near Coolin, Idaho

Location.--Lat 48°26'50", long 116°53'50", in SE $\frac{1}{4}$ sec.19, T.59 N., R.4 W., on left bank 190 ft downstream from Dickensheet Bridge, $2\frac{1}{2}$ miles downstream from Binarch Creek, 3 miles southwest of Coolin, and 5 miles downstream from outlet of Priest Lake.

Drainage area.--611 sq mi.

Records available.--October 1948 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 2,338.24 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Feb. 23, 1949, wire-weight gage at same site and datum.

Average discharge.--12 years (1948-60), 1,361 cfs (985,300 acre-ft per year).

Extremes.--1948-60: Maximum discharge, 8,130 cfs May 27, 1956 (gage height, 8.15 ft); minimum observed, 26 cfs Sept. 25, 1958 (gage height, 1.16 ft), but may have been less Sept. 11, 1953, Sept. 24, 1958, when stage was below intake.

Remarks.--No diversion above station. Flow partly regulated by Priest Lake (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	401	1,364	1,044	1,560	1,935	1,145	1,750	4,619	2,908	821	146	369	1,501
1952	1,146	1,155	1,482	817	630	520	1,628	5,070	3,118	925	207	85.8	1,402
1953	718	792	414	469	582	482	533	4,282	4,680	1,167	476	155	1,229
1954	835	835	546	498	462	526	1,051	4,645	5,235	2,324	512	481	1,500
1955	346	1,587	885	578	450	399	823	2,497	5,497	2,738	444	232	1,373
1956	1,060	1,651	923	914	632	621	2,035	5,631	4,963	1,039	258	225	1,662
1957	409	1,366	586	423	392	573	1,074	5,199	2,702	526	237	112	1,137
1958	1,313	552	408	395	552	1,095	1,863	4,310	2,394	439	102	77.1	1,129
1959	355	1,386	757	760	680	564	1,345	3,813	4,769	842	279	1,219	1,395
1960	1,392	1,046	880	710	626	614	2,571	4,107	4,368	866	290	391	1,486

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	24,650	81,160	64,190	95,900	107,500	70,420	104,100	284,000	173,100	50,470	8,960	21,950	1,086,000
1952	70,460	68,730	91,120	50,250	36,220	31,970	96,890	311,700	185,500	56,880	12,730	5,100	1,018,000
1953	44,020	47,120	25,440	28,850	32,340	29,620	31,690	263,300	277,500	71,780	29,300	9,210	890,000
1954	51,340	49,670	33,600	30,600	25,640	32,370	62,550	285,900	311,500	142,900	31,470	28,620	1,086,000
1955	21,260	94,410	54,440	35,560	24,980	24,560	48,940	153,500	327,100	168,400	27,330	13,800	994,300
1956	65,200	98,220	56,730	56,210	36,350	38,160	121,100	346,200	295,300	63,910	15,840	13,380	1,207,000
1957	25,120	81,310	36,050	26,020	21,800	35,250	63,900	319,700	160,800	32,360	14,550	6,680	823,500
1958	80,760	32,870	25,090	24,300	30,670	67,350	110,900	265,000	142,400	27,010	6,300	4,590	817,200
1959	21,800	82,470	46,560	46,730	37,740	34,680	80,040	234,400	285,800	51,760	17,130	72,530	1,010,000
1960	85,570	62,220	54,110	43,660	36,000	37,730	153,000	252,500	259,900	53,250	17,820	23,260	1,079,000

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	-	-	-	-	-	-	1,494	1,082,000	
1951	1216	5,550	May 19, 1951	38	1,501	1,086,000	1,584	1,147,000	
1952	1246	5,740	May 21, 1952	72	1,402	1,018,000	1,245	903,800	
1953	1286	5,270	June 3, 14, 1953	39	1,229	890,000	1,254	908,000	
1954	1346	7,290	May 26, 1954	98	1,500	1,086,000	1,549	1,122,000	
1955	1396	6,580	June 14, 1955	158	1,373	994,300	1,443	1,044,000	
1956	1446	8,130	May 27, 1956	135	1,662	1,207,000	1,555	1,129,000	
1957	1516	6,230	May 20, 1957	82	1,137	823,500	1,132	819,800	
1958	1566	5,860	May 28, 1958	49	1,129	817,200	1,146	829,400	
1959	1636	5,590	June 8, 1959	161	1,395	1,010,000	1,465	1,061,000	
1960	1716	5,390	June 7, 1960	174	1,486	1,079,000	-	-	

3950. Priest River near Priest River, Idaho

Location.--Lat 48°13', long 116°55', in NE¼SE¼ sec.11, T.56 N., R.5 W., on right bank 500 ft downstream from Saddler Creek, a quarter of a mile downstream from Lower West Branch, 2½ miles north of Priest River, and 3½ miles upstream from mouth.

Drainage area.--902 sq mi.

Records available.--June 1903 to April 1905, November 1910 to April 1911, May to December 1923, February 1929 to September 1960. Prior to October 1930, published as "at Priest River."

Gage.--Water-stage recorder. Altitude of gage is 2,090 ft (from river-profile map). Prior to May 15, 1929 (corrected), and Sept. 18, 1929, to Apr. 28, 1930, staff gages at site 3 miles downstream at altitude about 40 ft lower. June 4 to Sept. 17, 1929, and Apr. 29 to Sept. 11, 1930, staff gages at or near present site at present datum.

Average discharge.--32 years (1903-4, 1929-60), 1,645 cfs (1,191,000 acre-ft per year).

Extremes.--1903-5, 1910-11, 1923, 1929-60: Maximum discharge, 10,500 cfs May 29, 30, 1948; maximum gage height, 8.97 ft May 29, 1948; minimum discharge, 165 cfs Sept. 26, 1958 (gage height, 0.46 ft).

Remarks.--No diversion above station. Some regulation on tributary and, since Aug. 9, 1950, by low buttress and stoplog dam on Priest River three-quarters of a mile downstream from 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	672	1,754	1,726	2,144	2,794	1,718	3,135	5,743	3,456	1,150	282	510	2,083
1952	1,548	1,531	1,967	1,078	968	927	3,408	6,541	3,726	1,205	382	227	1,945
1953	806	955	567	926	1,033	886	1,283	5,574	5,529	1,491	662	307	1,653
1954	959	1,015	790	734	774	1,117	2,138	5,803	5,924	2,708	694	664	1,946
1955	491	1,840	1,121	759	637	589	1,728	3,602	6,329	3,076	627	382	1,765
1956	1,291	1,998	1,521	1,440	940	1,232	4,046	7,061	5,864	1,394	432	372	2,300
1957	555	1,578	825	581	639	1,085	2,029	6,480	3,282	760	377	229	1,540
1958	1,551	763	630	663	1,411	1,847	3,043	5,223	2,804	657	229	204	1,584
1959	472	1,622	969	1,291	986	1,011	2,601	4,912	5,736	1,235	444	1,350	1,883
1960	1,571	1,581	1,253	992	974	1,362	4,012	5,227	5,180	1,153	469	529	2,004

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	41,310	104,400	106,200	131,800	155,200	105,600	186,500	553,100	205,600	70,690	17,320	30,330	1,508,000
1952	95,170	91,080	121,000	66,310	55,710	57,030	202,800	589,900	221,700	74,070	23,460	13,480	1,412,000
1953	49,530	56,810	34,890	56,920	57,390	54,490	76,370	530,400	529,000	91,700	40,680	18,290	1,196,000
1954	57,720	60,380	48,550	45,140	43,010	68,660	127,300	556,800	552,500	166,600	42,680	39,510	1,409,000
1955	30,200	109,500	68,910	46,680	35,380	36,200	102,800	221,500	376,600	189,100	38,540	22,750	1,278,000
1956	79,390	118,900	93,500	88,540	54,090	75,750	240,800	434,100	550,100	85,730	26,540	22,180	1,670,000
1957	34,100	93,910	50,740	35,730	35,480	66,690	120,700	598,400	195,500	46,760	23,190	13,620	1,115,000
1958	94,110	45,400	38,750	40,740	78,380	115,600	181,100	521,100	66,800	40,380	14,090	12,160	1,147,000
1959	29,010	96,520	59,570	79,360	54,730	62,170	154,800	502,000	41,500	75,930	27,300	80,340	1,363,000
1960	96,610	82,200	77,040	61,000	56,030	85,760	238,800	521,400	508,200	69,660	28,850	31,500	1,455,000

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	-	-	-	-	-	-	2,080	1,506,000
1951	1216	6,880	May 14, 1951	203	2,083	1,508,000	2,160	1,563,000
1952	1248	7,140	May 1, 1952	215	1,945	1,412,000	1,716	1,246,000
1953	1286	6,400	May 21, 1953	172	1,653	1,196,000	1,668	1,222,000
1954	1346	8,300	May 21, 1954	258	1,946	1,409,000	2,004	1,451,000
1955	1396	7,570	June 14, 1955	302	1,765	1,278,000	1,880	1,361,000
1956	1446	9,690	May 26, 1956	289	2,300	1,670,000	2,144	1,557,000
1957	1516	8,540	May 20, 1957	202	1,540	1,115,000	1,539	1,114,000
1958	1566	6,680	May 26, 1958	175	1,584	1,147,000	1,593	1,153,000
1959	1636	6,920	June 7, 1959	260	1,883	1,363,000	1,980	1,434,000
1960	1716	6,840	May 21, 1960	320	2,004	1,455,000	-	-

3955. Pend Oreille River at Newport, Wash.
(Formerly published as Pend Oreille River at Priest River, Idaho)

Location.--Lat 48°11'00", long 117°02'00" in SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.24, T.56 N., R.6 W., on left bank at Newport, 0.2 mile upstream from bridge on U. S. Highway 2, a quarter of a mile east of Idaho-Washington State line, and 1.6 miles downstream from Albeni Falls Dam.

Drainage area.--24,200 sq mi, approximately.

Records available.--June 1903 to September 1941, October 1952 to September 1960. Prior to October 1921, published as Clark Fork at Newport, Wash., October 1921 to September 1937 as Clark Fork at Priest River, Idaho, and October 1937 to September 1941 as Pend Oreille River at Priest River, Idaho.

Gage (corrected).--Water-stage recorder. Datum of gage is 2,000.00 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Sept. 22, 1928, staff or wire-weight gages at Priest River, Newport, or Metaline Falls at various datums (see description, WSP 532, p. 92). Sept. 22, 1928, to Sept. 30, 1935, water-stage recorder at Priest River at datum 2,040.14 ft above mean sea level and Oct. 1, 1935, to Sept. 30, 1941, at datum 2,000 ft above mean sea level, datum of 1929. Since December 1952, auxiliary water-stage recorder 2.74 miles downstream from base gage.

Average discharge.--46 years (1903-41, 1952-60), 25,370 cfs (18,370,000 acre-ft per year).

Extremes.--1903-41, 1952-60: Maximum discharge, 136,000 cfs June 15, 1913, June 21, 1933; minimum, 2,200 cfs Dec. 12, 1919.

Maximum stage known, about 64.0 ft in June 1894, present site and datum, from water-surface profiles (discharge, about 200,000 cfs).

Remarks.--Flow regulated at Albeni Falls Dam and affected by storage in Pend Oreille Lake (see p. 285), Flathead Lake (see p. 274), Hungry Horse Reservoir (see p. 270), and several smaller reservoirs (see p. 279). Diversions above station for irrigation of about 337,600 acres (1946 determination).

Monthly and yearly 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	13,280	25,080	15,000	14,740	17,790	13,850	15,150	37,680	68,400	30,170	11,170	13,740	22,960
1954	22,380	20,590	14,950	12,450	14,850	20,580	23,570	65,580	77,800	48,750	14,620	12,320	29,090
1955	13,060	21,150	18,420	18,130	18,920	20,130	25,780	35,580	63,430	46,630	12,000	14,920	25,870
1956	17,680	20,510	22,980	21,720	23,270	26,540	56,940	83,730	89,980	30,960	11,540	16,850	35,170
1957	15,510	23,290	21,250	19,360	17,670	19,510	22,640	67,310	57,000	18,390	8,717	14,120	25,420
1958	18,790	25,510	20,380	12,560	10,910	20,810	21,380	53,780	49,310	18,710	6,902	9,444	22,410
1959	12,440	18,630	23,360	27,690	29,540	20,980	38,060	68,040	91,170	37,000	12,630	17,990	33,080
1960	31,330	32,280	23,840	17,420	19,260	27,490	50,590	57,570	58,110	27,090	11,170	10,350	30,520

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													
1952													
1953	616.8	1,493	922.3	906.4	988.2	851.7	901.7	2,317	4,070	1,655	686.9	817.3	16,630
1954	1,376	1,225	918.9	765.4	813.8	1,266	1,403	4,031	4,630	2,996	899.1	733.3	21,060
1955	803.3	1,258	1,133	1,115	1,051	1,238	1,534	2,188	3,775	2,867	737.9	887.6	18,590
1956	1,087	1,221	1,413	1,335	1,338	1,632	3,388	5,148	5,354	1,904	709.3	1,003	25,530
1957	953.7	1,386	1,306	1,190	981.4	1,199	1,347	4,139	3,392	1,131	536.0	840.5	18,400
1958	1,155	1,506	1,253	772.4	606.1	1,280	1,272	3,307	2,934	1,151	424.4	562.0	16,220
1959	765.0	1,109	1,437	1,702	1,641	1,290	2,265	4,184	5,425	2,275	788.9	1,071	23,950
1960	1,927	1,921	1,466	1,071	1,108	1,691	3,010	3,540	3,458	1,666	686.7	615.6	22,160

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					
1950								
1951								
1952								
1953	1286	96,500	June 17, 1953	3,850	22,960	16,630,000	23,360	16,910,000
1954	1346	103,000	May 29, 1954	7,680	29,090	21,060,000	28,640	20,730,000
1955	1396	86,200	June 20, 1955	7,020	25,670	18,590,000	26,400	19,110,000
1956	1446	127,000	June 4-7, 1956	6,210	35,170	25,530,000	35,070	25,460,000
1957	1516	97,900	May 26, 1957	3,880	25,420	18,400,000	25,790	18,670,000
1958	1566	94,100	May 30, 1958	3,780	22,410	16,220,000	21,570	15,620,000
1959	1636	100,000	(a)	5,150	33,080	23,950,000	35,850	25,960,000
1960	1716	71,000	June 7, 1960	4,180	30,520	22,160,000	-	-

a June 22, 23, 24, 25, 1959.

3960. Callispell Creek near Dalkena, Wash.

Location.--Lat 48°14'40", long 117°20'30", in SW $\frac{1}{4}$ sec.26, T.32 N., R.43 E., on left bank 2 miles upstream from Callispell Lake, 4.8 miles west of Dalkena, and 9 miles upstream from mouth.

Drainage area.--67.8 sq mi.

Records available.--August 1950 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 2,070 ft (from topographic map).

Average discharge.--10 years (1950-60), 76.5 cfs (55,380 acre-ft per year).

Extremes.--1950-60: Maximum discharge, 1,070 cfs Feb. 25, 1958; maximum gage height, 7.33 ft Mar. 30, 1960; minimum discharge, 3.5 cfs Sept. 1, Oct. 19, 1957.

Remarks.--No diversion above station. Regulation at low flow by Power Lake (capacity, 1,000 acre-ft) since September 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
1950	-	-	-	-	-	-	-	-	-	-	16.5	14.4	-
1951	23.7	33.5	86.6	59.0	115	68.6	356	276	64.4	26.8	19.4	18.3	95.3
1952	20.7	34.8	53.1	26.7	50.6	58.4	406	276	77.9	37.5	20.6	16.1	89.6
1953	14.7	14.1	13.7	34.3	51.5	54.6	180	211	107	32.9	20.2	16.2	62.4
1954	13.8	14.3	23.3	23.7	25.1	60.3	190	210	88.9	34.4	20.8	19.2	60.4
1955	14.0	26.4	22.2	19.5	19.3	18.6	147	239	134	57.8	23.3	19.0	61.9
1956	26.2	28.4	71.8	71.2	43.1	78.7	482	357	99.4	35.5	20.5	15.3	111
1957	23.0	19.3	18.2	16.9	19.8	47.0	154	206	55.4	24.5	10.6	8.89	50.5
1958	18.3	19.0	17.1	26.1	151	130	356	195	45.7	22.4	9.86	11.9	81.1
1959	12.5	20.7	16.9	58.6	36.8	51.1	255	244	101	28.7	14.1	22.7	71.9
1960	24.0	23.5	30.7	24.7	41.6	126	299	249	91.8	29.6	14.8	14.8	80.7

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1950	-	-	-	-	-	-	-	-	-	-	1,010	855	-
1951	1,460	1,990	5,330	3,630	6,380	4,220	21,210	16,990	3,830	1,650	1,190	1,090	68,970
1952	1,270	2,070	3,260	1,640	2,910	3,590	24,140	16,990	4,630	2,300	1,270	956	65,030
1953	906	839	842	2,110	2,860	3,360	10,710	12,950	6,370	2,020	1,240	964	45,170
1954	846	853	1,440	1,460	1,400	3,710	11,310	12,920	5,290	2,120	1,280	1,140	43,770
1955	863	1,570	1,370	1,200	1,070	1,140	8,770	14,700	7,990	3,550	1,430	1,130	44,780
1956	1,610	1,690	4,410	4,380	2,480	4,840	28,660	21,950	5,910	2,180	1,260	910	80,280
1957	1,420	1,150	1,120	1,040	1,100	2,890	9,180	12,660	3,300	1,510	652	529	36,550
1958	1,130	1,130	1,050	1,610	8,400	7,980	20,020	11,980	2,720	1,380	606	708	58,710
1959	770	1,230	1,040	3,600	2,040	3,140	15,190	15,030	6,040	1,760	869	1,350	52,060
1960	1,470	1,400	1,890	1,520	2,390	7,750	17,780	15,320	5,460	1,820	908	881	58,590

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	1216	-	-	-	-	-	-	-
1951	1216	515	Apr. 14-15, 1951	6.5	95.3	68,970	92.3	66,790
1952	1246	877	Apr. 26, 1952	14	89.6	65,030	84.1	61,010
1953	1286	755	Apr. 28, 1953	13.5	62.4	45,170	63.2	45,720
1954	1346	456	May 11, 1954	9.5	60.4	43,770	61.4	44,430
1955	1396	426	Apr. 22, 1955	9.6	61.9	44,780	67.3	48,690
1956	1446	904	Apr. 22, 1956	9.2	111	80,280	105	76,260
1957	1516	485	May 20, 1957	3.5	50.5	36,550	49.9	36,170
1958	1566	1,070	Feb. 25, 1958	3.8	81.1	58,710	80.7	58,440
1959	1636	444	Jan. 12, 1959	4.9	71.9	52,060	74.3	53,780
1960	1716	918	Mar. 30, 1960	4.0	80.7	58,590	-	-

3961. Winchester Creek near Cusick, Wash.

Location.--Lat 48°16'50", long 117°21'40", in NW $\frac{1}{4}$ sec.15, T.32 N., R.43 E., on right bank 10 ft upstream from county road and 5 miles southwest of Cusick.

Drainage area.--16.8 sq mi (revised).

Records available.--April to July 1957, water years 1954-56, 1958-60 (annual maximum).

Gage.--Crest-stage gage. Altitude of gage is 2,100 ft (from topographic map). Staff gage and crest-stage gage April to July 1957 at same site and datum.

Extremes.--1954-60: Maximum discharge, 184 cfs Apr. 22, 1956 (gage height, 14.40 ft).

April to July 1957: Minimum discharge observed, 3.0 cfs July 30, 31 (gage height, 0.45 ft).

Monthly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957							21.3	33.1	11.7	4.46			

Monthly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957							1,270	2,040	697	274			

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	1566	91.4	May 10, 1954	-	-	-	-	-	-
1955	1566	75.5	Apr. 22, 1955	-	-	-	-	-	-
1956	1566	184	Apr. 22, 1956	-	-	-	-	-	-
1957	1566	72	May 20, 1957	-	-	-	-	-	-
1958	1566	126	Feb. 25, 1958	-	-	-	-	-	-
1959	1636	65.9	Jan. 12, 1959	-	-	-	-	-	-
1960	1716	91	Mar. 29, 1960	-	-	-	-	-	-

3962. Smalle Creek near Cusick, Wash.

Location.--Lat 48°19'40", long 117°21'00", in SW $\frac{1}{4}$ sec.27, T.33 N., R.43 E., on left bank on downstream side of county road bridge, 2 $\frac{1}{2}$ miles southwest of Cusick.

Drainage area.--25.1 sq mi.

Records available.--April to July 1957.

Gage.--Staff gage. Altitude of gage is 2,060 ft (from topographic map).

Extremes.--April to July 1957: Maximum discharge observed, 128 cfs May 20 (gage height, 2.68 ft); minimum observed, 4.7 cfs July 31 (gage height, 0.62 ft).

Monthly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957							27.9	64.4	21.7	7.57			

Monthly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957							1,660	3,960	1,290	465			

3963. Trimble Creek near Cusick, Wash.

Location.--Lat 48°21'20", long 117°20'25", in NW $\frac{1}{4}$ sec.14, T.33 N., R.43 E., on right bank 200 ft below county road and 2 $\frac{1}{4}$ miles northwest of Cusick.

Drainage area.--3.50 sq mi.

Records available.--April to July 1957.

Gage.--Staff gage. Altitude of gage is 2,080 ft (from topographic map).

Extremes.--April to July 1957: Maximum discharge observed, 29 cfs May 20 (gage height, 2.60 ft); minimum daily, 0.1 cfs July 8-14, 23, 26-31; minimum gage height, 0.30 ft July 8, 9, 11, 29-31.

Monthly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957							4.42	3.30	1.27	0.22			

Monthly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957							263	203	75	13			

3965. Pend Oreille River below Box Canyon, near Ione, Wash.

Location.--Lat 48°46'50", long 117°24'40", in SE¹/₄NE¹/₄ sec.19, T.38 N., R.43 E., on left bank 1,000 ft downstream from Box Canyon Dam and 4 miles north of Ione.

Drainage area.--25,000 sq mi, approximately.

Records available.--October 1952 to September 1960.

Gage.--Water-stage recorder. Datum of gage is at mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Mar. 29, 1954, staff gage at site 300 ft upstream at same datum. Mar. 29 to Aug. 25, 1954, staff gage at present site and datum.

Extremes.--1952-60: Maximum discharge, 125,700 cfs June 6, 1956 (elevation, 2,011.74 ft); minimum, 3,190 cfs Aug. 17, 18, 20, 1958 (elevation, 1,980.5 ft, from hourly tailwater readings at Box Canyon Dam).

Flood in June 1948 reached elevation of 2,018.0 ft, from floodmarks (discharge, 167,000 cfs).

Remarks.--In 1946, there were diversions for irrigation of about 340,000 acres, and there probably has not been any appreciable change since that time. Flow regulated at Box Canyon and Albeni Falls Dams and affected by storage in Pend Oreille and Flathead Lakes, and by Hungry Horse Reservoir and smaller reservoirs in Pend Oreille River basin in Montana (see elsewhere in this report).

Monthly and yearly 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	12,430	25,790	15,840	15,050	18,590	14,390	16,070	40,300	70,500	32,530	11,760	13,500	23,860
1954	23,510	21,070	15,200	12,790	15,300	21,830	24,810	65,770	81,650	53,110	14,890	13,140	30,330
1955	12,810	21,880	18,880	18,390	19,250	19,990	27,750	36,070	62,260	47,870	12,350	14,360	25,980
1956	17,620	20,060	23,310	21,600	22,840	25,950	58,300	84,370	91,960	32,450	11,670	16,360	35,490
1957	15,320	24,330	22,480	20,160	18,940	21,090	24,720	68,500	60,060	19,280	8,797	14,240	26,510
1958	19,470	25,810	22,000	12,870	12,300	22,580	23,530	54,810	52,120	19,450	6,728	9,339	23,460
1959	11,790	18,950	23,810	28,350	30,780	21,480	39,070	68,510	91,530	39,050	11,670	16,120	33,380
1960	31,000	32,570	25,130	17,730	19,760	27,960	51,510	58,130	57,610	28,270	11,450	10,560	30,990

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													
1952													
1953	764.2	1,535	974.1	925.3	1,033	884.8	956.4	2,478	4,195	2,000	723.2	803.1	17,270
1954	1,448	1,254	934.4	786.2	849.9	1,342	1,476	4,044	4,859	3,266	915.4	782.0	21,950
1955	787.6	1,320	1,161	1,131	1,069	1,229	1,651	2,218	3,705	2,943	759.3	854.2	18,810
1956	1,083	1,194	1,433	1,328	1,314	1,596	3,469	5,188	5,472	1,995	717.4	973.8	25,760
1957	941.8	1,448	1,383	1,240	1,052	1,297	1,471	4,212	3,574	1,185	540.9	847.2	19,190
1958	1,197	1,536	1,353	791.4	683.1	1,389	1,400	3,370	3,101	1,196	413.7	555.7	16,990
1959	724.7	1,128	1,464	1,743	1,709	1,321	2,325	4,212	5,447	2,401	729.8	959.0	24,160
1960	1,906	1,962	1,545	1,090	1,136	1,719	3,065	3,574	3,428	1,738	703.9	628.5	22,500

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								
1951								
1952								
1953	1346	a95,100	June 17, 1953	5,000	23,860	17,270,000	24,360	17,630,000
1954	1346	a103,000	May 29, 1954	8,320	30,330	21,950,000	29,800	21,570,000
1955	1396	80,900	June 20, 1955	6,320	25,980	18,810,000	26,620	19,270,000
1956	1446	125,700	June 6, 1956	6,780	35,490	25,760,000	35,570	25,830,000
1957	1516	97,100	May 26, 1957	4,070	26,510	19,190,000	26,940	19,510,000
1958	1566	97,100	May 29, 1958	4,180	23,460	16,990,000	22,400	16,220,000
1959	1636	99,200	June 26, 1959	4,740	33,380	24,160,000	36,270	26,260,000
1960	1716	69,200	May 22, 1960	4,850	30,990	22,500,000	-	-

a Maximum observed.

3969. Sullivan Creek above Outlet Creek, near Metaline Falls, Wash.

Location.--Lat 48°50'45", long 117°17'10", in SW 1/4 sec.30, T.39 N., R.44 E., on right bank 30 ft downstream from road bridge, 1,000 ft upstream from Outlet Creek, and 4 miles southeast of Metaline Falls.

Drainage area.--70.2 sq mi.

Records available.--January 1959 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 2,540.09 ft above mean sea level (Pend Oreille County Public Utility District levels).

Extremes.--1959-60: Maximum discharge, 1,040 cfs June 6, 1959 (gage height, 12.67 ft); minimum, 18 cfs Jan. 20-23, 1959 (gage height, 10.00 ft).

Remarks.--No regulation or diversion 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
1959	-	-	-	37.3	32.3	31.8	96.4	396	578	126	49.7	64.7	-
1960	95.7	75.5	76.8	57.8	43.4	59.5	212	399	498	118	46.5	35.4	143

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1959	-	-	-	2,300	1,900	1,960	5,740	24,350	34,390	7,760	3,080	3,850	-
1960	5,880	4,490	4,720	3,550	2,500	3,660	12,620	24,560	29,650	7,260	2,860	2,110	103,900

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
1959	1636	1,040	June 6, 1959	-	-	-	-	-	139	26.78	100,300
1960	1716	958	June 3, 1960	29	143	2.04	27.74	103,900	-	-	-

3971. Outlet Creek near Metaline Falls, Wash.

Location.--Lat 48°50'45", long 117°17'15", in SW 1/4 sec.30, T.39 N., R.44 E., on right bank 600 ft upstream from mouth, half a mile below Sullivan Lake Dam, and 4 miles east of Metaline Falls.

Drainage area.--52.3 sq mi.

Records available.--January 1959 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 2,550 ft above mean sea level (Pend Oreille County Public Utility District levels).

Extremes.--1959-60: Maximum discharge, 616 cfs Dec. 9, 1959 (gage height, 11.49 ft); minimum, 4.4 cfs May 11, 1959 (gage height, 8.85 ft); minimum daily, 4.7 cfs May 8-15, 1959.

Remarks.--Flow regulated by Sullivan Lake. No 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	-	-	-	16.4	105	323	100	44.1	218	19.0	18.4	17.0	-
1960	19.5	28.3	382	137	45.0	32.3	7.31	124	212	54.1	25.4	23.8	91.3

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1959	-	-	-	1,010	5,830	19,890	5,960	2,710	12,940	1,170	1,130	1,010	-
1960	1,200	1,690	23,480	8,390	2,590	1,960	4	7,630	12,590	3,320	1,560	1,410	66,280

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year			
		Momentary maximum		Minimum day	Mean	Acre-feet	Runoff		Mean	Runoff	
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1959	1636	528	Feb. 27, 1959	-	-	-	-	-	108	-	78,020
1960	1716	616	Dec. 9, 1959	95.1	91.3	66,280	-	-	-	-	-

3980. Sullivan Creek at Metaline Falls, Wash.

Location.--Lat 48°51'40", long 117°21'50", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.22, T.39 N., R.43 E., on right bank 100 ft downstream from State highway bridge, half a mile upstream from mouth, and half a mile east of Metaline Falls.

Drainage area.--142 sq mi.

Records available.--October 1953 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 2,050 ft (from topographic map). Prior to Aug. 24, 1956, staff gage at site 120 ft upstream at datum 3.70 ft higher.

Average discharge.--7 years (1953-60), 240 cfs (173,800 acre-ft per year).

Extremes.--1953-60: Maximum discharge observed, 3,550 cfs June 12, 1955 (gage height, 3.90 ft, site and datum then in use); minimum, 7.3 cfs Jan. 1, 1958 (result of freezeup); minimum daily, 27 cfs Jan. 1, 1958.

Remarks.--Some regulation by storage in Sullivan Lake. Small diversions above station for municipal and mine water 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													
1952													
1953													
1954	109	105	107	102	96.0	111	165	986	937	343	107	97.9	273
1955	97.0	115	112	107	109	108	144	267	1,404	394	115	95.1	255
1956	95.0	90.0	100	140	100	138	463	1,071	564	231	79.4	60.2	261
1957	58.9	52.7	223	230	65.5	63.9	183	*879	391	138	80.9	262	*220
1958	271	79.8	44.6	40.8	75.8	124	191	*754	285	125	61.0	54.9	*177
1959	55.4	56.6	53.4	64.1	147	360	254	481	865	142	78.9	94.9	221
1960	126	118	465	205	99.3	128	290	617	821	203	89.8	79.2	270

* Revised; revised daily discharge for the periods thus affected are available and will be published in a future water-supply paper.

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	6,730	6,230	6,580	6,290	5,330	6,840	9,810	60,630	55,750	21,070	6,560	5,830	197,600
1955	5,960	6,850	6,890	6,560	6,060	6,620	8,590	16,430	83,560	24,240	7,070	5,660	184,500
1956	5,840	5,360	6,150	8,610	5,750	8,490	27,560	65,830	33,580	14,180	4,880	3,580	189,800
1957	3,620	3,140	13,740	14,150	3,640	3,930	10,880	*54,080	23,280	8,460	4,970	15,590	*159,500
1958	16,690	4,750	2,750	2,510	4,210	7,620	11,360	*46,370	16,970	7,700	3,750	3,270	*128,000
1959	3,410	3,370	3,280	3,940	8,140	22,150	15,130	29,550	51,460	8,760	4,850	5,650	159,700
1960	7,760	7,020	28,590	12,610	5,710	7,880	17,240	37,940	48,880	12,490	5,520	4,710	196,400

* Revised; see footnote to table above.

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							
1952							
1953							
1954	1346	al,860	May 19, 1954	80	273	197,600	273
1955	1396	a3,550	June 12, 1955	77	255	184,500	252
1956	1446	-	-	59	261	189,800	266
1957	1516	*1,410	May 14, 1957	36	*220	*159,500	*225
1958	1566	*1,340	May 20, 1958	27	*177	*128,000	*157
1959	1636	1,580	June 6, 1959	44	221	159,700	267
1960	1716	1,960	June 3, 1960	73	270	196,400	-

* Revised.

a Maximum observed.

3985. Pend Oreille River below Z Canyon, near Metaline Falls, Wash.

(International gaging station)

Location.--Lat 48°58'50", long 117°20'40", in lot 2, sec.11, T.40 N., R.43 E., on right bank three-quarters of a mile downstream from Z Canyon, $\frac{1}{2}$ miles south of international boundary, 5 miles downstream from Slate Creek, and 10 miles downstream from town of Metaline Falls.

Drainage area.--25,200 sq mi, approximately; at site prior to October 1928, 25,100 sq mi, approximately.

Records available.--November 1908 to September 1910 (gage heights only), October 1912 to September 1960. Prior to October 1928, published as Clark Fork at Metaline Falls and October 1928 to September 1937 as Clark Fork below Z Canyon, near Metaline Falls.

Gage.--Water-stage recorder. Datum of gage is 1,721.18 ft above mean sea level, datum of 1929, supplementary adjustment of 1947 (levels by Corps of Engineers). Prior to Dec. 19, 1928, staff gages at Metaline Falls 10 miles upstream at datum approximately 262.2 ft higher.

Average discharge.--48 years (1912-60), 26,830 cfs (19,420,000 acre-ft per year).

Extremes.--1912-60: Maximum discharge, 171,300 cfs June 13, 1948 (gage height, 60.25 ft); minimum, 2,500 cfs Dec. 12, 1919 (gage height, -2.4 ft, site and datum then in use).

Maximum stage known, 69.0 ft in June 1894, from floodmarks.

Remarks.--In 1946, there were diversions for irrigation of about 340,000 acres, and there probably has not been any appreciable change since that time. Flow regulated at Albeni Falls and Box Canyon Dams and affected by storage in Pend Oreille and Flathead Lakes, Hungry Horse Reservoir, and several smaller reservoirs in Pend Oreille River basin in Montana (see elsewhere in this report).

Cooperation.--This station is maintained by the United States under agreement with Canada.

Corrections.--In WSP 1316, the mean for September 1934 is listed in error. It should be 8,254 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	13,680	23,310	23,670	29,790	30,150	27,590	35,900	80,330	67,370	57,050	22,510	14,410	37,170
1952	19,190	19,620	19,870	18,070	20,340	17,780	30,100	80,120	50,080	23,540	9,626	10,650	26,520
1953	13,210	26,260	16,730	16,130	19,900	16,280	17,400	40,220	73,380	33,170	12,630	13,770	24,680
1954	24,390	21,720	16,260	14,000	16,290	22,890	25,810	67,690	83,920	53,970	15,300	13,510	31,380
1955	13,510	22,490	19,340	16,920	20,050	20,610	29,310	37,890	65,330	50,150	13,350	15,250	27,180
1956	19,090	21,290	24,900	23,750	24,680	28,420	61,360	67,930	95,180	33,490	12,240	17,380	37,420
1957	15,800	24,590	22,690	20,400	19,180	21,490	25,280	68,970	61,020	20,030	9,679	15,020	27,030
1958	20,020	26,660	22,670	13,760	13,830	25,610	25,510	55,960	53,230	21,610	8,618	10,710	24,780
1959	12,440	19,940	24,590	29,240	31,480	22,960	40,250	70,660	94,480	40,280	13,440	17,550	34,710
1960	31,490	33,630	26,690	19,370	21,630	29,080	53,190	60,940	60,410	30,160	13,620	11,220	32,600

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	841.2	1,367	1,456	1,632	1,674	1,697	2,136	4,939	5,199	3,508	1,384	657.3	26,910
1952	1,160	1,166	1,222	1,049	1,170	1,093	1,791	4,927	2,980	1,447	591.9	633.4	19,250
1953	812.1	1,563	1,029	991.9	1,105	1,001	1,035	2,473	4,367	2,040	776.6	819.2	18,010
1954	1,500	1,293	999.9	860.6	904.9	1,407	1,536	4,162	4,994	3,319	940.6	603.9	22,720
1955	830.4	1,338	1,189	1,163	1,113	1,267	1,744	2,330	3,888	3,084	820.8	907.5	19,670
1956	1,174	1,267	1,531	1,461	1,419	1,747	3,651	5,406	5,664	2,059	752.4	1,034	27,170
1957	971.3	1,463	1,395	1,254	1,065	1,321	1,504	4,241	3,631	1,232	595.1	894.0	19,570
1958	1,231	1,588	1,366	645.8	766.2	1,513	1,518	3,441	3,168	1,298	529.9	637.1	17,930
1959	764.6	1,166	1,512	1,798	1,746	1,413	2,395	4,345	5,622	2,477	826.5	1,044	25,130
1960	1,936	2,001	1,641	1,191	1,244	1,768	3,165	3,747	3,595	1,855	837.4	667.8	23,670

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year			
		Momentary		Maximum	Minimum	Mean	Per square mile	Runoff		Mean	Runoff
		Discharge	Date					Inches	Acre-feet		Inches
1950	-	-	-	-	-	-	-	-	-	37,270	20,09
1951	1216	109,400	(a)	10,800	37,170	1.48	20.02	26,910,000	37,010	19.94	26,800,000
1952	1246	91,600	May 25, 1952	5,010	26,520	1.05	14.33	19,250,000	26,290	14.20	19,080,000
1953	1266	100,700	June 18, 1953	5,150	24,680	.987	13.40	18,010,000	25,420	13.69	18,400,000
1954	1346	106,700	May 29, 1954	8,790	31,380	1.25	16.91	22,720,000	30,780	-	22,290,000
1955	1396	88,900	June 20, 1955	6,180	27,180	-	-	19,670,000	28,020	-	20,290,000
1956	1446	129,800	June 5, 1956	7,500	37,420	-	-	27,170,000	37,220	-	27,020,000
1957	1516	101,100	May 26, 1957	4,940	27,030	-	-	19,570,000	27,550	-	19,940,000
1958	1566	99,300	May 29, 1958	5,530	24,780	-	-	17,930,000	23,730	-	17,180,000
1959	1636	102,100	June 25, 1959	4,290	34,710	-	-	25,130,000	37,630	-	27,250,000
1960	1716	72,000	May 21, 1960	5,900	32,600	-	-	23,670,000	-	-	-

a May 31, June 1, 1951.

3995. Columbia River at international boundary

(International gaging station)

Location.--Lat 49°00'03", long 117°37'40", in SE $\frac{1}{4}$ sec.4, T.40 N., R.41 E., on left bank at international boundary, half a mile downstream from Pend Oreille River.

Drainage area.--59,700 sq mi, approximately.

Records available.--October 1937 to September 1960. Prior to March 1938 monthly discharge only, published in WSP 1316.

Gage.--Water-stage recorder. Datum of gage is at mean sea level (Bureau of Reclamation 1937 datum). Prior to Apr. 27, 1939, staff gage at same site and datum. Since May 31, 1942, auxiliary water-stage recorder 2.2 miles downstream from base gage. Jan. 1 to May 30, 1942, auxiliary staff gage at same site.

Average discharge.--23 years (1937-60), 98,270 cfs (71,140,000 acre-ft per year).

Extremes.--1937-60: Maximum discharge, 550,100 cfs June 12, 1948 (elevation, 1,338.13 ft); minimum, 18,000 cfs Feb. 7, 1954 (elevation, 1,289.38 ft).

Flood in June 1894 reached a stage of 1,346 ft, from information by Bureau of Reclamation (discharge, 680,000 cfs).

Flow of about 12,900 cfs occurred Jan. 30 or 31, 1937, based on information from other gaging stations (elevation, 1,287.9 ft), from rating curve extended below 1,291.6 ft; may have been as low sometime in January 1930.

Remarks.--Many diversions above station for irrigation. It was estimated that 346,700 acres was under irrigation in the United States in 1946. Water is diverted for irrigation of an additional 25,000 acres in Canada. Flow is affected by internationally controlled storage in Kootenay Lake as well as by natural and controlled regulation in other lakes and reservoirs in Kootenay and Pend Oreille River basins. Records of water temperatures for the period November 1951 to August 1958 are published in reports of 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	57,270	59,390	56,400	60,910	65,990	53,020	78,090	235,900	275,900	256,200	124,000	68,440	116,300
1952	68,610	50,080	44,320	38,760	39,840	38,850	71,470	224,100	244,600	182,000	96,380	55,370	96,400
1953	49,280	48,110	33,160	32,250	38,650	37,410	39,940	44,400	290,800	219,700	109,700	74,650	93,310
1954	65,800	59,700	45,420	35,790	35,460	48,580	53,680	89,300	331,800	338,600	61,400	101,300	122,800
1955	60,110	61,940	53,640	42,460	41,110	38,740	54,620	100,300	298,400	300,800	400,310	80,000	104,100
1956	59,680	61,990	51,250	47,330	43,200	49,700	110,900	240,500	380,900	217,900	113,100	67,950	120,400
1957	59,680	52,490	43,060	36,830	37,500	41,540	53,100	258,000	278,000	43,900	84,380	58,470	95,880
1958	54,630	49,550	40,140	30,960	33,270	47,690	57,790	93,700	282,600	49,200	87,910	61,590	90,980
1959	56,120	51,040	46,120	52,330	50,910	45,300	78,190	186,700	335,500	263,800	27,400	108,100	117,000
1960	97,580	82,240	60,320	42,710	43,420	53,950	116,300	160,800	250,000	227,500	115,500	64,690	109,700

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	3,521	3,534	3,468	3,745	3,664	3,260	4,646	14,510	16,420	15,750	7,627	4,072	84,220
1952	4,219	2,980	2,725	2,383	2,292	2,389	4,253	13,780	14,550	11,190	5,926	3,295	69,980
1953	3,030	2,863	2,039	1,983	2,147	2,300	2,377	8,880	17,310	13,510	6,682	4,442	67,560
1954	4,034	3,552	2,793	2,201	1,969	2,987	3,194	11,640	19,750	20,820	9,925	6,027	88,890
1955	3,696	3,686	3,298	2,611	2,283	2,382	3,250	6,167	17,160	18,470	8,104	4,245	75,350
1956	3,670	3,688	3,151	2,910	2,485	3,056	6,598	14,790	22,660	13,400	6,954	4,043	87,400
1957	3,670	3,123	2,648	2,264	2,083	2,554	3,160	15,860	16,540	8,845	5,189	3,479	69,420
1958	3,359	2,948	2,468	1,904	1,848	2,932	3,439	11,910	16,820	9,171	5,405	3,665	65,870
1959	3,450	3,037	2,836	3,218	2,828	2,785	4,653	11,480	19,960	16,220	7,832	6,430	84,730
1960	6,000	4,894	3,709	2,626	2,498	3,317	6,919	9,890	14,870	13,990	7,103	3,849	79,660

Yearly 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	Mean	Runoff	Inches	Acre-feet
		Discharge	Date									
1950	-	-	-	-	-	-	-	-	115,200	26.20	-	83,400,000
1951	1216	332,800	May 27, 1951	42,100	116,300	1.95	26.47	84,220,000	115,500	26.28	-	83,620,000
1952	1246	300,200	May 29, 1952	34,800	96,400	1.61	21.99	69,980,000	93,660	21.36	-	67,990,000
1953	1268	367,500	June 18, 1953	28,400	93,510	1.56	21.22	67,560,000	96,700	22.00	-	70,010,000
1954	1346	413,000	July 12, 1954	28,500	122,800	2.06	27.93	88,890,000	123,200	-	-	89,190,000
1955	1396	403,800	June 29, 1955	27,700	104,100	1.74	23.67	75,350,000	130,800	-	-	75,180,000
1956	1446	463,900	June 6, 1956	29,300	120,400	2.02	27.45	87,400,000	118,900	-	-	86,340,000
1957	1516	357,100	May 26, 1957	30,900	95,880	-	-	69,420,000	94,970	-	-	68,750,000
1958	1566	370,500	May 30, 1958	25,100	90,980	-	-	65,870,000	91,740	-	-	66,420,000
1959	1636	396,600	June 26, 1959	35,100	117,000	-	-	84,730,000	124,300	-	-	90,010,000
1960	1716	281,800	June 20, 1960	36,100	109,700	-	-	79,660,000	-	-	-	-

4015. Kettle River near Ferry, Wash.

(International gaging station)

Location.--Lat 48°58'40", long 118°46'10", in lot 7, sec.10, T.40 N., R.32 E., on right bank $\frac{1}{4}$ miles south of international boundary and Ferry and 3 miles upstream from Toroda Creek.

Drainage area.--2,220 sq mi, approximately.

Records available.--August 1928 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,836.8 ft above mean sea level, international joint adjustment of 1947. Prior to Nov. 23, 1928, staff gage at present site and datum.

Average discharge.--32 years (1928-60), 1,494 cfs (1,082,000 acre-ft per year).

Extremes.--1928-60: Maximum discharge, 21,200 cfs May 29, 1948 (gage height, 21.15 ft); minimum, 14 cfs (discharge measurement) Jan. 23, 1930, but may have been less during period of ice effect Jan. 18-23, 1930.

Remarks.--Several small diversions above station for irrigation. No regulation.

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	382	387	436	333	375	451	3,623	9,094	4,049	1,295	285	291	1,758
1952	855	494	329	275	263	310	5,107	9,676	4,451	1,489	311	159	1,980
1953	116	110	102	119	124	160	703	5,675	6,244	2,214	591	421	1,387
1954	441	158	302	223	267	270	782	7,789	6,168	3,365	938	1,182	1,863
1955	768	972	785	480	367	291	764	4,436	8,273	2,809	635	248	1,738
1956	506	450	298	253	179	282	4,033	9,455	5,909	1,408	323	220	1,945
1957	329	271	207	155	174	237	1,009	10,440	3,151	825	627	247	1,486
1958	251	283	201	186	323	661	2,412	8,740	3,613	974	214	203	1,513
1959	491	544	286	270	244	310	2,664	8,281	7,790	1,943	342	968	1,998
1960	1,353	896	438	306	272	502	2,633	5,464	5,619	1,092	252	237	1,588

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	23,510	23,030	26,800	20,490	20,830	27,730	215,600	559,200	240,900	79,650	17,530	17,310	1,273,000
1952	52,540	29,380	20,230	16,940	15,150	19,080	303,900	594,900	264,900	91,580	19,110	9,490	1,437,000
1953	7,160	6,530	6,250	7,290	6,900	9,810	41,830	548,900	371,500	136,200	36,340	25,070	1,004,000
1954	27,100	30,820	18,570	13,700	14,810	16,620	46,510	478,900	367,000	206,900	57,680	70,310	1,349,000
1955	47,200	57,830	48,240	29,540	20,390	17,870	45,430	272,700	492,300	172,700	39,060	14,770	1,258,000
1956	31,130	26,760	18,330	15,580	10,290	17,350	240,000	581,400	351,600	86,570	19,880	13,110	1,412,000
1957	20,250	16,130	12,740	9,500	9,650	14,800	50,030	441,600	187,500	50,740	38,570	14,890	1,076,000
1958	15,450	16,830	12,380	11,440	17,920	40,670	143,500	537,400	215,000	59,880	15,150	12,080	1,096,000
1959	30,170	20,470	17,570	16,570	13,570	19,040	158,500	509,200	463,600	119,500	21,060	57,590	1,447,000
1960	83,170	53,340	26,950	18,820	15,660	30,890	156,700	535,900	334,300	67,120	15,520	14,110	1,152,000

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	-	-	-	-	-	-	1,473	1,066,000
1951	1216	15,000	May 13, 1951	160	1,758	1,273,000	1,798	1,301,000
1952	1246	14,800	May 21, 1952	112	1,980	1,437,000	1,867	1,355,000
1953	1286	11,800	June 14, 1953	67	1,387	1,004,000	1,465	1,060,000
1954	1346	15,600	May 20, 1954	150	1,863	1,349,000	1,969	1,426,000
1955	1396	14,400	June 13, 1955	177	1,738	1,258,000	1,631	1,181,000
1956	1446	17,100	May 21, 1956	160	1,945	1,412,000	1,908	1,385,000
1957	1516	16,300	May 20, 1957	110	1,486	1,076,000	1,480	1,072,000
1958	1566	12,400	May 23, 1958	90	1,513	1,096,000	1,546	1,119,000
1959	1636	12,400	May 24, 1959	100	1,998	1,447,000	2,130	1,542,000
1960	1716	11,200	May 13, 1960	160	1,588	1,152,000	-	-

4025. Curlew Creek near Malo, Wash.

Location.--Lat 48°46'00", long 118°39'10", in NW¼ sec.28, T.38 N., R.33 E., on left bank a quarter of a mile downstream from Curlew Lake and 3 miles southwest of Malo.

Drainage area.--66.8 sq mi.

Records available.--April 1951 to October 1954.

Gage.--Water-stage recorder. Altitude of gage is 2,330 ft (from topographic map).

Extremes.--1951-54: Maximum discharge observed, 169 cfs Apr. 16, 1951 (gage height, 4.35 ft, discharge measurement); practically no flow Mar. 4, 1953 (gage height, 1.14 ft), as result of regulation during building of weir 300 yds above gage.

Remarks.--Occasional regulation at small crib dam at lake outlet. At high stage and during irrigation season, water from Sanpoil River is sometimes diverted into this basin above Curlew Lake. At extreme stages there may be some flow into Sanpoil 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	-	-	-	-	-	-	-	107	48.0	25.6	10.3	6.56	-
1952	9.20	8.66	14.2	18.0	24.8	16.5	70.1	92.5	44.2	21.6	8.22	6.20	27.8
1953	6.33	6.41	6.66	8.67	7.39	6.14	12.5	42.9	45.9	27.7	10.7	3.46	15.4
1954	.39	3.82	6.74	8.24	7.25	10.5	17.8	23.6	22.3	12.5	6.40	6.09	10.5

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	6,570	2,860	1,570	632	390	-
1952	566	515	871	1,110	1,430	1,020	4,170	5,690	2,630	1,330	505	369	20,210
1953	389	381	409	533	410	377	741	2,640	2,730	1,700	655	206	11,170
1954	24	228	414	506	402	644	1,060	1,450	1,320	766	393	362	7,570

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					
1951	1216	169	Apr. 16, 1951	-	-	-	-	-
1952	1246	124	Apr. 30, 1952	4.8	27.8	20,210	26.8	19,430
1953	1286	51	May 30, 1953	.2	15.4	11,170	14.7	10,660
1954	1346	28	May 15-19, 1954	.3	10.5	7,570	-	-

a Maximum observed during period April to September.

4045. Kettle River near Laurier, Wash.

(International gaging station)

Location.--Lat-48°59'10", long 118°13'00", in NW $\frac{1}{4}$ sec.11, T.40 N., R.36 E., on right bank 500 ft downstream from Deep Creek, $\frac{1}{2}$ miles southeast of Laurier, and 12 miles upstream from Boulder Creek.

Drainage area.--3,800 sq mi, approximately.

Records available.--September 1929 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,425.5 ft above mean sea level, international joint adjustment of 1947. Prior to Jan. 3, 1930, staff gage at same site and datum.

Average discharge.--31 years (1929-60), 2,889 cfs (2,092,000 acre-ft per year).

Extremes.--1929-60: Maximum discharge, 35,000 cfs May 29, 1948 (gage height, 17.25 ft); minimum, 88 cfs Dec. 1, 1936 (gage height, 2.20 ft), but was probably less during winter of 1929-30.

Maximum stage known, about 22 ft in May or June 1894, from information by local residents.

Remarks.--North Fork regulated by reservoir at Grand Forks, British Columbia. Numerous diversions for irrigation of about 720 acres in the United States (for 1946 from United States reports), and 2,090 acres in Canada from the Canada Year Book for 1940. Some diversion for domestic use.

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	703	956	1,253	1,074	1,098	1,244	7,776	16,390	7,801	2,558	581	567	3,511
1952	1,624	1,063	840	776	673	756	9,732	16,770	7,946	2,806	674	355	3,672
1953	248	1,238	232	276	308	439	2,144	11,210	12,200	4,220	1,080	794	2,791
1954	834	999	690	573	673	752	2,303	14,350	10,440	5,765	1,660	2,203	3,454
1955	1,400	1,918	1,695	1,035	869	661	2,043	8,600	14,480	5,273	1,330	497	3,321
1956	807	899	656	602	421	667	8,486	17,760	11,210	2,973	683	425	3,802
1957	584	508	449	357	370	542	2,651	18,070	5,553	1,479	1,002	424	2,686
1958	450	482	399	395	898	2,127	5,577	16,020	6,672	1,826	424	351	2,980
1959	777	594	523	558	516	690	5,544	14,450	13,910	3,629	656	1,590	3,626
1960	2,344	1,732	951	656	610	1,363	5,930	10,210	10,330	2,232	519	413	3,105

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	43,200	56,880	77,010	66,010	60,990	76,500	462,700	1,008,000	464,200	157,300	35,700	33,760	2,542,000
1952	99,880	62,230	51,640	47,740	38,700	46,480	579,100	1,031,000	472,800	172,500	41,420	21,130	2,666,000
1953	15,270	14,150	14,260	16,990	17,110	27,010	107,600	689,000	726,200	259,500	66,400	47,270	2,021,000
1954	51,290	59,440	42,450	35,210	37,360	46,230	137,100	882,600	621,400	354,500	102,100	31,100	2,501,000
1955	86,060	114,100	104,200	63,660	48,290	40,620	121,500	528,800	861,400	324,200	81,750	29,550	2,404,000
1956	49,590	53,510	40,350	36,990	24,220	41,030	505,000	1,092,000	667,000	182,800	41,990	25,320	2,760,000
1957	35,910	30,230	27,580	20,700	20,570	33,310	156,600	1,111,000	330,400	90,930	61,630	25,200	1,944,000
1958	28,440	28,680	24,540	24,290	49,890	30,800	331,800	894,900	397,000	112,300	26,070	20,870	2,158,000
1959	47,760	35,380	32,130	34,330	28,670	42,420	329,900	888,500	827,900	223,200	40,340	94,620	2,625,000
1960	144,100	103,100	58,500	40,340	35,110	83,830	352,900	627,900	614,600	137,200	31,900	24,550	2,254,000

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	-	-	-	-	-	-	2,862	-	2,072,000
1951	1216	26,700	May 13, 1951	325	3,511	2,542,000	3,563	2,580,000	
1952	1246	24,700	May 20, 1952	297	3,672	2,656,000	3,438	2,496,000	
1953	1286	21,700	June 14, 1953	200	2,791	2,021,000	2,942	2,130,000	
1954	1346	27,000	May 20, 1954	400	3,454	2,501,000	3,663	2,652,000	
1955	1396	24,400	June 13, 1955	415	3,321	2,404,000	3,099	2,243,000	
1956	1446	31,700	May 22, 1956	341	3,802	2,760,000	3,734	2,710,000	
1957	1516	25,400	May 20, 1957	280	2,686	1,944,000	2,666	1,930,000	
1958	1566	22,000	May 23, 1958	250	2,980	2,158,000	3,029	2,193,000	
1959	1636	21,300	June 4, 1959	180	3,626	2,625,000	3,869	2,816,000	
1960	1716	18,900	May 13, 1960	323	3,105	2,254,000	-	-	

4070. Sheep Creek at Loon Lake, Wash.

Location.--Lat 48°03'35", long 117°39'10", in NE¼ sec.32, T.30 N., R.41 E., on right bank 0.7 mile downstream from outlet of Loon Lake and 1 mile west of town of Loon Lake.

Drainage area.--36.2 sq mi; at site in 1950, 36.1 sq mi.

Records available.--April to September 1950, October 1951 to September 1959.

Gage.--Water-stage recorder and wooden control. Altitude of gage is 2,370 ft (from topographic map). Prior to October 1950, water-stage recorder at site a quarter of a mile upstream at different datum.

Average discharge.--8 years (1951-59), 2.27 cfs (1,640 acre-ft per year).

Extremes.--1950, 1951-59: Maximum discharge, 43 cfs Apr. 23, 1956 (gage height, 2.84 ft); maximum gage height, 3.43 ft Feb. 4, 1954 (ice jam); no flow at times in each year.

Remarks.--Flow regulated by dam at outlet of Loon Lake. 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													
1952	0	0	0.58	10.4	14.2	2.77	28.9	4.62	.23	0	0	0	5.07
1953	0	0	0	3.74	1.48	0	0	1.75	2.56	0	0	0	.79
1954	0	.003	0	0	6.58	1.02	4.29	0	0	0	0	0	.93
1955	0	.003	0	0	0	0	.19	2.32	.40	0	0	0	.25
1956	0	0	0	14.8	12.5	9.17	26.9	4.46	.52	0	0	0	5.65
1957	0	0	0	1.24	5.60	0	0	.139	.033	0	0	0	.55
1958	0	0	0	0	9.27	11.0	9.30	4.87	.25	0	0	0	2.84
1959	0	.21	0	.97	18.8	2.16	.04	2.56	1.75	0	0	0	2.09
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													
1952	0	0	36	641	817	171	720	284	14	0	0	0	3,680
1953	0	0	0	230	82	0	0	108	152	0	0	0	572
1954	0	.2	0	0	354	63	255	0	0	0	0	0	672
1955	0	.2	0	0	0	0	11	143	24	0	0	0	178
1956	0	0	0	912	717	564	1,600	275	3.1	0	0	0	4,100
1957	0	0	0	76	311	0	0	8.5	2.0	0	0	0	398
1958	0	0	0	0	515	675	553	300	15	0	0	0	2,060
1959	0	12	0	60	1,040	133	2.6	158	104	0	0	0	1,510
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								
1952	1246	42	Apr. 9, 1952	0	5.07	3,680	5.02	3,650
1953	1286	41	May 25, 1953	0	.79	572	.79	572
1954	1346, 1396	34	Apr. 6, 1954	0	.93	672	.93	672
1955	1396	6.3	Nov. 8, 1954	0	.25	178	.25	178
1956	1446	43	Apr. 23, 1956	0	5.65	4,100	5.65	4,100
1957	1516	14.0	Feb. 26, 1957	0	.55	398	.55	398
1958	1566	41	Mar. 4, 1958	0	2.84	2,060	2.86	2,070
1959	1636	27	Jan. 31, 1959	0	2.09	1,510	-	-
1960								

4075. Sheep Creek at Springdale, Wash.

Location.--Lat 48°03'30", long 117°45'05", in SW 1/4 sec. 34, T. 30 N., R. 40 E., on right bank 45 ft upstream from railroad trestle on State Highway 3, half a mile west of Springdale, and 4 miles upstream from mouth.

Drainage area.--46.4 sq mi.

Records available.--January 1953 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,980 ft (from topographic map). Prior to Sept. 30, 1958, at site 500 ft upstream at different datum.

Average discharge.--7 years (1953-60), 13.7 cfs (9,920 acre-ft per year).

Extremes.--1953-60: Maximum discharge, 78 cfs Feb. 26, 1958 (gage height, 2.30 ft, site and datum then in use); maximum gage height recorded, 5.22 ft Jan. 30 to Feb. 7, 1956 (backwater from ice), site and datum then in use; minimum discharge, 1.6 cfs Jan. 21, 1955.

Remarks.--Some small diversions for domestic use. Flow partly regulated by dam at outlet of Loon 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	-	-	-	20.0	17.1	12.3	12.7	11.5	16.1	10.5	9.75	9.46	-
1952	-	-	-	9.23	16.2	13.8	17.7	9.92	8.85	7.93	7.83	7.34	-
1953	10.2	10.7	9.01	8.23	16.2	13.8	17.7	9.92	8.85	7.93	7.83	7.34	10.7
1954	7.30	7.59	7.02	6.63	6.96	7.20	11.1	12.1	7.67	6.83	6.56	6.52	7.79
1955	7.25	7.57	13.6	30.5	23.4	29.8	52.8	18.1	14.4	15.6	16.5	16.2	20.5
1956	15.3	13.9	14.2	11.5	14.3	16.6	15.3	13.7	12.8	10.6	10.3	9.34	13.1
1957	8.89	9.33	9.39	9.38	27.1	29.7	25.8	19.0	13.9	12.6	11.4	11.4	15.6
1958	11.7	11.7	10.6	14.1	30.9	17.5	15.5	16.7	13.7	10.7	11.5	11.9	14.6
1959	9.63	11.0	12.3	11.1	32.3	19.4	16.1	12.5	10.9	9.90	10.7	11.0	13.8
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	-	-	-	1,230	952	754	758	707	958	648	599	563	-
1952	-	-	-	567	899	850	1,060	610	527	488	481	437	7,730
1953	626	634	554	407	387	443	661	745	457	420	404	388	5,640
1954	449	451	432	407	387	443	661	745	457	420	404	388	5,640
1955	446	450	836	1,880	1,350	1,830	3,140	1,110	857	961	1,020	964	14,840
1956	938	826	871	707	783	1,020	911	845	761	650	630	556	9,510
1957	547	555	577	577	1,500	1,830	1,530	1,170	828	775	699	678	11,270
1958	719	695	650	866	1,720	1,080	922	1,030	815	656	709	706	10,570
1959	592	655	759	680	1,860	1,190	956	767	651	609	657	656	10,030
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									
1952									
1953	1286	64	June 9 or 10, 1953	-	-	-	12.4	8,980	
1954	1346	49	Apr. 9, 17, 1954	7	10.7	7,730	10.0	7,250	
1955	1396	26	May 19, 1955	5.5	7.79	5,640	8.35	6,040	
1956	1446	72	Mar. 30, 1956	5.8	20.5	14,840	21.7	15,750	
1957	1516	42	Feb. 26, 1957	8.6	13.1	9,510	11.8	8,550	
1958	1566	78	Feb. 26, 1958	8.3	15.6	11,270	16.1	11,650	
1959	1636	46	Jan. 12, 1959	9.8	14.6	10,570	14.5	10,510	
1960	1716	71	Feb. 7, 1960	8.7	13.8	10,030	-	-	

4075.2. Deer Creek near Valley, Wash.

Location.--Lat 48°07'25", long 117°48'05", in SE $\frac{1}{4}$ sec.6, T.30 N., R.40 E., on left bank at downstream side of county road bridge, 2 miles upstream from confluence with Sheep Creek, and 5 miles southwest of Valley.

Drainage area.--36.0 sq mi.

Records available.--July 1959 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 2,060 ft (from topographic map).

Extremes.--1959-60: Maximum discharge, 425 cfs Mar. 29, 1960 (gage height, 2.33 ft); maximum gage height, 3.24 ft Feb. 29, 1960 (backwater from ice); minimum discharge, 5.6 cfs Aug. 18, 1959, Sept. 29, 30, 1960.

Remarks.--No regulation. 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
1959	-	-	-	-	-	-	-	-	-	-	6.54	7.49	-
1960	8.59	9.77	10.8	7.92	13.8	49.0	66.4	50.0	19.8	8.42	7.11	6.31	21.5

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1959	-	-	-	-	-	-	-	-	-	-	402	446	-
1960	528	582	666	487	795	3,010	3,950	3,070	1,180	517	437	375	15,600

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
1959	1636	-	-	-	-	-	-	-	-	-	-
1960	1716	425	Mar. 29, 1960	5.8	21.5	0.597	8.13	15,600	-	-	-

4077. Chewelah Creek at Chewelah, Wash.

Location.--Lat 48°17'00" long 117°43'00", on line between SE $\frac{1}{4}$ sec.11 and SW $\frac{1}{4}$ sec. 12, T.32 N., R.40 E., on left bank downstream from small road bridge to highway north of city park in northern part of Chewelah, 2 miles upstream from mouth.

Drainage area.--94 sq mi, approximately.

Records available.--March 1957 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,660 ft (from topographic map).

Extremes.--1957-60: Maximum discharge, 355 cfs Mar., 30, 1960 (gage height, 3.50 ft); minimum, 4.1 cfs Aug. 23, 1957 (gage height, 1.11 ft).

Remarks.--No regulation. Most of flow in South Fork used for irrigation during summer 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
1957	-	-	-	-	-	-	37.0	85.5	45.9	10.2	6.27	7.13	-
1958	15.2	17.8	18.9	19.3	48.9	64.7	121	96.2	34.3	18.0	6.78	9.56	39.0
1959	13.8	17.5	19.5	25.8	19.9	32.7	78.5	104	72.9	20.3	9.69	17.5	36.0
1960	18.1	20.0	22.5	18.0	22.8	58.8	136	132	72.5	18.5	12.3	15.0	45.4

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957	-	-	-	-	-	-	2,200	5,260	2,730	627	385	424	-
1958	935	1,060	1,160	1,190	2,720	3,980	7,170	5,920	2,040	1,110	417	569	28,270
1959	850	1,040	1,200	1,590	1,110	2,010	4,670	6,390	4,340	1,250	596	1,040	26,090
1960	1,110	1,190	1,390	1,100	1,310	3,610	8,080	6,090	4,310	1,140	756	892	32,980

Yearly 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
1957	1516	191	May 20, 1957	-	-	-	-	-	-	-	-
1958	1566	259	Feb. 25, 1958	5.8	39.0	0.415	5.63	28,270	38.9	5.62	28,210
1959	1636	153	May 26, 1959	6.8	36.0	.383	5.21	26,090	36.8	5.33	26,690
1960	1716	355	Mar. 30, 1960	8.5	45.4	.483	6.58	32,980	-	-	-

4083. Little Pend Oreille River near Colville, Wash.

Location.--Lat 48°27'50", long 117°44'40", in NE $\frac{1}{4}$ sec.10, T.34 N., R.40 E., on right bank 400 ft upstream from abandoned railroad bridge, half a mile downstream from Bear Creek, 6 miles east of Arden, and 9 miles southeast of Colville.

Drainage area.--129 sq mi.

Records available.--December 1957 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 2,010 ft (from topographic map).

Extremes.--1957-60: Maximum discharge, 668 cfs Apr. 7, 1960 (gage height, 3.17 ft); minimum, 7.0 cfs Jan. 6, 1958 (gage height, 0.14 ft).

Remarks.--Minor regulation by fish screens at outlet of Lake Sherry. No 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
1958	-	-	-	23.1	70.6	138	309	156	49.6	25.6	14.8	16.9	-
1959	19.5	25.0	25.0	37.1	25.8	41.7	199	233	113	35.3	19.0	24.3	66.6
1960	26.9	28.4	30.1	23.9	30.1	81.5	349	262	107	38.9	29.1	20.2	85.5

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1958	-	-	-	1,420	3,920	8,490	18,370	9,610	2,950	1,570	912	1,010	-
1959	1,200	1,480	1,540	2,280	1,430	2,570	11,840	14,340	6,730	2,170	1,170	1,450	48,200
1960	1,660	1,690	1,850	1,470	1,730	5,010	20,750	16,130	6,370	2,390	1,790	1,200	62,040

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year		
		Momentary maximum		Minimum day	Mean	Runoff			Runoff		
		Discharge	Date			Per square mile	Inches	Acre-feet	Mean	Inches	Acre-feet
1958	1566	512	Apr. 20, 1958	-	-	-	-	-	72.5	7.41	52,470
1959	1636	329	May 3, 1959	16	66.6	0.516	7.00	48,200	67.9	7.15	49,180
1960	1716	668	Apr. 7, 1960	16.5	85.5	0.663	9.02	62,040	-	-	-

4084.2. Haller Creek near Arden, Wash.

Location.--Lat 48°28'05", long 117°54'30", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.4, T.34 N., R.39 E., on left bank 10 ft downstream from county road bridge, three-quarters of a mile upstream from mouth, and $\frac{1}{2}$ miles northwest of Arden.

Drainage area.--37.0 sq mi.

Records available.--August 1959 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,600 ft (from topographic map). Prior to Sept. 23, 1960, at site 30 ft upstream at datum 1.24 ft higher.

Extremes.--1959-60: Maximum discharge, 148 cfs Mar. 29, 1960 (gage height, 2.65 ft); minimum, 0.5 cfs Aug. 12, 1960.

Remarks.--No regulation. Minor diversions for irrigation and domestic use 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
1959	-	-	-	-	-	-	-	-	-	-	1.53	2.68	-
1960	2.84	3.25	3.48	3.17	3.81	21.7	39.9	28.4	11.2	2.20	1.00	1.45	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
1959	-	-	-	-	-	-	-	-	-	-	94	159	-
1960	174	194	214	195	219	1,330	2,370	1,750	664	135	62	86	7,390

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30							Calendar year		
		Momentary maximum		Minimum day	Mean	Runoff			Runoff		
		Discharge	Date			Per square mile	Inches	Acre-feet	Mean	Inches	Acre-feet
1959	1636	-	-	-	-	-	-	-	-	-	-
1960	1716	148	Mar. 29, 1960	0.6	10.2	0.276	3.75	7,390	-	-	-

4084.5. Mill Creek below Forks, near Colville, Wash.

Location.--Lat 48°36'45", long 117°46'50", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.16, T.36 N., R.40 E., on left bank 200 ft above road crossing, half a mile downstream from North Fork, and $\frac{6}{12}$ miles northeast of Colville.

Drainage area.--67.9 sq mi.

Records available.--March to September 1959.

Gage.--Staff gage. Altitude of gage is 2,160 ft (from topographic map).

Extremes.--March to September 1959: Maximum discharge observed, 215 cfs May 1 (gage height, 16.24 ft); minimum observed, 5.7 cfs Sept. 13 (gage height, 14.40 ft).

Remarks.--No regulation. Several small diversions for domestic use and 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
1959	-	-	-	-	-	-	144	152	82.6	25.2	8.89	9.45	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1959	-	-	-	-	-	-	8,600	9,360	4,920	1,550	546	562	-

4085. Mill Creek near Colville, Wash.

Location--Lat 48°34'45", long 117°52'00", in SW¼ sec.35, T.36 N., R.39 E., on right bank 3 miles northeast of Colville and 5 miles downstream from North Fork.

Drainage area--85.1 sq mi (revised).

Records available--October 1939 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage--Water-stage recorder. Altitude of gage is 1,950 ft (from topographic map). Prior to Mar. 2, 1940, staff gage and Mar. 2, 1940, to Oct. 5, 1959, water-stage recorder (Nov. 2, 1952, to Oct. 5, 1959, used as supplementary gage), at site half a mile upstream at different datum. Nov. 2, 1952, to Oct. 5, 1959, staff gage and crest-stage gage at site 300 ft upstream at datum 0.47 ft higher.

Average discharge--21 years (1939-60), 50.3 cfs (36,420 acre-ft per year).

Extremes--1939-60: Maximum discharge, 609 cfs Apr. 22, 1956 (gage height, 7.16 ft, site and datum then in use); minimum, 3.6 cfs Aug. 28, 31, Sept. 1, 1940, but may have been less during period of no gage-height record Feb. 1-4, 1940.

Remarks--No regulation. Diversions for irrigation of about 50 acres 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	18.1	22.2	44.1	46.5	66.0	66.7	284	174	58.3	24.8	12.3	11.7	68.8
1952	17.3	17.3	23.3	17.6	19.9	30.9	269	166	57.5	28.1	13.8	10.9	55.7
1953	10.1	11.7	11.7	20.5	19.6	27.9	115	184	127	47.0	20.6	14.9	50.9
1954	14.0	14.6	16.2	15.5	17.3	27.9	105	145	70.3	31.9	16.2	14.0	40.7
1955	12.3	17.0	13.4	13.1	12.7	12.9	76.9	210	91.2	50.2	21.5	12.5	45.5
1956	16.3	14.7	20.4	24.5	18.8	33.0	320	192	59.8	26.1	14.5	10.9	62.4
1957	12.1	12.1	11.9	10.0	11.9	20.9	66.8	181	83.7	28.9	15.0	9.30	38.8
1958	14.0	15.1	14.8	17.5	80.4	119	260	161	51.5	22.6	10.1	11.2	64.4
1959	13.8	14.4	13.9	23.4	13.8	24.9	151	168	102	35.7	16.5	17.5	49.6
1960	19.2	21.1	20.3	17.5	22.2	85.2	237	201	99.7	31.7	16.5	14.3	65.4

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,110	1,320	2,710	2,860	3,670	4,100	16,870	10,700	3,470	1,520	759	694	49,780
1952	1,070	1,030	1,430	1,080	1,140	1,900	15,980	10,180	3,420	1,730	850	647	40,460
1953	621	693	717	1,260	1,090	1,710	6,870	11,310	7,540	2,890	1,270	885	36,860
1954	858	869	997	951	962	1,710	6,230	8,930	4,180	1,960	995	834	29,480
1955	758	1,010	825	804	703	794	4,570	12,900	5,430	3,080	1,320	745	32,940
1956	1,000	873	1,250	1,510	1,080	2,030	19,040	11,800	3,560	1,610	894	649	45,300
1957	744	719	734	615	661	1,280	3,970	11,110	4,980	1,780	919	554	28,070
1958	859	900	909	1,080	4,460	7,300	15,460	9,920	3,060	1,390	619	666	46,620
1959	850	857	856	1,440	769	1,530	8,980	10,310	6,090	2,190	1,020	1,040	35,930
1960	1,180	1,250	1,250	1,080	1,280	5,240	14,080	12,380	5,930	1,950	1,010	851	47,480

Yearly 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										
1950	-	-	-	-	-	-	-	-	-	-	-	8.75	38,300
1951	1216	413	Apr. 14, 1951	9.3	68.8	0.839	11.38	49,780	66.5	11.02	48,170		
1952	1246	538	Apr. 19, 1952	9.0	55.7	.679	9.25	40,460	53.7	8.90	38,960		
1953	1286	570	Apr. 29, 1953	8.6	50.9	.621	8.42	36,860	51.9	8.59	37,550		
1954	1348	*301	May 12, 1954	12	40.7	.496	6.76	29,480	40.5	6.72	29,340		
1955	1398	272	May 13, 1955	10	45.5	.555	7.53	32,940	46.2	7.66	33,470		
1956	1448	609	Apr. 22, 1956	9.6	62.4	.761	10.36	45,300	61.1	10.14	44,370		
1957	1518	526	May 20, 1957	8.1	35.8	.473	6.42	28,070	39.4	6.54	28,540		
1958	1568	460	Feb. 25, 1958	7.6	64.4	.785	10.67	46,620	64.3	10.62	46,520		
1959	1636	227	May 1, 1959	8.5	49.6	.583	7.92	35,930	51.2	8.16	37,050		
1960	1716	433	Mar. 30, 1960	12	65.4	.769	10.46	47,480	-	-	-		

* Revised.

4087. Mill Creek at mouth, near Colville, Wash.

Location.--Lat 48°34'25", long 117°56'40", in NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 31, T.36 N., R.39 E., on left bank at upstream side of bridge on U. S. Highway 395, 2 miles northwest of Colville.

Drainage area.--146 sq mi.

Records available.--July 1959 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,540 ft (from topographic map).

Extremes.--1959-60: Maximum discharge, 542 cfs Apr. 6, 1960 (gage height, 3.14 ft); minimum, 16.5 cfs Sept. 14, 1959.

Remarks.--No regulation. Many 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
1959	-	-	-	-	-	-	-	-	-	46.8	21.7	23.4	-
1960	25.4	28.0	28.4	28.4	37.7	114	327	267	132	41.6	24.1	24.9	89.8

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1959	-	-	-	-	-	-	-	-	-	2,880	1,330	1,390	-
1960	1,560	1,670	1,750	1,750	2,170	7,020	19,490	16,400	7,880	2,560	1,480	1,480	65,210

Yearly 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
1959	1636	-	-	-	-	-	-	-	-	-	-
1960	1716	542	Apr. 6, 1960	17	89.8	0.615	8.36	65,210	-	-	-

4090. Colville River at Kettle Falls, Wash.

Location.--Lat 48°35'40", long 118°03'30", in sec.29, T.36 N., R.38 E., on right bank 600 ft downstream from Washington Water Power Co.'s plant (revised) at foot of Meyers Falls, half a mile south of town of Kettle Falls, and 2 miles upstream from Franklin D. Roosevelt Lake.

Drainage area.--1,007 sq mi (revised).

Records available.--October 1922 to September 1960. Published as "at Meyers Falls" 1922-38.

Gage.--Water-stage recorder. Altitude of gage is 1,500 ft (from topographic map). Prior to Oct. 21, 1932, staff gage at site 500 ft upstream at different datum. Oct. 21, 1932, to Sept. 19, 1938, staff gages at site 200 ft upstream at different datum. Sept. 20, 1938, to Mar. 20, 1949, staff gage at present site and datum.

Average discharge.--38 years (1922-60), 297 cfs (215,000 acre-ft per year).

Extremes.--1922-60: Maximum discharge, 3,230 cfs Apr. 23, 1956 (gage height, 10.17 ft); minimum observed, 0.5 cfs Aug. 15, 1930.

Remarks.--Several ditches above station divert water for irrigation. Prior to Apr. 30, 1960, slight regulation for power by small reservoir above falls.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	167	233	385	455	727	823	1,801	1,098	368	184	113	129	538
1952	192	201	266	259	405	642	1,878	1,083	398	232	133	128	483
1953	137	157	194	338	328	348	581	904	589	208	114	113	354
1954	126	149	184	163	319	420	653	648	365	175	95.1	128	286
1955	127	156	144	151	149	163	554	867	420	272	121	96.5	271
1956	137	140	205	341	269	725	2,128	1,137	360	199	136	132	493
1957	147	149	161	141	202	395	477	787	447	159	98.3	88.6	271
1958	137	152	178	223	608	895	1,421	849	321	168	85.1	99.5	426
1959	126	158	180	392	296	540	1,006	947	580	197	110	154	390
1960	183	205	218	199	338	590	1,459	1,074	553	189	136	134	439

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	9,660	13,870	23,650	27,950	40,350	50,620	107,200	67,530	23,110	11,280	6,950	7,680	389,800
1952	11,780	11,940	16,360	15,950	23,280	39,470	111,800	66,610	23,660	14,250	8,150	7,620	350,900
1953	8,460	9,370	11,920	20,800	18,210	21,420	34,570	55,580	35,020	12,800	6,980	6,720	241,800
1954	7,760	8,890	11,320	10,020	17,710	25,830	38,860	39,850	22,900	10,760	5,850	7,590	207,300
1955	7,830	9,290	8,850	9,290	8,270	11,250	32,950	53,290	24,980	16,730	7,430	5,740	195,900
1956	8,440	8,350	12,630	20,990	15,480	44,560	126,600	69,920	22,630	12,250	8,360	7,830	358,000
1957	9,020	8,890	9,920	8,660	11,200	24,270	28,380	48,370	26,600	9,760	6,050	5,270	196,400
1958	8,430	9,030	10,930	13,720	33,780	55,050	84,560	52,200	19,120	10,320	5,230	5,920	308,300
1959	7,750	9,420	11,080	24,090	16,420	33,220	59,870	58,240	34,490	12,120	6,730	9,140	282,600
1960	11,230	12,190	13,400	12,250	19,420	36,270	86,840	66,010	32,890	11,640	8,350	7,950	318,400

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	1216	2,240	Apr. 14, 1951	75	538	389,800	390	282,100	
1952	1246	2,550	Apr. 21, 1952	110	483	350,900	329	362,800	
1953	1286	1,660	Apr. 30, 1953	95	334	241,800	332	340,500	
1954	1346	1,050	May 13, 1954	58	286	207,300	284	240,100	
1955	1396	990	May 22, 1955	78	271	195,900	275	205,300	
1956	1446	3,230	Apr. 23, 1956	81	493	358,000	491	199,400	
1957	1516	1,590	May 21, 1957	78	271	196,400	272	197,000	
1958	1566	1,750	Mar. 2, 1958	66	426	308,300	426	308,200	
1959	1636	1,120	Apr. 15, 1959	75	390	282,600	402	291,100	
1960	1716	2,300	Apr. 28, 1960	112	439	318,400	-	-	

4107. Harvey Creek near Cedonia, Wash.

Location.--Lat 48°10'25", long 118°06'55", in SW¹/₄NE¹/₄ sec.23, T.31 N., R.37 E., on right bank on downstream side of farm bridge, 400 ft downstream from confluence of North and South Forks, 3 miles northeast of Cedonia, and 3½ miles upstream from mouth.

Drainage area.--29.9 sq mi.

Records available.--July to October 1958.

Gage.--Staff gage. Altitude of gage is 2,100 ft (from topographic map).

Extremes.--July to October 1958: Maximum discharge observed, 5.2 cfs Oct. 19 (gage height, 0.74 ft); minimum observed, 0.5 cfs Aug. 17 (gage height, 0.36 ft).

Remarks.--No known regulation. A substantial percentage of the flow is diverted for irrigation above station during summer 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
1958	-	-	-	-	-	-	-	-	-	-	1.05	1.15	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1958	-	-	-	-	-	-	-	-	-	-	65	69	-

4110. Coeur d'Alene River above Shoshone Creek, near Prichard, Idaho

Location.--Lat 47°42', long 115°59', in NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 5, T.50 N., R.4 E., on left bank at Shoshone Creek ranger station, 0.2 mile downstream from Uranus Creek, 0.4 mile upstream from Shoshone Creek, and 3 $\frac{1}{2}$ miles north of Prichard.

Drainage area.--335 sq mi.

Records available.--December 1950 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 2,485 ft (from river-profile map).

Average discharge.--9 years (1951-60), 780 cfs (564,700 acre-ft per year).

Extremes.--1950-60: Maximum discharge, 9,610 cfs Feb. 11, 1951 (gage height, 7.17 ft), from rating curve extended above 5,500 cfs by logarithmic plotting; maximum gage height, 9.09 ft Feb. 26, 1957 (backwater from ice); minimum discharge, 34 cfs Dec. 26, 1952.

Remarks.--No regulation or diversion 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	*350	*650	1,613	624	1,646	512	2,368	2,005	431	186	106	92.5	* 876
1952	386	511	679	211	319	265	3,300	2,167	460	223	112	92.2	725
1953	77.4	76.8	75	857	1,169	545	2,044	2,246	783	205	120	97.2	687
1954	90.8	158	401	310	598	857	2,804	3,589	961	292	156	135	861
1955	139	348	220	148	282	188	1,209	3,194	1,247	344	140	116	633
1956	356	863	1,625	685	292	660	3,711	3,204	668	254	136	104	1,046
1957	147	146	549	175	417	924	2,393	3,339	526	176	114	88.3	752
1958	111	110	158	201	840	841	2,451	2,087	332	156	91.0	89.4	619
1959	105	784	662	1,093	439	481	2,827	2,601	926	224	125	146	868
1960	265	751	641	370	487	1,221	2,691	2,355	789	201	131	101	833

* Not previously published; estimated on basis of records for stations near Prichard and at Rnaville.

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	*21,520	*38,680	99,170	38,340	91,420	31,480	140,900	123,300	25,620	11,430	6,530	5,500	*633,900
1952	23,730	30,410	41,760	12,970	18,370	16,300	195,300	133,200	27,350	13,710	6,890	5,480	526,300
1953	4,160	4,570	4,610	52,670	64,940	33,480	121,600	138,100	46,600	12,630	7,390	5,790	497,100
1954	5,590	8,220	24,650	19,030	33,190	52,680	166,900	220,700	57,180	17,960	9,570	8,010	623,700
1955	8,520	20,700	13,540	9,120	15,660	11,570	71,940	196,400	74,200	21,120	8,640	6,900	458,300
1956	21,880	51,350	99,920	42,150	16,800	40,550	220,800	197,000	39,750	14,360	8,350	6,210	759,100
1957	9,050	8,710	33,760	10,760	23,160	56,810	142,400	205,300	31,510	10,840	7,020	5,250	544,400
1958	6,840	6,550	9,730	12,370	46,670	51,700	145,800	128,300	19,780	9,600	5,600	5,320	448,300
1959	6,470	46,680	40,680	67,230	24,390	29,550	168,200	159,900	55,080	13,760	7,660	8,720	628,300
1960	16,320	44,710	39,390	22,730	28,020	75,050	160,100	144,800	46,930	12,330	8,030	6,000	604,400

* 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		Mean	Runoff	
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1950											
1951	1216	9,610	Feb. 11, 1951	-	*876	*2.61	*35.48	*633,900	788	31.94	570,400
1952	1246	7,470	Apr. 26, 1952	75	725	2.16	29.49	526,500	612	24.91	444,500
1953	1286	6,900	Feb. 1, 1953	43	687	2.05	27.83	497,100	721	29.19	521,700
1954	1346	6,560	Apr. 18, 1954	81	861	2.57	34.92	623,700	867	35.17	628,000
1955	1396	5,800	May 21, 1955	90	633	1.89	25.66	458,300	813	32.94	588,700
1956	1446	7,110	Apr. 22, 1956	92	1,046	3.12	42.47	759,100	878	35.68	637,500
1957	1516	6,300	May 1, 1957	81	752	2.24	30.47	544,400	713	28.87	516,000
1958	1566	6,220	Apr. 18, 1958	74	619	1.85	25.08	448,300	717	29.04	519,000
1959	1636	5,570	Apr. 30, 1959	68	868	2.59	35.17	628,300	877	35.53	634,900
1960	1716	5,890	Apr. 9, 1960	85	833	2.49	33.82	604,400	-	-	-

* Not previously published.

4120. Coeur d'Alene River near Prichard, Idaho

Location.--Lat 47°38'05", long 115°58'55", in lot 7, sec.32, T.50 N., R.4 E., on right bank 0.2 mile downstream from Beaver Creek and 1½ miles southwest of Prichard.

Drainage area.--583 sq mi.

Records available.--August 1944 to September 1953.

Gage.--Staff gage. Altitude of gage is 2,360 ft (from river-profile map).

Average discharge.--9 years (1944-53), 1,400 cfs (1,014,000 acre-ft per year).

Extremes.--1944-53: Maximum discharge determined, 16,400 cfs Feb. 11, 1951 (gage height, 10.95 ft, from graph based on gage readings), but may have been higher Dec. 15, 1946; minimum daily, 80 cfs Nov. 29, 30, 1952; minimum gage height observed, 1.00 ft Sept. 13, 1944.

Remarks.--No regulation or diversion 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	570	1,049	2,498	1,122	2,946	877	3,854	3,466	929	355	200	178	1,475
1952	638	834	1,057	335	570	593	5,314	3,454	893	442	213	164	1,206
1953	131	124	135	1,403	1,963	1,011	3,224	3,759	1,649	429	230	168	1,178

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	35,040	62,420	53,600	68,970	163,600	53,940	217,400	213,100	55,280	21,850	12,300	10,610	1,068,000
1952	39,220	49,630	64,990	20,620	32,810	36,470	316,200	212,400	63,150	27,200	13,110	9,760	875,600
1953	8,080	7,380	8,300	86,280	109,000	62,170	191,900	231,100	98,140	26,400	14,130	9,970	852,800

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	-	-	-	-	-	-	-	-	1,993	46.41	1,443,000
1951	1216	16,400	Feb. 11, 1951	146	1,475	2.53	34.35	1,068,000	1,341	31.22	970,900
1952	1246	11,800	Apr. 26, 1952	138	1,206	2.07	28.15	875,600	1,027	23.97	745,500
1953	1286	11,200	Feb. 1, 1953	80	1,178	2.02	27.43	852,800	-	-	-

4130. Coeur d'Alene River at Enaville, Idaho

Location.--Lat 47°34'20", long 116°15'10", in NW $\frac{1}{4}$ sec.30, T.49 N., R.2 E., on right bank 800 ft upstream from highway bridge, a quarter of a mile northwest of Enaville Post Office, 1.1 miles upstream from South Fork, and 3.5 miles downstream from North Fork.

Drainage area.--895 sq mi.

Records available.--March 1911 to April 1913 (fragmentary), October 1939 to September 1960. Published as North Fork of Coeur d'Alene River at Enaville 1911-13.

Gage.--Water-stage recorder. Datum of gage is 2,100.00 ft above mean sea level. Mar. 3, 1911, to Apr. 12, 1913, staff gage at site a quarter of a mile downstream at different datum. Oct. 18 to Dec. 22, 1939, staff gage at present site and datum.

Average discharge.--21 years (1939-60), 1,967 cfs (1,424,000 acre-ft per year).

Extremes.--1911-13, 1939-60: Maximum discharge, 28,100 cfs Dec. 15, 1946, from rating curve extended above 13,000 cfs by logarithmic plotting; maximum gage height, 74.93 ft Feb. 11, 1951; minimum discharge, 104 cfs Dec. 26, 1952 (gage height, 60.10 ft). Flood in December 1933 reached a stage of 79.47 and that in April 1938 a stage of 78.16 ft, from information by local residents.

Remarks.--No appreciable regulation or diversion above station.

Revisions.--A period for the water year 1945 was revised in WSP 1396; the resulting revised records summarized herewith supersede those published in WSP 1316.

Month	Mean	Per square mile	Inches	Acre-feet
January 1945.....	1,465	-	-	90,080
Water year 1944-45..	1,521	1.70	23.08	1,101,000
Calendar year 1945..	1,740	-	26.41	1,259,000

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	802	1,518	3,723	1,775	5,014	1,412	5,780	4,785	1,288	520	296	273	2,243
1952	1,210	1,593	1,947	581	1,053	1,035	8,439	5,174	1,288	604	321	258	1,954
1953	205	197	211	2,657	3,746	1,747	4,802	5,246	2,254	835	333	248	1,842
1954	232	395	1,361	1,249	2,203	2,621	6,732	8,289	2,720	914	433	585	2,292
1955	411	916	674	511	1,020	573	3,571	7,617	3,447	1,116	426	333	1,720
1956	937	2,281	4,170	2,050	976	1,984	9,651	7,934	1,998	805	416	281	2,792
1957	400	399	1,730	580	1,127	2,757	6,391	8,900	1,655	556	323	242	2,095
1958	294	349	556	724	3,064	2,306	5,887	4,996	1,012	459	249	252	1,666
1959	333	2,333	2,333	3,659	1,352	1,572	6,974	6,575	2,854	676	367	421	2,456
1960	681	2,828	2,014	833	1,624	3,336	6,824	5,556	2,260	581	382	289	2,279

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	49,310	90,200	28,900	109,100	278,500	86,830	344,000	294,200	76,660	31,950	18,180	16,240	1,624,000
1952	74,380	94,790	119,700	35,690	60,890	63,610	502,200	318,100	76,640	37,160	19,710	15,350	1,418,000
1953	12,580	11,740	12,960	164,000	208,100	107,400	285,700	322,700	134,100	39,070	20,460	14,520	1,333,000
1954	14,280	23,500	83,680	76,820	122,300	161,200	400,600	509,700	161,800	56,220	26,650	22,910	1,660,000
1955	25,240	54,480	41,460	31,400	56,670	35,230	200,600	480,200	205,100	68,590	26,220	19,800	1,245,000
1956	57,620	135,700	256,400	126,000	56,160	122,000	574,300	487,900	118,900	49,500	25,590	16,700	2,027,000
1957	24,590	23,740	106,400	35,690	62,590	169,500	380,500	547,200	98,480	34,210	19,860	14,410	1,517,000
1958	18,100	20,750	34,210	44,540	70,200	141,800	350,300	307,200	60,220	28,200	15,330	14,980	1,206,000
1959	20,480	139,000	143,400	225,000	75,080	96,670	415,000	404,500	169,800	41,560	22,550	25,040	1,778,000
1960	54,150	168,200	123,800	51,250	93,440	205,100	406,100	541,700	134,500	35,750	23,460	17,170	1,655,000

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	-	-	-	-	-	-	-	-	3,064	46.47	2,218,000	
1951	1216	27,400	Feb. 11, 1951	243	2,243	2.51	34.05	1,624,000	2,133	32.37	1,544,000	
1952	1246	18,400	Apr. 26, 1952	222	1,954	2.18	29.72	1,418,000	1,607	24.44	1,187,000	
1953	1286	20,100	Feb. 1, 1953	119	1,842	2.06	27.94	1,333,000	1,958	29.70	1,418,000	
1954	1346	14,300	May 10, 1954	217	2,292	2.56	34.77	1,680,000	2,292	34.77	1,659,000	
1955	1396	14,600	May 21 1955	240	1,720	1.92	26.10	1,245,000	2,174	32.98	1,574,000	
1956	1446	19,100	Apr. 22, 1956	250	2,792	3.12	42.47	2,027,000	2,385	36.30	1,732,000	
1957	1516	17,300	May 21, 1957	225	2,095	2.34	31.79	1,517,000	1,983	30.07	1,435,000	
1958	1566	14,500	Apr. 18, 1958	164	1,666	1.86	25.25	1,206,000	1,983	30.07	1,436,000	
1959	1636	14,000	Apr. 30, 1959	218	2,456	2.69	37.24	1,778,000	2,515	38.13	1,821,000	
1960	1716	13,600	Mar. 30, 1960	243	2,279	2.55	34.66	1,655,000	-	-	-	

4135. Coeur d'Alene River near Cataldo, Idaho

Location.--Lat 47°34', long 116°18', in sec.26, T.49 N., R.1 E., on left bank 1½ miles upstream from Cataldo and 3 miles downstream from South Fork.

Drainage area.--1,220 sq mi, approximately.

Records available.--April 1911 to December 1912, July 1920 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 2,100 ft above mean sea level. Datum of 1929, supplementary adjustment of 1947, is 2.84 ft higher. Apr. 25, 1911, to Dec. 31, 1912, staff gage at site 300 ft downstream at different datum. July 29, 1920, to Oct. 10, 1925, staff gage at present site and datum.

Average discharge.--41 years (1911-12, 1920-60), 2,522 cfs (1,826,000 acre-ft per year).

Extremes.--1911-12, 1920-60: Maximum discharge, 67,000 cfs (revised) Dec. 22 or 23, 1933 (gage height, 56.9 ft, from floodmark), from rating curve extended above 24,000 cfs by logarithmic plotting; minimum, 122 cfs Dec. 4, 1929; minimum gage height, 37.03 ft Sept. 6, 1931.

Remarks.--No appreciable regulation or diversion above station. Records of chemical analyses and water temperatures for the period October 1952 to September 1958 are published in reports of Geological Survey.

Revisions.--Revised records for the water years 1934, 1938, and 1945, superseding those published in WSP 1316, are given herewith. Revised daily discharges for April 1938 are available and will be published in a future water-supply paper.

Month	Mean	Per square mile	Inches	Acre-feet	Momentary maximum	
					Discharge	Date
Water year 1933-34.....	-	-	-	-	67,000	Dec. 22 or 23, 1933
April 1938.....	10,750	-	-	638,700	-	-
Water year 1937-38.....	2,672	2.19	29.72	1,934,000	-	-
Calendar year 1938.....	2,429	-	27.03	1,759,000	55,600	Apr. 18, 19, 1938
January 1945.....	1,996	-	-	122,700	-	-
Water year 1944-45.....	2,003	1.64	22.31	1,450,000	-	-
Calendar year 1945.....	2,297	-	25.58	1,663,000	-	-

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	1,055	2,087	4,677	2,582	6,652	2,306	7,297	6,569	2,196	886	460	382	3,068
1952	1,448	1,916	2,440	863	1,707	1,520	10,360	6,905	2,017	952	471	388	2,575
1953	320	310	341	3,386	4,595	2,185	5,846	7,017	3,483	1,023	504	360	2,414
1954	337	518	1,840	1,721	3,166	3,402	8,241	10,870	3,896	1,416	735	603	3,058
1955	658	1,441	955	719	1,374	810	4,193	9,704	4,721	1,562	664	521	2,279
1956	1,278	3,006	5,559	2,731	1,228	2,752	12,430	10,560	3,034	1,126	606	429	3,731
1957	639	639	2,406	832	1,545	3,666	8,142	11,940	2,400	925	552	406	2,851
1958	436	588	1,015	1,268	4,131	2,770	7,026	6,920	1,545	669	379	360	2,242
1959	435	2,759	2,876	4,632	1,916	2,178	8,430	8,443	4,231	1,127	554	609	3,184
1960	1,294	3,362	2,381	1,177	2,190	4,254	8,441	6,878	3,367	935	536	404	2,928

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	64,900	124,200	287,600	158,700	569,400	141,800	434,200	403,900	130,700	54,510	28,260	22,740	2,221,000
1952	88,880	114,000	150,000	53,060	98,210	93,460	16,300	424,600	20,000	58,520	28,960	23,060	1,869,000
1953	19,670	18,440	20,970	208,240	414,100	134,200	347,800	431,500	207,900	62,880	30,970	21,420	1,748,000
1954	20,710	30,820	113,100	105,800	175,900	209,200	490,400	668,200	231,800	87,090	45,200	35,870	2,214,000
1955	40,440	85,770	58,750	44,220	76,290	49,810	249,500	596,700	280,900	96,060	40,820	31,010	1,650,000
1956	78,600	178,900	341,800	167,900	70,660	189,200	739,900	649,100	180,600	69,260	37,250	25,500	2,709,000
1957	39,310	38,050	148,000	51,150	85,810	225,400	484,500	734,200	142,800	56,870	33,950	24,180	2,064,000
1958	26,780	34,980	62,410	77,950	229,400	70,300	418,100	425,500	91,930	41,130	23,310	21,400	1,623,000
1959	26,740	164,200	76,800	284,800	106,400	133,800	501,600	519,100	102,510	69,330	34,070	36,240	2,305,000
1960	79,540	200,100	146,400	72,390	126,000	261,600	502,300	422,900	200,400	57,460	32,950	24,020	2,126,000

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		Mean	Runoff	
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet		Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	-	-	-	4,097	45.60	2,966,000
1951	1218	34,800	Feb. 11, 1951	316	3,068	2.51	34.14	2,221,000	2,697	32.24	2,097,000	2,697	32.24	2,097,000
1952	1246	21,100	Apr. 27, 1952	343	2,575	2.11	28.74	1,869,000	2,170	24.21	1,575,000	2,170	24.21	1,575,000
1953	1286	20,900	Feb. 1, 1953	187	2,414	1.98	26.86	1,748,000	2,560	28.49	1,854,000	2,560	28.49	1,854,000
1954	1346	18,300	May 10, 1954	312	3,058	2.51	34.03	2,214,000	3,086	34.34	2,334,000	3,086	34.34	2,334,000
1955	1396	18,100	May 21, 1955	395	2,279	1.87	25.37	1,650,000	2,852	31.74	2,065,000	2,852	31.74	2,065,000
1956	1446	24,200	Dec. 23, 1955	376	3,731	3.06	41.62	2,709,000	3,216	35.86	2,335,000	3,216	35.86	2,335,000
1957	1516	23,200	May 21, 1957	343	2,851	2.34	31.70	2,064,000	2,712	30.16	1,963,000	2,712	30.16	1,963,000
1958	1566	17,000	Apr. 18, 1958	301	2,242	1.84	24.96	1,623,000	2,579	28.70	1,867,000	2,579	28.70	1,867,000
1959	1636	17,500	May 1, 1959	331	3,184	2.61	35.44	2,305,000	3,264	36.33	2,363,000	3,264	36.33	2,363,000
1960	1716	16,300	Apr. 9, 1960	356	2,928	2.40	32.67	2,126,000	-	-	-	-	-	-

4145. St. Joe River at Calder, Idaho

Location.--Lat 47°16', long 116°11', in sec.3, T.45 N., R.2 E., on right bank 150 ft southwest of Chicago, Milwaukee, St. Paul and Pacific Railroad station at Calder.

Drainage area.--1,030 sq mi, approximately.

Records available.--April 1911 to September 1912 (published as "near Calder"), July 1920 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 2,096.76 ft above mean sea level, datum of 1929, supplementary adjustment of 1947, or 2,100 ft above mean sea level, datum of Geological Survey as given in Bulletin 567. Apr. 14, 1911, to Sept. 30, 1912, staff gage at site $2\frac{1}{2}$ miles downstream at different datum. July 13 to Dec. 21, 1920, staff gage at present site and datum.

Average discharge.--41 years (1911-12, 1920-60), 2,342 cfs (1,691,000 acre-ft per year).

Extremes.--1911-12, 1920-60: Maximum discharge, 53,000 cfs Dec. 23, 1933, computed on basis of slope between gages downstream; maximum gage height, 93.1 ft Apr. 18, 1938, from floodmark; minimum discharge, 91 cfs Nov. 27, 1952; minimum gage height, 78.43 ft Dec. 5, 1928.

Remarks.--No regulation or diversion 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	889	1,761	2,822	1,756	3,826	1,766	6,491	7,656	3,610	1,377	587	442	2,736
1952	919	881	1,090	805	889	871	6,991	8,040	3,213	1,378	612	420	2,158
1953	312	259	288	1,393	1,853	1,283	4,200	7,293	5,927	1,587	599	433	2,115
1954	327	491	702	661	1,511	1,837	5,641	11,650	6,074	2,214	810	617	2,715
1955	687	1,042	951	720	758	646	2,530	8,550	7,467	2,663	819	535	2,286
1956	919	1,901	3,545	1,919	1,006	1,769	9,413	13,170	5,457	1,530	714	480	3,490
1957	513	611	1,078	484	875	2,274	5,351	12,200	4,143	1,182	579	375	2,484
1958	451	387	455	447	1,631	1,414	4,768	9,760	2,885	942	485	427	2,004
1959	512	2,202	2,754	3,049	1,504	1,713	6,527	8,823	7,119	1,866	684	734	3,109
1960	1,572	2,845	1,690	1,055	1,310	2,547	6,100	7,080	4,947	1,284	604	432	2,619

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	54,670	104,800	173,500	108,000	212,500	108,600	386,300	470,700	214,800	84,660	36,120	26,280	1,981,000
1952	56,480	52,430	67,040	37,170	51,150	53,540	416,000	494,400	191,200	84,700	37,660	24,960	1,567,000
1953	19,160	15,420	17,730	85,620	102,900	78,890	249,900	448,400	352,700	97,560	36,820	25,790	1,531,000
1954	20,080	29,210	43,160	40,630	83,940	113,000	335,700	716,000	361,400	136,100	49,800	36,740	1,968,000
1955	42,230	61,990	58,490	44,290	42,090	39,700	150,500	525,700	444,300	163,700	50,580	31,840	1,655,000
1956	56,500	113,100	218,000	118,000	57,880	108,800	560,100	809,700	324,700	94,070	43,880	28,590	2,533,000
1957	31,570	36,340	66,270	29,770	48,610	39,800	318,400	750,300	246,500	72,680	35,630	22,190	1,798,000
1958	26,520	23,030	27,980	27,510	90,580	86,950	283,700	600,100	100,710	70,590	29,810	25,400	1,451,000
1959	31,460	131,000	169,300	187,500	83,520	105,300	388,400	542,500	423,600	102,400	42,080	43,670	2,251,000
1960	96,650	169,300	103,900	64,880	75,350	156,600	363,000	435,300	294,400	78,940	37,120	25,690	1,901,000

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	Inches	Acre-feet	Mean	Runoff	
		Discharge	Date								Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	-	3,603	47.49	2,608,000
1951	1216	17,200	Feb. 11, 1951	380	2,736	2.66	36.08	1,981,000	2,519	33.21	1,824,000	
1952	1246	16,200	Apr. 27, 1952	346	2,158	2.10	28.51	1,567,000	1,988	26.26	1,443,000	
1953	1286	13,600	Apr. 28, 1953	100	2,115	2.05	27.87	1,531,000	2,170	28.61	1,571,000	
1954	1346	20,400	May 19, 1954	302	2,715	2.64	35.80	1,966,000	2,812	37.07	2,036,000	
1955	1396	18,200	May 21, 1955	390	2,286	2.22	30.14	1,655,000	2,597	34.24	1,880,000	
1956	1446	20,600	May 21, 1956	398	3,490	3.39	46.12	2,533,000	3,140	41.50	2,280,000	
1957	1516	16,700	May 20, 1957	230	2,484	2.41	32.73	1,798,000	2,405	31.70	1,741,000	
1958	1566	14,000	May 12, 1958	240	2,004	1.95	26.40	1,451,000	2,356	31.03	1,705,000	
1959	1636	15,200	May 1, 1959	351	3,109	3.02	40.97	2,251,000	3,162	41.66	2,289,000	
1960	1716	13,500	Apr. 9, 1960	381	2,619	2.54	34.61	1,901,000	-	-	-	

4150. St. Maries River at Lotus, Idaho

Location.--Lat 47°14'40", long 116°37'30", in sec.17, T.45 N., R.2 W., on left bank 1 mile northwest of Lotus, 1 mile downstream from Carlton Creek, and 5½ miles southwest of St. Maries.

Drainage area.--437 sq mi; at site prior to Oct. 1, 1945, 431 sq mi.

Records available.--July, August, October to December 1911, January 1912 (gage heights only), February to October 1912, July 1920 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 2,140.19 ft above mean sea level, referenced to bench mark "U.S.G.S. 2155 1911 35" (Geological Survey Bull. 567, p.45). Datum of 1929, supplementary adjustment of 1947, is 3.17 ft higher. Prior to Oct. 1, 1945, staff gages at sites 0.8 to 1.3 miles upstream at different datums. Oct. 1, 1945, to Feb. 21, 1949 (corrected) staff gage at present site and datum.

Average discharge.--40 years (1920-60), 520 cfs (376,500 acre-ft per year).

Extremes.--1911-12, 1920-60: Maximum discharge observed, 23,800 cfs Dec. 22, 23, 1933, from rating curve extended above 4,000 cfs by logarithmic plotting; maximum gage height, 13.4 ft probably Feb. 9, 1951, from floodmark (ice jam); minimum discharge, 11 cfs Nov. 23, 1952 (gage height, 0.98 ft).

Remarks.--No regulation or diversion above station. All computations in WSP 1316 were made using applicable drainage area.

Correction.--In WSP 1316, the monthly runoff in acre-feet for August 1944 is listed in error; it should be 2,390 acre-ft. The following records were omitted from WSP 1316:

Month	Mean	Acre-feet
August 1920.....	66.4	4,080
September.....	111	6,600

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	163	328	713	532	1,430	617	1,497	753	286	115	61.4	59.0	539
1952	190	227	308	179	481	605	2,560	1,000	339	169	72.1	57.1	513
1953	48.0	45.8	85.5	964	1,019	707	979	1,108	592	141	73.9	55.8	479
1954	58.3	109	378	457	1,233	918	1,977	1,063	469	174	107	92.3	580
1955	89.5	165	112	126	198	284	1,411	1,567	588	280	89.1	80.7	416
1956	203	504	1,400	751	418	1,057	3,061	1,728	468	160	93.0	74.4	826
1957	119	119	318	83.7	357	1,199	2,018	2,212	416	118	70.5	51.8	591
1958	85.0	118	243	346	1,572	646	1,762	965	260	117	60.8	70.7	511
1959	88.1	421	679	1,758	461	1,010	1,665	1,443	500	137	77.8	135	674
1960	232	582	305	239	858	1,383	1,682	890	345	110	79.1	61.1	561

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	10,040	19,500	43,850	32,720	79,440	37,960	89,090	46,280	17,030	7,070	3,780	3,510	390,300
1952	11,670	13,500	18,940	11,010	27,690	37,220	152,300	61,490	20,150	10,410	4,430	3,400	372,200
1953	2,950	2,730	3,910	59,280	56,570	43,480	58,230	68,150	34,630	8,670	4,540	3,320	346,500
1954	3,580	6,460	23,230	28,090	68,490	56,440	117,600	65,370	27,940	10,670	6,570	5,490	419,900
1955	5,500	9,820	6,910	7,770	11,010	17,430	85,960	96,360	34,990	17,230	5,480	4,800	301,500
1956	12,470	30,010	86,090	46,180	24,020	65,000	182,100	106,200	27,850	9,860	5,720	4,430	599,900
1957	7,320	7,070	19,550	5,150	19,820	73,700	120,100	136,000	24,730	7,270	4,340	3,080	428,100
1958	5,230	7,040	14,910	21,270	87,280	39,720	104,800	59,330	15,450	7,190	3,740	4,210	370,200
1959	5,410	25,060	41,730	08,100	25,610	62,080	99,050	70,280	29,770	8,400	4,780	8,060	488,300
1960	14,240	34,630	18,730	14,710	49,330	85,060	100,100	54,700	20,520	6,790	4,860	3,640	407,300

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	-	-	-	-	-	-	-	-	864	26.84	625,500
1951	1216	10,300	Feb. 11, 1951	47	539	1.23	16.74	390,300	499	15.48	361,000
1952	1246	4,680	Apr. 7, 1952	44	513	1.17	15.98	372,200	465	14.51	337,700
1953	1286	4,190	Apr. 28, 1953	15	479	1.10	14.87	346,500	511	15.88	370,100
1954	1346	5,560	Apr. 14, 1954	51	580	1.33	18.03	419,900	565	17.56	408,900
1955	1396	3,300	Apr. 22, 1955	50	416	.952	12.93	301,300	563	17.49	407,600
1956	1446	8,500	Dec. 22, 1955	64	826	1.89	25.75	599,900	696	21.68	505,300
1957	1516	10,800	May 20, 1957	40	591	1.35	18.36	428,100	582	18.07	421,400
1958	1566	4,840	Feb. 25, 1958	49	511	1.17	15.87	370,200	574	17.81	415,200
1959	1636	9,980	Jan. 24, 1959	60	674	1.54	20.97	488,300	668	20.77	485,700
1960	1716	5,540	Mar. 30, 1960	47	561	1.28	17.48	407,300	-	-	-

4155. Coeur d'Alene Lake at Coeur d'Alene, Idaho

Location.--Lat 47°39'55", long 116°46'05", in sec.24, T.50 N., R.4 W., 500 ft southwest of south end of Eleventh Street in Coeur d'Alene.

Drainage area.--3,700 sq mi, approximately.

Records available.--April 1903 to September 1960.

Gage (corrected).--Water-stage recorder. Datum of gage is 2,100.00 ft above mean sea level, referred to originally accepted elevation (2,157.40 ft) of Geological Survey bench mark in southeast corner of Merriam Building (see WSP 882). Gage heights reduced to elevations above mean sea level. Datum of 1929, supplementary adjustment of 1947, is 3.00 ft higher. Apr. 26, 1903, to Feb. 14, 1905, staff gage at mouth of St. Joe River at datum about 18.7 ft higher. Feb. 15, 1905, to Mar. 23, 1921, staff gage and Mar. 24, 1921, to Dec. 22, 1930, water-stage recorder, at Johnson Wharf 800 ft southeast of railroad station and 1 mile northwest of present site at datum 19.75 ft higher. Dec. 23, 1930, to Feb. 9, 1931, staff gage at present site and datum.

Extremes.--1903-60: Maximum contents, 834,900 acre-ft Dec. 25, 1933 (elevation, 2,139.05 ft); minimum, 2,700 acre-ft below zero of contents table Oct. 10-12, 1904, Sept. 24, 25, 1905, Oct. 14 to Nov. 3, 1906 (elevation, 2,119.9 ft).
Maximum contents known prior to 1903, 753,300 acre-ft May 31, 1894 (elevation, 2,137.6 ft, from high-water marks).

Remarks.--The Washington Water Power Co. stores water in Coeur d'Alene Lake by regulation at Post Falls Dam for power generation at Post Falls and other plants on Spokane River. Storage is within natural range of lake stage. Contents given herein are those above elevation 2,120.0 ft. Capacity of lake between elevations 2,120 and 2,140 ft, 889,000 acre-ft.

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	231.8	238.5	260.9	189.4	192.3	141.0	265.4	239.5	233.2	237.1	236.1	237.1
1952	233.7	216.7	186.6	87.4	86.9	149.7	522.1	247.1	287.1	234.7	231.5	184.5
1953	145.0	98.4	59.9	179.2	140.7	142.9	355.9	283.0	185.2	237.5	237.1	187.3
1954	127.0	100.8	108.2	102.5	177.6	127.0	335.5	375.0	175.4	237.5	238.0	238.5
1955	148.1	113.9	60.2	46.1	60.7	70.2	190.5	364.9	172.9	236.6	238.5	215.4
1956	192.3	231.6	356.5	194.9	118.3	256.4	585.6	478.9	203.7	238.0	234.2	206.1
1957	152.5	92.7	130.9	45.6	125.6	176.4	295.8	439.5	215.8	237.1	236.6	215.4
1958	162.6	108.4	87.18	116.1	263.9	152.3	292.2	287.1	234.2	236.6	229.5	197.2
1959	178.9	227.1	220.7	296.3	148.1	168.7	324.1	303.4	180.5	232.8	238.0	215.4
1960	229.0	253.0	185.2	118.3	154.5	336.6	235.6	253.5	223.8	238.5	238.0	176.4

4160. Hayden Creek below North Fork, near Hayden Lake, Idaho

Location.--Lat 47°39'20", long 116°39'20", in NW¼SW¼ sec.25, T.52 N., R.3 W., on right bank 0.35 mile downstream from North Fork, 2½ miles upstream from mouth, and 7 miles northeast of Hayden Lake Post Office.

Drainage area.--22.0 sq mi.

Records available.--April 1948 to December 1953, October 1958 to September 1959.

Gage.--Water-stage recorder. Altitude of gage is 2,370 ft (from topographic map). Prior to Nov. 2, 1948, staff gage and Nov. 2, 1948, to June 26, 1951, water-stage recorder, at site 200 ft downstream at datum 1.39 ft lower.

Average discharge.--6 years (1948-53, 1958-59), 37.6 cfs (27,220 acre-ft per year).

Extremes.--1948-53, 1958-59: Maximum discharge, 774 cfs Mar. 18, 1950 (gage height, 4.73 ft), from rating curve extended above 300 cfs on basis of slope-area measurement at gage height 4.38 ft; maximum gage height, 4.93 ft Feb. 11, 1951 (ice jam), site and datum then in use; minimum discharge recorded, 2.8 cfs Nov. 29, 30, 1952.

Remarks.--No regulation or diversion 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	14.6	64.2	25.3	102	32.8	94.7	41.8	14.7	7.38	4.71	4.28	34.3
1952	20.7	24.5	31.3	10.8	41.4	35.4	154	52.5	17.0	9.36	5.12	4.20	33.6
1953	3.68	4.00	4.65	55.7	98.2	45.6	75.2	66.9	41.0	11.9	6.99	4.35	34.4
1954	3.96	7.38	-	-	-	-	-	-	-	-	-	-	-
1959	5.71	19.3	26.5	95.2	27.6	39.0	115	94.0	32.3	11.1	7.00	8.10	40.2

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	707	869	3,950	1,560	5,690	2,020	5,640	2,570	873	454	290	253	24,880
1952	1,270	1,460	1,930	682	2,380	2,170	9,170	3,230	1,010	576	315	250	24,420
1953	226	238	286	3,430	5,450	2,800	4,470	4,110	2,440	733	430	259	24,870
1954	243	439	-	-	-	-	-	-	-	-	-	-	-
1959	351	1,150	1,630	5,860	1,530	2,400	6,860	5,780	1,920	682	430	482	29,080

Yearly 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	-	-	-	-	-	-	-	-	56.9	35.14	41,220
1951	1216	600	Feb. 11, 1951	3.7	34.3	1.56	21.19	24,860	33.1	20.45	24,010
1952	1248	371	Apr. 7, 1952	3.4	33.6	1.53	20.79	24,420	28.3	17.46	20,510
1953	1286	744	Feb. 1, 1953	2.8	34.4	1.56	21.19	24,670	-	-	-
1959	1636	366	Jan. 25, 1959	4.3	40.2	1.83	24.79	29,080	-	-	-

4175. Hayden Lake Irrigation District diversion near Hayden Lake, Idaho

Location.--Lat 47°46'10", long 116°47'30", in NE $\frac{1}{4}$ sec.14, T.51 N., R.4 W., at dividing tower at end of main pipeline, $1\frac{1}{2}$ miles west of Hayden Lake Post Office and pumping plant and 7 miles north of Coeur d'Alene.
Records available.--October 1945 to September 1953. Monthly discharge only prior to June 1946, published in WSP 1316.
Gage.--Water-stage recorder and Cippoletti weir.
Extremes.--1945-53: Maximum daily discharge, 16 cfs for several days in June, July, and August 1951; no flow for long periods in each year.
Remarks.--Discharge at station is pumped from Hayden Lake in sec.18, T.51 N., R.3 W., for irrigation of about 620 acres in Hayden Lake Irrigation District.

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	0	7.3	287	753	836	0	1,880
1952	0	0	0	0	0	0	0	10	290	755	906	0	1,960
1953	0	0	0	0	0	0	0	3.2	29	805	483	659	1,980

4180. Rathdrum Prairie Canal at Huetter, Idaho

Location.--Lat 47°43', long 116°52', in sec.6, T.50 N., R.4 W., on left bank 450 ft downstream from outlet of discharge pipe, five-eighths of a mile north of pumping plant, and three-quarters of a mile northwest of Huetter.
Records available.--October 1945 to September 1960. Monthly discharge only prior to April 1946, published in WSP 1316.
Gage.--Water-stage recorder. Datum of gage is 2,273.02 ft above mean sea level (Bureau of Reclamation bench mark).
Extremes.--1945-60: Maximum daily discharge, 66 cfs June 29 to July 2, 1947; no flow for long periods in each year.
Remarks.--Canal carries water which is pumped from Spokane River in sec.7, T.50 N., R.4 W., for irrigation of first unit of Rathdrum Prairie project (about 3,000 acres).

Monthly and yearly diversion, 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	7.3	1,790	2,860	3,580	3,420	1,580	13,220
1952	0	0	0	0	0	0	1.2	1,740	2,210	3,500	3,720	1,730	12,900
1953	0	0	0	0	0	0	0	1,670	1,740	3,330	3,450	2,540	12,730
1954	0	0	0	0	0	0	0	2,020	2,250	3,210	2,560	1,060	10,100
1955	18	0	0	0	0	0	0	208	2,490	2,230	3,350	2,580	10,880
1956	0	0	0	0	0	0	22	1,850	1,510	3,410	2,760	2,100	11,650
1957	0	0	0	0	0	0	20	575	935	3,350	3,420	1,670	9,970
1958	0	0	0	0	0	0	284	1,640	2,130	3,270	3,510	1,680	12,310
1959	0	0	0	0	0	0	111	1,750	2,590	3,260	3,060	1,510	12,280
1960	0	0	0	0	0	0	69	1,120	2,740	2,990	3,230	1,480	11,630

4185. Spokane Valley Farms Co.'s Canal at Post Falls, Idaho

Location.--Lat 47°43', long 116°57', in sec.3, T.50 N., R.5 W., on left bank 300 ft downstream from headgate and half a mile northwest of Post Falls.
Records available.--May 1911 to September 1917, September 1919 to September 1960. Published as Spokane Valley Land and Water Co.'s canal at Post Falls, prior to 1924.
Gage.--Water-stage recorder. Prior to Apr. 22, 1938, staff gages at several sites within 1,000 ft of present site at various datums.
Extremes.--1911-17, 1919-60: Maximum daily discharge, 312 cfs May 22-24, 26, 28, 1956; no flow or small amount of leakage during nonirrigation seasons.
Remarks.--Canal diverts water for irrigation from Spokane River in SE $\frac{1}{4}$ sec.3, T.50 N., R.5 W.

Monthly and yearly diversion, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	311	0	0	0	0	0	0	7,110	15,000	17,860	15,790	6,080	62,150
1952	145	0	0	0	0	0	1,610	10,710	14,310	15,820	14,970	6,170	63,740
1953	105	0	46	61	56	28	1,280	9,740	11,490	16,750	16,120	6,530	62,210
1954	12	0	71	93	56	20	1,550	12,230	11,540	15,970	13,940	4,620	60,100
1955	61	30	0	0	0	0	1,080	7,720	15,580	15,450	15,260	7,840	63,020
1956	22	0	0	0	0	0	1,210	14,580	17,390	16,010	15,270	5,870	70,350
1957	0	0	0	0	0	0	1,980	9,660	15,540	16,520	13,960	7,300	64,860
1958	16	18	0	0	424	454	2,840	11,230	15,980	14,840	14,590	6,590	66,980
1959	0	0	0	0	0	0	3,320	9,020	12,730	16,130	15,050	6,600	62,850
1960	38	8	0	0	0	0	2,570	9,540	13,740	16,120	14,870	6,720	63,610

4190. Spokane River near Post Falls, Idaho

Location.--Lat 47°42'10", long 116°58'40", in SW¹/₄SW¹/₄ sec. 4, T.50 N., R.5 W., on right bank 1 mile downstream from powerplant of Washington Water Power Co., $\frac{1}{2}$ miles downstream from intake of Spokane Valley Farms Co.'s canal, and $\frac{1}{2}$ miles southwest of Post Falls.

Drainage area.--3,840 sq mi, approximately, of which about 122 sq mi in the vicinity of Hayden Lake is noncontributing to this station.

Records available.--October 1912 to September 1960 (prior to January 1913 monthly discharges only, published in WSP 870). Prior to October 1949, published as "at Post Falls."

Gage.--Water-stage recorder. Datum of gage is 2,000.00 ft above mean sea level, referenced to same datum as gage on Coeur d'Alene Lake at Coeur d'Alene (see p. 314). Datum of 1929, supplementary adjustment of 1947, is 3.00 ft higher. Jan. 1, 1913, to Nov. 21, 1920, staff gage and Sept. 16, 1934, to Nov. 15, 1949, water-stage recorder, at site 0.8 mile upstream. Nov. 22, 1920, to Sept. 15, 1934, water-stage recorder at site 0.6 mile upstream. All gages at present datum.

Average discharge.--River only, 48 years (1912-60), 6,212 cfs (4,497,000 acre-ft per year); combined river, Spokane Valley Farms Co.'s canal, and Rathdrum Prairie Canal, 48 years (1912-60), 6,318 cfs (4,574,000 acre-ft per year).

Extremes.--1912-60: Maximum discharge, 50,100 cfs when recorder was not operating Dec. 25 1933 (determined from unpublished records collected by Washington Water Power Co. for station at Liberty Bridge); minimum daily, 104 cfs Aug. 18, 1958.

Remarks.--Spokane Valley Farms Co.'s canal (see preceding page) and Rathdrum Prairie Canal (see preceding page) divert water above gage for irrigation. Figures of monthly discharge do not include water diverted by these canals. Flow regulated by dam at Post Falls and affected by storage in Coeur d'Alene Lake (see p. 314).

Corrections.--In WSP 1316, the runoff in acre-feet for March 1941 and the adjusted water year mean for 1945 are listed in error; they should be 287,700 acre-ft and 4,680 cfs, respectively. The following discharges were inadvertently omitted in WSP 1316.

Month	Mean	Acre-feet
October 1912.....	1,980	122,000
November.....	3,980	237,000
December.....	5,460	213,000

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	2,289	4,494	5,512	8,010	15,980	7,548	15,630	16,950	5,915	1,454	253	381	7,306
1952	3,015	3,876	5,576	4,460	5,374	4,170	18,130	22,290	6,048	1,912	384	1,269	6,371
1953	1,379	1,691	1,892	6,233	11,040	5,914	8,884	18,710	12,770	1,265	527	1,235	5,918
1954	2,043	1,982	3,534	4,188	7,078	9,303	14,600	24,340	14,700	2,474	1,133	1,087	7,196
1955	3,083	3,887	3,441	2,234	2,846	2,517	9,174	19,470	16,650	3,032	737	1,003	5,674
1956	3,190	6,097	12,570	10,430	5,026	6,986	24,270	29,240	14,000	1,733	810	1,066	9,624
1957	2,418	2,909	3,672	3,564	2,170	9,890	16,120	27,690	11,350	1,150	425	564	6,855
1958	2,040	2,439	2,668	8,846	8,822	8,455	14,710	19,500	5,457	1,051	184	862	5,724
1959	1,357	5,639	8,755	12,730	7,946	6,937	16,750	21,530	14,600	1,365	501	1,740	8,309
1960	3,120	8,169	6,364	4,335	5,871	7,371	21,590	16,710	9,552	1,246	593	1,606	7,169

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	140.7	267.4	584.8	492.5	987.3	464.1	930	1,043	352	89.40	15.53	22.64	5,289
1952	185.4	230.0	342.8	274.2	309.1	256.4	1,079	1,371	359.9	117.6	23.63	75.48	4,825
1953	84.75	100.6	116.3	383.3	613	363.6	529.2	1,150	758.7	77.76	32.38	73.52	4,284
1954	125.6	118	217.3	257.4	393.1	572	868.8	1,497	974.4	152.1	69.66	64.66	5,210
1955	189.5	231.3	211.6	137.4	158	154.8	545.9	1,197	991	186.4	45.31	59.69	4,108
1956	196.1	362.8	772.8	641.6	289.1	429.6	1,444	1,798	832.8	106.6	49.81	63.44	6,987
1957	148.7	173.1	225.8	219.2	120.5	608.1	959.4	1,702	675.4	70.73	26.15	33.55	4,963
1958	125.4	145.1	164.1	175	489.9	519.9	875	1,199	324.7	64.60	11.33	51.24	4,145
1959	83.44	335.6	538.3	762.6	441.3	426.5	996.9	1,324	888.6	83.93	30.80	103.6	6,016
1960	191.8	486.1	391.3	266.5	326.2	453.2	1,284	1,027	568.4	76.59	36.48	95.59	5,203

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	Runoff in acre-feet	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet	Mean
		Discharge	Date												
1950	-	-	-	-	-	-	-	-	-	-	9,886	7,157,000	9,989	7,231,000	-
1951	1216	27,400	Feb. 14, 1951	148	7,306	5,289,000	8,175	5,365,000	6,982	5,055,000	7,086	5,130,000	6,857	6,284,000	6,857
1952	1246	30,800	May 1, 1952	136	6,371	4,625,000	6,476	4,702,000	5,741	4,168,000	5,846	4,245,000	6,802	4,925,000	6,802
1953	1286	22,000	May 2, 1953	173	5,918	4,284,000	6,021	4,359,000	6,138	4,443,000	6,241	4,518,000	6,558	4,747,000	6,558
1954	1346	32,000	May 22, 1954	192	7,196	5,210,000	7,293	5,280,000	7,435	5,382,000	7,530	5,452,000	8,463	6,202,000	8,463
1955	1396	27,500	May 25, 1955	120	5,674	4,108,000	5,776	4,182,000	6,404	4,807,000	6,724	4,881,000	6,724	4,881,000	6,724
1956	1446	38,600	Apr. 27, 1956	139	9,624	6,987,000	9,737	7,068,000	8,544	6,203,000	8,657	6,284,000	8,657	6,284,000	8,657
1957	1516	35,000	May 25, 1957	131	6,855	4,963,000	6,959	5,038,000	6,699	4,850,000	6,802	4,925,000	6,802	4,925,000	6,802
1958	1566	24,800	Apr. 24, 1958	104	5,724	4,145,000	5,834	4,225,000	6,448	4,668,000	6,558	4,747,000	6,558	4,747,000	6,558
1959	1636	27,000	May 5, 1959	114	8,309	6,016,000	8,413	6,091,000	8,463	6,127,000	8,567	6,202,000	8,567	6,202,000	8,567
1960	1716	27,100	Apr. 12, 1960	174	7,169	5,203,000	7,272	5,279,000	-	-	-	-	-	-	-

4195. Spokane River above Liberty Bridge, near Otis Orchards, Wash.

Location.--Lat 47°40'55", long 117°05'05", in NW¹/₄ sec.11, T.25 N., R.45 E., on left bank 1.2 miles upstream from Liberty Bridge, 1¹/₂ miles southeast of Otis Orchards, and 3.3 miles northeast of Greensacres.

Drainage area.--3,880 sq mi, approximately.

Records available.--January 1929 to December 1936, March 1937, August 1937 to August 1941, October 1941 to October 1942, February to May 1943, August 1943 to November 1946, February to July 1947, September 1947 to February 1948, May to November 1948, March to November 1949, and April to September 1950 (monthly discharge only); October 1950 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 2,000 ft above mean sea level (levels by Washington Water Power Co.).

Average discharge.--24 years (1929-36, 1937-40, 1941-42, 1943-46, 1950-60), 5,998 cfs (4,342,000 acre-ft per year), unadjusted.

Extremes.--1929-60: Maximum discharge, 50,100 cfs Dec. 25, 1933 (gage height, 22.24 ft); minimum, 61 cfs Aug. 7, 1951; minimum gage height observed, 7.67 ft Sept. 2, 1955.

Remarks.--Flow partly regulated by powerplant at Post Falls, Idaho, and by Coeur d'Alene Lake (see p. 314). Spokane Valley Farms Co.'s canal and Rathdrum Prairie Canal (see elsewhere in this report) divert water 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
1929				1,108	1,025	1,673	6,730	12,980	5,039	1,240	1,117	1,230	-
1930	937	971	915	1,305	2,317	3,673	10,480	6,481	3,672	1,076	1,148	1,078	2,829
1931	1,022	954	1,014	1,001	1,894	6,579	13,880	11,250	2,067	915	1,018	994	3,553
1932	1,016	855	911	2,540	2,380	11,860	24,000	28,700	12,860	1,723	878	882	7,386
1933	1,020	4,970	4,700	4,530	2,570	5,490	14,270	22,700	21,110	3,178	785	876	7,188
1934	2,824	6,840	23,660	24,980	13,730	12,700	21,230	9,125	2,101	927	619	727	9,932
1935	785	3,987	4,255	5,226	6,277	7,713	14,540	22,870	9,844	1,420	956	1,226	6,586
1936	1,022	597	726	1,540	2,035	5,335	16,740	21,940	5,033	1,045	1,058	1,146	4,856
1937	1,373	799	814	-	2,374	-	-	-	-	-	928	1,226	-
1938	928	1,931	5,197	7,027	4,201	9,349	18,610	18,990	6,949	1,220	859	1,040	6,368
1939	1,257	1,250	1,074	1,755	2,548	4,992	16,920	16,280	3,211	1,357	1,445	1,249	4,447
1940	1,031	664	1,214	2,035	5,194	13,440	15,390	10,560	2,344	1,062	959	963	4,565
1941	1,036	1,273	3,569	4,418	3,803	4,477	3,861	6,712	3,986	906	947	-	-
1942	1,677	3,174	9,567	3,653	4,784	4,715	12,680	8,657	5,499	2,252	587	714	4,823
1943	999	-	-	-	3,744	4,833	25,150	19,000	-	-	799	858	-
1944	1,268	1,673	2,725	2,035	2,308	2,000	6,602	5,452	2,236	833	944	970	1,928
1945	1,191	1,368	1,233	2,828	4,987	6,328	9,050	18,490	5,989	1,904	325	751	4,536
1946	1,298	2,796	4,961	7,837	3,897	7,963	17,250	22,000	8,676	1,704	301	528	6,615
1947	1,109	4,334	-	-	9,335	9,355	13,590	15,610	5,037	2,044	-	868	-
1948	2,795	3,654	5,449	8,634	4,900	-	-	27,530	21,310	1,923	1,464	655	-
1949	1,525	1,557	-	-	-	10,460	18,440	25,720	6,627	1,017	499	127	-
1950	770	2,722	-	-	-	-	19,040	23,250	21,920	6,043	984	339	-
1951	2,115	4,339	9,079	7,673	15,150	7,071	14,920	16,250	5,490	1,261	150	298	6,926
1952	2,670	3,486	5,107	4,073	4,936	3,784	17,330	22,050	5,839	1,850	335	1,177	6,049
1953	1,274	1,578	1,784	5,975	10,990	5,767	8,697	18,540	12,630	1,140	452	1,052	5,779
1954	1,844	1,873	3,452	4,112	6,692	8,976	14,040	23,210	14,620	2,401	992	1,000	6,927
1955	2,900	3,725	3,289	2,120	2,694	2,379	9,087	19,200	16,540	2,907	690	918	5,539
1956	3,037	5,875	12,520	10,300	4,982	6,889	24,180	28,580	13,820	1,688	775	985	9,474
1957	2,286	2,787	3,565	3,496	2,156	9,821	16,270	27,980	11,630	1,185	441	553	6,875
1958	1,961	2,363	2,578	2,826	8,643	8,265	14,390	19,360	5,356	1,043	159	863	5,625
1959	1,300	5,428	8,479	12,590	7,888	6,770	16,410	12,410	14,480	1,254	410	1,597	8,155
1960	2,981	7,913	6,073	4,135	5,429	7,146	21,170	16,580	9,396	1,250	565	1,591	6,995

Monthly and yearly discharge, in thousands of acre-feet, of Spokane River above Liberty Bridge, near Otis Orchards, Wash.

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1929	-	-	-	68.13	56.91	102.9	400.5	798.2	299.9	76.22	68.69	73.21	-
1930	57.60	57.78	56.27	80.21	128.7	225.8	623.5	398.9	218.5	66.16	70.57	64.18	2,048
1931	62.83	56.75	62.36	61.56	105.2	404.5	825.9	691.9	123.0	56.27	62.60	59.14	2,572
1932	62.45	50.89	55.99	156.0	137.2	728.9	1,428	1,765	765.0	105.9	54.00	52.50	5,362
1933	62.79	295.7	289.2	278.3	142.8	337.6	849.1	1,397	1,256	195.3	48.29	52.11	5,204
1934	161.3	395.1	1,455	1,536	762.3	780.7	1,263	561.0	125.0	56.97	50.33	43.29	7,190
1935	48.28	237.3	261.6	321.4	348.6	474.2	865.1	1,406	585.7	87.29	58.80	72.93	4,767
1936	62.85	35.52	44.64	94.68	117.1	328.0	996.0	1,349	299.5	64.24	65.07	68.16	3,525
1937	84.40	47.55	50.08	-	-	146.0	-	-	-	-	57.07	72.97	-
1938	57.05	114.9	319.5	432.1	233.3	574.8	1,107	1,168	413.5	75.01	52.80	61.88	4,610
1939	77.30	74.40	66.02	107.8	141.5	306.9	1,007	1,001	191.0	83.42	88.88	74.34	3,220
1940	63.38	39.54	74.66	125.1	298.8	826.5	915.8	649.0	139.5	65.33	58.97	57.32	3,314
1941	63.70	75.74	219.5	271.7	211.2	275.3	229.7	412.7	237.2	55.73	58.24	-	-
1942	103.1	188.8	568.2	224.6	265.7	269.9	754.5	532.3	327.2	138.5	36.06	42.48	3,491
1943	61.41	-	-	-	207.9	297.2	1,437	1,165	-	-	49.11	51.07	-
1944	77.86	99.57	167.5	125.1	132.8	123.0	39.29	334.6	133.1	51.24	58.04	57.74	1,400
1945	73.25	81.40	75.84	173.9	277.0	389.1	538.5	1,137	356.4	117.1	19.98	44.66	3,284
1946	79.80	166.4	305.1	461.9	216.4	489.6	1,026	1,353	516.3	104.8	18.49	31.44	4,789
1947	68.22	257.9	-	-	425.9	575.2	808.7	959.8	299.7	125.7	-	51.63	-
1948	171.9	217.4	335.0	530.9	281.9	-	-	1,693	1,268	118.3	90.03	39.00	-
1949	93.81	92.68	-	-	-	643.5	1,097	1,583	394.4	62.54	30.69	7.58	-
1950	47.27	161.9	-	-	-	-	1,133	1,430	1,304	371.6	60.50	20.19	-
1951	130.1	258.2	558.2	471.8	841.6	434.8	887.8	999.8	326.7	78.78	9.23	17.75	5,014
1952	164.2	207.4	314.0	250.5	283.9	232.7	1,031	1,356	347.5	113.7	20.61	70.05	4,392
1953	78.33	93.92	109.7	367.4	610.6	354.6	517.5	1,140	751.6	70.10	27.79	62.60	4,184
1954	113.4	111.5	212.3	252.8	371.7	551.9	835.7	1,427	869.9	147.6	61.02	59.50	5,014
1955	178.3	221.6	202.2	130.4	149.6	146.3	540.7	1,181	984.4	178.8	42.42	54.61	4,010
1956	186.7	349.6	769.8	633.6	286.6	423.6	1,439	1,757	822.2	103.8	47.68	58.60	6,878
1957	140.6	165.8	219.2	214.9	119.8	603.9	968.1	1,720	691.9	72.87	27.13	32.92	4,977
1958	120.6	140.6	158.5	173.8	480.0	508.2	856.2	1,190	318.7	64.11	9.77	51.33	4,072
1959	79.94	323.0	521.4	773.9	438.1	416.3	978.7	1,316	861.5	77.13	25.21	95.01	5,904
1960	183.3	470.9	373.4	254.3	312.3	439.4	1,260	1,019	559.1	76.87	34.75	94.65	5,078

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					
1929	(a)	-	-	-	-	-	2,923	2,116,000
1930	(a)	-	-	700	2,829	2,048,000	2,843	2,058,000
1931	(a)	-	-	775	3,553	2,572,000	3,535	2,559,000
1932	(a)	-	-	750	7,386	5,362,000	8,045	5,840,000
1933	(a)	-	-	718	7,188	5,204,000	9,072	6,568,000
1934	(a)	50,100	Dec. 25, 1933	610	9,932	7,190,000	7,909	5,726,000
1935	(a)	-	-	635	6,586	4,767,000	6,027	4,363,000
1936	(a)	-	-	460	4,856	3,525,000	4,909	3,564,000
1937	(a)	-	-	-	-	-	-	-
1938	(a)	-	-	608	6,368	4,610,000	5,989	4,336,000
1939	(a)	-	-	822	4,447	3,220,000	4,391	3,179,000
1940	(a)	-	-	504	4,565	3,314,000	4,815	3,495,000
1941	(a)	-	-	-	-	-	-	-
1942	(a)	-	-	440	4,823	3,491,000	-	-
1943	(a)	-	-	-	-	-	-	-
1944	(a)	-	-	390	1,928	1,400,000	1,775	1,285,000
1945	(a)	-	-	214	4,536	3,284,000	4,979	3,605,000
1946	(a)	-	-	136	6,615	4,789,000	-	-
1947	(a)	-	-	-	-	-	-	-
1948	(a)	-	-	-	-	-	-	-
1949	(a)	-	-	-	-	-	-	-
1950	(a)	-	-	-	-	-	-	-
1951	1286	26,200	Feb. 15, 1951	67	6,926	5,014,000	6,566	4,754,000
1952	1286	30,400	May 1, 1952	95	6,049	4,392,000	5,493	3,988,000
1953	1286	21,800	May 2, 1953	111	5,779	4,184,000	5,993	4,339,000
1954	1346	29,700	May 22, 1954	176	6,927	5,014,000	7,155	5,179,000
1955	1396	26,100	May 25, 1955	100	5,539	4,010,000	6,511	4,714,000
1956	1446	38,800	Apr. 26, 1956	105	9,474	6,878,000	8,399	6,098,000
1957	1516	35,400	May 25, 1957	125	6,875	4,977,000	6,729	4,871,000
1958	1568	24,000	Apr. 24, 1958	70	5,625	4,072,000	6,322	4,576,000
1959	1636	26,500	May 5, 1959	90	8,155	5,904,000	8,298	6,007,000
1960	1716	26,700	Apr. 12, 1960	143	6,995	5,078,000	-	-

a From records of Washington Power Co.

Note.--Records for 1929-50 not previously published; furnished by Washington Water Power Co.

4205. Spokane River at Greenacres, Wash.

Location.--Lat 47°40'45", long 117°09'25", on east line of sec.7, T.25 N., R.45 E., on downstream side of center pier of county road bridge, 12 miles upstream from Spokane.
Drainage area.--4,150 sq mi, approximately.
Records available.--March 1948 to June 1952.
Gage.--Water-stage recorder. Datum of gage is 1,975.82 ft above mean sea level (levels by Bureau of Reclamation). Prior to Apr. 1, 1949, water-stage recorder at site 1 mile downstream at different datum.
Extremes.--1948-52: Maximum discharge not determined, probably occurred May 30, 1948, during period of no gage-height record (comparison with other stations on this stream indicates a discharge of at least 40,000 cfs); minimum, 52 cfs Aug. 26, 27, 1949 (gage height, 1.04 ft).
Remarks.--Flow partly regulated by powerplant at Post Falls, Idaho, and by Coeur d'Alene Lake (see p. 314). Many diversions above station, including Spokane Valley Farms Co.'s canal and Rathdrum Prairie Canal (see elsewhere in this report) for irrigation of about 15,000 acres, part of which is above station and part 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	2,195	4,435	9,128	7,735	15,440	7,296	15,160	16,550	5,648	1,324	199	329	7,059
1952	2,788	3,600	5,185	4,241	5,176	3,988	17,820	21,870	5,814	-	-	-	-

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	134.9	263.9	561.3	475.6	857.6	448.6	902.2	1,017	336.1	81.4	12.24	19.58	5,110
1952	171.4	214.2	318.8	260.8	297.7	245.2	1,060	1,345	345.9	-	-	-	-

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	-	-	-	-	-	-	9,757	7,064,000
1951	1216	26,200	Feb. 15, 1951	112	7,059	5,110,000	6,716	4,862,000
1952	1246	30,800	(a)	-	-	-	-	-

a Apr. 30 to May 1, 1952.

4215. Spokane River below Trent Bridge, near Spokane, Wash.

Location.--Lat 47°41'50", long 117°14'35", in NE $\frac{1}{4}$ sec.4, T.25 N., R.44 E., on right bank half a mile downstream from Trent Bridge and 9 miles east of Spokane.
Drainage area.--4,210 sq mi, approximately.
Records available.--January 1948 to September 1954.
Gage.--Water-stage recorder. Datum of gage is 1,907.49 ft above mean sea level (levels by Bureau of Reclamation). Prior to Dec. 4, 1948, at site 20 ft upstream at same datum.
Average discharge.--6 years (1948-54), 7,332 cfs (5,308,000 acre-ft per year).
Extremes.--1948-54: Maximum discharge, 40,100 cfs May 30 or 31, 1948 (gage height, 18.5 ft, from high-water mark on gage); minimum, 615 cfs Oct. 24, 1949, Sept. 4, 1952.
Remarks.--Flow partly regulated by powerplant of Washington Water Power Co. at Post Falls, Idaho, and by Coeur d'Alene Lake (see p. 314). Spokane Valley Farms Co.'s canal and Rathdrum Prairie Canal (see elsewhere in this report) divert water above station for irrigation. In 1946, approximately 22,600 acres were under irrigation above Spokane, of which about 15,000 acres utilized surface water.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2,557	4,748	9,478	8,253	15,820	7,873	15,500	16,860	6,387	2,038	780	850	7,536
1952	5,110	3,982	5,689	4,585	5,497	4,313	18,250	22,940	6,530	2,377	865	1,593	6,642
1953	1,690	1,922	2,094	6,119	11,040	6,005	8,836	18,750	13,060	1,754	975	1,453	6,100
1954	2,194	2,218	3,732	4,374	7,079	9,447	14,670	24,210	14,940	2,900	1,485	1,392	7,379

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	157.2	282.5	582.8	507.5	878.7	484.1	922.3	1,037	380.1	125.3	47.94	50.55	5,456
1952	191.2	236.9	349.8	281.9	316.2	265.2	1,086	1,411	388.6	146.1	54.42	94.81	4,322
1953	105.9	114.3	128.8	376.3	613.4	369.2	525.8	1,153	777.1	107.9	59.95	86.48	4,416
1954	134.3	132.0	229.5	269.0	393.1	580.9	873.0	1,489	888.7	178.3	91.32	82.84	5,343

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	-	-	-	-	-	-	10,150	7,348,000
1951	1216	27,100	Feb. 14, 15, 1951	674	7,536	5,456,000	7,198	5,211,000
1952	1246	31,900	Apr. 30, 1952	625	6,642	4,822,000	6,049	4,391,000
1953	1286	21,900	May 2, 1953	678	6,100	4,416,000	6,306	4,566,000
1954	1346	31,300	May 23, 1954	736	7,379	5,343,000	-	-

4220. Spokane River below Green Street, at Spokane, Wash.

Location.--Lat 47°40'40", long 117°22'20", in W $\frac{1}{2}$ sec. 10, T.25 N., R.43 E., on right bank at Spokane, 250 ft downstream from Green Street Bridge and $5\frac{1}{2}$ miles upstream from Latah Creek.

Drainage area.--4,230 sq mi, approximately.

Records available.--December 1948 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 1,864.31 ft above mean sea level (levels by Bureau of Reclamation).

Extremes.--1948-52: Maximum discharge, 34,400 cfs May 16, 1949 (gage height, 18.54 ft); minimum, 702 cfs Sept. 10, 1949 (gage height, 4.09 ft).

Remarks.--Flow partly regulated by powerplants at Post Falls, Idaho, and near Spokane, and by Coeur d'Alene Lake (see p. 314). Many diversions above station, including Spokane Valley Farms Co.'s canal and Rathdrum Prairie Canal (see elsewhere in this report) for irrigation of about 15,000 acres, part of which is above station and part 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	2,877	4,995	9,614	8,587	16,360	8,135	16,000	17,570	6,857	2,370	1,060	1,154	7,906
1952	3,363	4,241	5,884	4,817	5,682	4,595	18,340	23,310	6,980	2,768	1,174	1,858	6,914

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	176.9	297.2	591.1	528.0	908.7	500.2	952.3	1,080	408.0	145.7	66.41	68.69	5,723
1952	206.8	252.4	361.8	296.2	326.9	282.5	1,091	1,433	415.3	170.2	72.18	110.6	5,019

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	-	-	-	-	-	-	10,700	7,742,000
1951	1216	28,500	Feb. 15, 1951	976	7,906	5,723,000	7,568	5,479,000
1952	1246	31,900	May 1, 1952	889	6,914	5,019,000	-	-

4225. Spokane River at Spokane, Wash.

Location.--Lat 47°39'35", long 117°26'50" in SW 1/4 sec.13, T.25 N., R.42 E., on right bank at Cochran Street in Spokane, half a mile upstream from Latah Creek.

Drainage area.--4,290 sq mi, approximately.

Records available.--April 1891 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,696.6 ft above mean sea level, datum of 1929 (river-profile survey). Prior to July 1, 1921, water-stage recorders and staff or wire-weight gages at several sites within 4 miles of present site at various datums.

Average discharge.--69 years (1891-1960), 6,864 cfs (4,969,000 acre-ft per year), unadjusted.

Remarks.--1891-1960: Maximum discharge, 49,000 cfs (estimated) May 31, 1894 (gage height, 12.42 ft, site and datum then in use); minimum, 95 cfs Sept. 19, 1956 (gage height, 15.60 ft); minimum daily, 740 cfs Sept. 7, 1947.

Remarks.--Flow partly regulated by powerplant of Washington Water Power Co. at Post Falls, Idaho, and at Spokane, and by Coeur d'Alene Lake (see p. 314). Spokane Valley Farms Co.'s canal and Rathdrum Prairie Canal (see elsewhere in this report) divert water above station for irrigation. In 1946, approximately 22,600 acres (of which about 15,000 acres utilized surface water) were under irrigation upstream from Spokane.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2,752	4,985	9,681	8,783	16,420	8,311	16,000	17,530	6,840	2,302	1,035	1,156	7,921
1952	3,421	4,299	6,006	5,118	5,908	4,790	18,220	23,270	6,989	2,719	1,208	1,853	6,978
1953	1,934	2,227	2,408	6,428	11,600	6,425	9,164	19,330	13,570	2,098	1,261	1,669	6,466
1954	2,387	2,422	3,830	4,541	7,248	9,645	14,370	23,920	15,110	3,487	1,939	1,773	7,549
1955	3,596	4,230	3,901	2,762	3,195	2,919	9,287	20,000	17,560	3,895	1,565	1,598	6,196
1956	3,527	6,142	12,360	10,950	5,598	7,262	23,810	29,390	15,100	2,849	1,712	1,849	10,050
1957	3,030	3,586	4,165	4,155	2,794	9,768	16,090	28,060	12,590	2,277	1,349	1,344	7,462
1958	2,537	2,981	3,139	5,424	8,895	9,120	15,060	20,290	6,801	1,987	1,002	1,534	6,375
1959	1,911	5,885	8,946	15,160	8,865	7,538	16,930	21,850	15,190	2,549	1,315	2,279	8,838
1960	3,521	8,164	6,931	5,003	6,068	7,808	21,920	17,350	10,590	2,181	1,452	2,303	7,734

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	169.2	296.6	595.2	540.1	911.7	511.0	952.0	1,078	407.0	141.6	63.63	68.79	5,735
1952	210.3	255.8	369.3	314.7	339.8	294.5	1,084	1,431	415.9	167.2	74.18	109.1	5,066
1953	118.9	132.5	148.1	395.3	644.3	395.1	545.3	1,188	807.7	129.0	77.51	99.29	4,681
1954	146.8	144.1	235.5	279.2	402.5	593.0	855.1	1,471	899.1	214.4	119.2	105.5	5,465
1955	208.8	251.7	239.9	169.8	177.5	179.5	552.6	1,230	1,045	239.5	96.26	95.11	4,486
1956	216.9	365.5	760.0	673.0	322.0	446.5	1,417	1,807	898.4	175.2	105.3	110.0	7,297
1957	186.3	213.4	256.1	255.5	155.2	600.6	957.6	1,725	749.0	140.0	82.94	79.95	5,402
1958	156.0	177.4	193.0	210.5	494.0	560.8	896.3	1,247	404.7	122.2	61.59	91.30	4,615
1959	117.5	350.2	550.1	809.3	492.3	463.5	1,007	1,344	903.8	144.5	80.84	135.6	6,399
1960	216.5	485.8	426.2	307.6	349.0	467.8	1,304	1,067	630.0	134.1	89.28	137.1	5,614

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	-	-	-	-	-	-	10,660	7,721,000
1951	1216	28,200	Feb. 15, 1951	871	7,921	5,735,000	7,609	5,509,000
1952	1246	32,100	May 1, 1952	900	6,978	5,066,000	6,377	4,630,000
1953	1286	22,400	May 5, 1953	770	6,466	4,681,000	6,641	4,808,000
1954	1346	31,000	May 21, 1954	1,000	7,549	5,465,000	7,789	5,639,000
1955	1396	27,000	May 25, 1955	841	6,196	4,486,000	7,082	5,128,000
1956	1446	37,800	Apr. 27, 1956	1,100	10,050	7,297,000	9,106	6,610,000
1957	1516	35,600	May 25, 1957	903	7,462	5,402,000	7,283	5,272,000
1958	1566	24,400	Apr. 24, 1958	814	6,375	4,615,000	7,053	5,106,000
1959	1636	26,500	May 4, 1959	858	8,838	6,399,000	8,991	6,509,000
1960	1716	27,400	Apr. 12, 1960	1,060	7,734	5,614,000	-	-

4240. Hangman Creek at Spokane, Wash.

Location.--Lat 47°39'10", long 117°26'55", in NW¼ sec.24, T.25 N., R.42 E., on left bank in Spokane, three-quarters of a mile upstream from mouth.

Drainage area.--619 sq mi.

Records available.--April 1948 to September 1960. Prior to October 1958, published as Latah Creek at Spokane.

Gage.--Water-stage recorder. Altitude of gage is 1,720 ft (from topographic map). Prior to Nov. 22, 1948, wire-weight gage at site half a mile upstream at different datum.

Average discharge.--12 years (1948-60), 271 cfs (196,200 acre-ft per year).

Extremes.--1948-60: Maximum discharge, 16,200 cfs Jan. 24, 1959 (gage height, 12.30 ft); minimum, 3.8 cfs Sept. 4, 5, 8, 1955 (gage height, 2.12 ft).

Remarks.--No regulation. Some 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	25.3	53.4	272	571	979	667	231	86.3	59.9	21.3	13.2	14.5	245
1952	32.4	41.9	138	106	1,004	1,499	742	130	46.3	34.5	17.5	16.9	315
1953	18.7	22.0	34.3	818	664	392	200	215	119	20.0	13.3	13.1	208
1954	15.2	25.4	123	306	1,233	434	222	64.7	61.1	21.6	12.5	20.8	205
1955	17.6	28.5	51.6	83.1	309	317	564	169	28.7	15.1	5.38	5.38	131
1956	16.2	188	1,251	855	248	1,763	519	168	66.1	27.6	20.1	20.2	432
1957	26.0	32.5	45.9	41.7	668	1,123	490	960	157	26.5	18.6	12.9	299
1958	19.2	33.6	134	650	1,370	299	723	110	37.8	20.0	12.4	13.6	277
1959	16.9	58.6	419	1,574	399	779	297	157	53.4	23.0	16.4	21.6	320
1960	30.5	123	78.2	161	648	439	329	137	36.9	9.22	9.60	10.6	166

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,560	3,180	16,750	35,120	54,350	41,030	13,740	5,310	3,560	1,310	813	861	177,600
1952	1,990	2,500	8,480	6,530	57,740	92,140	44,180	8,010	2,760	2,120	1,080	1,010	228,500
1953	1,150	1,310	2,110	50,310	36,680	24,120	11,910	13,250	7,050	1,230	817	778	150,900
1954	937	1,510	7,580	18,810	68,490	26,660	13,240	3,980	3,630	1,330	769	1,240	148,200
1955	1,080	1,690	3,170	5,110	17,170	19,490	33,570	10,400	1,710	928	331	347	95,000
1956	997	11,190	76,890	52,570	14,280	108,400	30,890	10,340	3,930	1,700	1,240	1,200	313,600
1957	1,600	1,930	2,820	2,560	37,100	69,060	29,170	59,050	9,350	1,630	1,150	769	216,200
1958	1,180	2,000	8,220	39,940	76,070	18,370	43,020	6,760	2,250	1,230	760	810	200,600
1959	1,040	3,490	25,740	96,800	22,150	47,920	17,680	9,630	3,180	1,420	1,010	1,290	231,400
1960	1,870	7,320	4,810	9,910	37,290	27,000	19,560	8,420	2,200	567	590	628	120,200

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	-	-	-	-	-	-	-	-	369	7.96	267,100
1951	1216	6,080	Mar. 15, 1951	12	245	0.396	5.39	177,600	234	5.13	169,100
1952	1246	9,140	Mar. 26, 1952	14	315	.509	6.92	228,500	303	6.65	220,100
1953	1286	3,560	Jan. 18, 1953	11.5	208	.336	4.55	150,900	216	4.73	156,400
1954	1346	6,500	Feb. 22, 1954	7.5	205	.331	4.49	148,200	199	4.36	144,100
1955	1396	4,730	Feb. 8, 1955	4.0	131	.212	2.88	95,000	246	5.40	178,100
1956	1446	11,300	Dec. 22, 1955	8.0	432	.698	9.50	313,600	318	7.00	230,900
1957	1516	9,320	Feb. 27, 1957	11.5	299	.483	6.54	216,200	306	6.69	221,200
1958	1566	6,090	Feb. 13, 1958	11.5	277	.447	6.07	200,600	313	6.64	219,500
1959	1636	16,200	Jan. 24, 1959	13.5	320	.517	7.01	231,400	297	6.52	215,100
1960	1716	2,710	Feb. 7, 1960	5.1	166	.268	3.66	120,200	-	-	-

4245. Spokane River above Seven-Mile Bridge, near Spokane, Wash.

Location--Lat 47°43'05", long 117°29'55", in E½ sec.28, T.26 N., R.42 E., on left bank 5 miles northwest of Spokane.

Drainage area--4,970 sq mi, approximately.

Records available--November 1948 to September 1952.

Gage--Water-stage recorder. Altitude of gage is 1,630 ft (from topographic map).

Extremes--1948-52: Maximum discharge, 33,400 cfs (corrected) May 1, 1952; maximum gage height, 14.62 ft May 16, 1949; minimum discharge, 302 cfs Sept. 9, 11, 12, 1949 (gage height, 3.57 ft).

Correction--In WSP 1246 the momentary maximum discharge for water year 1952 is listed in error; it should be 33,400 cfs.

Remarks--Flow partly regulated by powerplants at Post Falls, Idaho, and at Spokane, and by Coeur d'Alene Lake (see p. 314). Many diversions above station, including Spokane Valley Farms Co.'s canal and Rathdrum Prairie Canal (see elsewhere in this report) for irrigation of several thousands acres above station.

Corrections--In WSP 1316, some figures for the water year 1950 are listed in error; they should be as follows:

Month	Mean	Acre-feet
July 1950.	7,947	468,700
August.....	2,263	139,200
September	1,493	88,860
Water year 1949-50.....	10,390	7,519,000

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	2,899	5,119	9,922	9,411	17,680	9,082	16,360	17,900	7,185	2,578	1,207	1,217	8,314
1952	3,387	4,308	6,133	5,054	7,027	6,224	19,200	23,940	7,346	3,018	1,370	1,932	7,405

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	178.3	304.6	610.1	578.7	981.9	558.4	973.7	1,101	427.5	158.5	74.24	72.44	6,019
1952	208.3	256.4	377.1	310.8	404.2	362.7	1,142	1,472	437.1	185.6	64.26	114.9	5,375

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	-	-	-	-	-	-	11,130	8,054,000
1951	1216	30,000	Feb. 15, 1951	1,020	8,314	6,019,000	7,967	5,768,000
1952	1246	†33,400	May 1, 1952	1,010	7,405	5,375,000	-	-

† Corrected.

4270. Little Spokane River at Elk, Wash.

Location.--Lat 48°01'20", long 117°16'20", in SE $\frac{1}{4}$ sec.8, T.29 N., R.44 E., on right bank half a mile upstream and northeast of Elk.

Drainage area.--115 sq mi.

Records available.--July 1948 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,870 ft (from topographic map).

Average discharge.--12 years (1948-60), 59.8 cfs (43,290 acre-ft per year).

Extremes.--1948-60: Maximum discharge, 148 cfs Apr. 7, 1956 (gage height, 1.87 ft); maximum gage height, 2.98 ft Jan. 16, 1957 (backwater from ice); minimum discharge, 28 cfs Jan. 16, 1954 (gage height, 1.01 ft).

Remarks.--No regulation or diversion 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	53.4	53.7	58.3	61.5	75.9	78.7	98.1	80.8	65.6	52.7	48.9	48.3	64.6
1952	56.9	54.4	56.5	52.7	63.8	78.4	123	98.7	77.3	64.7	54.0	52.2	69.2
1953	50.4	51.5	51.8	72.9	77.2	68.5	69.3	66.1	62.3	49.0	44.5	42.9	58.8
1954	44.4	45.8	46.7	46.4	52.6	71.5	78.0	68.1	55.8	43.7	42.8	43.8	53.3
1955	41.2	39.5	42.4	44.8	44.6	47.1	67.1	70.3	51.9	45.1	40.4	40.1	47.9
1956	45.6	45.3	61.3	69.7	56.3	81.9	137	95.2	78.6	63.8	51.9	50.1	69.7
1957	48.8	48.2	53.7	49.0	49.1	61.6	68.1	70.9	62.1	48.1	45.0	42.8	54.0
1958	46.2	44.1	45.5	63.1	76.5	86.5	89.3	71.7	57.1	51.0	46.7	45.8	59.3
1959	45.1	46.2	47.2	62.5	58.1	66.9	80.3	71.6	63.4	48.0	42.3	44.5	56.5
1960	43.2	47.9	53.9	47.6	64.7	72.3	101	89.7	71.2	55.5	51.0	50.2	62.2

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	3,290	3,200	3,580	3,780	4,220	4,840	5,840	4,970	3,900	3,240	3,010	2,870	46,740
1952	3,500	3,240	3,480	3,240	3,670	4,700	7,300	6,070	4,600	3,980	3,320	3,110	50,210
1953	3,100	3,060	3,180	4,480	4,290	4,210	4,120	4,070	3,710	3,010	2,740	2,550	42,520
1954	2,730	2,730	2,870	2,850	2,920	4,400	4,640	4,190	3,320	2,690	2,630	2,610	38,580
1955	2,530	2,350	2,600	2,760	2,480	2,890	5,990	4,320	3,090	2,770	2,480	2,380	34,640
1956	2,810	2,690	3,770	4,290	3,240	5,040	8,140	5,850	4,680	3,920	3,190	2,980	50,600
1957	3,000	2,870	3,300	3,010	2,730	3,790	4,050	4,360	3,700	2,960	2,770	2,540	39,080
1958	2,840	2,630	2,800	3,260	4,250	5,320	5,320	4,410	3,400	3,140	2,870	2,720	42,960
1959	2,770	2,870	2,900	3,840	3,230	4,110	4,780	4,410	3,770	2,950	2,600	2,650	40,880
1960	2,650	2,850	3,320	2,930	3,720	4,440	6,000	5,460	4,240	3,410	3,140	2,990	45,150

Yearly 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	-	-	-	-	-	-	-	64.8	7.64	46,890	-	-
1951	1216	114	Apr. 4, 1951	47	64.6	0.562	7.63	46,740	64.8	7.66	46,890	-
1952	1246	128	(a)	50	69.2	.602	8.20	50,210	68.0	8.06	49,330	-
1953	1286	89	Jan. 23, 1953	42	58.8	.511	6.94	42,520	57.3	6.76	41,510	-
1954	1346	86	Mar.10, 11, 1954	40	53.3	.463	6.29	38,580	52.1	6.15	37,730	-
1955	1396	94	Apr. 23, 1955	37	47.9	.417	5.62	34,640	50.3	5.92	36,430	-
1956	1446	148	Apr. 7, 1956	38	69.7	.606	8.25	50,600	69.6	8.24	50,500	-
1957	1516	108	May 20, 1957	42	54.0	.470	6.36	39,080	52.7	6.21	38,180	-
1958	1566	113	Feb.26, 27, 1958	40	59.3	.516	7.00	42,960	59.7	7.04	43,230	-
1959	1636	101	Jan. 12, 1959	40	56.5	.491	6.66	40,880	56.8	6.70	41,160	-
1960	1716	137	Mar. 31, 1960	36	62.2	.541	7.36	45,150	-	-	-	-

a Apr. 8, 9, 14, 15, 18-22, 1952.

4310. Little Spokane River at Dartford, Wash.

Location--Lat 47°47'00", long 117°24'50", in NE $\frac{1}{4}$ sec.6, T.26 N., R.43 E., on right bank 50 ft downstream from highway bridge at Dartford, 6 miles upstream from mouth, and 8 miles north of Spokane.

Drainage area--665 sq mi.

Records available--April 1929 to September 1932, December 1946 to September 1960.

Gage--Water-stage recorder. Altitude of gage is 1,580 ft (from topographic map). Prior to Mar. 16, 1951, staff gage at same site and datum.

Average discharge--16 years (1929-32, 1947-60), 331 cfs (239,600 acre-ft per year).

Extremes--1929-32, 1946-60: Maximum discharge, 2,460 cfs Feb. 7, 1960 (gage height, 5.07 ft); minimum observed, 63 cfs July 24, 1930 (gage height, 1.07 ft).

Remarks--Small diversions for irrigation and domestic use above station. No known 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	209	235	346	425	676	669	951	480	270	180	149	162	394
1952	234	248	322	270	521	751	1,235	575	299	225	175	175	418
1953	177	191	216	420	499	454	504	504	376	193	151	151	318
1954	161	177	223	233	384	569	567	373	265	183	151	160	286
1955	156	180	187	193	205	279	665	556	271	183	138	135	262
1956	172	201	353	557	375	844	1,259	552	334	234	174	169	435
1957	189	193	239	173	311	501	509	523	324	162	130	142	283
1958	170	184	207	330	869	694	842	443	240	173	140	151	366
1959	166	204	222	616	424	658	704	544	357	188	151	174	367
1960	188	247	288	248	624	568	929	679	421	203	175	171	393

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	12,840	13,990	21,270	26,120	37,570	41,160	56,580	29,530	16,060	11,060	9,150	9,640	285,000
1952	14,410	14,770	19,810	16,630	29,950	46,180	73,460	35,360	17,780	13,820	10,770	10,440	303,400
1953	10,890	11,350	13,260	25,840	27,700	27,900	29,970	30,980	22,400	11,890	9,260	8,990	230,400
1954	9,890	10,520	13,730	14,320	21,550	35,010	33,730	22,940	15,760	11,270	9,310	9,510	207,300
1955	9,600	10,730	11,490	11,880	11,360	17,150	39,550	34,200	16,130	11,230	8,470	8,060	189,800
1956	10,570	11,990	21,710	34,250	21,570	51,870	74,910	33,950	19,850	14,400	10,680	10,030	315,800
1957	11,620	11,480	14,670	10,620	17,300	30,810	30,290	32,160	19,270	9,940	8,000	8,420	204,600
1958	10,440	10,970	12,710	20,280	48,280	42,660	50,100	27,270	14,260	10,650	8,640	9,010	285,300
1959	10,230	12,160	13,650	37,850	23,550	40,480	41,880	33,480	21,240	11,580	9,280	10,360	265,700
1960	11,540	14,720	17,710	15,270	35,900	34,930	55,280	41,780	25,020	12,480	10,730	10,170	285,500

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		Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	410	8.79	296,700
1951	1216	1,560	Feb. 11, 1951	140	394	0.592	8.03	285,000	395	8.07	285,900
1952	1246	1,580	Mar. 28, 1952	164	418	.629	8.55	303,400	399	8.16	289,900
1953	1286	a950	Apr. 29, 1953	134	318	.478	6.49	230,400	316	-	229,100
1954	1346	1,110	Mar. 10, 1954	131	286	-	-	207,300	283	5.77	205,000
1955	1396	1,320	Apr. 23, 1955	126	262	.394	5.34	189,800	279	5.70	202,300
1956	1446	1,720	Mar. 26, 1956	144	435	.654	8.91	315,800	419	8.59	304,100
1957	1516	2,060	Feb. 27, 1957	120	283	.426	5.77	204,600	278	5.67	200,900
1958	1566	2,040	Feb. 26, 1958	133	366	.550	7.46	265,300	369	7.51	267,200
1959	1636	2,060	Jan. 12, 1959	130	367	.552	7.48	265,700	378	7.72	273,700
1960	1716	2,460	Feb. 7, 1960	147	393	.591	8.06	285,500	-	-	-

a Estimated.

4315. Little Spokane River near Dartford, Wash.

Location.--Lat 47°46'50", long 117°29'45", in NW $\frac{1}{4}$ sec.3, T.26 N., R.42 E., in left center of stream on downstream side of county bridge, 3 miles upstream from mouth and 4 miles west of Dartford.

Drainage area.--698 sq mi.

Records available.--April 1948 to March 1952.

Gage.--Water-stage recorder. Altitude of gage is 1,550 ft (from topographic map).

Extremes.--1948-52: Maximum discharge, 2,220 cfs Mar. 18, 1950 (gage height, 7.40 ft); minimum, 377 cfs Sept. 3, 1949 (gage height, 2.89 ft).

Remarks.--No regulation. Many small diversions for irrigation and domestic use 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	446	476	586	666	866	878	1,171	732	508	418	394	405	627
1952	449	500	577	522	776	986	-	-	-	-	-	-	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	27,400	28,340	36,010	40,970	48,070	53,990	69,690	44,990	30,250	25,700	24,230	24,110	453,800
1952	30,100	29,750	35,470	32,120	44,640	60,640	-	-	-	-	-	-	-

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			Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	-	-	627	12.87	454,000
1951	1216	1,660	Feb. 12, 1951	388	627	0.898	12.19	453,800	632	12.28	457,300	-	-
1952	1246	1,850	Mar. 29, 1952	-	-	-	-	-	-	-	-	-	-

4325. Long Lake at Long Lake, Wash.

Location.--Lat 47°50'15", long 117°50'20", in NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.13, T.27 N., R.39 E., at left end of spillway at Long Lake dam, 12 miles north of Reardan.

Drainage area.--5,920 sq mi, approximately.

Records available.--October 1913 to September 1960. Prior to October 1950 monthly contents only, published in WSP 1316.

Gage.--Water-stage recorder and staff gage, with long distance indicator in powerhouse.

Datum of gage is at mean sea level (levels by Washington Water Power Co.).

Extremes.--1913-60: Maximum contents, 104,200 acre-ft for many days in 1950-56 (elevation, 1,536.0 ft); minimum since filling reservoir in 1920, 7,950 acre-ft Mar. 31, 1955 (elevation, 1,514.20 ft).

Remarks.--Reservoir is formed by concrete dam, completed in 1913 and raised in 1950.

Capacity, 104,200 acre-ft between elevations 1,512 (lower limit of normal operation) and 1,536 ft (top of gates). Contents at elevation 1,512 ft by capacity table used prior to October 1915, 148,600 acre-ft. Records given herein represent usable contents. Water used for power. Diversions above station for irrigation of about 25,000 acres in Idaho and Washington. Other regulation in Coeur d'Alene Lake (see p. 314) and at powerplants along Spokane River.

Cooperation.--Lake elevations and capacity table furnished by Washington Water Power Co.

Correction.--Figures of contents for the water years 1916-33 were listed in error in

WSP 1316, correct listing is given herewith:

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

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1916	400	4,900	4,700	7,200	12,900	33,500	31,000	25,700	24,300	7,050	4,500	4,090
1917	5,100	5,400	5,190	5,250	5,830	9,620	33,540	44,000	23,660	10,640	9,540	8,700
1918	8,780	6,300	42,300	20,000	14,200	25,500	29,000	20,500	2,000	2,500	400	4,000
1919	5,250	8,400	8,700	24,500	9,020	32,300	35,020	53,000	59,600	59,750	58,400	59,100
1920	60,800	60,650	57,700	59,750	48,800	55,250	60,000	56,800	62,950	63,850	67,550	67,300
1921	67,300	65,700	49,500	52,300	48,600	48,150	47,700	47,700	77,450	79,400	77,950	77,700
1922	79,200	75,050	78,950	78,950	77,200	60,650	79,200	60,650	79,200	79,600	77,450	79,200
1923	77,200	78,200	78,950	70,600	77,950	77,000	68,950	74,500	77,700	77,200	78,700	79,600
1924	77,950	78,950	78,950	75,550	67,300	74,150	71,900	68,300	77,950	78,700	78,700	79,850
1925	77,950	77,950	77,000	73,650	68,500	71,100	68,300	68,500	79,400	77,950	79,400	78,450
1926	77,200	78,950	79,200	76,050	75,800	73,000	68,500	77,450	78,950	77,700	78,200	78,700
1927	78,700	72,500	73,900	76,550	70,100	69,900	65,700	63,850	74,800	79,200	78,950	78,700
1928	77,450	70,100	71,500	72,000	74,800	68,950	70,600	65,900	79,400	79,200	78,450	78,450
1929	76,300	79,200	78,700	74,600	58,200	68,050	67,100	67,800	78,700	78,700	77,700	79,200
1930	74,400	63,600	74,150	68,050	62,700	9,900	29,800	66,150	77,450	76,550	78,700	78,200
1931	78,450	78,700	74,600	78,450	77,200	73,400	72,250	76,300	74,600	78,700	77,700	75,050
1932	77,000	77,000	75,550	72,000	63,200	66,150	60,200	64,500	79,400	79,400	76,800	76,300
1933	79,200	75,550	76,800	74,800	75,300	70,850	71,500	64,500	72,500	77,700	78,450	77,450
1951	103,250	103,300	87,140	101,800	98,700	102,450	97,200	96,200	102,400	102,750	98,800	103,500
1952	100,750	83,940	95,300	102,200	102,350	101,900	84,790	97,500	103,250	101,500	101,700	104,200
1953	140,200	103,400	102,100	97,500	102,800	102,650	96,800	100,900	99,700	102,950	96,950	102,700
1954	98,500	103,050	99,200	99,600	96,350	101,450	98,200	99,950	102,300	93,350	103,450	103,200
1955	103,700	100,950	84,900	54,450	40,950	7,950	102,700	100,350	99,700	103,350	103,800	102,000
1956	102,300	103,400	99,100	103,650	98,250	93,700	88,600	91,400	98,200	103,000	100,750	103,350
1957	101,950	87,400	101,050	68,600	58,600	97,200	100,700	89,300	97,300	103,250	102,150	103,200
1958	102,450	102,150	101,300	96,350	98,250	102,700	97,850	99,700	101,200	101,100	101,600	103,150
1959	96,200	103,350	101,700	97,500	101,600	101,700	99,650	98,850	101,750	98,550	103,350	103,250
1960	101,450	99,200	103,600	90,450	90,900	72,450	65,500	101,650	102,100	102,900	103,150	92,800

Note.--Contents based on 8 a.m. readings for first day of the following month from October 1915 to December 1923 and January 1927 to September 1933 and from mean daily elevations from January 1924 to December 1926.

SPOKANE RIVER BASIN

4330. Spokane River at Long Lake, Wash.

Location.--Lat 47°50'15", long 117°50'25", in SW $\frac{1}{4}$ sec.13, T.27 N., R.39 E., on left bank at Long Lake powerhouse, $1\frac{1}{2}$ miles upstream from Chamokane Creek and 12 miles north of Reardan.

Drainage area.--5,920 sq mi, approximately.

Records available.--April 1939 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,299.00 ft above mean sea level, datum of 1929.

Average discharge.--21 years (1939-60), 8,122 cfs (5,880,000 acre-ft per year), adjusted for storage.

Extremes.--1939-60: Maximum discharge recorded, 49,400 cfs May 24, 1948 (gage height, 78.66 ft); minimum not determined, occurred sometime during periods of backwater; minimum daily, 114 cfs Sept. 2, 1956.

Remarks.--Flow partly regulated above station by Coeur d'Alene Lake (see p. 314), Long Lake (see preceding page), and by powerplants of Washington Water Power Co. Many diversions above station, including Spokane Valley Farms Co.'s canal and Rathdrum Prairie Canal (see elsewhere in this report) for irrigation of several thousand acres above station. Records of water temperatures for the period July 1959 to September 1960 are published in reports of 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	3,487	5,867	11,150	10,230	18,880	10,090	17,810	19,060	8,073	3,011	1,859	1,769	9,205
1952	4,278	5,254	7,058	5,739	8,001	7,492	20,780	24,530	8,088	3,595	1,821	2,374	8,243
1953	2,576	2,981	3,269	8,318	13,250	7,755	10,260	20,860	14,870	2,870	2,157	2,282	7,575
1954	3,256	3,148	4,945	5,747	9,611	11,180	16,000	25,550	16,180	4,212	2,368	2,481	8,708
1955	3,996	4,957	4,979	4,166	4,664	4,688	8,756	20,370	18,000	4,384	2,063	2,257	6,942
1956	3,869	6,815	14,760	13,140	6,506	10,660	26,850	31,820	16,770	3,342	2,464	2,375	11,630
1957	3,636	4,413	4,554	5,474	4,683	10,720	17,440	30,660	13,920	2,658	2,006	1,909	8,529
1958	3,309	3,760	3,974	5,115	11,540	10,510	17,120	21,070	7,539	2,758	1,646	2,158	7,508
1959	2,683	6,498	10,200	16,430	10,180	9,766	18,290	23,000	16,420	3,296	1,889	3,105	10,140
1960	4,327	9,065	7,780	6,170	7,841	9,417	23,370	17,800	11,530	2,887	2,084	3,122	8,756

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	214.4	349.1	685.6	628.8	1,048	620.3	1,060	1,172	480.4	185.2	114.3	105.2	6,663
1952	263.1	312.6	434.0	352.9	460.2	460.7	1,236	1,508	481.2	221.1	112.0	141.3	5,983
1953	156.4	177.4	201.0	511.5	735.8	476.8	610.7	1,283	884.9	176.5	132.6	135.8	5,484
1954	200.2	187.3	304.1	353.4	533.8	687.4	951.8	1,571	962.8	259.0	145.6	147.6	6,304
1955	245.7	295.0	306.1	256.2	259.0	288.3	521.0	1,253	1,071	269.6	126.9	134.3	5,026
1956	239.1	405.5	907.8	807.7	374.2	655.6	1,598	1,956	997.7	205.5	151.5	141.3	8,440
1957	223.5	282.6	280.0	336.6	260.1	659.3	1,038	1,885	828.5	163.4	123.4	113.6	6,174
1958	203.5	223.8	244.4	314.5	641.0	646.4	1,019	1,296	448.6	169.6	101.2	128.4	5,436
1959	165.0	366.6	627.2	1,010	565.5	600.5	1,089	1,414	977.2	202.7	116.2	184.8	7,339
1960	266.1	539.4	476.4	379.4	451.0	579.0	1,391	1,095	666.1	177.5	128.1	185.8	6,357

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	Runoff in acre-feet	Mean	Runoff in inches	Mean	Runoff in acre-feet	Mean	Runoff in inches			
		Discharge	Date												
1950	-	-	-	-	-	-	-	-	12,010	6,998,000	12,010	-	27.54		
1951	1216	44,900	Apr. 15, 1951	222	9,205	6,663,000	9,207	21.11	8,874	5,424,000	8,885	-	20.37		
1952	1246	38,000	May 9, 1952	174	8,243	5,983,000	8,243	18.95	7,591	5,510,000	7,598	-	17.47		
1953	1286	34,100	Apr. 30, 1953	202	7,575	5,484,000	7,574	17.37	7,785	6,339,000	7,785	-	17.85		
1954	1346	44,400	May 25, 1954	144	8,708	6,304,000	8,709	19.97	8,922	6,459,000	8,902	-	20.41		
1955	1396	28,600	June 15, 1955	144	6,942	5,026,000	6,941	15.92	7,917	5,732,000	7,937	-	18.20		
1956	1446	45,100	Apr. 25, 1956	114	11,630	8,440,000	11,630	26.73	10,547	6,554,000	10,550	-	24.25		
1957	1516	47,400	May 24, 1957	144	8,523	6,174,000	8,529	19.55	8,398	6,080,000	8,398	-	19.26		
1958	1566	32,600	Apr. 23, 1958	150	7,508	5,436,000	7,508	17.22	8,205	6,944,000	8,209	-	18.83		
1959	1636	38,100	Jan. 25, 1959	150	10,140	7,339,000	10,140	23.24	10,287	7,444,000	10,280	-	23.58		
1960	1716	29,700	Mar. 31, 1960	330	8,756	6,357,000	8,743	20.10	-	-	-	-	-		

4345. Sanpoil River near Keller, Wash.

Location.--Lat 48°06'30", long 118°41'50", in SE $\frac{1}{4}$ sec.7, T.30 N., R.33 E., on right bank 0.3 mile upstream from Brush Creek and 2 $\frac{1}{4}$ miles north of Keller.

Drainage area.--890 sq mi, approximately.

Records available.--August 1952 to September 1955, water years 1956-59 (annual maximum).

Gage.--Staff gage in stilling well. Datum of gage is 1,464.08 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Aug. 28, 1952, to Sept. 30, 1955, water-stage recorder at same site and datum.

Extremes.--1952-59: Maximum discharge, 3,920 cfs Apr. 23, 1956 (gage height, 10.02 ft, from high-water mark in well).
1952-55: Minimum discharge, 32 cfs Sept. 13, 1955 (gage height, 3.72 ft).

Remarks.--No regulation. At high stage and during irrigation season water is sometimes diverted into Kettle River basin through Curlew Lake and Creek. At extreme stages there may be some flow from Curlew Creek into Sanpoil 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
1952	-	-	-	-	-	-	-	-	-	-	-	47.3	-
1953	47.9	55.1	62.5	137	179	353	785	1,158	640	211	80.5	53.8	314
1954	57.2	62.3	62.7	67.9	113	274	678	637	298	119	54.6	56.4	207
1955	52.7	83.5	70.0	63.3	63.3	73.5	608	773	379	196	81.9	39.3	207

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1952	-	-	-	-	-	-	-	-	-	-	-	2,820	-
1953	2,940	3,280	3,850	8,440	9,960	21,700	46,720	71,180	38,090	13,000	4,950	3,200	227,300
1954	3,520	3,710	3,860	4,170	6,280	16,850	40,350	39,180	17,700	7,320	3,360	3,360	149,700
1955	3,240	4,970	4,300	3,890	3,510	4,520	36,150	47,500	22,570	12,070	5,040	2,340	150,100

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								
1951								
1952	1246	-	-	-	-	-	-	-
1953	1286	2,210	Apr. 29, 1953	44	314	227,300	315	228,300
1954	1346	1,200	May 12, 1954	44	207	149,700	209	151,100
1955	1396	1,120	Apr. 23, 1955	32	207	150,100	-	-
1956	1566	3,920	Apr. 23, 1956	-	-	-	-	-
1957	1566	1,420	May 21, 1957	-	-	-	-	-
1958	1566	1,350	-	-	-	-	-	-
1959	1636	1,080	-	-	-	-	-	-
1960								

4355. Feeder canal at Grand Coulee, Wash.

Location.--Lat 47°57'00", long 118°59'40", on line between secs.1 and 2, T.28 N., R.30 E., on left bank at Grand Coulee, a quarter of a mile downstream from intake and half a mile southwest of Grand Coulee Dam.

Records available.--October 1951 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,550.0 ft above mean sea level, Bureau of Reclamation adjustment of 1937. Supplementary water-stage recorder 3,100 ft downstream from base gage at same datum. Auxiliary water-stage recorder 1 mile downstream from base gage.

Extremes.--1951-60: Maximum daily discharge, 11,000 cfs July 11, 1954; no flow except during pumping seasons.

Remarks.--Water is pumped (beginning May 1951) from Franklin D. Roosevelt Lake behind Grand Coulee Dam, through a lift of about 280 ft into feeder canal for a distance of 2 miles into Banks Lake (formerly called equalizing reservoir). From Banks Lake it is distributed through a system of canals to the Columbia Basin project.

Monthly and yearly diversion, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	117,000	1,000	0	0	0	0	0	93,770	144,600	215,800	185,400	543	758,100
1952	1,190	0	0	0	0	0	0	188,200	339,500	234,800	0	0	763,700
1953	0	0	0	0	0	0	0	160,300	552,700	435,400	195,900	24,600	1,489,000
1954	3,120	135,300	12,260	0	0	0	0	95,030	538,700	373,900	247,100	70,800	1,476,000
1955	48,380	224,500	52,540	0	0	0	83,530	225,400	240,700	281,700	239,100	15,910	1,412,000
1956	0	0	0	0	0	0	101,600	289,200	412,300	270,200	128,300	0	1,202,000
1957	0	0	0	0	236,400	140,100	0	249,200	466,300	547,400	283,100	136,000	1,858,000
1958	0	103,100	0	0	0	0	0	140,300	372,600	515,400	329,900	85,610	1,347,000
1959	0	0	0	0	0	0	78,270	353,400	546,500	408,900	514,100	140,400	1,606,000
1960													

COLUMBIA RIVER MAIN STEM

4360. Franklin D. Roosevelt Lake at Grand Coulee Dam, Wash.

Location.--Lat 47°57'20", long 118°59'10", in lot 3, sec.1, T.28 N., R.30 E., in block 12 of Grand Coulee Dam at Grand Coulee.

Drainage area.--74,100 sq mi, approximately.

Records available.--April 1938 to September 1960. Prior to October 1943, published as Columbia River Reservoir at Grand Coulee Dam.

Gage.--Water-stage recorder. Datum of gage is at mean sea level, Bureau of Reclamation datum, or 1,425 ft above mean sea level, datum of 1929, supplementary adjustment of 1947 (levels by Bureau of Reclamation). Prior to Apr. 24, 1942, staff gage at site 2,000 ft upstream at same datum.

Extremes.--1938-60: Maximum contents recorded, 9,586,200 acre-ft July 17, 1942, June 3, 1945 (elevation, 1,290.3 ft); minimum observed, 16,200 acre-ft Aug. 29, 1938 (elevation, 956.1 ft).

Remarks.--Reservoir is formed by concrete dam; construction of dam began in 1934; completed in 1941; storage began early in construction period. Capacity, 5,071,700 acre-ft between elevations 1,208 (proposed lower limit of operation) and 1,288 ft (top of gates) above mean sea level. Storage below 1,208 ft, 4,330,000 acre-ft. Figures given herein represent total contents. Water is used for power development and diversion by pumping for irrigation of Grand Coulee project (began in May 1951) of Bureau of Reclamation.

Correction.--In WSP 1316, the month-end contents for December 1942 is listed in error; it should be 9,269,600 acre-ft.

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	9,472.6	9,407.0	9,431.6	9,267.6	9,374.2	8,999.0	9,210.2	9,572.0	9,646.7	9,638.4	9,480.9	9,489.0
1952	9,464.4	9,226.6	8,715.2	7,389.8	6,688.4	5,381.5	7,598.0	8,808.8	9,638.4	9,621.8	9,456.2	9,456.2
1953	9,288.7	9,237.3	8,600.1	8,445.8	7,868.3	6,386.8	5,367.6	8,770.0	9,567.7	9,549.1	9,548.3	9,310.2
1954	9,305.4	9,306.2	9,069.8	7,955.0	7,492.5	7,263.6	8,183.5	8,412.3	8,702.7	9,554.0	9,558.0	9,396.1
1955	9,338.0	9,371.4	9,083.1	8,194.4	6,955.9	5,063.4	4,960.1	8,305.5	9,547.5	9,554.0	9,488.1	9,378.6
1956	9,451.3	9,393.7	9,548.3	9,314.1	8,493.8	8,379.5	7,473.8	8,724.1	9,556.4	9,554.0	9,554	9,385.0
1957	9,356.3	9,119.1	8,800.7	7,330.6	6,132.4	6,433.7	6,743.0	9,097.2	9,550.0	9,539.5	9,242.8	9,352.3
1958	9,374.6	9,306.2	8,975.4	8,056.1	7,275.1	6,367.2	6,525.4	9,201.7	9,552.4	9,548.3	9,555.6	9,536.3
1959	9,370.6	9,529.1	9,478.9	9,529.1	8,864.6	7,003.0	6,741.1	7,733.2	9,547.5	9,540.3	9,555.6	9,545.9
1960	9,551.6	9,466.5	8,930.4	7,701.5	6,972.4	7,057.6	7,217.3	8,035.1	9,545.9	9,549.1	9,510.6	9,379.4

Location--Lat 47°58'00", long 118°58'45", opposite lot 4, sec.36, T.29 N., R.30 E., in pier 3 of highway bridge, 2,500 ft downstream from Grand Coulee Dam and 14 miles upstream from Nespelem River.

Records available.--April 1913 to June 1923 (monthly discharge only), July to December 1923, January 1924 to May 1928 (monthly discharge only), June 1928 to September 1960. Published as "at Grand Coulee, near Nespelem" prior to 1936 and as "at Grand Coulee" 1936-42.

Average discharge.--47 years (1913-60), 109,500 cfs (79,270,000 acre-ft per year),
unadjusted.

Remarks.--Feeder canal diverts water by pumping from Franklin D. Roosevelt Lake for Columbia Basin project. Other diversions above station for irrigation are a small percentage of flow past gage. Flow regulated by Franklin D. Roosevelt Lake (see preceding page) and reservoirs in Kootenai, Pend Oreille, and Spokane River basins. Records of water temperatures for the period November 1950 to September 1958 are published in reports of Geological Survey.

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	61,940	68,250	69,810	76,640	86,840	74,350	11,201	70,056	40,027	40,129	69,140		154,400
1952	74,230	60,710	60,950	69,980	63,550	74,130	75,028	20,556	80,019	90,950	58,710		112,400
1953	52,270	51,050	47,910	44,350	64,170	73,690	75,130	22,008	50,026	60,011	81,170		105,000
1954	68,500	61,920	54,640	61,640	56,180	65,030	58,403	22,352	50,058	100,029	60,016	30,007	135,400
1955	85,640	65,110	64,300	63,510	71,710	79,200	71,520	75,320	29,000	70,000	20,033	33,700	113,000
1956	62,210	66,190	62,320	65,480	65,610	66,740	76,027	79,005	99,400	219,600	60,113	000	157,200
1957	62,200	61,500	52,430	55,890	64,760	49,230	69,480	74,500	288,400	145,700	92,690	60,160	108,300
1958	59,240	57,190	54,780	73,280	62,730	78,530	65,110	19,096	00,288	70,153	60,870	87,520	104,500
1959	62,130	54,610	58,800	70,980	75,000	89,640	110,021	11,800	35,700	269,100	124,100	10,400	131,300
1960	104,700	95,530	77,430	70,980	67,100	65,940	147,100	71,000	245,900	90,231	50,013	30,130	121,800

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	3,809	4,061	4,292	4,712	4,824	4,572	6,614	17,320	18,230	16,750	7,968	4,114	97,270
1952	4,564	6,162	7,348	4,303	3,649	4,558	4,392	16,060	15,280	11,800	6,121	3,493	81,580
1953	3,214	3,038	2,946	2,727	3,564	4,543	4,471	17,514	18,340	13,940	6,874	4,830	78,000
1954	4,212	3,684	3,359	3,790	3,120	4,060	4,377	14,290	21,310	20,260	10,100	6,369	98,030
1955	4,036	3,874	3,953	3,893	3,982	4,870	4,256	4,631	17,300	18,460	8,222	4,312	81,790
1956	3,625	3,839	3,832	4,026	3,785	4,104	10,500	17,090	23,770	13,500	6,948	4,286	99,600
1957	3,625	3,854	3,347	3,500	3,587	3,027	4,133	16,080	17,220	8,838	5,699	3,580	78,430
1958	3,643	4,422	3,445	3,500	3,484	4,829	5,036	12,850	17,780	9,443	5,381	3,799	75,400
1959	3,820	3,249	3,616	3,364	4,165	5,524	6,546	13,000	20,030	16,540	7,630	6,568	95,050
1960	6,435	5,685	4,761	4,346	3,860	4,057	8,755	10,570	14,630	14,230	6,967	4,127	88,420

Year	WSP	Water year ending Sept. 30							Calendar year						
		Observed					Adjusted		Observed			Adjusted			
		Momentary maximum		Min- imum day	Mean	Runoff in acre-feet	Mean	Per square mile	Runoff in inches	Mean	Runoff in acre-feet	Mean	Runoff in inches		
		Discharge	Date												
1950	-	-	-	-	-	-	-	-	-	-	-	-	-		
1951	1216	376,600	May 28, 1951	487,000	134,400	97,270,000	135,100	1.82	24,750	13,400	96,140,000	133,000	-		
1952	1246	354,700	May 25, 1952	245,000	112,400	81,580,000	113,400	1.53	20,820	10,600	97,030,000	133,900	-		
1953	1286	374,000	June 17, 1953	284,000	105,000	76,000,000	-	-	107,600	78,060,000	-	-	-		
1954	1346	403,500	July 10, 1954	438,700	135,400	98,030,000	-	-	136,300	98,640,000	-	-	-		
1955	1396	414,100	June 28, 1955	436,000	113,000	81,790,000	-	-	112,600	81,520,000	-	-	-		
1956	1446	522,000	June 8, 1956	642,200	137,200	99,600,000	-	-	136,300	98,960,000	-	-	-		
1957	1516	401,800	May 26, 1957	273,000	108,300	78,430,000	-	-	107,400	77,790,000	-	-	-		
1958	1566	387,100	June 6, 1958	567,000	104,500	75,640,000	-	-	105,000	76,020,000	-	-	-		
1959	1636	426,400	June 28, 1959	574,000	131,300	95,050,000	-	-	139,900	101,250,000	-	-	-		
1960	1716	297,700	July 1, 1960	498,000	121,600	88,420,000	-	-	-	-	-	-	-		

4379. Rufus Woods Lake at Bridgeport, Wash.

Location.--Lat 47°59'40", long 119°38'05", in SW $\frac{1}{4}$ sec.24, T.29 N., R.25 E., in intake structure of Chief Joseph Dam, half a mile upstream from Foster Creek and $\frac{1}{2}$ miles southeast of Bridgeport.

Drainage area.--75,000 sq mi, approximately.

Records available.--November 1954 to September 1960.

Gage.--Water-stage transmitter and recorder. Datum of gage is at mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to June 28, 1955, staff gage at same site and datum.

Extremes.--1954-60: Maximum contents, 532,200 acre-ft June 27, 1956 (elevation, 948.1 ft); minimum since normal low operating level reached in November 1954, 380,500 acre-ft July 6, 1958 (elevation, 927.0 ft).

Remarks.--Reservoir is formed by concrete gravity-type dam completed in June 1955; storage began in November 1954. Capacity, 287,600 acre-ft between elevations 901.5 (spillway crest and lower limit of operation) and 946.0 ft (normal maximum operating pool). Storage below 901.5 ft, 228,600 acre-ft. Records given herein represent total contents. Water used for power development.

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

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1955	-	40,000	249,000	269,300	286,600	281,500	282,600	299,400	516,300	442,800	452,900	424,400
1956	458,700	447,100	499,100	452,200	462,300	437,100	429,300	427,200	427,200	425,800	435,700	428,600
1957	432,900	435,700	433,600	427,900	419,500	441,400	435,700	508,800	495,200	426,500	516,300	508,000
1958	499,800	505,000	508,000	508,800	506,000	487,200	435,700	452,900	435,700	488,000	422,300	470,300
1959	504,300	492,400	473,300	489,500	474,000	459,400	470,300	495,400	506,000	485,000	496,100	493,900
1960	494,600	496,900	514,000	477,600	502,000	482,800	493,200	483,500	491,700	511,800	503,600	468,200

4380. Columbia River at Bridgeport, Wash.

Location.--Lat 48°00'25", long 119°39'50", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.14, T.29 N., R.25 E., on left bank at Bridgeport, 1 mile downstream from Foster Creek and 1½ miles downstream from Chief Joseph Dam.

Drainage area.--75,000 sq mi, approximately.

Records available.--April 1952 to September 1960.

Gage.--Water-stage recorder. Datum of gage is at mean sea level (levels by Corps of Engineers).

Average discharge.--8 years (1952-60), 119,900 cfs (86,800,000 acre-ft per year).

Extremes.--1952-60: Maximum discharge, 488,600 cfs June 7, 1956 (elevation, 792.20 ft); minimum recorded, 31,000 cfs Dec. 21, 1956 (elevation, 753.88 ft); minimum daily, 31,000 cfs Jan. 11, 1953.

Remarks.--Feeder canal diverts water by pumping from Franklin D. Roosevelt Lake for Columbia Basin project. Other diversions above station for irrigation are small percentage of flow past gage. Flow regulated by Rufus Woods Lake (see p. 332), Franklin D. Roosevelt Lake (see p. 330), and reservoirs in Kootenai, Flathead, Pend Oreille, and Spokane River basins.

Monthly and yearly 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	-	-	-	-	-	-	78,030	260,300	257,600	194,800	102,800	61,680	-
1953	54,890	53,370	50,020	46,710	66,640	76,040	77,850	122,000	509,100	27,400	114,300	85,850	106,900
1954	70,390	63,320	56,380	63,480	57,660	67,800	60,170	225,800	556,500	329,800	165,900	107,900	135,900
1955	68,020	66,460	62,230	63,160	71,890	79,550	72,500	75,090	285,300	305,300	131,400	76,110	113,200
1956	62,710	67,420	63,030	68,020	67,550	68,320	173,600	279,200	593,000	222,200	112,500	74,210	137,600
1957	64,880	61,440	55,510	73,050	65,950	51,160	69,870	270,400	290,600	145,000	90,620	60,670	108,500
1958	59,530	56,610	52,060	55,320	62,650	80,530	86,350	192,000	295,500	150,300	88,600	63,280	103,700
1959	61,610	54,560	58,660	70,660	75,690	90,190	109,400	210,900	334,300	217,000	123,800	10,500	131,200
1960	104,500	95,140	77,630	71,040	66,710	66,260	147,100	172,600	246,000	231,300	113,800	69,830	121,900

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	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	3,375	3,176	3,076	2,872	3,701	4,676	4,643	16,000	15,330	11,980	6,319	3,671	77,390
1954	4,328	3,768	3,467	3,903	3,202	4,169	3,581	13,870	21,210	20,280	10,207	4,990	99,400
1955	4,182	3,895	3,826	3,884	3,993	4,891	4,314	4,617	16,980	18,770	8,078	4,529	81,960
1956	3,856	4,012	3,875	4,183	3,886	4,201	10,330	17,170	23,390	13,660	6,920	4,416	99,900
1957	3,989	3,656	3,413	4,491	3,663	3,146	4,158	16,630	17,290	8,914	5,572	3,610	78,530
1958	3,660	3,369	3,201	3,402	3,479	4,952	5,138	11,800	17,580	9,243	5,448	3,765	75,040
1959	3,788	3,247	3,607	4,345	4,204	5,545	6,511	12,970	19,870	16,660	7,611	6,576	94,950
1960	6,428	5,661	4,773	4,368	3,837	4,074	8,756	10,610	14,640	14,220	6,995	4,155	88,520

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	1286	349,700	May 26, 1952	-	-	-	-	-	-
1953	1286	374,500	June 17, 1953	31,000	108,900	77,390,000	109,800	79,330,000	
1954	1346	395,800	July 14, 1954	39,100	135,900	98,400,000	136,400	98,740,000	
1955	1396	418,000	June 30, 1955	46,100	113,200	81,960,000	133,000	81,800,000	
1956	1446	488,600	June 7, 1956	47,000	137,600	99,900,000	136,700	99,210,000	
1957	1516	398,000	May 25, 1957	36,600	108,500	78,530,000	107,300	77,700,000	
1958	1566	376,600	June 5, 1958	36,400	103,700	75,040,000	104,200	75,450,000	
1959	1636	397,500	June 27, 1959	42,000	131,200	94,950,000	139,800	101,200,000	
1960	1716	288,300	July 5, 1960	50,100	121,900	99,520,000	-	-	

4385. Okanogan River at Okanogan Falls, British Columbia

(International gaging station)

Location.--Lat 49°20', long 119°35', on right bank 0.1 mile downstream from dam at outlet of Skaha Lake at Okanogan Falls.

Drainage area.--2,650 sq mi, approximately.

Records available.--January 1915 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Datum of gage is 1,092.82 ft above mean sea level (Geodetic Survey of Canada, 1947 joint adjustment). Prior to Oct. 2, 1933, staff gages at sites 600 to 700 ft upstream at different datums. Oct. 2, 1933, to Apr. 13, 1936, staff gage and Apr. 14, 1936, to Nov. 12, 1954, water-stage recorder, at site 200 ft upstream at same datum.

Average discharge.--45 years (1915-60), 529 cfs (383,000 acre-ft per year).

Extremes.--1915-60: Maximum discharge, 2,790 cfs Apr. 25, 1958 (gage height, 2.88 ft); minimum observed, 4.6 cfs Mar. 14, 1931.

Remarks.--Diversions above station for irrigation of approximately 38,000 acres. Flow regulated by control dams at outlets of Okanogan and Skaha Lakes.

Cooperation.--This station is 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	498	545	646	686	721	836	893	1,230	1,240	1,180	865	711	838
1952	765	787	791	687	800	566	815	1,270	953	832	729	742	811
1953	598	235	173	170	182	192	201	534	483	684	680	601	396
1954	561	578	606	508	846	637	399	519	714	1,080	1,030	824	691
1955	645	772	773	690	680	664	644	624	938	883	834	846	750
1956	467	297	281	475	575	679	809	1,130	1,310	1,310	692	500	711
1957	437	408	542	528	487	459	448	769	740	734	846	679	574
1958	621	553	522	516	515	508	873	664	584	548	551	506	578
1959	350	356	420	452	669	808	825	1,380	1,700	999	621	551	761
1960	491	1,090	1,150	903	612	356	423	430	417	541	573	558	629

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	30,640	32,430	39,720	42,190	40,030	51,400	53,160	75,910	73,610	72,480	53,160	42,310	607,000
1952	47,060	46,820	46,630	42,250	26,010	34,430	48,510	77,970	56,710	51,160	44,820	44,150	588,500
1953	36,750	13,990	10,610	10,470	10,120	11,810	11,940	32,840	28,720	42,030	41,790	35,740	286,800
1954	34,480	34,390	37,240	31,260	46,960	39,190	23,730	31,890	42,510	66,160	63,580	49,040	500,400
1955	39,650	45,960	47,560	42,460	37,770	40,830	38,330	38,370	55,810	54,270	51,300	50,330	542,600
1956	28,710	17,680	17,260	29,240	33,050	41,730	48,110	69,320	78,050	80,360	42,560	29,740	515,800
1957	26,850	24,170	33,550	32,340	27,070	29,210	26,670	47,290	44,020	45,150	39,750	40,430	415,300
1958	38,190	31,730	32,070	31,740	28,600	31,090	51,970	40,830	34,780	33,680	33,880	30,080	418,600
1959	21,500	21,210	25,800	27,810	37,140	49,650	49,060	84,890	101,100	61,400	38,210	32,770	550,500
1960	30,190	64,750	70,910	55,520	35,190	21,910	25,140	26,470	24,830	33,260	35,250	33,200	456,600

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	-	-	-	-	-	-	878	490,800
1951	1216	1,440	May 13, 1951	475	838	607,000	893	646,800
1952	1246	1,410	May 20, 1952	524	811	588,500	699	507,400
1953	1286	1,040	May 22, 1953	152	396	286,800	458	331,600
1954	1346	1,190	July 11, 1954	68	691	500,400	729	527,500
1955	1396	1,030	June 10, 1955	45	750	542,600	653	473,100
1956	1446	1,540	July 15, 1956	276	711	515,800	739	536,600
1957	1516	1,670	Aug. 27, 1957	223	574	415,300	598	432,900
1958	1568	2,790	Apr. 25, 1958	442	578	418,600	532	395,200
1959	1636	2,150	May 25, 1959	315	761	550,500	895	647,900
1960	1716	1,380	Nov. 26, 1959	315	629	456,600	-	-

4395. Okanogan River at Oroville, Wash.

Location.--Lat 48°55'55", long 119°25'05", in SW $\frac{1}{4}$ sec.27, T.40 N., R.27 E., on left bank in Oroville, 20 ft downstream from Great Northern Railway trestle, half a mile downstream from Tonasket Creek, and $\frac{1}{2}$ miles downstream from Osoyoos Lake.

Drainage area.--3,210 sq mi, approximately.

Records available.--October 1942 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 899.77 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Oct. 26, 1944, staff gage at Zosel's milldam 200 ft upstream at same datum. Oct. 26, 1944, to Mar. 6, 1948, water-stage recorder on railroad trestle 20 ft upstream at same datum. Auxiliary water-stage recorder half a mile downstream used during high-water periods since Apr. 10, 1948. May 15, 1946, to Apr. 9, 1948, auxiliary staff gage at same site and datum.

Average discharge.--18 years (1942-60), 737 cfs (533,600 acre-ft per year).

Extremes.--1942-60: Maximum discharge recorded, 3,430 cfs June 2, 1948 (gage height, 15.28 ft); maximum gage height, 16.50 ft May 31, 1948 (backwater from Similkameen River); maximum daily reverse flow, 2,270 cfs May 29, 1948; minimum gage height, 3.98 ft Mar. 1, 1948.

Remarks.--Diversions made to irrigate approximately 44,000 acres in Canada and minor diversions in the United States above station. Natural regulation in several large lakes and artificial regulation in Okanogan Lake as an aid to navigation in that lake; also variations in pondage back of Zosel's milldam at Oroville, 200 ft above gage. Records of water temperatures for the period July 1959 to September 1960 are published in reports of 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	559	607	674	769	869	879	1,180	1,930	1,587	1,193	888	806	977
1952	656	872	745	737	917	749	1,035	1,818	1,024	845	652	701	911
1953	713	341	280	231	282	215	256	870	788	613	546	643	483
1954	572	615	662	628	859	749	526	725	905	1,071	880	920	759
1955	746	811	674	830	779	664	650	802	1,212	918	784	827	824
1956	526	394	339	511	565	800	1,045	1,643	1,778	1,522	704	455	858
1957	495	475	556	561	491	475	503	1,195	829	626	464	657	612
1958	769	572	616	586	557	578	1,082	1,289	683	467	427	521	679
1959	489	458	471	609	632	843	903	1,767	2,122	1,178	542	576	884
1960	555	1,047	1,281	1,114	844	333	527	684	477	351	449	561	685

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	34,400	36,110	41,420	47,290	48,240	54,040	70,200	118,700	82,510	73,370	53,400	47,930	707,600
1952	52,630	51,890	45,810	45,310	52,770	46,040	61,580	111,800	60,960	51,940	38,880	41,700	661,300
1953	43,860	20,280	17,210	14,210	15,680	13,110	15,240	53,520	46,910	37,710	33,550	38,280	349,600
1954	35,160	36,600	40,700	38,630	48,290	46,040	31,300	44,570	53,850	65,830	54,140	54,750	549,900
1955	45,840	48,230	53,760	51,030	43,260	40,810	38,670	49,310	72,110	56,440	48,190	49,180	596,800
1956	32,320	23,470	20,850	31,420	32,520	49,220	62,190	101,000	105,800	93,560	43,290	27,060	622,700
1957	30,430	28,280	34,180	34,510	27,290	29,210	29,960	73,480	49,310	38,510	28,520	39,070	442,800
1958	47,310	34,020	37,860	36,060	30,910	35,540	64,370	79,250	40,650	28,720	26,260	31,000	491,900
1959	30,090	27,240	28,940	37,470	35,100	52,210	54,110	108,700	26,300	72,440	33,340	34,260	640,200
1960	34,130	62,290	78,760	68,480	48,560	20,480	31,380	42,030	28,360	21,610	27,620	33,410	497,100

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	-	-	-	-	-	-	760	550,500	
1951	1216	2,500	May 15, 1951	426	977	707,600	1,030	746,000	
1952	1246	2,080	May 22, 1952	502	911	661,300	816	592,300	
1953	1286	1,250	May 21, 1953	141	483	349,600	526	380,700	
1954	1346	1,710	June 2, 1954	140	759	549,900	808	585,200	
1955	1396	2,320	June 16, 1955	-540	824	596,800	726	525,600	
1956	1446	2,480	May 29, 1956	150	858	622,700	880	639,000	
1957	1516	al,800	May 23, 1957	70	812	442,800	648	469,000	
1958	1566	2,010	Apr. 28, 1958	367	679	491,900	634	453,000	
1959	1636	2,610	May 30, 1959	100	884	640,200	1,007	729,100	
1960	1716	1,410	Nov. 30, 1959	-100	685	497,100	-	-	

a Maximum recorded.

OKANOGAN RIVER BASIN

4420. Toats Coulee Creek near Loomis, Wash.

Location.--Lat 48°50'00", long 119°41'50", in SE $\frac{1}{4}$ sec.33, T.39 N., R.25 E., on left bank 600 ft upstream from Deer Creek, 1,800 ft upstream from intake of Whitestone Irrigation Canal, and 3 miles northwest of Loomis.

Drainage area.--130 sq mi; at site prior to April 1957, 132 sq mi.

Records available.--May 1920 to September 1926 (fragmentary), April 1957 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,880 ft (from topographic map). May 11 to June 2, 1920, staff gage 1,000 ft downstream at different datum. June 3, 1920, to Sept. 30, 1926, water-stage recorder 600 ft downstream at different datum.

Extremes.--1920-26, 1957-60: Maximum discharge, 1,100 cfs May 19, 1957 (gage height, 5.67 ft); minimum, 1.6 cfs Sept. 13, 14, 1926 (gage height, 0.72 ft, site and datum then in use).

Flood of May 28, 1948, 6,010 cfs, result of slope-area measurement of peak flow.

Remarks.--No regulation or diversion 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
1957	-	-	-	-	-	-	-	482	140	37.4	20.0	7.11	-
1958	10.4	9.44	9.44	9.21	11.8	11.6	18.6	377	168	45.3	13.8	9.52	58.3
1959	11.5	11.6	12.1	20.1	11.8	11.6	29.0	242	322	75.2	17.9	26.7	66.1
1960	25.5	14.6	11.0	7.40	9.58	17.1	35.8	154	199	34.4	15.0	9.00	44.3

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957	-	-	-	-	-	-	-	29,630	8,310	2,300	1,230	423	-
1958	641	562	580	566	658	715	1,110	23,190	9,980	2,780	848	566	42,200
1959	705	687	743	1,230	655	715	1,720	14,890	19,180	4,620	1,100	1,590	47,840
1960	1,570	868	677	455	551	1,050	2,130	9,480	11,850	2,110	922	535	32,200

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
1957	1516	1,100	May 19, 1957	-	-	-	-	-	-	-	-
1958	1566	852	May 29, 1958	6.0	58.3	0.448	6.06	42,200	57.8	6.12	42,550
1959	1636	640	June 2, 1959	6.0	66.1	.508	6.91	47,840	67.4	7.06	48,820
1960	1716	626	May 12, 1960	4.7	44.3	.341	4.66	32,200	-	-	-

4422. Whitestone Irrigation Canal near Loomis, Wash.

Location.--Lat 48°49'50", long 119°41'25", in SW $\frac{1}{4}$ sec.34, T.39 N., R.25 E., on right bank 200 ft downstream from headworks and 2 $\frac{1}{2}$ miles northwest of Loomis.

Records available.--April 1957 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,650 ft (from topographic map).

Extremes.--1957-60: Maximum daily discharge, 48 cfs May 21, 1958, May 14-16, June 2, 3, July 12, 13, 1959; no flow during nonirrigation season.

Remarks.--Canal diverts from Toats Coulee Creek for irrigation of about 2,000 acres in Whitestone Irrigation District.

Monthly and yearly diversion, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957	-	-	-	-	-	-	-	2,040	2,070	1,840	1,030	507	-
1958	357	0	0	0	0	0	369	2,650	2,190	1,530	687	500	8,280
1959	505	228	0	0	0	0	239	2,450	2,260	2,400	1,020	822	9,920
1960	244	16	0	0	0	0	726	1,850	2,320	1,650	910	582	8,300

4423. Sinlahekin Creek above Chopaka Creek, near Loomis, Wash.

Location.--Lat 48°51'10", long 119°38'50", in NE¼ sec.26, T.39 N., R.25 E., on right bank 400 ft upstream from Chopaka Creek, 2 miles upstream from mouth, and 2¼ miles north of Loomis.

Drainage area.--256 sq mi.

Records available.--April 1957 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,150 ft (from topographic map).

Extremes.--1957-60: Maximum discharge, 1,680 cfs May 19, 1957 (gage height, 8.62 ft); minimum, 8.6 cfs Sept. 18, 1957.

Remarks.--No regulation. Diversions above station by Whitestone Irrigation Canal (see preceding page) and other smaller 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
1957	-	-	-	-	-	-	-	774	183	20.6	14.7	11.2	-
1958	21.5	24.6	27.5	27.3	32.0	30.3	35.6	495	191	49.1	17.4	17.7	81.3
1959	23.5	27.3	29.9	43.5	28.8	36.8	51.4	352	406	62.2	19.7	38.9	93.4
1960	47.1	38.7	32.6	24.8	29.1	35.0	30.5	114	162	22.0	14.1	13.6	47.0

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957	-	-	-	-	-	-	-	47,600	10,890	1,260	901	664	-
1958	1,320	1,460	1,690	1,680	1,780	1,860	2,120	30,460	11,360	3,020	1,070	1,050	58,870
1959	1,450	1,620	1,840	2,670	1,600	2,260	3,060	21,610	24,160	3,820	1,210	2,310	67,610
1960	2,890	2,300	2,010	1,530	1,670	2,150	1,820	7,040	9,660	1,360	870	809	34,110

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						
1957	1516	1,680	May 19, 1957	-	-	-	-	-	
1958	1566	792	May 22, 1958	13.5	81.3	58,870	81.9	59,310	
1959	1636	679	June 3, 1959	17.5	93.4	67,610	96.6	69,900	
1960	1716	494	June 4, 1960	10.5	47.0	34,110	-	-	

4425. Similkameen River near Nighthawk, Wash.

(International gaging station)

Location.--Lat 48°59'10", long 119°37'00", in NW¼ sec.7, T.40 N., R.26 E., on left bank three-quarters of a mile upstream from Oroville-Tonasket Irrigation District canal intake, about 1¼ miles downstream from and northeast of Nighthawk, and 12 miles upstream from mouth.

Drainage area.--3,550 sq mi, approximately.

Records available.--May 1911 to September 1960 (prior to September 1928, mean monthly discharge included Oroville-Tonasket Irrigation District canal). Published as "near Oroville" 1911-28.

Gage.--Water-stage recorder. Datum of gage is 1,137.70 ft above mean sea level, international joint adjustment of 1947. Prior to Sept. 11, 1928, staff gages at sites 7 miles downstream (below Oroville-Tonasket Irrigation District canal) at various datums.

Average discharge.--49 years (1911-60), 2,271 cfs (1,644,000 acre-ft per year).

Extremes.--1928-60: Maximum discharge, 38,700 cfs May 30, 1948 (gage height, 17.62 ft); minimum, 120 cfs Jan. 6, 1930 (gage height, 2.05 ft).

Remarks.--Flow at high stages regulated by natural diversion into and release from Palmer Lake. Several small diversions above station for irrigation of about 2,900 acres in the United States in 1946 and approximately 10,500 acres in Canada in 1957.

Cooperation.--This station is maintained by the United States under agreement with Canada.

Correction.--In WSP 1316, the mean discharge for July 1945 was listed in error; it should be 2,139 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	811	1,129	1,637	1,115	1,393	988	3,515	13,960	9,288	3,561	951	851	3,279
1952	862	814	542	456	537	540	2,121	8,616	5,355	2,265	752	446	1,947
1953	330	338	320	448	609	493	1,191	8,531	9,530	3,932	1,042	609	2,288
1954	822	914	740	524	670	622	1,014	9,548	11,650	8,004	2,195	1,614	3,207
1955	1,165	1,692	1,370	778	599	533	744	4,060	14,090	6,278	1,490	618	2,788
1956	1,181	2,212	1,019	802	540	598	2,903	13,800	11,140	3,784	1,058	665	3,313
1957	1,091	1,071	1,016	589	607	655	1,228	14,900	6,654	1,655	826	491	2,584
1958	453	579	502	513	474	526	1,059	8,986	4,795	1,337	422	354	1,677
1959	796	978	1,438	1,256	736	727	1,957	9,801	14,330	4,837	1,087	1,293	3,276
1960	2,265	2,166	1,656	735	751	878	3,157	6,500	8,436	2,328	684	509	2,503

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	49,850	67,200	100,600	68,590	77,360	60,760	209,200	859,400	552,700	219,000	58,490	50,640	2,374,000
1952	52,970	48,460	33,320	28,030	30,870	33,180	126,200	529,800	318,600	139,300	46,250	26,530	1,414,000
1953	20,270	20,100	19,700	27,530	33,820	30,300	70,570	524,500	567,100	241,800	64,060	36,210	1,656,000
1954	50,560	54,370	45,520	32,240	37,200	38,270	60,510	567,100	653,300	492,100	135,000	96,060	2,322,000
1955	72,690	100,700	84,220	47,840	33,270	32,760	44,280	249,700	858,200	356,000	91,640	36,750	2,018,000
1956	72,620	131,600	62,650	49,340	31,050	36,750	172,700	848,400	663,000	232,600	65,030	39,590	2,405,000
1957	67,090	63,720	62,490	36,220	33,720	40,260	73,090	916,100	395,900	101,800	50,820	29,200	1,870,000
1958	27,830	34,380	30,890	31,560	26,330	32,360	63,010	552,500	285,300	82,220	25,960	21,690	1,214,000
1959	48,940	58,200	88,400	77,250	40,860	44,710	116,400	602,700	852,000	297,400	66,830	76,940	2,371,000
1960	139,300	128,900	101,800	45,200	43,220	54,000	187,900	399,600	502,000	143,100	42,070	30,290	1,817,000

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	-	-	-	-	-	-	3,315	2,400,000
1951	1216	22,700	May 24, 1951	495	3,279	2,374,000	3,164	2,291,000
1952	1246	14,400	May 20, 1952	350	1,947	1,414,000	1,844	1,339,000
1953	1286	16,200	June 14, 1953	239	2,288	1,656,000	2,413	1,747,000
1954	1346	19,700	May 21, 1954	240	3,207	2,322,000	3,356	2,429,000
1955	1396	28,200	June 13, 1955	426	2,788	2,018,000	2,800	2,027,000
1956	1446	24,500	May 22, 1956	300	3,313	2,405,000	3,212	2,332,000
1957	1516	23,200	May 21, 1957	404	2,584	1,870,000	2,445	1,770,000
1958	1566	15,500	May 25, 1958	272	1,677	1,214,000	1,819	1,316,000
1959	1656	19,700	June 4, 1959	350	3,276	2,371,000	3,516	2,546,000
1960	1716	15,200	June 4, 1960	425	2,503	1,817,000	-	-

4441. Whitestone Creek near Tonasket, Wash.

Location.--Lat 48°47'05", long 119°26'00", in NE¼NE¼ sec.21, T.38 N., R.27 E., 1,000 ft above Greenaway Diversion and 6 miles north of Tonasket.

Drainage area.--39.5 sq mi.

Records available.--October 1958 to September 1960.

Gage.--Water-stage recorder. Artificial weir control since Mar. 31, 1960. Altitude of gage is 1,180 ft (from topographic map).

Extremes.--1958-60: Maximum discharge, 25 cfs Jan. 9, 1959 (gage height, 7.27 ft); minimum, 0.1 cfs Apr. 27 to May 1, 1960.

Remarks.--Flow regulated by headworks on Whitestone Lake by Whitestone Water Users' Association. 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
1959	2.30	1.14	1.24	7.28	7.45	4.73	0.93	4.22	2.99	4.14	5.09	4.28	3.80
1960	.72	.61	6.63	5.86	5.62	1.30	.82	1.68	3.24	3.64	4.15	3.95	3.35

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1959	141	68	76	448	414	291	55	260	178	254	313	255	2,750
1960	44	36	408	361	324	80	49	104	193	224	255	354	2,430

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					
1959	1636	25	Jan. 9, 1959	0.5	3.80	2,750	4.08	2,960
1960	1716	8.3	Dec. 3, 1959	.1	3.35	2,430	-	-

4450. Okanogan River near Tonasket, Wash.

(International gaging station)

Location.--Lat 48°38'00", long 119°27'50", in lot 3, sec.8, T.36 N., R.27 E., on right bank 1,000 ft upstream from Chewiliken Creek and 5½ miles south of Tonasket.

Drainage area.--7,270 sq mi, approximately.

Records available.--April 1929 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 860.78 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.--31 years (1929-60), 2,975 cfs (2,154,000 acre-ft per year).

Extremes.--1929-60: Maximum discharge, 40,900 cfs May 31, 1948 (gage height, 21.79 ft, from floodmark); minimum recorded, 126 cfs Sept. 5, 1931 (gage height, 3.43 ft).

Remarks.--Diversions above station for irrigation of about 10,700 acres in the United States and 45,580 acres in Canada. Flow affected by regulation of Okanogan and Skaha Lakes and by natural storage in other lakes. Some diurnal fluctuation at low flow caused by powerplant on Similkameen 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	1,384	1,812	2,342	1,984	2,380	2,027	4,583	15,710	11,600	4,596	1,708	1,659	4,324
1952	1,746	1,765	1,359	1,246	1,527	1,329	3,093	10,560	6,459	3,074	1,293	1,085	2,882
1953	1,072	778	674	757	950	770	1,384	9,323	10,510	4,607	1,557	1,211	2,807
1954	1,441	1,655	1,459	1,141	1,570	1,307	1,343	9,957	12,940	9,510	5,031	2,513	3,998
1955	2,093	2,618	2,419	1,745	1,469	1,265	1,508	4,627	15,160	7,179	2,517	1,402	3,655
1956	1,782	2,653	1,365	1,450	1,120	1,541	3,553	14,460	13,020	4,953	1,693	1,097	4,062
1957	1,657	1,629	1,691	1,164	1,262	1,322	1,694	16,010	7,601	2,325	1,265	1,138	3,249
1958	1,325	1,206	1,205	1,169	1,188	1,194	2,060	9,863	5,522	1,689	728	814	2,339
1959	1,318	1,432	1,988	1,825	1,459	1,814	3,058	10,970	16,660	6,081	1,590	1,810	4,172
1960	2,849	3,194	3,105	1,895	1,681	1,344	3,655	6,968	8,717	2,630	1,019	993	3,168

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	85,090	107,800	144,000	122,000	132,200	124,700	272,700	965,700	690,000	282,600	105,000	98,740	3,131,000
1952	107,300	105,000	83,540	76,840	87,810	81,700	184,100	649,100	300,840	300,189,000	79,500	64,540	2,095,000
1953	65,910	46,280	41,420	46,560	52,760	47,350	82,370	573,300	625,300	283,300	95,720	72,050	2,032,000
1954	88,580	97,310	89,690	70,140	87,210	80,390	79,930	611,000	769,800	584,800	186,400	149,500	2,895,000
1955	128,700	155,800	148,700	107,300	81,560	77,770	89,710	284,500	902,400	441,400	142,500	83,440	2,644,000
1956	109,500	157,900	83,910	89,140	64,400	94,730	211,400	889,400	774,500	304,500	104,100	65,300	2,949,000
1957	101,900	96,950	104,000	71,580	70,100	81,500	100,800	984,500	452,300	143,000	77,790	67,740	2,352,000
1958	81,480	71,760	74,080	71,900	65,990	73,430	122,600	806,400	528,600	103,900	44,750	48,440	1,693,000
1959	81,060	85,210	122,200	112,200	81,040	111,600	181,900	674,400	891,500	573,900	97,750	107,700	3,020,000
1960	75,200	190,000	190,900	116,500	96,710	82,610	217,500	428,500	518,700	161,700	62,690	59,060	2,300,000

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	1218	23,600	May 25, 1951	980	4,324	3,131,000	4,202	3,043,000
1952	1246	16,200	May 21, 1952	930	2,882	2,095,000	4,268	3,089,000
1953	1286	15,800	June 15, 1953	534	2,807	2,032,000	2,686	1,950,000
1954	1346	19,100	May 22, 1954	520	3,998	2,895,000	4,216	3,052,000
1955	1396	27,600	June 14, 1955	1,000	3,655	2,644,000	3,539	2,562,000
1956	1446	25,000	May 26, 1956	850	4,062	2,949,000	3,995	2,900,000
1957	1516	23,600	May 22, 1957	940	3,249	2,352,000	3,144	2,276,000
1958	1566	16,100	May 26, 1958	590	2,339	1,693,000	2,423	1,754,000
1959	1636	21,500	June 8, 1959	640	4,172	3,020,000	4,542	3,258,000
1960	1716	14,100	June 5, 1960	865	3,168	2,300,000	-	-

4473. Okanogan River near Malott, Wash.

Location.--Lat 48°14'20", long 119°43'50", in SE $\frac{1}{4}$ sec.30, T.32 N., R.25 E., on left bank 2 miles downstream from Chiliwist Creek, 4 miles southwest of Malott, and 13 miles upstream from mouth.

Drainage area.--8,210 sq mi, approximately.

Records available.--April 1958 to September 1960.

Gage.--Water-stage recorder. Datum of gage is at mean sea level, supplementary adjustment of 1947.

Extremes.--1958-60: •Maximum discharge, 21,400 cfs June 6, 1959 (elevation, 791.28 ft); minimum, 610 cfs Aug. 27, 1958 (elevation, 778.54 ft).

Remarks.--Diversions above station for irrigation of about 15,000 acres in the United States and 45,580 acres in Canada. Flow affected by regulation of Okanogan and Skaha Lakes and by natural storage in other 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
1958	-	-	-	-	-	-	2,340	10,330	5,830	1,826	789	860	-
1959	1,398	1,520	2,118	1,885	1,499	1,904	3,005	11,120	18,860	6,463	1,728	1,915	4,290
1960	2,955	3,305	3,221	1,942	1,770	1,388	3,598	6,877	8,841	2,724	1,074	1,067	3,228

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1958	-	-	-	-	-	-	139,200	534,900	546,900	112,300	48,490	51,180	-
1959	85,940	90,450	130,200	115,900	85,270	117,000	178,800	83,700	1,003,000	597,400	106,200	114,000	3,106,000
1960	181,700	196,800	198,100	119,400	101,800	85,330	214,100	422,900	526,100	167,500	66,020	63,500	2,343,000

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					
1958	1566	-	-	-	-	-	-	-
1959	1636	21,400	June 6, 1959	700	4,290	3,106,000	4,663	3,376,000
1960	1716	14,100	June 5, 1960	920	3,228	2,343,000	-	-

4495. Methow River at Twisp, Wash.

Location.--Lat 48°21'40", long 120°06'50", in NW¼ sec.17, T.33 N., R.22 E., on left bank a quarter of a mile downstream from Twisp River and 0.3 mile east of center of Twisp.

Drainage area.--1,330 sq mi, approximately.

Records available.--June 1919 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Altitude of gage is 1,580 ft (from topographic map). Prior to Oct. 3, 1919, several staff gages in the immediate vicinity at different datum. Oct. 3, 1919, to Sept. 30, 1929, and Oct. 31 to Nov. 6, 1933, chain gage on road bridge 40 ft upstream at same datum as staff gages. Nov. 7 to Dec. 18, 1933, staff gage at present site at different datum.

Average discharge.--41 years (1919-60), 1,335 cfs (966,500 acre-ft per year).

Extremes.--1919-29, 1933-60: Maximum discharge, 40,800 cfs May 29, 1948 (gage height, 12.94 ft, in gage well), from rating curve extended above 18,000 cfs on basis of slope-area measurement of peak flow; minimum observed, 134 cfs Sept. 4, 5, 1926, Sept. 9, 10, 1929, but may have been less during period of ice effect Jan. 6 to Mar. 4, 1937.

Remarks.--A large part of the flow diverted above station for irrigation by two canals of Methow Valley Irrigation District, by Risley ditch, and by many other smaller ditches. Diversions for irrigation of 7,410 acres above station (1946 estimate).

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	525	612	553	491	762	616	3,632	9,385	6,538	2,426	668	493	2,231
1952	566	504	356	324	297	363	1,991	5,770	3,454	1,441	464	255	1,517
1953	301	285	247	257	261	378	1,052	5,621	6,503	3,181	673	276	1,592
1954	456	456	371	302	318	349	655	5,880	6,063	4,392	1,205	694	1,788
1955	572	702	627	416	336	316	637	2,501	7,721	2,937	721	323	1,484
1956	548	989	526	377	274	321	2,910	9,256	7,006	2,461	697	394	2,149
1957	556	521	459	322	358	363	1,124	9,515	3,855	942	562	195	1,553
1958	342	349	292	266	298	404	1,144	8,202	3,793	981	282	235	1,592
1959	380	439	526	435	367	452	2,030	4,892	7,285	2,913	644	727	1,759
1960	1,383	1,115	923	511	390	644	2,011	3,659	5,489	1,767	464	282	1,552

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	32,280	36,430	33,990	30,220	42,340	37,850	216,100	577,100	389,100	149,200	41,060	29,350	1,615,000
1952	34,830	29,990	21,870	19,900	17,090	22,330	118,500	354,800	204,300	88,620	28,550	15,190	956,000
1953	18,510	16,950	15,160	15,830	14,520	23,250	62,620	345,600	387,000	195,600	41,370	16,430	1,153,000
1954	28,030	27,150	22,790	18,590	17,660	21,440	50,850	361,600	360,800	270,000	74,110	41,320	1,294,000
1955	35,170	41,780	36,530	25,550	18,670	19,400	37,890	153,800	459,400	180,600	44,310	19,220	1,074,000
1956	33,670	58,850	32,340	23,180	15,740	19,750	173,200	569,100	416,900	151,300	42,850	23,460	1,560,000
1957	32,930	31,000	28,200	19,780	18,740	22,340	66,890	385,000	227,600	57,930	22,260	11,560	1,124,000
1958	21,010	20,770	17,950	16,470	16,610	24,860	68,050	304,300	225,700	60,340	17,350	13,970	1,007,000
1959	23,360	26,110	32,350	26,760	20,370	27,770	120,800	300,800	433,500	179,100	39,580	43,240	1,274,000
1960	85,020	66,370	56,720	31,400	22,450	39,600	119,700	225,000	326,600	108,600	28,560	16,810	1,127,000

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	-	-	-	-	-	-	2,052	-	1,485,000	
1951	1216	17,600	May 12, 1951	310	2,231	1,615,000	2,209	1,599,000		
1952	1246	10,000	May 19, 1952	220	1,317	956,000	1,267	919,900		
1953	1288	12,700	June 13, 1953	210	1,592	1,153,000	1,630	1,180,000		
1954	1348	12,900	May 19, 1954	277	1,788	1,294,000	1,840	1,332,000		
1955	1396	16,800	June 12, 1955	283	1,484	1,074,000	1,497	1,083,000		
1956	1446	17,400	(a)	250	2,149	1,560,000	2,104	1,528,000		
1957	1516	19,000	May 19, 1957	159	1,553	1,124,000	1,508	1,092,000		
1958	1566	15,900	May 25, 1958	206	1,592	1,007,000	1,422	1,029,000		
1959	1636	10,700	June 3, 1959	296	1,759	1,274,000	1,934	1,400,000		
1960	1716	11,000	June 4, 1960	236	1,552	1,127,000	-	-		

a May 21, June 1, 1956.

4496. Beaver Creek below South Fork, near Twisp, Wash.

Location.--Lat 48°25'45", long 120°01'10", in center sec.24, T.34 N., R.22 E., on right bank 300 ft downstream from South Fork Beaver Creek and 6½ miles northeast of Twisp.

Drainage area.--58 sq mi, approximately.

Records available.--April to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 2,800 ft (from topographic map).

Extremes.--April to September 1960: Maximum discharge, 166 cfs May 12 (gage height, 5.96 ft); minimum, 6.9 cfs Sept. 19 (gage height, 4.65 ft).

Remarks.--No regulation or diversion above station.

Monthly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1960	-	-	-	-	-	-	-	23.7	74.1	61.0	21.8	11.6	8.09

Monthly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1960	-	-	-	-	-	-	-	1,410	4,550	3,630	1,340	713	481

4497. Beaver Creek near Twisp, Wash.

Location.--Lat 48°23'50", long 120°02'20", in SE¼ sec.35, T.34 N., R.22 E., on left bank 3 miles downstream from South Fork and 4 miles northeast of Twisp.

Drainage area.--62 sq mi, approximately.

Records available.--May 1956 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 2,250 ft (from topographic map).

Extremes.--1956-60: Maximum discharge, 966 cfs May 18, 1957; maximum gage height, 3.35 ft May 16, 1956; minimum discharge, 3.1 cfs Nov. 13, 1959 (gage height, 1.27 ft, result of freezeup).

Remarks.--No regulation. Several small 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
1956	-	-	-	-	-	-	-	-	55.7	25.7	15.0	14.0	-
1957	13.7	11.0	10.7	9.48	11.1	10.3	18.4	258	67.7	28.2	12.8	9.01	38.5
1958	11.0	9.42	10.4	10.7	13.1	14.5	21.2	161	68.1	24.0	11.2	8.70	30.5
1959	8.45	9.95	12.7	10.7	9.21	9.25	27.5	90.6	100	32.0	11.0	16.5	28.2
1960	14.6	10.6	10.9	8.84	8.72	12.3	25.9	80.7	63.7	19.0	11.1	7.92	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	-	-	-	-	-	-	-	-	3,310	1,580	925	830	-
1957	843	658	656	583	615	631	1,090	15,850	4,030	1,610	787	536	27,890
1958	674	561	640	660	730	894	1,260	9,930	4,050	1,470	690	518	22,080
1959	519	592	781	659	511	589	1,640	5,570	5,950	1,970	678	985	20,420
1960	900	635	672	544	502	757	1,540	4,960	3,790	1,170	683	471	16,820

Yearly 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	
1956	1516	412	May 19, 1956	-	-	-	-	-	-	-	-	
1957	1516	966	May 18, 1957	5.6	38.5	0.621	8.44	27,890	38.1	8.35	27,610	
1958	1566	370	May 21, 1958	7.2	30.5	.492	6.68	22,080	30.5	6.70	22,090	
1959	1636	169	June 1, 1959	5.0	28.2	.455	6.17	20,420	28.6	6.25	20,740	
1960	1716	160	May 11, 1960	4.0	22.9	.369	5.02	16,620	-	-	-	

METHOW RIVER BASIN

4499.5. Methow River near Pateros, Wash.

Location--Lat 48°04'40", long 119°59'00", in SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.20, T.30 N., R.23 E., on right bank 1.2 miles downstream from Black Canyon Creek and 4 miles northwest of Pateros.

Drainage area--1,780 sq mi, approximately.

Records available--April 1959 to September 1960.

Gage--Staff gage. Altitude of gage is 900 ft (from topographic map).

Extremes--1959-60: Maximum discharge observed, 12,400 cfs June 4, 1959 (gage height, 8.86 ft); minimum observed, 364 cfs Sept. 21, 1960 (gage height, 2.79 ft).
Maximum discharge known, 46,700 cfs May 29, 1948, from slope-area measurement of peak flow at site 1 mile downstream.

Remarks--No regulation. Diversions for irrigation of about 11,000 acres above station (1959 Bureau of Reclamation land classification).

Monthly and 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	-	-	-	-	-	-	2,082	5,246	8,200	3,241	866	872	-
1960	1,458	1,246	1,097	652	479	812	2,294	4,029	6,516	2,185	643	435	1,819

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1959	-	-	-	-	-	-	123,900	322,600	488,000	199,300	53,280	51,890	-
1960	89,630	74,140	67,470	40,070	27,550	49,910	136,500	247,700	397,700	134,400	39,560	25,860	1,320,000

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					
1959	1636	a12,400	June 4, 1959	-	-	-	-	-
1960	1716	a10,800	May 12, 1960	364	1,819	1,320,000	-	-

a Maximum observed.

451C. Stehekin River at Stehekin, Wash.

Location.--Lat 48°19'30", long 120°41'20", in SE¼ sec.26, T.33 N., R.17 E., on left bank 1,200 ft upstream from Boulder Creek, 1½ miles upstream from Lake Chelan, and 2 miles northwest of Stehekin. Records include flow of Boulder Creek.

Drainage area.--372 sq mi, includes that of Boulder Creek.

Records available.--October 1910 to October 1915, October 1926 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,100 ft above mean sea level, unadjusted. Prior to Aug. 17, 1911, staff gage three-eighths of a mile upstream from mouth at Lake Chelan at different datums (datum change made June 13, 1911). Aug. 17, 1911, to Oct. 31, 1915, staff gage a quarter of a mile downstream from Boulder Creek at different datum.

Average discharge.--39 years (1910-15, 1926-60), 1,406 cfs (1,018,000 acre-ft per year).

Extremes.--1910-15, 1926-60: Maximum discharge, 18,900 cfs May 29, 1948 (gage height, 29.00 ft), from rating curve extended above 11,000 cfs on basis of slope-area measurement of peak flow; minimum, 56 cfs Jan. 21, 1930.

Revisions.--The momentary maximum discharge for the water year 1912 published in WSP 1316 has been revised to 7,090 cfs.

Remarks.--No regulation or diversion 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	889	844	991	637	913	430	1,898	4,678	4,773	3,382	1,289	756	1,792
1952	788	553	325	219	198	258	1,622	3,929	3,252	2,175	1,086	522	1,247
1953	324	175	150	311	563	439	1,098	3,623	3,655	3,558	1,492	745	1,548
1954	771	747	523	422	333	372	946	4,110	4,637	4,940	2,343	1,163	1,786
1955	570	1,246	761	367	289	260	549	2,024	5,462	3,686	1,566	801	1,469
1956	1,185	1,877	504	270	181	204	1,827	5,528	5,166	4,115	1,576	960	1,953
1957	901	712	1,018	398	250	326	1,333	5,653	3,751	1,679	931	699	1,479
1958	486	478	355	241	346	468	1,068	5,810	3,874	1,716	971	650	1,379
1959	867	834	1,167	654	360	445	1,884	3,602	5,302	3,769	1,395	1,399	1,612
1960	1,869	1,475	1,188	431	282	517	1,634	2,887	4,786	3,196	1,219	637	1,679

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	54,640	50,210	60,920	39,170	50,680	26,410	113,000	287,600	284,000	208,000	78,040	44,990	1,298,000
1952	48,480	32,900	20,000	13,490	11,370	15,860	96,520	241,600	193,500	133,700	66,760	31,060	905,200
1953	19,900	10,430	9,240	19,120	31,280	26,970	65,320	222,800	217,500	217,400	91,730	44,200	975,900
1954	47,430	44,430	32,150	25,960	18,520	22,880	56,300	252,700	275,900	203,700	144,100	69,180	1,293,000
1955	35,040	74,160	46,770	22,590	16,070	15,990	32,690	124,400	325,000	226,700	96,310	47,660	1,063,000
1956	72,840	111,700	30,970	16,610	10,430	12,540	108,700	339,900	307,400	253,000	96,890	57,120	1,418,000
1957	55,400	42,360	62,580	24,480	13,900	20,040	79,290	347,600	223,200	103,200	57,260	41,590	1,071,000
1958	29,890	28,470	21,730	14,830	19,190	28,790	63,440	357,300	230,500	105,500	59,680	38,710	998,000
1959	53,280	49,640	71,760	38,980	21,090	27,370	112,100	221,500	315,500	231,700	85,780	83,260	1,312,000
1960	114,900	87,760	73,030	26,510	16,240	31,790	97,210	177,500	284,800	196,500	74,950	37,920	1,219,000

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	Maximum	Datum				Inches	Acres-foot			Inches	Acres-foot
1950	-	-	-	-	-	-	-	-	-	-	1,950	71.18	1,412,000
1951	1216	12,700	May 11, 1951		360	1,792	4.82	65.39	1,298,000		1,703	62.15	1,233,000
1952	1246	7,400	June 5, 1952		167	1,247	3.35	45.64	905,200		1,162	42.52	843,000
1953	1266	6,730	May 17, 1953		145	1,348	3.62	49.18	975,900		1,465	53.44	1,060,000
1954	1346	9,440	May 19, 1954		272	1,786	4.60	65.19	1,293,000		1,831	66.81	1,325,000
1955	1396	12,400	June 11, 1955		240	1,469	3.95	53.60	1,063,000		1,551	56.59	1,123,000
1956	1446	13,100	June 1, 1956		150	1,953	5.25	71.47	1,418,000		1,878	68.69	1,363,000
1957	1516	9,890	May 6, 1957		205	1,479	3.98	53.98	1,071,000		1,368	49.95	990,600
1958	1566	12,100	May 25, 1958		222	1,379	3.71	50.33	998,000		1,509	55.09	1,093,000
1959	1636	9,190	June 20, 1959		320	1,812	4.87	66.12	1,312,000		1,952	71.20	1,413,000
1960	1716	10,300	June 3, 1960		210	1,679	4.51	61.45	1,219,000		-	-	-

Location.--Lat 48°11'45", long 120°35'50", in sec.9, T.31 N., R.18 E., on left bank half a mile upstream from mouth and half a mile southwest of Lucerne.

Records available.--October 1910 to September 1913, October 1926 to September 1957.
Monthly discharge only for some periods, published in WSP 1316.

Average discharge.--34 years (1910-13, 1926-57), 204 cfs (147,700 acre-ft per year).

Remarks.--No regulation or diversion above station.

Correction --In WSP 1316, the mean discharge for September 1929 is listed in error; it should be 86.4 cfs.

[illegible][illegible][illegible]

4517. Antilon Lake Feeder System near Manson, Wash.

Location.--Lat 47°56'30", long 120°09'30", in SE $\frac{1}{4}$ sec.26, T.29 N., R.21 E., on left bank at tunnel outlet, 500 ft upstream from Antilon Lake and 6 miles north of Manson.

Records available.--March 1958 to September 1960 (seasonal records only).

Gage.--Water-stage recorder. Altitude of gage is 2,500 ft (from topographic map).

Extremes.--1958-60: Maximum daily discharge, 68 cfs May 17-20, 1958; minimum daily determined, 0.5 cfs Sept. 26, Nov. 26-30, 1958, Apr. 11-16, 1959.

Remarks.--Flow at site represents total diversion from headwaters of 10 streams, which have a drainage area of 52 sq mi and are tributaries to Lake Chelan. Water stored in Antilon Lake is used for irrigation of 4,000 acres near Manson.

Monthly mean discharge, in cubic feet per second

year	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1958		9.27	52.5	40.7	24.4	10.4	5.32	4.43	0.87
1959		6.19	38.5	51.7	32.9	12.1	11.0	8.77	-
1960	-	23.1	17.3	38.3	28.0	13.7	6.04	6.52	-

Monthly discharge, in acre-feet

year	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1958		552	3,230	2,420	1,500	640	316	273	52
1959		368	2,370	3,080	2,020	745	657	539	-
1960	-	1,370	1,060	2,280	1,720	840	359	401	-

4520. Lake Chelan at Chelan, Wash.

Location.--Lat 47°50'00", long 120°03'40", in lot 3, sec.15, T.27 N., R.22 E., on south shore of Lake Chelan at Lakeside, 2 miles west of Chelan.

Drainage area.--951 sq mi (revised).

Records available.--September 1897 to December 1899, January to June 1905 and December 1910 to September 1911 (fragmentary gage heights only), October 1911 to September 1960.

Gage.--Water-stage recorder. Datum of gage is at mean sea level, adjustment of 1912. Prior to Jan. 1, 1900, staff gage at Lakeside about 1 mile west of Chelan at datum 1,070.18 ft above mean sea level, adjustment of 1912. Jan. 1 to June 30, 1905, staff gage at upper highway bridge at Chelan at different datum. Dec. 5, 1910, to Nov. 13, 1927, staff gage at Forest Service boat landing at Chelan at datum 1,076.07 ft above mean sea level, adjustment of 1912.

Extremes.--1897-99, 1905, 1910-60: Maximum elevation, 1,100.05 ft July 19, 1947 (contents, 677,800 acre-ft); minimum since completion of dam in 1927, 1,079.68 ft Apr. 3, 4, 1937 (contents, 21,400 acre-ft). Minimum elevation, 1,076.78 ft Jan. 27, 28, Dec. 2-5, 1898.

Remarks.--Reservoir is formed by low concrete dam at lake outlet, completed Sept. 3, 1927. Usable capacity between elevations 1,079 and 1,100 ft, 676,100 acre-ft. Regulation between these elevations is allowed by stipulation of Federal Power Commission. Water is used for power development. Elevation of lake maintained between 1,092 and 1,100 ft each year during period Aug. 16 to Sept. 15 for scenic effect and recreational purposes. Diversions for irrigation of about 6,280 acres with an annual depletion of about 11,000 acre-ft (1946 estimate).

Cooperation.--Records furnished by Public Utility District No. 1 of Chelan County since July 1, 1955, and by Washington Water Power Co. prior thereto.

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

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1951	654,470	663,330	656,770	622,330	484,190	402,960	449,630	557,540	664,970	670,870	661,690	607,240
1952	629,870	554,930	468,210	271,670	189,750	135,170	191,030	453,870	640,700	670,870	643,320	549,060
1953	460,060	343,390	257,590	210,870	166,850	85,850	82,490	320,200	620,360	669,560	664,310	532,150
1954	540,590	475,390	391,620	306,360	242,870	157,630	182,120	421,110	640,040	669,560	669,890	630,860
1955	538,300	515,160	437,950	335,340	247,350	140,780	107,500	297,660	648,570	672,180	640,040	566,010
1956	550,690	621,670	564,380	498,530	348,220	247,350	363,430	583,310	657,100	672,180	663,660	605,270
1957	533,740	453,540	401,990	301,530	211,830	137,300	190,070	640,370	666,280	661,030	655,130	571,560
1958	475,710	377,370	281,270	180,530	147,770	82,810	109,400	580,690	672,180	669,560	670,540	577,100
1959	512,220	481,910	489,400	435,360	282,230	198,390	300,240	485,820	662,340	673,170	673,170	663,000
1960	663,700	661,700	625,900	504,100	412,700	343,400	382,200	551,000	665,300	674,800	673,800	579,700

4525. Chelan River at Chelan, Wash.

Location.--Lat 47°50'05", long 120°00'40", in SE $\frac{1}{4}$ sec.13, T.27 N., R.22 E., near right bank in Forebay upstream from control dam at outlet of Lake Chelan, a quarter of a mile south of Chelan.

Drainage area.--951 sq mi.

Records available.--November 1903 to September 1960. Published as "below Chelan Lake" 1904-5.

Gage.--Water-stage recorder and concrete power dam. Datum of gage is at mean sea level, adjustment of 1912. Prior to Jan. 7, 1927, staff gage at site 800 ft downstream at same datum. Jan. 7 to Sept. 30, 1927, staff gage about 500 to 1,000 ft below dam at same datum. Oct. 1, 1927, to Nov. 10, 1928, staff gage and Nov. 11, 1928, to Mar. 19, 1939, water-stage recorder at sites 2 $\frac{1}{2}$ miles downstream at same datum.

Average discharge.--56 years (1904-60), 2,058 cfs (1,490,000 acre-ft per year), adjusted for storage since October 1911.

Extremes.--1903-60: Maximum daily discharge, 16,000 cfs May 30, 1948; no flow part of day Jan. 30, 1917, when lake outlet was blocked with ice, and at other times owing to artificial regulation.

Remarks.--Unmeasured water that is diverted for irrigation above station is small percentage of total runoff. Chelan County Public Utility District No. 1 diverts water at Chelan to develop about 54,000 horsepower and to irrigate an unknown area near Chelan, which quantity is included in records of daily discharge. Diversions for irrigation of about 6,280 acres with an annual depletion of about 11,000 acre-ft (1946 estimate). Flow regulated by Lake Chelan (see p. 347).

Cooperation.--Records furnished by Public Utility District No. 1 of Chelan County since 1956 and by Washington Water Power Co. prior thereto.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	952	1,253	1,725	1,679	4,308	2,260	2,657	2,295	5,576	4,305	1,651	1,729	2,855
1952	651	1,988	1,855	3,651	1,733	1,446	1,472	1,400	1,499	2,257	1,628	2,063	1,805
1953	1,737	2,067	1,675	1,651	1,722	2,016	1,700	1,496	797	4,078	1,967	1,965	1,910
1954	1,623	2,070	2,206	2,197	1,933	2,072	1,089	2,333	3,284	6,340	2,980	2,137	2,531
1955	2,188	2,213	2,232	2,227	2,192	2,155	1,563	97.2	2,502	4,590	2,366	2,098	2,203
1956	1,647	1,247	1,986	1,761	3,047	2,325	1,624	5,660	7,133	5,366	2,126	2,033	2,989
1957	2,224	2,283	2,307	2,302	2,238	2,093	1,179	1,302	5,063	2,292	1,169	2,236	2,217
1958	2,286	2,517	2,303	2,222	1,504	1,910	1,273	772	4,063	2,178	977	2,130	1,994
1959	2,059	1,755	1,522	1,874	3,479	2,369	1,106	2,212	5,182	5,373	1,674	1,882	2,534
1960	2,491	2,331	2,365	2,754	2,316	2,332	1,902	1,611	5,125	3,975	1,346	2,187	2,559

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	58,550	74,570	106,100	103,300	239,500	138,900	158,100	387,100	331,800	264,700	101,500	102,900	2,067,000
1952	40,050	118,300	114,100	224,500	99,710	88,940	87,610	86,110	89,200	138,800	100,100	122,800	1,310,000
1953	106,800	123,000	103,000	101,500	95,620	124,000	101,200	92,020	47,450	250,700	121,000	116,900	1,383,000
1954	99,810	123,200	135,600	135,100	107,300	127,400	64,820	143,500	195,400	589,800	183,200	127,200	1,852,000
1955	134,600	131,700	137,200	136,900	121,700	132,500	92,990	5,970	148,900	282,200	145,500	124,800	1,595,000
1956	101,300	74,220	116,000	108,300	175,200	142,900	96,630	548,000	424,500	331,200	130,700	121,000	2,170,000
1957	136,700	135,800	141,800	141,500	124,500	128,700	70,170	80,090	300,700	140,900	71,300	133,100	1,605,000
1958	140,500	137,900	141,600	136,600	85,510	117,400	75,720	47,440	241,800	133,900	60,100	126,800	1,443,000
1959	126,600	104,400	93,560	115,200	193,200	145,700	65,790	136,000	308,300	330,400	103,000	112,000	1,834,000
1960	153,200	138,700	145,400	169,300	133,200	143,400	113,200	99,080	305,000	244,400	82,750	130,100	1,858,000

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Maximum day		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	2,588	1,874,000
1951	1216	10,400	June 16, 1951	55	2,855	2,067,000	2,901	2,100,000
1952	1246	7,490	Jan. 6, 1952	154	1,805	1,310,000	1,888	1,371,000
1953	1286	10,600	July 8, 1953	31	1,910	1,383,000	1,946	1,409,000
1954	1346	10,100	July 6, 1954	51	2,531	1,832,000	2,593	1,877,000
1955	1396	10,100	July 14, 1955	28	2,203	1,595,000	2,048	1,483,000
1956	1446	12,100	June 3, 1956	52	2,989	2,170,000	3,158	2,293,000
1957	1516	10,500	June 3, 1957	30	2,217	1,605,000	2,225	1,611,000
1958	1566	7,600	June 9, 1958	2	1,994	1,443,000	1,862	1,348,000
1959	1636	12,500	June 21, 1959	65	2,534	1,834,000	2,689	1,947,000
1960	1716	8,510	June 14, 1960	8	2,559	1,858,000		

4528. Entiat River near Ardenvoir, Wash.

Location.--Lat 47°48'30", long 120°24'50", in N $\frac{1}{2}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.27, T.27 N., R.19 E., on left bank 6 miles northwest of Ardenvoir.

Drainage area.--207 sq mi.

Records available.--September 1957 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,563.22 ft above mean sea level, datum of 1929, supplementary adjustment of 1947 (from Conservation Division planetable survey).

Extremes.--1957-60: Maximum discharge, 4,110 cfs May 25, 1958 (gage height, 7.72 ft); minimum, 52 cfs Jan. 1, 1958 (gage height, 0.83 ft).

Remarks.--No known regulation or diversion 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
1957	-	-	-	-	-	-	-	-	-	-	-	104	-
1958	92.6	95.0	78.9	70.8	91.5	104	183	1,862	1,268	325	142	91.0	369
1959	109	121	175	132	96.0	113	393	1,053	1,774	963	237	174	446
1960	292	288	364	142	108	158	498	900	1,506	677	193	105	436

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957	-	-	-	-	-	-	-	-	-	-	-	6,170	-
1958	5,690	5,650	4,650	4,360	5,080	6,410	10,910	114,500	75,360	19,950	8,760	5,410	266,900
1959	6,690	7,170	10,790	8,090	5,330	6,970	23,360	64,720	105,600	59,240	14,550	10,360	322,900
1960	17,970	17,120	22,350	8,750	6,160	9,580	29,620	55,360	89,610	41,610	11,880	6,220	316,200

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
1957	1566	-	-	-	-	-	-	-	-	-	-
1958	1566	4,110	May 25, 1958	54	369	1.78	24.18	266,900	380	24.95	275,000
1959	1636	2,560	June 22, 1959	72	446	2.15	29.25	322,900	491	32.21	355,700
1960	1716	2,470	June 4, 1960	75	436	2.11	28.64	316,200	-	-	-

4530. Entiat River at Entiat, Wash.

Location.--Lat 47°39'40", long 120°13'30", in SE $\frac{1}{4}$ sec.17, T.25 N., R.21 E., on right bank at Entiat, a quarter of a mile upstream from mouth.

Drainage area.--419 sq mi.

Records available.--October 1910 to September 1925, June 1951 to September 1958.

Gage.--Water-stage recorder. Altitude of gage is 690 ft (from topographic map). October 1910 to Sept. 30, 1925, staff gage at site three-quarters of a mile upstream at different datum.

Average discharge.--22 years (1910-25, 1951-58), 507 cfs (367,100 acre-ft per year), unadjusted.

Extremes.--1910-25, 1951-58: Maximum discharge, 5,380 cfs June 18, 1916; maximum gage height, 5.71 ft June 1, 1956; minimum discharge, 29 cfs Jan. 26, 1956, result of freezeup.

Maximum discharge known, 10,800 cfs May 29, 1948, on basis of conveyance-slope measurement of peak flow.

Remarks.--Occasional regulation by millpond 10 miles upstream. Many diversions above station for irrigation of an estimated 2,560 acres in 1946 with a resulting estimated depletion of 4,480 acre-ft of 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	-	-	-	-	-	-	-	-	2,288	1,082	295	173	-
1952	234	201	148	103	123	161	530	1,486	1,294	534	183	103	425
1953	90.8	90.1	93.8	153	201	183	305	1,396	1,869	1,269	355	151	515
1954	170	166	165	122	150	160	271	1,430	1,965	1,689	519	266	592
1955	194	288	254	173	160	128	224	711	2,534	1,163	335	159	527
1956	213	441	187	153	110	180	959	2,605	2,615	1,239	362	188	772
1957	183	172	226	123	108	151	380	2,335	1,391	582	177	123	462
1958	142	144	126	112	169	185	312	2,268	1,493	408	168	121	473
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	-	-	-	-	-	-	-	-	136,100	66,520	18,120	10,310	-
1952	14,360	11,980	9,070	6,360	7,090	9,900	31,530	91,350	76,990	32,860	11,240	6,120	308,800
1953	5,580	5,360	5,770	9,380	11,150	11,260	18,130	85,850	111,200	78,000	21,860	8,980	372,500
1954	10,460	9,910	10,160	7,500	8,320	9,820	16,130	87,950	116,900	103,900	31,940	15,840	428,800
1955	11,930	17,120	15,630	10,610	8,890	7,890	13,320	43,730	150,800	71,520	20,610	9,480	381,500
1956	13,090	26,240	11,470	9,390	6,320	11,040	57,090	160,200	155,600	76,200	22,280	11,190	560,100
1957	11,220	10,220	13,870	7,540	5,980	9,280	22,620	43,600	82,780	23,480	10,880	7,320	348,800
1958	8,740	8,540	7,760	6,880	9,390	11,350	18,580	139,400	88,660	25,080	10,310	7,200	342,100
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	1216	2,460	June 14, 1951	-	-	-	-	-
1952	1246	2,360	May 19, 1952	90	425	308,800	400	290,200
1953	1286	2,660	June 13, 1953	80	515	372,500	534	386,300
1954	1346	3,210	July 1, 1954	70	592	428,800	612	443,000
1955	1396	4,800	June 13, 1955	111	527	381,500	535	387,600
1956	1446	4,960	June 1, 1956	42	772	560,100	750	544,800
1957	1516	3,790	May 19, 1957	72	462	348,800	468	338,500
1958	1566	4,500	May 26, 1958	98	473	342,100	-	-
1959								
1960								

a Maximum during period June to September.

4540. White River near Plain, Wash.
(Formerly published as White River near Chiwaukum)

Location--Lat 47°52'30", long 120°52'10", in NE $\frac{1}{4}$ sec. 5, T.27 N., R.16 E., on left bank at downstream side of Forest Service bridge, 1 $\frac{1}{4}$ miles downstream from Sears Creek, 4 miles upstream from Wenatchee Lake, and 12 $\frac{1}{2}$ miles northwest of Plain.

Drainage area--150 sq mi.

Records available--May 1911 to April 1912; May to September 1912, July to August 1913, and October 1913 to March 1914 (monthly discharge only); April to September 1914, August 1954 to September 1960. Published as "near Chiwaukum" 1911-14.

Gage--Water-stage recorder. Altitude of gage is 1,880 ft (from river-profile map). May 1911 to September 1914 staff gage at same site at different datum.

Average discharge--6 years (1954-60), 878 cfs (635,600 acre-ft per year).

Extremes--1911-14, 1954-60: Maximum discharge, 5,780 cfs May 26, 1958 (gage height, 13.25 ft); minimum, 104 cfs Mar. 10, 1956; minimum gage height observed, 2.16 ft Oct. 18, 1957.

Remarks--No regulation or diversion 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													
1952													
1953													
1954													
1955	336	821	388	219	205	162	306	1,191	3,005	2,217	851	601	837
1956	612	1,072	335	197	140	141	963	2,846	2,828	2,427	701	354	1,053
1957	467	458	792	234	171	248	744	2,812	2,053	880	385	250	795
1958	210	212	197	157	248	306	646	2,987	2,147	681	321	221	697
1959	400	549	867	441	262	300	1,142	1,763	2,816	2,234	679	657	1,012
1960	995	921	816	253	178	328	931	1,453	2,278	1,625	479	239	876

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	20,650	48,880	23,850	13,480	11,390	9,950	18,180	72,230	178,800	136,300	51,070	19,780	605,600
1956	37,640	63,800	20,620	12,080	8,080	8,650	57,290	175,000	168,100	149,200	43,120	21,070	764,600
1957	28,700	27,250	48,710	14,410	9,510	15,250	44,240	172,900	122,100	54,130	23,890	14,870	575,800
1958	12,910	12,600	12,100	9,670	13,750	18,610	38,420	183,700	127,800	41,860	19,710	13,120	504,400
1959	24,570	32,690	53,330	27,140	14,570	18,450	67,940	108,400	167,500	137,400	41,750	39,080	732,800
1960	61,190	54,790	50,150	15,550	10,230	20,150	55,400	89,360	135,600	99,920	29,450	14,250	636,000

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											
1952											
1953											
1954	1396										
1955	1396	5,360	June 12, 1955	144	837	5.58	75.67	605,600	876	79.27	634,200
1956	1446	5,700	June 1, 1956	121	1,053	7.02	95.61	764,600	1,029	93.43	747,200
1957	1516	4,460	May 9, 1957	120	795	5.30	71.99	575,800	703	63.59	509,700
1958	1568	5,780	May 26, 1958	110	697	4.65	63.03	504,400	798	72.17	577,400
1959	1636	4,590	June 22, 1959	154	1,012	6.75	91.60	732,800	1,089	98.54	788,400
1960	1716	4,320	Dec. 18, 1959	140	876	5.84	79.49	636,000			

4565. Chiwawa River near Plain, Wash.

Location--Lat 47°50'30", long 120°39'40", in SE $\frac{1}{4}$ sec.13, T.27 N., R.17 E., on right bank half a mile upstream from Goose Creek, 6 miles north of Plain, 7 miles upstream from mouth, and 11 miles northeast of Chiwaukum.

Drainage area--170 sq mi; at site 1911-14, 181 sq mi.

Records available--May 1911 to October 1914, August 1936 to November 1949, August 1954 to September 1957. Prior to August 1936 (published as Chiwawa Creek near Leavenworth).

Gage--Water-stage recorder. Altitude of gage is 2,100 ft (from river-profile map). May 29, 1911, to Oct. 31, 1914, staff gage at site 3 miles downstream at different datum.

Average discharge--19 years (1911-14, 1936-49, 1954-57), 501 cfs (362,700 acre-ft per year).

Extremes--1911-14, 1936-49, 1954-57: Maximum discharge, 5,880 cfs May 29, 1948 (gage height, 9.17 ft); minimum recorded, 56 cfs Oct. 24-27, 1942 (gage height, 3.73 ft).

Remarks--No regulation or diversion 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
1954	-	-	-	-	-	-	-	-	-	-	-	359	-
1955	259	420	282	176	163	148	233	942	2,637	1,459	481	198	616
1956	347	571	197	142	96.0	107	763	2,683	2,398	1,439	419	218	783
1957	229	206	328	153	131	173	550	2,277	1,446	512	219	141	533

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1954	-	-	-	-	-	-	-	-	-	-	-	21,390	-
1955	14,690	24,990	17,320	10,800	9,040	9,110	13,840	57,900	156,900	89,690	29,590	11,780	445,600
1956	21,310	33,990	12,120	8,720	5,520	6,590	45,400	165,000	142,700	88,470	25,760	13,000	568,600
1957	14,060	12,230	20,160	9,380	7,270	10,640	32,740	140,000	86,030	31,510	13,470	8,390	385,900

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	
1954	1396	-	-	-	-	-	-	-	-	-	-	-
1955	1396	4,730	June 13, 1955	123	616	3.62	49.15	445,600	630	50.30	456,100	-
1956	1446	5,080	June 1, 1956	90	783	4.61	62.71	568,600	754	60.39	547,600	-
1957	1516	3,460	May 19, 1957	100	533	3.14	42.56	385,900	-	-	-	-

4570. Wenatchee River at Plain, Wash.

Location.--Lat 47°45'50", long 120°39'30", in lot 8, sec.12, T.26 N., R.17 E., on left bank at Plain, a quarter of a mile downstream from Beaver Creek, 7½ miles downstream from Nason Creek, and 12 miles north of Leavenworth.

Drainage area.--591 sq mi.

Records available.--October 1910 to September 1960. Published as "near Leavenworth" 1910-31.

Gage.--Water-stage recorder. Altitude of gage is 1,805 ft (from river-profile map). Prior to Jan. 8, 1932, staff gages at site a quarter of a mile downstream at different datum.

Average discharge.--50 years (1910-60), 2,217 cfs (1,605,000 acre-ft per year).

Extremes.--1910-29, 1931-60: Maximum discharge, 22,700 cfs May 29, 1948 (gage height, 12.43 ft, from high-water mark in well); minimum, 168 cfs Nov. 30, 1952 (gage height, 1.31 ft).

Remarks.--Wenatchee Park Land & Irrigation Co. diverts a maximum of about 12 cfs from Chiwawa River for irrigation of 1,400 acres near Plain. Natural regulation by Wenatchee 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	1,678	2,113	2,544	1,531	2,805	1,192	3,719	8,119	6,943	3,426	1,036	627	2,975
1952	1,296	1,223	713	525	573	656	2,781	5,956	4,906	2,535	870	427	1,874
1953	300	271	296	1,532	2,064	1,071	2,057	5,656	5,798	4,891	1,472	645	2,172
1954	810	1,301	1,594	1,054	817	901	1,995	6,868	7,549	7,540	3,045	1,383	2,920
1955	1,026	2,232	1,309	768	852	628	1,196	3,945	9,442	5,733	1,974	791	2,495
1956	1,594	3,316	1,379	800	584	636	3,654	9,771	9,198	6,094	1,618	825	3,293
1957	1,462	1,424	2,801	898	687	998	2,566	8,855	5,769	2,006	851	527	2,415
1958	480	689	750	636	889	1,069	2,214	8,643	5,621	1,536	687	533	2,003
1959	1,089	2,028	2,687	1,689	1,040	1,190	3,572	6,029	8,227	5,372	1,499	1,573	3,006
1960	2,722	3,193	3,056	1,068	801	1,132	3,371	4,901	6,707	3,680	1,047	598	2,692

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	103,200	125,800	156,400	94,120	155,800	73,290	221,300	499,200	413,100	210,600	63,680	37,290	2,154,000
1952	79,680	72,750	45,840	32,280	32,950	40,360	165,500	366,200	291,900	155,900	53,510	25,430	1,360,000
1953	18,420	16,130	18,190	94,200	114,600	65,880	122,400	347,800	345,000	500,700	90,530	38,350	1,572,000
1954	49,800	77,420	98,000	64,820	45,360	55,420	118,700	422,300	449,200	200,483	60,017	20,000	2,114,000
1955	63,110	132,800	80,500	47,250	47,320	38,600	71,150	242,600	561,900	352,500	121,300	47,060	1,806,000
1956	97,990	197,500	84,770	49,180	33,590	39,090	217,400	600,800	547,300	374,700	99,470	49,070	2,391,000
1957	89,890	84,750	172,200	54,620	38,140	61,340	152,700	544,500	343,300	123,400	52,310	31,350	1,748,000
1958	29,500	40,990	46,120	39,110	49,370	66,950	131,700	543,700	334,500	94,430	42,250	31,700	1,450,000
1959	66,930	120,700	165,200	103,800	57,790	73,170	212,500	570,700	489,600	330,300	92,170	93,620	2,176,000
1960	167,400	190,000	187,900	65,680	46,080	69,630	200,600	501,300	399,100	226,300	64,380	35,610	1,954,000

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	-	-	-	-	-	-	-	-	3,084	70.83	2,233,000	-
1951	1216	15,300	May 12, 1951	460	2,975	5.03	68.33	2,154,000	2,714	62.34	1,985,000	-
1952	1246	9,060	May 19, 1952	351	1,874	3.17	43.17	1,360,000	1,676	38.61	1,217,000	-
1953	1286	8,540	May 19, 1953	186	2,172	3.68	49.88	1,572,000	2,410	55.36	1,745,000	-
1954	1346	12,400	May 20, 1954	586	2,920	4.94	67.09	2,114,000	2,991	68.70	2,165,000	-
1955	1396	17,000	June 13, 1955	490	2,495	4.22	57.29	1,806,000	2,658	60.59	1,910,000	-
1956	1446	17,100	May 21, 1956	443	3,293	5.57	75.86	2,391,000	3,247	74.80	2,357,000	-
1957	1516	12,700	May 9, 1957	426	2,415	4.09	55.45	1,748,000	2,097	48.15	1,518,000	-
1958	1566	14,700	May 26, 1958	340	2,003	3.39	46.02	1,450,000	2,350	55.51	1,687,000	-
1959	1636	11,400	June 22, 1959	420	3,006	5.09	69.03	2,176,000	3,272	75.14	2,369,000	-
1960	1716	11,500	Nov. 25, 1959	475	2,692	4.55	61.98	1,954,000	-	-	-	-

4580. Icicle Creek above Snow Creek, near Leavenworth, Wash.

Location.--Lat 47°32'25", long 120°42'55", in SE $\frac{1}{4}$ sec.28, T.24 N., R.17 E., on right bank three-eighths of a mile upstream from Snow Creek and $\frac{1}{2}$ miles southwest of Leavenworth.

Drainage area.--193 sq mi.

Records available.--September 1936 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,450 ft (from river-profile map).

Average discharge.--24 years (1936-60), 628 cfs (454,700 acre-ft per year).

Extremes.--1936-60: Maximum discharge, 11,600 cfs May 28, 1948 (gage height, 13.93 ft), from rating curve extended above 7,000 cfs on basis of slope-area measurement of peak flow; minimum daily, 44 cfs Nov. 30, 1936.

Revisions.--The momentary maximum discharge for the water year 1943 published in WSP 1816 has been revised to 3,880 cfs.

Remarks.--No diversion. Some regulation in headwater lakes 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	417	568	175	408	797	324	1,008	2,253	2,118	891	239	145	821
1952	359	516	175	123	144	154	827	1,739	1,562	660	192	120	515
1953	77.0	66.2	72.9	366	515	266	533	1,659	1,731	1,481	411	160	610
1954	156	252	403	248	206	251	496	2,018	2,244	2,292	764	335	810
1955	261	517	323	200	205	149	276	1,019	2,957	1,573	443	180	676
1956	383	919	343	207	158	162	1,016	2,798	2,655	1,609	385	211	905
1957	340	332	736	213	161	240	569	2,428	1,422	454	186	149	602
1958	127	146	165	157	224	273	495	2,627	1,453	373	151	137	550
1959	274	594	801	506	512	304	891	1,506	2,494	1,364	342	380	815
1960	703	1,049	925	281	197	322	813	1,303	1,923	712	208	124	713

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	25,670	33,780	42,830	25,090	44,260	19,940	59,950	138,500	126,000	54,790	14,690	8,610	594,100
1952	22,040	18,770	10,740	7,580	8,260	9,490	49,180	106,900	81,020	40,610	11,820	7,140	373,600
1953	4,730	3,940	4,480	22,510	28,610	16,330	31,690	100,800	103,000	91,090	25,260	9,490	441,900
1954	9,600	14,970	24,770	15,150	11,460	15,450	29,530	124,100	133,500	140,900	46,950	19,920	586,300
1955	16,060	30,740	19,880	12,320	11,410	9,150	16,400	62,680	176,000	96,720	27,240	10,680	489,300
1956	23,530	54,700	21,110	12,730	9,090	9,950	60,450	172,000	158,000	98,910	23,670	12,540	656,700
1957	20,900	19,780	45,230	13,100	8,970	14,730	33,870	49,300	84,590	27,890	11,450	8,880	438,700
1958	7,790	8,690	10,180	9,650	12,430	16,810	29,480	61,500	86,480	22,940	9,300	8,180	383,400
1959	16,860	35,350	49,250	31,090	17,340	18,690	53,030	92,630	148,400	83,850	21,040	22,600	590,100
1960	43,230	62,410	56,890	17,250	11,360	19,780	48,370	80,130	114,400	43,800	12,790	7,400	517,800

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	-	-	-	-	-	-	-	-	822	57.77	594,800
1951	1216	6,110	May 11, 1951	110	821	4.25	57.72	594,100	751	52.79	543,400
1952	1246	3,000	May 19, 1952	100	515	2.67	36.28	373,600	482	32.56	335,200
1953	1286	2,940	July 8, 1953	45	610	3.16	42.94	441,900	660	46.45	478,100
1954	1346	4,910	May 19, 1954	124	810	4.20	56.94	586,300	834	58.63	603,600
1955	1396	6,010	June 12, 1955	128	676	3.50	47.56	489,300	721	50.72	521,900
1956	1446	6,470	June 1, 1956	114	905	4.69	63.80	656,700	886	62.49	643,200
1957	1516	4,020	May 9, 1957	100	606	3.14	42.60	438,700	524	36.85	379,400
1958	1566	5,040	May 25, 1958	88	530	2.75	37.24	383,400	633	44.50	458,200
1959	1636	3,900	June 20, 1959	95	815	4.22	57.33	590,100	900	63.27	651,200
1960	1716	6,820	Nov. 23, 1959	97	713	3.69	50.30	517,800	-	-	-

4590. Wenatchee River at Peshastin, Wash.

Location.--Lat 47°34'50", long 120°37'00", in SE¼SW¼ sec.8, T.24 N., R.18 E., on right bank 1 mile northwest of Peshastin and 3½ miles upstream from Peshastin Creek.

Drainage area.--1,000 sq mi, approximately.

Records available.--October 1928 to February 1929 (monthly discharge only), March 1929 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,028.04 ft above mean sea level, datum of 1929. Prior to Mar. 24, 1932, staff gage at site 1¼ miles downstream at different datum.

Average discharge.--32 years (1928-60), 3,070 cfs (2,223,000 acre-ft per year).

Extremes.--1929-60: Maximum discharge, 32,300 cfs May 28, 1948 (gage height, 15.88 ft); minimum, 183 cfs Oct. 14, 1939; minimum gage height, 1.24 ft Nov. 1, 1952; minimum daily discharge, 270 cfs Oct. 2, 1929, Nov. 30, 1936, Dec. 1, 1952.

Remarks.--Numerous diversions upstream for irrigation of an estimated 3,200 acres above station and domestic use above and below station. Diversion by Icicle Creek irrigation canal 8 miles upstream from station is used for irrigation of a substantial part of the 22,000 acres irrigated 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	2,255	2,893	3,563	2,194	3,944	1,862	5,379	11,250	9,754	4,651	1,357	802	4,154
1952	1,848	1,765	1,081	809	830	948	3,979	8,514	6,723	3,367	1,081	615	2,616
1953	463	384	421	2,076	2,917	1,588	2,883	7,955	8,183	6,888	1,867	802	3,045
1954	979	1,558	2,045	1,371	1,143	1,325	2,729	9,400	10,230	10,350	4,008	1,746	3,928
1955	1,329	2,689	1,732	1,019	1,140	880	1,706	5,305	13,320	7,695	2,420	942	3,369
1956	2,034	4,511	2,107	1,213	906	1,001	5,719	13,800	13,030	8,358	2,149	1,105	4,666
1957	1,901	1,853	3,794	1,199	932	1,474	3,348	12,430	7,723	2,577	1,069	699	3,267
1958	655	903	992	873	1,330	1,594	3,009	12,390	7,734	2,019	808	653	2,755
1959	1,453	2,892	3,855	2,448	1,512	1,845	5,008	8,160	11,430	7,076	1,840	1,997	4,134
1960	3,654	4,622	4,365	1,440	1,081	1,640	4,432	6,537	9,141	4,538	1,218	704	3,616

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	136,600	172,100	219,100	134,900	219,000	114,500	320,100	691,600	580,400	286,000	83,440	47,740	3,007,000
1952	113,600	105,000	66,450	49,750	47,750	58,280	256,800	511,200	400,000	207,000	66,490	36,590	1,899,000
1953	28,490	22,840	25,300	127,600	162,000	97,830	171,500	489,100	486,300	423,600	121,000	47,750	2,204,000
1954	60,170	92,690	25,600	84,300	63,500	81,440	162,400	578,000	608,800	636,600	246,100	103,900	2,844,000
1955	81,710	171,900	106,500	62,670	63,300	54,140	101,500	326,200	792,800	473,100	148,800	56,060	2,439,000
1956	125,100	268,400	129,500	74,600	52,140	61,570	340,300	848,300	775,300	513,900	132,100	65,750	3,387,000
1957	116,900	110,300	233,300	73,750	51,770	90,620	199,200	764,400	459,600	158,400	65,740	41,600	2,366,000
1958	40,240	53,750	61,000	53,650	73,880	98,020	179,000	761,900	460,200	124,100	49,690	58,870	1,994,000
1959	89,360	72,100	37,000	50,500	83,980	113,500	298,000	601,700	680,000	435,100	113,100	118,800	2,993,000
1960	224,600	275,000	266,400	88,520	62,160	100,800	263,700	402,000	543,900	279,000	74,700	41,900	2,625,000

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	-	-	-	-	-	-	4,264	3,087,000
1951	1216	20,600	May 12, 1951	613	4,154	3,007,000	3,816	2,765,000
1952	1248	12,900	May 19, 1952	475	2,616	1,899,000	2,329	1,631,000
1953	1286	12,200	(a)	270	3,045	2,204,000	3,323	2,406,000
1954	1346	17,900	May 20, 1954	736	3,928	2,844,000	4,040	2,925,000
1955	1396	23,400	June 13, 1955	588	3,369	2,439,000	3,593	2,602,000
1956	1446	24,200	May 21, 1956	552	4,666	3,387,000	4,579	3,324,000
1957	1516	17,800	May 9, 1957	616	3,267	2,366,000	2,846	2,060,000
1958	1566	21,000	May 26, 1958	432	2,755	1,994,000	3,229	2,338,000
1959	1636	15,700	June 22, 1959	554	4,134	2,993,000	4,507	3,263,000
1960	1716	16,400	Dec. 16, 1959	572	3,616	2,625,000	-	-

a May 19, July 9, 1953.

4614. Mission Creek above Sand Creek, near Cashmere, Wash.

Location.--Lat 47°25'45", long 120°30'45", in SE¼NW¼ sec.6, T.22 N., R.19 E., on left bank 400 ft upstream from Sand Creek, 3 miles downstream from East Fork, and 7 miles south of Cashmere.

Drainage area.--40 sq mi, approximately.

Records available.--December 1958 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,750 ft (from topographic map).

Extremes.--1958-60: Maximum discharge, 240 cfs Nov. 22, 1959 (gage height, 3.10 ft); maximum gage height, 4.31 ft Jan. 7, 1959 (backwater from ice); minimum discharge, 2.1 cfs Sept. 12, 13, 1959 (gage height, 1.14 ft).

Remarks.--No regulation or diversion 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
1959	-	-	-	18.4	12.9	33.8	43.6	35.6	20.1	7.89	3.65	4.19	-
1960	5.95	12.6	6.71	5.00	8.60	29.4	48.3	68.0	27.0	8.77	4.78	2.68	19.0

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1959	-	-	-	1,130	718	2,080	2,590	2,190	1,200	485	224	249	-
1960	366	752	413	307	495	1,810	2,880	4,180	1,600	539	294	160	13,800

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	
1959	1638	1444	Apr. 1, 1959	-	-	-	-	17.1	5.82	12,400	-
1960	1718	240	Nov. 22, 1959	2.3	19.0	0.475	6.45	-	-	-	-

a Maximum during period December 1958 to September 1959.

4615. Sand Creek near Cashmere, Wash.

Location.--Lat 47°25'50", long 120°30'45", in NW¼ sec.6, T.22 N., R.19 E., 800 ft upstream from mouth and 6¼ miles southwest of Cashmere.

Drainage area.--18.6 sq mi (revised).

Records available.--May 1954 to September 1956, water years 1954, 1957-60 (annual maximum).

Gage.--Crest-stage gage. Altitude of gage is 1,730 ft (from topographic map). May 30, 1954, to Sept. 30, 1956, water-stage recorder a quarter of a mile upstream at different datum.

Extremes.--1954-60: Maximum discharge, 425 cfs Aug. 15, 1956 (gage height, 5.95 ft), estimated on basis of computation of peak flow through culvert 600 ft downstream, adjusted for channel storage.

1954-56: Minimum discharge, 0.4 cfs Sept. 10, 1955 (gage height, 1.06 ft).

Remarks.--No regulation or diversion 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
1954	-	-	-	-	-	-	-	-	4.14	1.67	1.06	0.94	-
1955	0.92	1.65	1.29	1.31	2.61	3.39	14.2	19.6	5.53	1.82	.68	.53	4.46
1956	.84	1.25	4.77	9.30	3.77	23.4	93.4	44.1	7.43	3.87	3.13	1.66	16.4

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1954	-	-	-	-	-	-	-	-	246	103	85	56	-
1955	57	98	79	80	145	209	845	1,200	329	112	42	31	3,230
1956	52	74	293	572	217	1,440	5,560	2,710	442	238	192	99	11,890

Yearly 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	-	-	-	-	-	-	-	-	-	-	-
1951	-	-	-	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-	-	-	-
1953	-	-	-	-	-	-	-	-	-	-	-
1954	1346	67.4	Apr. 18, 1954	-	-	-	-	-	-	-	-
1955	1396	71	Feb. 7, 1955	0.5	4.46	0.225	3.07	3,230	4.72	3,25	3,410
1956	1446	425	Aug. 15, 1956	.5	16.4	.828	11.26	11,890	-	-	-
1957	-	112	Apr. 12, 1957	-	-	-	-	-	-	-	-
1958	-	68.5	Apr. 20, 1958	-	-	-	-	-	-	-	-
1959	-	115	Jan. - 1959	-	-	-	-	-	-	-	-
1960	-	120	Nov. 22, 1959	-	-	-	-	-	-	-	-

WENATCHEE RIVER BASIN

4620. Mission Creek near Cashmere, Wash.

Location.--Lat 47°30'15", long 120°28'30", in SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.8, T.23 N., R.19 E., on right bank $\frac{1}{2}$ miles upstream from mouth and $\frac{1}{2}$ miles south of Cashmere.

Drainage area.--77.9 sq mi; at crest-stage gage site, 79.1 sq mi.

Records available.--May 1954 to November 1958, water years 1954, 1959-60 (annual maximum) published as "at Cashmere."

Gage.--Crest-stage gage. Altitude of gage is 850 ft (from topographic map). May 20, 1954, to Nov. 30, 1958, water-stage recorder half a mile upstream at different datum.

Extremes.--1954-60: Maximum discharge, 463 cfs Apr. 22, 1956 (gage height, 2.78 ft).

1954-58: Minimum daily discharge, 0.1 cfs Aug. 25 to Sept. 12, 1955.

Remarks.--No regulation. Many small diversions for domestic use and 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
1954	-	-	-	-	-	-	-	-	19.8	7.53	4.71	5.21	-
1955	4.44	10.8	6.37	6.52	14.5	11.6	35.4	59.7	34.7	9.63	2.00	1.97	16.4
1956	6.12	11.2	11.9	22.3	17.2	65.1	224	131	53.6	17.1	11.0	9.35	48.3
1957	8.65	10.1	37.3	8.14	13.0	36.4	73.1	72.5	17.3	6.62	4.46	3.96	24.4
1958	8.82	8.92	10.2	11.2	42.0	41.8	71.5	70.4	20.4	6.41	2.35	3.27	24.6
1959	4.06	18.0	-	-	-	-	-	-	-	-	-	-	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1954	-	-	-	-	-	-	-	-	1,180	463	289	310	-
1955	273	642	392	401	804	714	2,110	3,670	2,060	592	123	117	11,900
1956	376	664	730	1,370	989	4,000	13,350	8,080	3,190	1,050	677	557	35,030
1957	532	601	2,290	500	722	2,240	4,350	4,480	1,030	407	274	236	17,640
1958	542	531	630	690	2,530	2,570	4,250	4,530	1,210	394	144	194	17,820
1959	250	1,070	-	-	-	-	-	-	-	-	-	-	-

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	1346	168	Apr. 18, 1954	-	-	-	-	-	-
1955	1396	215	Feb. 8, 1955	0.1	16.4	11,900	17.1	12,360	-
1956	1446	463	Apr. 22, 1956	3.7	48.3	35,030	50.6	36,690	-
1957	1516	192	May 1, 1957	2.6	24.4	17,640	22.0	15,920	-
1958	1566	151	Feb. 25, 1958	1.9	24.6	17,820	-	-	-
1959	1716	141	Apr. 1, 1959	-	-	-	-	-	-
1960	1716	235	Nov. 22, 1959	-	-	-	-	-	-

DOUGLAS CREEK BASIN

4630. Douglas Creek near Alstown, Wash.

Location.--Lat 47°35'00", long 120°00'50", in S $\frac{1}{2}$ sec.12, T.24 N., R.22 E., on left bank $\frac{1}{2}$ miles northwest of Alstown and 2.9 miles south of Douglas.

Drainage area.--114 sq mi.

Records available.--June 1949 to September 1955, water years 1956-60 (annual maximum).

Gage.--Crest-stage gage. Altitude of gage is 2,260 ft (by barometer). June 18, 1949, to Sept. 30, 1955, water-stage recorder at same site and datum.

Average discharge.--6 years (1949-55), 5.74 cfs (4,160 acre-ft per year).

Extremes.--1949-60: Maximum discharge, 3,360 cfs Mar. 18, 1957 (gage height, 8.7 ft, from outside floodmarks), from rating curve extended above 760 cfs.

1949-55: Minimum discharge, 0.1 cfs Oct. 19, 1949, but may have been less during period of no gage-height record Jan. 21-24, 1950.

Flood of June 10, 1948, reached a stage of 13.05 ft, from floodmarks (discharge, 6,420 cfs, on basis of slope-area measurement).

Remarks.--No regulation. Possible minor diversions for domestic use 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	0.65	0.83	0.79	1.13	5.20	43.3	25.0	3.41	1.76	1.15	0.56	0.68	7.05
1952	.77	1.16	1.70	1.50	2.14	10.3	3.78	2.24	1.41	.69	.54	.88	2.27
1953	.67	.52	.74	2.62	2.27	1.87	1.67	1.59	1.53	1.01	.84	.60	1.32
1954	.67	.95	1.10	1.10	50.8	9.81	2.10	1.94	1.30	.62	.60	.57	5.64
1955	.60	.71	.75	.70	34.2	19.8	8.70	1.37	.82	.69	.35	.46	5.56

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	40	50	48	70	289	2,660	1,490	209	105	71	34	41	5,110
1952	47	89	105	92	123	636	225	137	84	42	33	52	1,640
1953	41	31	46	161	126	115	99	98	91	62	52	36	958
1954	41	57	68	68	2,820	603	125	119	77	38	31	34	4,080
1955	37	42	46	43	1,900	1,220	518	84	49	43	21	28	4,030

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						
1950	-	-	-	-	-	-	12.7	-	9,190
1951	1216	293	Mar. 26, 1951	-	7.05	5,110	7.17	-	5,190
1952	1246	214	Mar. 25, 1952	-	2.27	1,640	2.13	-	1,540
1953	1286	73	Aug. 26, 1953	-	1.32	958	1.39	-	1,010
1954	1346	3,160	Feb. 25, 1954	0.5	5.64	4,080	5.58	-	4,040
1955	1396	563	Feb. 8, 1955	.2	5.56	4,030	-	-	-
1956	1566	a400	Aug. 25, 1956	-	-	-	-	-	-
1957	1566	3,560	Mar. 18, 1957	-	-	-	-	-	-
1958	1566	1,790	June 7, 1958	-	-	-	-	-	-
1959	1636	1,850	Mar. 26, 1959	-	-	-	-	-	-
1960	1716	710	(b)	-	-	-	-	-	-

a Based on gage height estimated by local resident.

b Occurred sometime during March 1960.

4635. Douglas Creek near Palisades, Wash.

Location.--Lat 47°28'00", long 119°52'30", in NW¼ sec.30, T.23 N., R.24 E., on right bank just upstream from Great Northern Railway (Mansfield Branch) bridge, 1.3 miles upstream from Moses Coulee and 3.8 miles northeast of Palisades.

Drainage area.--206 sq mi.

Records available.--November 1949 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 1,360 ft (by altimeter).

Extremes.--1949-52: Maximum discharge, 1,960 cfs June 18, 1950 (gage height, 6.30 ft, from high-water mark in well), from rating curve extended above 70 cfs on basis of slope-area measurement of peak flow; minimum, 3.1 cfs Dec. 25, 26, 1951 (gage height, 1.74 ft), but may have been less sometime during period of no gage-height record.

Remarks.--No regulation. A few minor diversions above station for irrigation and domestic 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	7.65	7.90	8.35	7.88	29.8	135	93.3	14.3	9.33	7.94	7.37	7.38	28.0
1952	7.57	7.82	6.58	4.51	8.14	24.2	13.8	9.45	7.91	8.71	7.70	8.28	9.57

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	470	470	514	483	1,660	8,290	5,550	880	555	488	453	439	20,250
1952	468	465	404	277	468	1,490	823	581	470	535	473	492	6,940

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	-	-	-	-	-	-	38.7	27,990
1951	1216	1,520	Mar. 26, 1951	6.8	28.0	20,250	27.8	20,130
1952	1246	408	Mar. 25, 1952	-	9.57	6,940	-	-

4640. Douglas Creek at Palisades, Wash.

Location.--Lat 47°25', long 119°56', in SE¼ sec.10, T.22 N., R.23 E., on left bank three-quarters of a mile south of Palisades.

Drainage area.--844 sq mi.

Records available.--January 1951 to September 1955 (fragmentary).

Gage.--Water-stage recorder. Altitude of gage is 955 ft (by barometer).

Extremes.--1951-55: Maximum discharge, 1,990 cfs Mar. 26, 1951 (gage height, 7.22 ft), from rating curve extended above 260 cfs by logarithmic plotting; no flow at times in each year.

Peak of Jan. 24, 1959, reached a stage of 9.8 ft, from high-water mark in well (discharge, 3,500 cfs).

Remarks.--No regulation. A few diversions for irrigation and domestic use above station. Station operated to obtain floodflows only.

Monthly and 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	27.1	12.8	3.83	0.75	0	0	0	2.70	3.77
1955	0	.86	0	0	0	21.9	4.40	0	0	0	0	0	2.30

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	1,510	784	228	46	0	0	0	160	2,730
1955	0	51	0	0	0	1,350	262	0	0	0	0	0	1,660

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					
1951	1216	1,990	Mar. 26, 1951	-	-	-	-	-
1952	1246	442	Mar. 25, 1952	-	-	-	-	-
1953	1286	0	-	0	0	0	0	0
1954	1346	1,020	Feb. 25, 1954	0	3.77	2,730	3.84	2,780
1955	1396	347	Mar. 29, 1955	0	2.30	1,660	-	-

4645. Columbia River at Trinidad, Wash.

Location.--Lat 47°13'30", long 120°00'50", in SE $\frac{1}{4}$ sec.13, T.20 N., R.22 E., on left bank half a mile southwest of Trinidad, $\frac{3}{4}$ miles downstream from Colococham Creek, and 12 miles downstream from Rock Island Dam.

Drainage area.--89,700 sq mi, approximately.

Records available.--January to December 1910 (gage heights only), May 1913 to September 1960. Published as "at Wenatchee" 1910, 1913-16 and as "at Vernita" 1917-30.

Gage.--Water-stage recorder. Datum of gage is 499.3 ft above mean sea level (river-profile survey). Prior to Jan. 1, 1916, staff gage 1 mile upstream from highway bridge at Wenatchee (24 miles upstream) at datum 583 ft above mean sea level, unadjusted. Jan. 1 to Dec. 31, 1916, staff gage on pier of highway bridge at Wenatchee at datum 579.30 ft above mean sea level, unadjusted. Jan. 14, 1917, to Sept. 30, 1930, staff gages at ferry at Vernita (50 miles downstream) at datum 368.7 ft above mean sea level, unadjusted.

Average discharge.--47 years (1913-60), 120,300 cfs (87,090,000 acre-ft per year), unadjusted.

Extremes.--1913-60: Maximum discharge, 692,600 cfs June 12, 1948 (gage height, 59.35 ft); minimum, 4,120 cfs Feb. 10, 1932 (gage height, 11.40 ft).

Maximum discharge known, about 740,000 cfs June 7, 1894 (based on information obtained at other points).

Remarks.--Diversion above station for irrigation of about 500,000 acres is small percentage of flow past gage. Some diurnal fluctuation caused by powerplants at Rock Island, Chief Joseph, and Grand Coulee Dams. Flow regulated by Rufus Woods Lake (see p. 332), Franklin D. Roosevelt Lake (see p. 330), and reservoirs in Kootenai, Flathead, Pend Oreille, Spokane, Okanogan, and Chelan River basins.

Corrections.--In WSP 1316, the monthly mean discharges for June 1914 and September 1923 are listed in error; they should be 322,000 cfs and 99,900 cfs, 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	68,820	78,040	79,360	87,580	100,800	85,520	128,500	137,700	339,200	289,000	141,400	77,410	149,800
1952	79,890	69,190	67,750	77,840	69,610	80,910	88,120	276,300	273,700	204,100	107,900	64,660	121,900
1953	57,210	55,850	52,000	50,830	71,560	80,450	84,660	43,400	351,100	246,900	21,100	68,200	115,400
1954	75,670	69,200	62,530	69,150	62,770	72,510	66,530	247,000	387,300	359,100	78,900	117,800	147,800
1955	75,360	75,320	71,380	69,310	78,210	66,700	80,220	89,580	326,000	342,000	49,300	53,760	127,500
1956	69,050	78,510	69,440	73,590	73,650	74,450	188,700	322,100	447,400	402,480	300,230,000	80,640	154,000
1957	71,690	68,640	64,590	78,590	72,420	56,010	77,230	305,600	319,100	156,500	96,490	64,900	119,600
1958	63,750	61,150	56,750	59,540	66,750	86,920	95,380	221,500	320,500	160,800	93,200	67,580	112,900
1959	67,500	61,640	67,230	78,520	84,400	99,630	123,400	239,800	375,900	299,100	134,900	118,100	146,100
1960	117,600	108,900	92,560	78,160	74,670	72,680	163,500	194,300	278,400	250,500	122,800	75,000	135,900

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	4,231	4,644	4,880	5,385	5,598	5,259	7,644	19,530	20,180	17,770	8,692	4,608	108,400
1952	4,912	4,117	4,165	4,766	4,015	4,975	5,244	16,990	16,280	12,550	6,633	3,848	88,520
1953	3,517	3,324	3,197	3,126	3,974	4,946	5,037	8,614	19,700	15,180	7,446	5,248	83,510
1954	4,653	4,118	3,845	4,190	3,486	4,458	3,959	15,190	23,040	22,080	11,000	7,008	107,000
1955	4,634	4,482	4,359	4,261	4,344	5,331	4,773	5,508	19,400	21,030	9,181	4,984	92,320
1956	4,246	4,671	4,270	4,525	4,236	4,577	11,230	19,800	26,620	15,260	7,561	4,799	111,800
1957	4,408	4,084	3,972	4,833	4,022	3,444	4,596	18,790	18,990	9,624	5,933	3,862	86,560
1958	3,920	3,639	3,490	3,661	3,707	5,344	5,676	13,620	19,070	9,865	5,731	4,021	81,760
1959	4,151	3,668	4,134	4,828	4,687	6,126	7,344	14,750	22,370	18,390	8,294	7,027	105,800
1960	7,234	6,480	5,691	4,806	4,295	4,469	9,730	11,950	16,560	15,400	7,548	4,463	98,630

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	147,800	107,000,000
1951	1216	408,000	May 26, 1951	57,300	149,800	108,400,000	149,000	107,900,000
1952	1246	369,800	May 27, 1952	53,800	121,900	88,520,000	117,600	85,360,000
1953	1286	395,100	June 17, 1953	35,200	115,400	83,510,000	118,900	86,090,000
1954	1346	420,600	July 15, 1954	46,600	147,800	107,000,000	149,100	107,900,000
1955	1396	448,500	July 1, 1955	54,200	127,500	92,320,000	127,100	92,000,000
1956	1446	553,900	June 6, 1956	49,000	154,000	111,800,000	153,000	11,070,000
1957	1516	427,400	May 26, 1957	45,800	113,600	86,560,000	117,600	85,140,000
1958	1566	397,800	June 5, 1958	41,600	112,900	81,760,000	114,200	82,670,000
1959	1636	438,600	June 28, 1959	51,700	146,100	105,800,000	156,400	113,200,000
1960	1716	311,400	July 8, 1960	53,300	135,900	98,630,000	-	-

4650. Crab Creek at Irby, Wash.

Location.--Lat 47°21'30", long 118°51'00", in NW¼ sec.31, T.22 N., R.32 E., on right bank 8 ft upstream from highway bridge at Irby, 5 miles downstream from Lake Creek, and 7 miles west of Odessa.

Drainage area.--974 sq mi.

Records available.--September 1942 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,386.30 ft above mean sea level, datum of 1929, supplementary adjustment of 1947.

Average discharge.--18 years (1942-60), 91.4 cfs (66,170 acre-ft per year).

Extremes.--1942-60: Maximum discharge, 8,370 cfs Feb. 27, 1957 (gage height, 11.94 ft);

minimum, 2.0 cfs Jan. 12, 1948 (gage height, 1.80 ft).

Remarks.--No regulation. Some diversion above station for irrigation.

Revisions.--Some periods for the water years 1949-50 were revised in WSP 1446; resulting revised records as summarized herewith supersede those published in WSP 1316.

Month	Mean	Acre-feet	Momentary maximum	
			Discharge	Date
February 1949.....	744	41,300	-	-
Water year 1948-49...	135	97,560	2,970	Feb. 24, 1949
Calendar year 1949...	130	94,170	-	-
February 1950.....	490	27,190	-	-
March.....	908	55,860	-	-
Water year 1949-50...	157	113,300	3,070	Mar. 5, 1950
Calendar year 1950...	158	114,200	-	-

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	19.2	17.1	22.0	49.4	424	497	195	91.9	55.9	32.1	23.3	20.2	119
1952	20.0	22.3	24.8	34.8	279	260	195	81.7	46.0	30.7	21.7	15.9	85.0
1953	16.8	17.1	22.0	53.1	91.6	88.6	59.8	34.8	28.4	18.9	13.2	9.89	37.5
1954	9.55	12.0	13.5	20.1	128	140	64.3	29.3	26.2	17.5	10.9	9.83	39.5
1955	10.6	13.3	19.7	72.3	303	166	78.5	42.1	22.1	18.3	13.6	9.98	62.5
1956	7.76	7.83	295	1,163	510	1,141	248	82.9	47.4	29.3	22.4	14.4	299
1957	14.8	21.2	28.5	27.7	691	288	95.4	47.1	55.7	26.8	23.2	12.6	107
1958	10.1	11.3	13.8	129	151	186	101	45.2	28.6	21.5	13.6	9.89	59.6
1959	8.95	9.00	18.7	779	339	289	111	52.6	32.5	24.4	15.5	11.0	140
1960	11.7	13.9	24.5	76.2	342	93.2	63.2	38.1	27.6	17.9	12.3	8.75	59.6

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	1,020	1,360	3,040	23,530	30,570	11,590	5,650	3,330	1,970	1,430	1,200	85,870
1952	1,230	1,330	1,520	2,140	16,030	15,960	11,600	5,020	2,740	1,890	1,330	944	61,730
1953	1,030	1,020	1,350	3,260	5,090	5,450	3,560	2,140	1,690	1,160	813	588	27,150
1954	587	715	830	1,230	7,110	8,610	3,820	1,800	1,560	1,080	668	585	28,600
1955	652	793	1,210	4,450	16,850	10,180	4,670	2,590	1,320	1,120	836	594	45,260
1956	477	466	18,160	71,520	29,350	70,150	14,760	5,100	2,820	1,800	1,370	855	216,800
1957	908	1,260	1,760	1,710	38,400	17,680	5,680	2,900	3,310	1,650	1,430	753	77,440
1958	622	671	849	7,930	8,390	11,410	6,040	2,780	1,700	1,320	837	589	43,140
1959	550	536	1,150	47,880	18,840	17,760	6,610	3,240	1,940	1,500	950	656	101,600
1960	721	827	1,510	4,680	19,660	5,730	3,760	2,340	1,640	1,100	759	521	43,250

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					
1950	-	-	-	-	-	-	158	114,200
1951	1216,1446	2,410	Mar. 16, 1951	14.5	119	85,870	119	86,390
1952	1246	1,300	Feb. 5, 1952	14.5	85.0	61,730	84.1	61,050
1953	1286	103	Feb. 19, 1953	9.1	37.5	27,150	35.8	25,880
1954	1346	744	Feb. 23, 1954	9.1	39.5	28,600	40.2	29,120
1955	1396	2,160	Feb. 8, 1955	8.4	62.5	45,260	85.2	61,710
1956	1446	4,170	Mar. 2, 1956	6.6	299	216,800	278	201,700
1957	1516	8,370	Feb. 27, 1957	9.5	107	77,440	104	75,660
1958	1566	832	Jan. 19, 1958	8.8	59.6	43,140	59.7	43,230
1959	1636	5,550	Jan. 24, 1959	8.2	140	101,600	141	102,400
1960	1716	1,290	Feb. 8, 1960	7.4	59.6	43,250	-	-

4655. Wilson Creek at Wilson Creek, Wash.

Location.--Lat 47°26', long 119°06', in SW¹/₄ sec.6, T.22 N., R.30 E., on right bank 1 mile upstream from mouth and 1 mile northeast of town of Wilson Creek.

Drainage area.--About 470 sq mi.

Records available.--February 1951 to March 1957, October 1958 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,280 ft (from Great Northern Railway). Feb. 28 to Mar. 25, 1957, staff gage at same site and datum. Prior to flood of Feb. 26, 1957, water-stage recorder at same site and datum.

Extremes.--1951-57, 1958-60: Maximum discharge, 12,900 cfs Feb. 26, 1957 (gage height, 20.74 ft), result of slope-area measurement of peak flow; no flow for long periods in each year.

Remarks.--Some regulation by small dams above station. Numerous 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	-	-	-	-	20.7	77.9	35.6	9.56	0.520	0	0	0	-
1952	0	0	0	0	0	0	14.2	.987	0	0	0	0	1.25
1953	0	0	0	0	0	0	0	0	0	0	0	0	0
1954	0	0	0	0	17.2	.16	.24	0	0	0	0	0	1.35
1955	0	0	0	0	0	.39	3.70	.1	0	.61	0	0	.39
1956	0	0	0	0	1.88	239	74.6	15.6	0	0	0	0	27.8
1957	0	0	2.34	0	294	96.2	-	-	-	-	-	-	-
1958	0	0	0	0	0	0	0	0	0	0	0	0	0
1959	0	0	1.94	457	54.1	233	9.70	0	0	0	0	0	63.7
1960	0	0	2.03	19.4	239	1.25	1.63	0	0	0	0	0	21.0

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	1,150	4,790	2,120	586	37	0	0	0	-
1952	0	0	0	0	0	0	847	61	0	0	0	0	908
1953	0	0	0	0	0	0	0	0	0	0	0	0	0
1954	0	0	0	0	956	9.7	14	0	0	0	0	0	980
1955	0	0	0	0	0	24	220	.6	0	37	0	0	282
1956	0	0	0	0	108	14,700	4,440	958	0	0	0	0	20,210
1957	0	0	144	0	16,340	5,910	-	-	-	-	-	-	-
1958	0	0	0	0	0	0	0	0	0	0	0	0	0
1959	0	0	199	28,080	3,000	14,310	577	0	0	0	0	0	46,090
1960	0	0	125	1,190	13,740	77	97	0	0	0	0	0	15,230

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	12176	*1,690	Mar. 16, 1951	0	-	-	-	-
1952	1246	421	Apr. 9, 1952	0	1.25	908	1.25	908
1953	1286	0	-	0	0	0	0	0
1954	1346	811	Feb. 22, 1954	0	1.35	980	1.35	980
1955	1396	*234	Mar. 31, 1955	0	.39	282	.39	282
1956	1446	1,270	Mar. 23, 1956	0	27.8	20,210	28.0	20,350
1957	1516	12,900	Feb. 26, 1957	-	-	-	-	-
1958								
1959	1636	4,620	Jan. 24, 1959	0	63.7	46,090	63.7	46,090
1960	1716	2,900	Feb. 7, 1960	0	21.0	15,230	-	-

* Revised.

4670. Crab Creek near Moses Lake, Wash.

Location.--Lat 47°11'25", long 119°16'00", in NW¼NE¼ sec.35 (revised), T.20 N., R.28 E., on left bank on downstream side of highway bridge, 3 miles upstream from Parker Horn and 4 miles north of town of Moses Lake.

Drainage area.--About 2,040 sq mi.

Records available.--September 1942 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,070.39 ft above mean sea level (Bureau of Reclamation bench mark). Prior to July 14, 1956, at site 300 ft upstream at same datum.

Extremes.--1942-60: Maximum discharge, 10,400 cfs Feb. 28, 1957 (gage height, 6.81 ft); no flow during several months in each year prior to 1952 and part of each day Jan. 14, 15, 1953.

Remarks.--Numerous small diversions for irrigation and domestic use above station. Most of natural flow from upper basin passes this station underground. No regulation. Beginning in 1952, return flow from irrigation on Columbia Basin project has increased runoff during summer 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
1951	1.11	0.36	0.29	0.15	220	389	183	65.0	13.6	1.45	0.92	0.43	72.0
1952	28	19	.13	.03	51.6	85.1	141	41.8	42.1	54.6	67.0	75.4	46.4
1953	67.2	15.8	10.3	8.00	4.31	3.60	9.14	25.9	57.5	76.0	93.6	90.5	38.7
1954	65.7	24.0	12.6	9.69	9.47	7.39	11.9	29.0	42.1	63.2	80.1	78.1	36.3
1955	66.2	30.5	14.2	12.7	73.4	87.0	46.8	21.0	20.2	36.4	38.7	44.2	40.7
1956	33.8	24.2	18.5	351	193	1,012	287	100	42.9	34.8	41.6	45.6	183
1957	41.0	26.9	19.8	11.5	228	802	56.8	30.3	25.7	31.4	35.2	35.6	112
1958	32.6	21.7	14.9	12.7	24.9	123	74.0	25.8	19.7	33.7	39.9	37.0	38.4
1959	31.7	23.2	17.4	779	285	482	95.6	39.2	18.4	25.4	39.7	47.1	157
1960	31.9	20.4	13.8	9.91	422	50.5	43.2	21.7	16.6	32.0	42.8	40.4	60.5

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	68	21	18	9.3	12,220	23,900	10,920	4,000	808	89	57	25	52,140
1952	18	11	7.7	1.8	2,970	5,230	8,380	2,570	2,510	3,360	4,120	4,480	33,660
1953	4,130	941	633	492	239	221	544	1,590	3,420	4,680	5,760	5,390	28,040
1954	4,040	1,430	777	596	526	454	706	1,780	2,500	3,890	4,930	4,650	26,280
1955	4,070	1,820	875	782	4,080	5,350	2,790	1,290	1,200	2,240	2,380	2,630	29,510
1956	2,080	1,440	1,130	21,580	11,070	62,230	17,070	6,160	2,550	2,140	2,560	2,720	132,700
1957	2,520	1,600	1,220	704	12,640	49,320	5,380	1,880	1,530	1,330	2,170	2,120	80,990
1958	2,010	1,290	917	780	1,380	7,550	4,400	1,580	1,170	2,070	2,460	2,200	27,810
1959	1,950	1,380	1,070	47,920	15,800	29,630	5,690	2,410	1,090	1,560	2,440	2,800	113,700
1960	1,960	1,210	851	610	24,290	3,100	2,570	1,330	988	1,970	2,630	2,400	43,910

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	102	74,050
1951	1216	1,590	Mar. 18, 1951	0	72.0	52,140	71.9	52,070
1952	1246	195	Apr. 6, 1952	0	46.4	33,660	54.2	39,330
1953	1286	109	Aug. 27, 1953	.2	38.7	28,040	39.5	28,580
1954	1346	95	Aug. 20, 1954	5.3	36.3	26,280	37.0	26,800
1955	1396	355	Feb. 14, 1955	10	40.7	29,510	37.8	27,390
1956	1446	3,090	Mar. 5, 1956	14	183	132,700	184	133,400
1957	1516	10,400	Feb. 28, 1957	8	112	80,990	110	79,870
1958	1566	166	Mar. 8, 1958	9.8	38.4	27,810	38.7	27,990
1959	1636	5,000	Jan. 27, 1959	11.5	157	113,700	157	113,400
1960	1716	1,230	Feb. 9, 1960	8.0	60.5	43,910	-	-

4685. Park Creek below Park Lake, near Coulee City, Wash.

Location.--Lat 47°34'20", long 119°25'10", in SW $\frac{1}{4}$ sec.15, T.24 N., R.27 E., on left bank at highway crossing, 100 ft upstream from mouth, 500 ft downstream from Park Lake, and $\frac{6}{16}$ miles southwest of Coulee City.

Drainage area.--38.4 sq mi (revised). Since August 1951, flow from about 360 sq mi, which was tributary to Banks Lake, has been diverted through main canal. This area was formerly a closed noncontributing basin within the area above gage site.

Records available.--July 1945 to September 1960.

Gage.--Water-stage recorder and concrete control. Datum of gage is 1,091.52 ft above mean sea level (Bureau of Reclamation bench mark).

Average discharge.--15 years (1945-60), 9.76 cfs (7,070 acre-ft per year).

Extremes.--1945-60: Maximum discharge, 47 cfs Feb. 9, 1951 (gage height, 2.71 ft); maximum gage height, 3.05 ft Jan. 28, 1950 (backwater from ice); minimum discharge not determined, probably less than 0.1 cfs during period Aug. 17 to Sept. 21 or Oct. 1-17, 1945 (gage height, less than 1.4 ft).

Remarks.--Some diversion during summer months for irrigation above Park Lake. Occasional regulation by operation of fish screen at outlet of Park 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	6.58	9.38	10.9	8.27	13.0	14.3	11.4	8.78	6.67	3.16	1.20	3.75	8.08
1952	8.73	9.69	10.5	13.3	18.2	14.4	10.6	8.77	4.90	3.56	2.54	6.56	9.27
1953	10.8	6.03	20.7	21.8	16.1	12.3	14.0	12.5	11.8	5.31	6.59	7.15	12.1
1954	8.85	13.0	13.2	14.8	15.9	9.82	10.3	7.65	8.24	5.11	4.95	7.98	9.94
1955	9.27	12.2	13.8	12.8	14.5	9.53	11.4	12.8	5.52	5.65	6.29	8.55	10.2
1956	10.0	8.82	15.3	15.7	14.6	17.1	10.6	12.5	11.3	5.21	6.98	7.71	11.3
1957	11.4	15.2	12.5	12.3	14.2	19.1	12.2	14.5	11.5	6.23	6.15	7.38	11.9
1958	10.3	13.4	15.1	16.0	16.0	15.2	14.7	11.5	6.58	8.02	6.90	8.34	11.8
1959	10.5	16.1	15.1	23.5	25.2	19.4	14.4	11.6	9.38	9.45	17.2	16.2	15.6
1960	18.2	18.9	21.2	19.1	21.3	18.7	15.0	15.7	12.3	8.63	8.64	13.0	15.9

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	405	558	671	508	724	880	677	540	397	194	74	223	5,850
1952	537	577	645	816	1,040	884	633	539	291	219	156	291	6,730
1953	662	359	1,280	1,340	896	758	835	766	703	326	405	425	8,760
1954	544	774	809	908	883	604	616	471	490	314	304	475	7,190
1955	570	725	850	787	806	586	681	784	328	348	387	509	7,360
1956	617	525	942	964	838	1,050	629	771	672	321	429	459	8,220
1957	702	905	769	758	789	1,170	723	889	686	383	378	439	8,590
1958	633	797	926	981	887	933	874	709	391	493	424	496	8,540
1959	644	957	928	1,450	1,400	1,190	858	715	557	581	1,060	966	11,310
1960	1,120	1,120	1,300	1,180	1,230	1,150	893	967	732	531	531	771	11,520

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	-	-	-	-	-	-	7.43
1951	1216	47	Feb. 9, 1951	0.9	8.08	5,850	8.23
1952	1246	24	Dec. 13, 1951	1.2	9.27	6,730	10.0
1953	1286	27	Dec. 17, 1952	.1	12.1	8,760	11.9
1954	1346	27	Jan. 22, 1954	.1	9.94	7,190	9.96
1955	1396	19.5	Dec. 1, 1954	.9	10.2	7,360	10.1
1956	1446	24	Feb. 29, 1956	.7	11.3	8,220	11.7
1957	1516	23	Mar. 15, 1957	1.0	11.9	8,590	11.8
1958	1566	24	July 1, 1958	3.8	11.8	8,540	12.0
1959	1636	38	Jan. 12, 1959	3.0	15.6	11,310	17.0
1960	1716	a40	Nov. 24, 1959	4.2	15.9	11,520	-

a About.

4705. Rocky Ford Creek near Ephrata, Wash.

Location.--Lat 47°18'20", long 119°26'50", in NW¼NW¼ sec.21, T.21 N., R.27 E., on right bank 1½ miles downstream from source at Rocky Ford Springs, 5 miles upstream from mouth, and 5 miles east of Ephrata.

Drainage area.--11.7 sq mi (revised), contributing area. Does not include about 500 sq mi in closed basins upstream from Ephrata.

Records available.--June 1909 to April 1910, July to December 1911, August 1942 to September 1960. Prior to January 1910, published as Upper Crab Creek near Ephrata.

Gage.--Water-stage recorder. Datum of gage is 1,064.88 ft above mean sea level (Bureau of Reclamation bench mark). Prior to Jan. 1, 1912, staff gages at sites 4½ to 5½ miles downstream at different datums. Aug. 19, 1942, to May 23, 1945, water-stage recorder at site 3½ miles downstream at datum 5.37 ft lower.

Average discharge.--18 years (1942-60), 82.4 cfs (59,660 acre-ft per year).

Extremes.--1909-11, 1942-60: Maximum discharge, 212 cfs Apr. 15-18, 1956 (gage height, 3.58 ft); minimum observed, 20 cfs Aug. 13-18, 1911.

Remarks.--A few small diversions for domestic use above station. Slight regulation by fish hatchery.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	91.8	82.9	75.1	68.6	66.7	67.4	82.5	98.4	101	98.9	94.5	90.8	85.0
1952	87.6	84.1	78.7	72.8	71.7	78.1	85.2	89.6	92.0	96.6	103	103	87.0
1953	106	104	94.0	83.6	78.9	84.8	99.2	98.8	95.5	94.4	93.8	89.9	93.6
1954	88.8	85.5	77.6	71.2	67.5	66.9	78.1	89.5	89.9	91.3	94.9	93.1	82.9
1955	91.0	83.0	89.2	77.8	73.4	76.2	89.6	94.8	97.0	105	102	101	89.3
1956	98.0	86.3	76.8	75.0	110	169	206	199	179	165	155	144	139
1957	138	129	117	104	94.7	100	122	129	125	118	114	107	117
1958	100	96.6	90.2	84.8	88.5	103	103	98.6	93.6	92.5	91.7	94.4	94.7
1959	92.9	85.3	79.9	74.8	88.6	117	144	138	122	112	108	103	106
1960	97.5	93.6	86.1	74.1	69.8	85.5	98.3	93.5	87.2	90.9	99.9	100	89.8

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	5,640	4,930	4,620	4,220	3,710	4,150	4,910	6,050	6,020	6,080	5,810	5,400	61,540
1952	5,390	5,000	4,840	4,480	4,120	4,800	5,070	5,510	5,470	5,940	6,350	6,150	63,120
1953	6,520	6,170	5,780	5,140	4,380	5,210	5,900	6,080	5,680	5,800	5,770	5,350	67,780
1954	5,480	5,090	4,770	4,380	3,750	4,110	4,650	5,550	5,350	5,610	5,840	5,540	60,050
1955	5,800	4,940	4,810	4,790	4,070	4,690	5,330	5,830	5,770	6,480	6,300	6,040	64,630
1956	6,030	5,130	4,720	4,610	6,330	10,390	12,280	12,230	10,650	10,150	9,540	8,560	100,600
1957	8,480	7,680	7,190	6,370	5,260	6,180	7,250	7,930	7,450	7,280	6,980	6,350	84,400
1958	6,140	5,750	5,550	5,220	4,920	6,310	6,130	6,060	5,570	5,690	5,640	5,620	68,600
1959	5,710	5,080	4,920	4,800	4,920	7,160	8,580	8,520	7,260	6,860	6,650	6,150	76,410
1960	5,990	5,570	5,290	4,560	4,010	5,260	5,850	5,750	5,190	5,590	6,140	5,970	65,170

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	-	-	-	-	-	-	96.1
1951	1216	108	June 28, 1951	66	85.0	61,540	85.0
1952	1246	106	Aug. 31, 1952	70	87.0	63,120	91.4
1953	1286	109	Oct. 13, 1952	77	93.6	67,780	89.3
1954	1346	100	Aug. 20, 1954	65	82.9	60,050	83.0
1955	1396	109	July 24, 1955	71	89.3	64,630	90.0
1956	1446	212	Apr.15-18, 1956	72	139	100,600	149
1957	1516	142	Oct. 5, 1956	89	117	84,400	108
1958	1566	108	Apr. 2, 1958	82	94.7	68,600	92.3
1959	1636	148	Apr.17-19, 1959	72	106	76,410	107
1960	1716	106	Aug. 15, 1960	67	89.8	65,170	-

4715. Crab Creek near Warden, Wash.

Location (revised).--Lat 46°57'00", long 119°15'20", in SW¹/₄ NW¹/₄ sec.24, T.17 N., R.28 E., on left bank half a mile east of Goose Lake, $2\frac{1}{4}$ miles downstream from O'Sullivan Dam, and 10 miles west of Warden.

Drainage area.--About 4,150 sq mi, of which 500 sq mi in the vicinity of Soap Lake is probably noncontributing.

Records available.--June to December 1909, March to December 1910, February to December 1911, February to June 1912, October 1942 to September 1950, April 1951 to September 1953, October 1955 to September 1960. Published as Lower Crab Creek near Warden 1909-12. Records for September 1952 to September 1955 at site 2 miles upstream not equivalent owing to seepage bypassing gate.

Gage.--Water-stage recorder and timber control; prior to May 8, 1958, rock and culvert control. Altitude of gage is 880 ft (from topographic map). Prior to June 27, 1912, staff gages at several sites within 3 miles of present station at various datums. October 1942 to September 1950 water-stage recorder at site 1.6 miles upstream at different datum. October 1950 to September 1952 water-stage recorder at site 2 miles upstream at different datum.

Extremes.--1909-12, 1942-53, 1955-60: Maximum discharge, 3,000 cfs Feb. 7, 1943 (gage height, 4.25 ft, site and datum then in use), from rating curve extended above 20 cfs on basis of slope-area measurement of flood in Lind Coulee; no flow for short intervals in June and July 1948 and part of each day Feb. 2-21, 1952, when water was shut off at O'Sullivan Dam.

Remarks.--Many diversions for irrigation. Flow regulated by Potholes Reservoir and partially by Fish and Wildlife Service Dam since January 1958. Storage began in Potholes Reservoir in September 1952 and from this time until September 1955 the flow consisted of a small part of dam seepage. Discharge at present location includes essentially all of the seepage.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	8.80	22.0	21.8	24.1	23.1	-
1952	19.6	18.6	20.4	22.3	4.45	11.7	11.5	12.2	15.1	16.8	16.5	4.27	14.5
1953	.164	.170	.194	.170	.141	.120	.130	.164	.214	.258	.352	.361	.204
1954													
1955													
1956	29.0	29.8	30.1	30.5	32.4	33.4	32.3	31.2	31.0	31.1	31.1	32.0	31.2
1957	32.6	33.0	33.0	31.3	32.0	33.0	32.7	31.0	29.5	28.6	29.2	31.2	31.4
1958	30.0	30.9	29.0	29.3	28.9	29.8	33.2	19.2	25.2	25.8	22.1	22.3	27.1
1959	23.6	25.2	28.7	29.6	32.7	28.5	24.4	25.4	25.5	21.4	20.2	22.4	25.6
1960	26.2	31.6	35.8	19.8	31.3	27.7	28.9	25.9	20.3	20.9	23.8	25.0	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	-	-	-	-	-	-	-	541	1,310	1,340	1,480	1,380	-
1952	1,210	1,110	1,260	1,370	256	722	684	752	897	1,030	1,010	254	10,560
1953	10	10	12	10	7.9	7.4	7.7	10	13	16	22	22	148
1954													
1955													
1956	1,760	1,770	1,850	1,860	1,860	2,050	1,920	1,920	1,850	1,910	1,910	1,900	22,600
1957	2,010	1,960	2,030	1,920	1,780	2,030	1,950	1,910	1,750	1,760	1,800	1,850	22,750
1958	1,850	1,840	1,790	1,800	1,610	1,830	1,980	1,180	1,500	1,580	1,360	1,330	19,650
1959	1,450	1,500	1,760	1,820	1,610	1,750	1,450	1,560	1,520	1,320	1,240	1,330	18,510
1960	1,610	1,860	2,200	1,220	1,600	1,710	1,720	1,590	1,210	1,290	1,470	1,490	19,190

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	1216	-	-	-	-	-	-	-
1952	1246	a23	(b)	0	14.5	10,560	9.66	7,010
1953	1286	12	May 22, 1953	.12	.204	148	-	-
1954								
1955								
1956	1446	37	Feb. 21, 1956	29	31.2	22,600	32.0	23,200
1957	1516	35	June 1, 1957	28	31.4	22,750	30.7	22,230
1958	1568	392	May 24, 1958	11.5	27.1	19,650	26.1	18,880
1959	1636	174	Apr. 30, 1959	11.5	25.6	18,510	26.9	19,490
1960	1716	372	Oct. 21, 1959	10	28.4	19,190	-	-

a Maximum daily.

b Jan. 21 to Feb. 1, 1952.

Note.--The discharge for the water years 1954-55 consisted entirely of seepage from O'Sullivan Dam. The average seepage was 0.3 cfs.

4725. Crab Creek near Smyrna, Wash.

Location.--Lat 46°50'35", long 119°36'25", in SE $\frac{1}{4}$ sec.30, T.16 N., R.26 E., on left bank at highway bridge, 2 $\frac{1}{2}$ miles east of Smyrna and 17 miles upstream from mouth.

Drainage area.--About 4,500 sq mi (revised), of which about 500 sq mi in the vicinity of Soap Lake is probably noncontributing.

Records available.--August 1942 to November 1959.

Gage.--Water-stage recorder. Datum of gage is 530.83 ft above mean sea level (Bureau of Reclamation bench mark).

Extremes.--1942-59: Maximum discharge, 3,300 cfs Feb. 8, 1943 (gage height, 7.5 ft, estimated by observer), from rating curve extended above 1,000 cfs; possibly no flow at times during summer of 1947.

Remarks.--Many diversions above station for irrigation. Flow is entirely regulated by Potholes Reservoir. Flow by station is essentially seepage from Potholes Reservoir and return flow from part of the Columbia Basin project. Records of water temperatures for the period August 1959 to September 1960 are published in reports of 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	14.4	28.2	36.3	41.8	204	306	394	32.7	12.4	3.89	3.74	7.69	89.3
1952	12.2	17.6	13.7	12.1	22.5	14.4	9.74	7.52	7.78	8.17	11.3	12.4	12.4
1953	14.0	16.8	19.9	24.8	18.7	21.5	20.2	13.3	14.0	11.8	19.0	25.4	18.3
1954	37.4	40.9	35.8	26.3	41.0	35.1	36.0	32.8	30.0	27.2	26.3	33.7	33.5
1955	44.9	42.7	37.4	39.4	37.9	33.0	34.9	31.5	21.2	23.5	29.9	35.8	34.3
1956	51.1	40.0	49.9	54.1	49.4	47.2	39.1	35.5	40.8	38.6	33.4	42.3	43.4
1957	54.5	52.3	53.0	35.4	65.3	44.0	46.4	59.2	47.4	58.6	49.7	58.8	52.8
1958	67.9	51.5	56.0	65.2	65.2	53.3	48.7	34.7	35.9	37.2	41.2	51.4	50.6
1959	54.3	55.5	62.4	68.7	74.0	59.1	50.0	55.9	51.3	38.1	59.4	82.9	59.2
1960	74.7	63.3	-	-	-	-	-	-	-	-	-	-	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	885	1,680	2,230	2,570	11,330	18,830	23,460	2,010	741	239	230	458	64,660
1952	748	1,040	841	746	1,300	883	580	463	463	502	696	737	9,000
1953	863	1,000	1,220	1,520	1,040	1,320	1,200	818	853	725	1,170	1,510	13,220
1954	2,500	2,450	2,200	1,610	2,280	2,160	2,140	2,020	1,790	1,670	1,610	2,010	24,220
1955	2,760	2,540	2,300	2,420	2,100	2,030	2,070	1,940	1,260	1,450	1,840	2,130	24,840
1956	3,140	2,380	3,070	3,320	2,840	2,900	2,330	2,180	2,430	2,380	2,050	2,520	31,540
1957	3,350	3,110	3,260	2,170	3,630	3,380	2,760	3,640	2,820	3,600	2,990	3,500	38,210
1958	4,180	3,070	3,440	4,010	3,620	3,280	2,900	2,130	2,140	2,290	2,530	3,060	36,650
1959	3,340	3,300	3,840	4,220	4,110	3,630	2,970	3,440	3,050	2,340	3,650	4,930	42,820
1960	4,590	3,760	-	-	-	-	-	-	-	-	-	-	-

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	-	-	-	-	-	-	129	93,180
1951	1216	620	Feb. 10, 1951	1.2	89.3	64,660	86.3	62,500
1952	1246	98	Feb. 3, 1952	5.6	12.4	9,000	13.0	9,450
1953	1286	34	Jan. 21, 1953	7.2	18.3	13,220	23.6	17,070
1954	1346	98	Apr. 18, 1954	10	33.5	24,220	34.4	24,890
1955	1396	53	Oct. 22, 1954	13.5	34.3	24,840	35.7	25,850
1956	1446	134	Feb. 23, 1956	14.5	43.4	31,540	45.0	32,670
1957	1516	110	Feb. 13, 1957	15	52.8	38,210	54.1	39,180
1958	1566	83	Oct. 10, 1957	13	50.6	36,650	50.3	36,440
1959	1636	143	Jan. 13, 1959	21	59.2	42,820	-	-
1960	1656	884	Nov. 22, 1959	-	-	-	-	-

a Maximum during period October to November.

4726. Crab Creek near Beverly, Wash.

Location.--Lat 46°49'45", long 119°49'45", in NW¼SW¼ sec.33, T.16 N., R.24 E., on right bank 4½ miles upstream from mouth and 5 miles east of Beverly.

Drainage area.--About 4,550 sq mi, of which about 500 sq mi in the vicinity of Soap Lake is probably noncontributing.

Records available.--February 1959 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 500 ft (from topographic map).

Extremes.--1959-60: Maximum discharge, 177 cfs Feb. 4, 1960 (gage height, 3.62 ft), from rating curve extended above 83 cfs by logarithmic plotting; maximum gage height, 3.88 ft Jan. 4, 1960 (backwater from ice); minimum discharge, 14.5 cfs Mar. 2, 1960 (gage height, 1.39 ft), result of freezeup.

Remarks.--Many diversions above station for irrigation. Flow is entirely regulated by Potholes Reservoir. Flow by station is essentially seepage from Potholes Reservoir and return flow from part of the Columbia Basin 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
1959	-	-	-	-	-	62.7	51.6	52.9	48.4	32.6	48.9	71.6	-
1960	79.0	66.0	58.7	63.6	88.7	55.0	52.3	50.8	62.3	51.2	56.7	68.0	62.6

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1959	-	-	-	-	-	3,860	3,070	3,250	2,880	2,000	3,010	4,260	-
1960	4,860	3,930	3,610	3,910	5,100	3,380	3,110	3,120	3,710	3,150	3,490	4,050	45,420

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	1638	105	Feb. 19, 1959	-	-	-	-	-	-	-
1960	1716	177	Feb. 4, 1960	33	62.6	45,420	-	-	-	-

COLUMBIA RIVER MAIN STEM

4728. Columbia River below Priest Rapids Dam, Wash.

Location.--Lat 46°37'45", long 119°52'00", in SE¼NW¼ sec.7, T.13 N., R.24 E., on left bank 2½ miles downstream from Priest Rapids Dam and 14 miles south of Beverly.

Drainage area.--95,500 sq mi, approximately.

Records available.--January 1917 to September 1930 (at site 3 miles downstream, published as "at Vernita"), October 1930 to July 1959 (at site 47 miles upstream, published as "at Trinidad"), July 1959 to September 1960.

Gage.--Water-stage recorder. Datum of gage is at mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Oct. 1, 1930, staff gages at ferry at Vernita (3 miles downstream) at datum 388.7 ft above mean sea level, unadjusted. Oct. 1, 1930, to July 27, 1959, water-stage recorder at Trinidad (47 miles upstream) at datum 499.3 ft above mean sea level (river-profile survey).

Extremes.--1959-60: Maximum discharge, 325,000 cfs July 7, 1960 (elevation, 418.30 ft), from rating curve extended above 140,000 cfs; minimum, 40,100 cfs Mar. 15, 1960 (elevation, 396.84 ft); minimum daily, 52,100 cfs Mar. 12, 1960.

Remarks.--Diversion above station for irrigation of about 500,000 acres is small percentage of flow past gage. Some diurnal fluctuation caused by Priest Rapids Dam. Flow regulated by Franklin D. Roosevelt Lake (see p. 330) and reservoirs in Kootenai, Flathead, Pend Oreille, Spokane, Okanogan, and Chelan River basins.

Monthly and 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	-	-	-	-	-	-	-	-	-	-	136,300	118,000	-
1960	118,100	108,900	92,760	77,340	75,130	68,940	163,600	195,800	278,900	251,700	22,400	74,190	135,600

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
1959	-	-	-	-	-	-	-	-	-	-	8,379	7,023	-
1960	7,265	6,479	5,704	4,756	4,322	4,239	9,736	11,920	16,600	15,470	7,523	4,414	98,430

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							
1959	1716	251,000	July 28, 1959	-	-	-	-	-	-	-
1960	1716	325,000	July 7, 1960	52,100	135,600	98,430,000	-	-	-	-

a Maximum daily during period July to September.

Note.--For records prior to August 1959 see Columbia River at Trinidad (p.).

4740. Keechelus Lake near Martin, Wash.

Location--Lat 47°19'20", long 121°20'20", in NE $\frac{1}{4}$ sec.12, T.21 N., R.11 E., at dam on Yakima River at outlet of Keechelus Lake, 3 $\frac{1}{2}$ miles northwest of Martin and 9 $\frac{1}{2}$ miles northwest of Easton.

Drainage area--55.8 sq mi.

Records available--January 1906 to September 1960.

Gage--Staff gage. Datum of gage is at mean sea level (Bureau of Reclamation bench mark). Prior to Mar. 20, 1919 (corrected), staff gage and Mar. 20, 1919 (corrected), to May 31, 1920, water-stage recorder, at several sites in vicinity of dam at same datum.

Extremes--1906-60: Maximum contents observed, 160,570 acre-ft May 16, 1925 (elevation, 2,518.09 ft); minimum observed, 448 acre-ft Sept. 6, 12, 13, 1906 (original crib dam); minimum elevation observed, 2,428.30 ft Sept. 20, 1926.

Remarks--Reservoir is formed on natural lake by earth- and gravel-fill dam completed in 1917; storage began above crib dam Jan. 12, 1906, above present dam Aug. 19, 1914. To aid in construction and clearing of reservoir site, the water surface was kept low and present reservoir was not filled until June 15, 1920. Capacity, 157,800 acre-ft between gate sill (elevation, 2,425.00 ft) and spillway crest (elevation, 2,517.00 ft). Spillway raised 2 ft, construction completed Sept. 12, 1952. Records given herein represent usable contents. Water used for irrigation.

Cooperation--Records furnished by Bureau of Reclamation and reviewed 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	72,710	79,750	91,020	69,140	76,060	65,670	95,280	148,240	154,030	136,090	97,790	55,610
1952	54,970	70,540	76,740	77,060	80,080	85,890	109,520	141,800	147,670	116,610	87,820	62,280
1953	48,180	49,910	53,830	102,620	117,930	121,120	116,760	147,950	154,610	136,770	102,390	77,060
1954	61,680	81,260	114,210	83,090	78,370	82,500	86,240	127,840	158,390	145,930	115,400	68,100
1955	43,490	66,420	76,400	86,260	101,420	109,370	107,840	125,720	158,230	147,000	101,590	63,460
1956	76,880	97,750	82,210	68,810	66,160	54,010	73,980	137,530	157,180	131,410	76,220	64,290
1957	77,590	85,270	117,780	114,410	121,190	131,600	156,570	155,700	138,330	82,890	34,900	11,800
1958	15,230	24,800	44,030	57,160	75,750	87,200	115,310	148,270	134,070	87,130	36,350	14,290
1959	33,830	83,510	122,960	143,940	118,730	119,090	155,020	154,710	159,080	139,610	93,820	90,120
1960	103,090	129,580	107,420	82,300	93,800	108,920	138,380	152,560	158,750	121,750	66,130	33,320

4745. Yakima River near Martin, Wash.

Location.--Lat 47°19'10", long 121°20'10", in NE $\frac{1}{4}$ sec.12, T.21 N., R.11 E., on left bank 800 ft downstream from dam at outlet of Keechelus Lake, $\frac{3}{4}$ miles northwest of Martin, and $\frac{9}{16}$ miles northwest of Easton.

Drainage area.--55.8 sq mi.

Records available.--October 1903 to September 1960.

Gage.--Water-stage recorder and masonry channel. Datum of gage is 2,422.40 ft above mean sea level (Bureau of Reclamation bench mark). Prior to July 20, 1923, staff gages at several sites within 2 miles of present site at various datums.

Average discharge.--57 years (1903-60), 334 cfs (241,800 acre-ft per year), adjusted for storage since January 1906.

Extremes.--1903-60: Maximum discharge, 7,370 cfs Mar. 26, 1915, when temporary crib dam was washed out; practically no flow when gates in Keechelus Lake Dam are closed.

Remarks.--Flow regulated by Keechelus Lake (see preceding page). Keechelus Lake spillway discharge, computed from reservoir elevations and spillway rating, bypassed gage and is added to flow at station. No diversion above station.

Cooperation.--Records furnished by Bureau of Reclamation and reviewed by 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	569	442	381	630	476	335	12.1	77.1	537	435	677	758	444
1952	337	12.3	77.1	99.4	115	50.8	114	321	372	716	523	491	270
1953	274	6.45	5.14	7.92	174	126	481	209	501	630	635	473	294
1954	373	10.5	95.5	775	280	104	307	224	460	855	701	922	427
1955	573	3.22	4.66	5.39	6.92	7.56	225	315	594	824	897	722	350
1956	262	269	666	375	161	340	200	230	729	969	1,002	284	460
1957	110	188	387	194	10.3	8.3	75.1	918	658	1,002	842	432	406
1958	17.9	5.69	6.23	8.04	10.8	13.0	19.6	358	544	832	896	443	265
1959	2.91	5.57	8.62	153	650	273	66.7	712	678	609	801	519	372
1960	342	497	891	528	13.7	7.06	9.15	520	507	739	974	629	475

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	34,980	26,290	23,430	38,750	26,460	20,610	722	4,740	31,930	26,740	41,610	45,120	321,400
1952	20,720	731	4,740	6,110	6,630	3,120	6,800	19,720	22,150	44,050	32,160	29,190	196,100
1953	16,870	394	316	481	9,650	7,720	28,640	12,880	29,830	38,720	39,020	28,170	212,700
1954	22,920	622	5,870	47,670	15,560	6,400	18,260	13,780	27,400	52,600	43,100	54,840	309,000
1955	35,230	191	286	331	384	465	13,390	19,370	35,350	50,640	55,150	42,940	253,700
1956	16,110	15,990	40,980	23,060	9,250	20,940	11,880	14,130	43,360	59,570	61,610	16,920	333,800
1957	6,730	11,210	23,790	11,920	574	510	4,470	56,420	39,150	61,610	51,770	25,730	293,900
1958	1,100	339	383	494	600	801	1,170	21,990	32,350	51,160	55,110	26,380	191,900
1959	179	331	530	9,410	36,120	16,790	3,970	43,780	40,320	37,440	49,240	30,880	269,000
1960	21,030	29,550	54,780	32,480	787	434	544	31,970	30,160	45,450	59,890	37,420	344,500

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30										Calendar year			
		Observed					Adjusted					Observed		Adjusted	
		Momentary maximum		Mini-	Mean	Runoff in acre-feet	Mean	Per square mile	Runoff in inches	Mean	Runoff in acre-feet	Mean	Runoff in inches	Mean	Runoff in inches
		Discharge	Date	um day											
1950	-	-	-	-	-	-	-	-	-	-	454	328,600	459	111.73	-
1951	1216	-	1,220 Aug. 18-21, 1951	3.1	444	321,400	403	7.22	98.02	353	262,900	343	83.54	-	-
1952	1246	-	789 July 18, 19, 1952	2.2	270	196,100	279	5.00	68.15	258	197,500	228	55.49	-	-
1953	1286	-	1,170 June 13, 14, 1953	.8	284	212,700	315	5.65	76.63	310	224,500	394	95.75	-	-
1954	1346	-	al, 280 July 1, 1954	.8	427	309,000	414	7.42	100.82	436	315,300	383	93.24	-	-
1955	1396	-	al, 300 June 23, 1955	1.4	350	253,700	344	6.16	83.70	402	291,100	410	99.77	-	-
1956	1446	-	1,240 Aug. 12, 13, 1956	2.0	460	333,800	461	8.26	112.45	417	302,400	466	113.59	-	-
1957	1516	-	abl, 360 May 9, 1957	1.6	406	293,900	333	5.97	81.10	351	254,000	249	60.54	-	-
1958	1566	-	998 July 27, 1958	1.7	265	191,900	269	4.82	65.31	264	191,100	373	90.73	-	-
1959	1636	-	1,290 June 4, 1959	1.0	372	269,000	476	8.53	115.87	516	373,300	494	120.22	-	-
1960	1716	-	al, 310 May 20, 1960	6.4	475	344,500	396	7.10	96.65	-	-	-	-	-	-

a Computed from combined flow at gage and over spillway.

b Maximum observed.

4755. Kachess Lake near Easton, Wash.

Location.--Lat 47°15'50", long 121°12'00", in SW¼ sec.34, T.21 N., R.13 E., at dam on Kachess River at outlet of Kachess Lake, 2½ miles northwest of Easton.

Drainage area.--63.6 sq mi.

Records available.--September 1905 to September 1960.

Gage.--Staff gage. Datum of gage is at mean sea level (Bureau of Reclamation bench mark). Prior to Oct. 1, 1921, staff gages and water-stage recorder at sites in vicinity of Bureau of Reclamation reservoir dam at same datum.

Extremes.--1905-60: Maximum contents observed, 244,850 acre-ft May 9, 1957 (elevation, 2,263.29 ft); minimum observed, 525 acre-ft Sept. 14, 15, 1910 (original crib dam); minimum elevation observed, 2,197.73 ft Sept. 26, 27, 1915.

Remarks.--Reservoir is formed on natural lake by earth- and gravel-fill dam completed in 1912. Original crib dam, creating capacity of 21,000 acre-ft, used Sept. 20, 1905, to June 30, 1911. Storage above present dam began June 30, 1911. Capacity, 239,000 acre-ft between gate sill (elevation, 2,192.75 ft) and top of spillway gate (elevation, 2,262.00 ft). Records given herein represent usable contents. Water used for irrigation.

Cooperation.--Records furnished by Bureau of Reclamation and reviewed 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	144,080	172,150	177,170	173,890	182,320	174,550	201,330	234,410	231,260	162,310	121,110	123,770
1952	137,750	152,380	162,640	168,580	176,500	184,250	213,190	240,250	226,470	180,050	123,700	93,530
1953	91,600	92,700	96,670	134,630	158,980	170,670	193,980	235,360	239,710	221,530	177,500	143,230
1954	144,580	157,060	189,330	178,710	179,470	183,110	186,450	231,220	240,070	227,900	179,800	168,300
1955	169,690	182,860	187,630	193,420	203,070	206,540	197,540	226,380	239,750	229,470	183,410	151,870
1956	171,540	191,160	176,210	158,820	153,450	141,690	168,210	230,050	239,430	221,710	186,570	153,530
1957	153,210	166,460	193,940	189,500	196,470	206,190	234,100	235,180	222,420	180,220	131,400	88,440
1958	78,470	84,010	100,030	110,940	127,840	140,050	166,410	214,550	208,370	177,750	138,440	103,660
1959	111,080	152,380	189,080	205,890	174,550	190,610	218,340	235,900	240,750	206,800	172,770	172,150
1960	197,330	225,930	194,970	178,420	189,030	203,980	230,660	231,710	238,440	190,310	155,110	135,660

4760. Kachess River near Easton, Wash.

Location.--Lat 47°15'30", long 121°11'50", in NE¼ sec.3, T.20 N., R.13 E., on left bank three-quarters of a mile downstream from Kachess Lake and 2 miles northwest of Easton.

Drainage area.--63.6 sq mi.

Records available.--October 1903 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 2,188.10 ft above mean sea level (Bureau of Reclamation bench mark). Prior to July 22, 1913, staff gage and July 22, 1913, to Aug. 14, 1916, water-stage recorder, at site a quarter of a mile upstream at different datum. Aug. 15, 1916, to Oct. 8, 1927, water-stage recorder at site half a mile downstream at different datum. Oct. 9, 1927, to Oct. 30, 1951, staff gage and water-stage recorder at present site at datum 1.33 ft higher.

Average discharge.--57 years (1903-60), 290 cfs (210,000 acre-ft per year), adjusted for storage since October 1905.

Extremes.--1903-60: Maximum discharge, 2,530 cfs May 28, 1948 (gage height, 8.45 ft, present datum); no flow at times when gates in dam are closed.

Remarks.--No diversion. Flow regulated by Kachess Lake (see preceding page).

Cooperation.--Records collected and prepared in cooperation with Bureau of Reclamation.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	23.7	4.35	437	341	422	301	84.6	348	590	1,222	677	0.30	373
1952	31	1.04	1.26	.76	1.25	1.73	6.06	288	848	897	942	540	278
1953	48.6	1.01	4.545	4.00	3.74	2.33	3.01	2.55	486	596	781	823	214
1954	61.7	4.21	6.59	451	196	100	330	176	702	754	927	264	332
1955	80.8	79.4	80.3	25.9	80.3	80.2	358	139	790	649	841	581	316
1956	13.1	289	625	455	221	343	151	264	702	682	627	604	416
1957	220	2.24	556	219	4.83	5.66	19.5	849	537	734	806	735	378
1958	218	15.0	2.95	3.08	5.02	3.23	4.05	102	411	556	644	648	219
1959	88.1	5.53	4.70	172	757	12.1	130	369	591	780	615	325	318
1960	56.9	398	989	405	5.94	6.59	55.5	592	414	887	612	361	402

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,450	259	26,880	20,950	23,420	18,490	5,030	21,400	35,100	75,130	41,650	18	269,800
1952	19	62	78	47	72	106	360	17,720	38,430	55,150	57,950	32,130	202,100
1953	2,990	60	34	246	208	143	179	157	28,930	36,650	48,020	37,090	154,700
1954	3,790	250	405	27,760	10,890	6,150	19,650	10,850	41,780	46,330	57,030	15,730	240,600
1955	4,970	4,720	4,940	1,590	4,460	4,930	21,280	8,560	47,020	39,920	51,700	34,570	228,700
1956	807	17,180	38,410	27,990	12,720	21,070	8,990	16,210	41,790	41,960	38,570	35,950	301,600
1957	13,510	133	21,900	13,490	268	348	1,160	52,180	31,930	45,180	49,530	43,720	273,300
1958	13,380	892	181	189	279	199	241	6,270	24,450	34,200	39,580	38,550	158,400
1959	5,420	329	289	10,570	42,050	742	7,740	22,690	35,140	47,960	37,790	19,310	230,000
1960	3,620	23,700	60,810	24,910	342	405	3,300	36,410	24,660	54,530	37,610	21,500	291,800

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	Runoff in acre-feet	Mean	Per square mile	Runoff in inches	Mean	Runoff in acre-feet	Mean	Runoff in inches				
		Discharge	Date														
1950	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
1951	1216	1,320	July 17, 1951	0.2	373	269,800	364	5.72	77.74	335	241,300	313	66.87	402	85.81		
1952	1246	1,560	June 16, 1952		278	202,100	237	3.73	50.69	282	205,000	192	41.07	313	68.04		
1953	1286	1,170	July 20, 1953	.4	214	154,700	283	4.45	60.33	216	156,100	344	73.37	344	73.43		
1954	1346	1,220	Aug. 2, 1954	1.7	332	240,600	367	5.77	78.33	346	250,800	344	73.43	344	73.43		
1955	1396	1,570	June 12, 1955	1.7	316	228,700	293	4.61	62.56	374	270,400	358	76.37	358	76.37		
1956	1446	1,050	June 8, 1956	.6	416	301,600	418	6.57	89.43	387	280,800	411	88.01	411	88.01		
1957	1516	1,390	May 11, 1957	.6	378	273,300	288	4.53	61.38	348	252,200	219	46.68	219	46.68		
1958	1566	1,714	Aug. 24, 1958	1.4	219	158,400	240	3.77	51.20	207	150,000	330	70.48	330	70.48		
1959	1636	1,360	July 18, 1959	2.0	318	230,000	412	6.48	88.02	431	312,100	439	93.76	439	93.76		
1960	1716	1,290	Dec. 22, 1959	3.5	402	291,800	352	5.53	75.26	-	-	-	-	-	-		

4765. Kittitas Canal at Easton, Wash.

Location.--Lat 47°14'20", long 121°11'00", in SW $\frac{1}{4}$ sec.11, T.20 N., R.13 E., on left bank at Easton, a quarter of a mile downstream from diversion dam.

Records available.--May 1930 to September 1960 (monthly diversion only).

Gage.--Water-stage recorder. Altitude of gage is 2,170 ft (from topographic map).

Extremes.--1930-60: Maximum daily discharge, 1,270 cfs July 25-27, 1960; no flow at times in each year.

Remarks.--Canal operated by Kittitas Reclamation District. Station operated by Bureau of Reclamation. Approximately 55,000 acres are irrigated currently.

Cooperation.--Records collected and prepared in cooperation with Bureau of Reclamation.

Monthly and yearly diversion, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	11,510	0	0	0	0	0	12,610	37,760	53,290	66,670	68,590	42,760	293,200
1952	16,360	0	0	0	0	0	16,500	51,000	58,330	66,160	65,750	50,800	324,900
1953	14,410	0	0	0	0	0	12,110	36,500	41,960	67,760	65,760	52,860	291,600
1954	12,770	0	0	0	0	0	11,500	48,740	46,500	62,770	66,090	40,130	288,500
1955	20,570	0	0	0	0	0	3,150	44,690	56,600	61,900	72,220	48,870	308,000
1956	11,460	0	0	0	0	0	1,040	29,710	40,400	67,730	68,410	47,160	265,900
1957	15,980	0	0	0	0	0	1,320	42,450	59,140	71,090	62,360	50,830	303,200
1958	10,300	0	0	0	0	0	3,050	46,410	56,200	70,580	69,400	48,390	304,300
1959	218	0	0	0	0	0	9,000	51,000	53,730	66,700	69,210	44,580	294,400
1960	1,050	0	0	0	0	0	3,290	45,500	59,390	75,390	68,040	51,330	304,000

4785. Cle Elum Lake near Roslyn, Wash.

Location.--Lat 47°14'40", long 121°04'00", in NE $\frac{1}{4}$ sec.10, T.20 N., R.14 E., at dam on Cle Elum River at outlet of Cle Elum Lake, 4 miles northwest of Roslyn.

Drainage area.--203 sq mi.

Records available.--May 1906 to September 1960.

Gage.--Staff gage. Datum of gage is at mean sea level (Bureau of Reclamation bench mark). Prior to Mar. 31, 1906, staff gage several hundred feet upstream at different datum. May 4, 1906, to Nov. 7, 1916, staff gage and Nov. 8, 1916, to Sept. 4, 1931, water-stage recorder, at approximate site of original gage at datum 2,123.75 ft higher.

Extremes.--1906-60: Maximum contents observed, 446,520 acre-ft May 8, 9, 1957 (elevation, 2,241.98 ft); minimum observed, 2,380 acre-ft Aug. 31, 1906; minimum elevation observed, 2,114.85 ft Oct. 14, 1932. Storage was uncontrolled Oct. 3, 1931, to Feb. 26, 1932.

Remarks.--Reservoir is formed on natural lake by earth- and gravel-fill dam completed in 1933; storage began above present dam Feb. 26, 1932. Capacity, 436,900 acre-ft between gate sill (elevation, 2,110.00 ft) and top of spillway gate (elevation, 2,240.00 ft). Records given herein represent usable contents. Water used for irrigation.

Cooperation.--Records furnished by Bureau of Reclamation and reviewed 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	214,960	235,230	274,520	261,590	266,860	256,320	333,900	437,720	438,680	378,810	245,910	158,680
1952	182,800	218,300	236,490	240,640	247,930	257,980	342,320	438,780	421,650	352,060	220,690	112,420
1953	83,180	85,690	90,830	156,830	213,740	239,100	283,560	428,560	439,450	392,440	284,330	198,440
1954	190,140	217,710	275,160	282,050	269,290	256,440	275,000	394,840	440,800	423,170	341,500	263,340
1955	235,730	282,870	298,180	304,940	328,040	331,970	316,540	390,560	438,680	413,820	306,390	219,240
1956	247,420	318,900	302,240	270,210	242,410	179,020	229,690	408,950	414,380	415,180	307,810	226,660
1957	234,050	284,770	345,060	338,510	347,110	367,190	412,410	426,790	401,180	277,220	151,180	50,120
1958	45,180	58,840	84,750	104,630	134,600	170,270	229,530	421,270	415,890	281,080	128,770	46,820
1959	54,650	141,270	229,990	288,660	312,000	342,190	420,090	406,620	432,820	383,980	248,170	192,540
1960	262,020	375,470	332,920	273,140	291,440	326,460	387,310	404,330	427,130	328,800	214,330	115,360

4790. Cle Elum River near Roslyn, Wash.

Location.--Lat 47°14'30", long 121°03'50", in NW $\frac{1}{4}$ sec.11, T.20 N., R.14 E., on left bank 1,000 ft downstream from dam at Cle Elum Lake and 4 miles northwest of Roslyn.

Drainage area.--203 sq mi.

Records available.--October 1903 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 2,102.10 ft above mean sea level (Bureau of Reclamation bench mark). Prior to Oct. 14, 1913, and Sept. 4, 1931, to Apr. 19, 1933, several staff gages and Oct. 14, 1913, to Sept. 3, 1931, water-stage recorder, at about same sites at same datum.

Average discharge.--57 years (1903-60), 925 cfs (669,700 acre-ft per year), adjusted for storage since 1906.

Extremes.--1903-60: Maximum discharge, 18,700 cfs Nov. 15, 1906 (gage height, 14.05 ft); no flow at times when gates in dam are closed.

Remarks.--No diversion above station. Flow regulated by Cle Elum Lake (see preceding page).

Cooperation.--Records collected and prepared in cooperation with Bureau of Reclamation.

Correction.--In WSP 1316, the mean discharge for October 1942 is listed in error; it should be 404 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	972	800	616	635	948	924	373	1,422	2,339	1,876	2,476	1,638	1,271
1952	263	12.6	98.4	149	174	139	75.0	909	1,902	1,984	2,426	1,855	843
1953	535	45.8	54.9	53.6	44.0	46.1	303	63.8	1,973	2,268	2,252	1,644	777
1954	396	42.0	69.1	414	620	629	649	1,028	2,204	2,666	2,160	1,714	1,052
1955	789	109	158	164	82.0	206	777	647	2,895	2,201	2,358	1,749	1,015
1956	317	459	1,187	908	707	1,352	938	1,185	3,109	1,848	2,247	1,651	1,327
1957	513	81.3	502	448	123	99.9	1,988	3,064	1,988	2,539	2,301	1,870	1,177
1958	257	15.4	21.5	21.0	19.3	10.6	40.9	380	1,686	2,637	2,684	1,633	789
1959	442	6.19	2.31	32.8	39.5	23.1	271	2,514	2,470	2,241	2,658	1,760	1,045
1960	178	310	2,046	1,288	29.6	27.1	276	1,676	1,796	2,366	2,134	1,831	1,172

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	59,780	47,600	37,880	51,360	52,670	56,810	22,200	87,410	139,200	15,400	52,300	97,550	920,200
1952	16,190	750	6,050	9,160	10,010	8,530	4,460	55,880	113,200	22,000	149,200	116,300	611,700
1953	32,910	2,730	3,370	3,300	2,450	2,830	18,050	3,920	17,400	39,400	38,500	97,800	562,700
1954	24,390	2,500	4,280	25,460	34,440	38,700	38,630	63,240	131,100	63,900	32,800	102,000	761,400
1955	48,530	6,470	9,740	10,060	4,560	12,640	46,220	39,780	172,300	35,400	145,000	104,100	734,800
1956	19,490	27,330	72,970	55,840	40,670	83,120	55,790	72,850	185,000	113,600	138,100	98,260	963,000
1957	31,540	4,840	30,860	27,530	6,850	6,140	28,880	88,400	118,300	156,100	141,500	111,300	852,200
1958	15,620	917	1,320	1,290	1,070	653	2,430	23,360	100,300	62,100	65,000	97,190	571,400
1959	27,160	368	142	2,020	2,190	1,420	16,130	54,600	147,000	37,800	63,400	104,700	756,900
1960	10,940	18,430	125,900	79,190	1,700	1,670	16,430	103,000	106,900	146,700	131,200	109,000	851,100

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	Runoff in acre-feet	Mean	Per square mile	Runoff in inches	Mean	Runoff in acre-feet	Mean	Runoff in inches	Mean	Runoff in inches
		Discharge	Date												
1950	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1951	1216	3,800	May 25, 1951	88	1,271	920,200	1,175	5.79	78.56	1,139	824,400	1,265	64.60	-	-
1952	1246	3,180	June 5, 1952	0	843	611,700	779	3.84	52.22	1,102	797,900	1,050	70.19	-	-
1953	1286	3,760	June 13, 1953	0	777	582,700	698	4.42	60.03	766	554,800	1,021	68.26	-	-
1954	1346	3,940	July 1, 1954	2	1,052	761,400	1,141	5.62	76.33	1,098	795,000	1,130	75.55	-	-
1955	1396	6,620	June 12, 1955	30	1,015	734,800	954	4.70	63.78	1,091	789,800	1,097	73.32	-	-
1956	1446	3,630	June 23, 1956	43	1,327	963,000	1,337	6.59	89.64	1,254	100,500	1,313	68.06	-	-
1957	1516	5,000	May 9, 1957	68	1,177	852,200	933	4.80	62.42	1,109	803,100	750	50.14	-	-
1958	1566	3,040	July 17, 1958	1.4	789	571,400	785	3.87	52.49	803	581,100	1,003	67.09	-	-
1959	1636	3,570	June 22, 1959	1.2	1,045	756,900	1,247	6.14	83.38	1,222	884,500	1,564	91.22	-	-
1960	1716	2,950	June 16, 1960	2.6	1,172	651,100	1,066	5.25	71.49	-	-	-	-	-	-

4795. Yakima River at Cle Elum, Wash.

Location.--Lat 47°11'20", long 120°56'40", in sec.27, T.20 N., R.15 E., on left bank at highway bridge at Cle Elum just upstream from Roslyn Creek, 7 miles upstream from Teanaway River.

Drainage area.--500 sq mi, approximately.

Records available.--August 1906 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 1,902.27 ft above mean sea level (levels by Bureau of Reclamation). Prior to Aug. 12, 1910, chain gage on highway bridge at different datum. Aug. 12, 1910, to July 11, 1911, staff gage; July 12, 1911, to June 27, 1923, water-stage recorder; June 28, 1923, to Oct. 21, 1924, staff gages; all at various locations within vicinity of bridge at datum 2.0 ft higher.

Average discharge.--54 years (1906-60), 2,004 cfs (1,451,000 acre-ft per year), adjusted for storage since October 1906 and Kittitas Canal diversion since 1930.

Extremes.--1906-60: Maximum discharge, 25,600 cfs Nov. 14, 1906 (gage height, 12.5 ft, from floodmarks); minimum, 46 cfs Nov. 17, 1953.

Remarks.--Kittitas high-line canal diverts water from river at Easton for irrigation below station. Several smaller diversions for irrigation of several hundred acres above station. Considerable regulation by Keechelus, Kachess, and Cle Elum Lakes (see elsewhere in this report). Records of water temperatures for the period December 1952 to September 1956 are published in reports of Geological Survey.

Cooperation.--Records collected and prepared in cooperation with Bureau of Reclamation.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,615	2,070	2,267	2,298	2,688	2,084	1,459	2,601	2,991	2,651	3,108	1,961	2,315
1952	658	300	413	393	571	895	1,751	2,398	2,742	2,949	2,306		1,331
1953	825	108	132	614	1,069	578	1,309	712	2,874	2,602	2,760	1,959	1,294
1954	891	180	1,086	2,063	1,484	1,272	1,857	2,064	3,406	3,729	2,914	2,328	1,943
1955	1,534	472	493	449	664	595	1,750	1,519	4,577	3,140	3,063	2,431	1,709
1956	895	1,895	3,059	2,053	1,279	2,305	2,803	3,269	4,824	2,664	2,891	1,896	2,489
1957	876	542	2,574	1,308	379	469	1,556	2,537	2,492	3,180	3,122	2,387	2,027
1958	518	165	345	326	652	477	804	1,105	1,987	2,985	3,181	2,112	1,225
1959	832	1,128	1,093	1,349	1,981	894	1,286	3,647	3,418	2,703	3,095	2,181	1,967
1960	1,262	2,531	4,883	2,539	405	549	1,125	2,906	2,299	3,015	2,831	2,167	2,226

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	99,310	123,200	139,400	141,300	149,300	128,100	86,840	159,900	178,000	163,000	191,100	116,700	1,676,000
1952	40,430	17,850	25,380	24,150	32,860	35,080	53,280	107,700	142,700	168,600	181,300	137,200	966,500
1953	50,730	6,140	8,110	37,740	59,370	35,560	77,910	43,770	171,000	160,000	169,700	116,600	936,900
1954	54,760	10,740	66,800	26,900	82,430	78,230	110,500	26,900	202,700	229,300	179,200	138,500	1,407,000
1955	82,040	28,110	30,290	27,580	36,880	36,570	104,200	93,390	272,400	193,100	188,300	144,700	1,238,000
1956	55,060	112,800	188,100	126,200	73,570	141,800	166,800	201,000	287,000	163,800	177,700	112,800	1,807,000
1957	53,850	32,280	158,300	80,450	21,050	28,830	92,570	22,000	148,300	195,500	192,000	142,100	1,467,000
1958	31,870	9,830	21,200	20,060	36,190	29,310	47,860	67,930	118,200	183,400	195,600	125,700	887,200
1959	51,140	67,100	67,180	82,960	110,000	54,970	76,500	224,200	203,400	166,200	190,300	129,800	1,424,000
1960	77,580	150,600	300,200	159,800	23,310	33,740	66,930	178,700	136,800	185,400	174,100	129,000	1,616,000

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	Runoff in acre-feet	Mean	Per square mile	Runoff in inches	Mean	Runoff in acre-feet	Mean	Runoff in inches	Mean	Runoff in inches		
		Discharge	Date														
1950	-	-	-	-	-	-	-	-	-	-	2,305	1,669,000	2,841	77.11			
1951	1216	4,880	May 25, 1951	695	2,315	1,676,000	2,575	5.15	69.89	1,931	1,398,000	2,250	61.07				
1952	1246	3,520	June 6, 1952	179	1,331	866,500	1,683	3.37	45.81	1,306	948,200	1,431	38.96				
1953	1286	6,010	June 14, 1953	60	1,294	936,900	1,908	3.82	61.80	1,586	1,004,000	2,253	61.18				
1954	1346	5,720	July 2, 1954	116	1,943	1,407,000	2,454	4.91	66.61	1,955	1,415,000	2,541	63.55				
1955	1396	10,000	June 12, 1955	149	1,709	1,238,000	2,045	4.09	55.50	2,007	1,453,000	2,418	65.63				
1956	1446	5,740	June 11, 1956	410	2,489	1,807,000	2,869	5.74	78.11	2,335	1,695,000	2,840	77.33				
1957	1516	8,280	May 9, 1957	251	2,027	1,467,000	2,039	4.08	55.37	1,776	1,286,000	1,597	43.33				
1958	1566	3,460	July 28, 1958	126	1,225	887,200	1,666	3.33	45.21	1,395	1,010,000	2,234	60.63				
1959	1636	4,980	May 15, 1959	150	1,967	1,424,000	2,774	5.55	75.32	2,441	1,787,000	2,977	80.83				
1960	1716	14,000	Nov. 23, 1959	236	2,226	1,616,000	2,411	4.82	65.62	-	-	-	-				

4805. Teanaway River near Cle Elum, Wash.

Location.--Lat 47°11'40", long 120°46'50", in SW $\frac{1}{4}$ sec.25, T.20 N., R.16 E., on right bank 100 ft upstream from highway bridge, 4 miles upstream from mouth, and 8 miles east of Cle Elum.

Drainage area.--200 sq mi; at site 1909-14, 205 sq mi.

Records available.--April 1909 to September 1914 (fragmentary), October 1946 to September 1952. Prior to October 1912, published as "near Clealum."

Gage.--Water-stage recorder. Datum of gage is 1,931.91 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Apr. 2, 1909, to Sept. 30, 1914, chain gage 3 $\frac{1}{2}$ miles downstream at different datum. Oct. 2, 1946, to Oct. 20, 1949, water-stage recorder at site 100 ft downstream at datum 32.08 ft lower.

Average discharge.--11 years (1909-14, 1946-52), 374 cfs (270,800 acre-ft per year).

Extremes.--1909-14, 1946-52: Maximum discharge, 4,330 cfs Mar. 20, 1910 (gage height, 7.35 ft, from graph based on gage readings, site and datum then in use); minimum observed, 1 cfs Aug. 6, 1914 (gage height, 2.17 ft, site and datum then in use).

Remarks.--No regulation. Small diversions in Teanaway Valley 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	112	360	514	274	705	434	1,313	1,223	501	108	14.8	21.0	462
1952	129	167	154	67.9	147	327	1,002	733	237	67.6	6.26	4.53	253

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	6,900	21,450	31,620	16,820	29,180	26,670	78,100	75,170	29,840	6,630	911	1,250	334,500
1952	7,950	9,960	9,470	4,170	8,430	20,130	59,620	45,040	14,080	4,160	385	270	183,700

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	464	350,700
1951	1216	2,880	Feb. 11, 1951	7.0	462	334,500	417	302,000
1952	1246	2,030	Apr. 26, 1952	1	253	183,700	-	-

4836. Wilson Creek near Ellensburg, Wash.

Location.--Lat 47°07'35", long 120°29'35", in NW $\frac{1}{4}$ sec.20, T.19 N., R.19 E., on right bank at downstream side of Pope farm bridge, three-quarters of a mile above Naneum Creek and 9 miles north of Ellensburg.

Drainage area.--13.6 sq mi.

Records available.--March 1957 to May 1960 (flood seasons only).

Gage.--Water-stage recorder. Altitude of gage is 2,650 ft (from topographic map).

Extremes.--1957-60: Maximum discharge, 244 cfs May 18, 1957 (gage height, 2.96 ft); minimum, 0.8 cfs Nov. 21, 1957.

Remarks.--About 1 cfs is diverted above station for irrigation. No regulation.

Monthly mean discharge, in cubic feet per second

Water year	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May					
1957					-	20.7	66.6					
1958	1.48	2.69	2.69	7.91	8.35	13.7	70.5					
1959	4.50	10.9	11.3	6.36	8.65	31.3	45.6					
1960	8.10	6.04	3.87	2.86	9.26	25.7	42.8					

Monthly discharge, in acre-feet

Water year	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May					
1957					-	1,230	4,090					
1958	88	165	165	440	513	814	4,340					
1959	268	673	694	353	532	1,860	2,820					
1960	482	371	238	164	569	1,530	2,630					

4838. Naneum Creek near Ellensburg, Wash.

Location.--Lat 47°07'30", long 120°28'40", in NE $\frac{1}{4}$ sec.20, T.19 N., R.19 E., on right bank 10 ft upstream from intake of Ellensburg water-supply system and 9 miles north of Ellensburg.

Drainage area.--69.5 sq mi.

Records available.--March 1957 to September 1960.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 2,500 ft (from topographic map).

Extremes.--1957-60: Maximum discharge, 700 cfs May 18, 1957 (gage height, 3.36 ft); minimum observed, less than 5 cfs Nov. 29, 1957, result of freezeup.

Remarks.--No regulation. Small diversion 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
1957	-	-	-	-	-	-	95.9	297	88.6	35.8	24.0	17.1	-
1958	19.3	16.0	17.7	19.2	37.1	38.8	76.3	311	91.7	32.9	20.3	15.4	58.3
1959	17.1	33.0	38.1	44.8	36.7	39.3	131	215	174	54.7	26.9	23.0	69.6
1960	24.3	42.6	42.0	23.9	23.5	50.1	126	213	161	45.9	25.8	19.0	66.5

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1957	-	-	-	-	-	-	5,700	18,290	5,270	2,200	1,470	1,020	-
1958	1,190	955	1,090	1,180	2,060	2,390	4,540	19,120	5,460	2,030	1,250	917	42,180
1959	1,050	1,960	2,340	2,750	2,040	2,420	7,810	13,220	10,370	3,360	1,650	1,370	50,340
1960	1,490	2,530	2,580	1,470	1,350	3,080	7,520	13,120	9,580	2,820	1,590	1,150	48,260

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		Mean	Inches
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet		
1957	1516	700	May 18, 1957	-	-	-	-	-	-	-	-	-	-
1958	1566	553	May 20, 1958	10	58.3	0.839	11.38	42,180	61.2	11.95	44,300	-	-
1959	1636	293	May 15, 1959	12.5	69.6	1.00	13.59	50,340	71.3	13.93	51,590	-	-
1960	1716	666	May 12, 1960	7.9	66.5	1.957	13.01	48,260	-	-	-	-	-

4843. Cooke Creek near Ellensburg, Wash.

Location.--Lat 47°05'40", long 120°22'40", in SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.31, T.19 N., R.20 E., on left bank 4 miles upstream from mouth and 10 miles northeast of Ellensburg.

Drainage area.--19.3 sq mi.

Records available.--November 1957 to May 1960 (flood seasons only).

Gage.--Water-stage recorder. Altitude of gage is 2,550 ft (from topographic map).

Extremes.--1957-60: Maximum discharge, 267 cfs May 11, 1960 (gage height, 2.50 ft); minimum, 1.2 cfs Dec. 30, 1957.

Remarks.--No regulation. Small diversion above station for irrigation.

Monthly mean discharge, in cubic feet per second

Water year	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May						
1958	2.27	2.39	2.24	10.0	7.24	27.8	48.6						
1959	3.54	3.83	7.75	5.36	11.1	51.8	31.6						
1960	3.86	2.94	2.63	3.48	17.3	39.1	50.3						

Monthly discharge, in acre-feet

Water year	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May						
1958	135	147	138	556	445	1,650	2,990						
1959	211	235	477	298	684	3,080	1,950						
1960	230	180	161	200	1,060	2,330	3,090						

4845. Yakima River at Umtanum, Wash.

Location.--Lat 46°51'45", long 120°28'30", in NW¼ sec.20, T.16 N., R.19 E., on right bank at Umtanum, half a mile upstream from Umtanum Creek and 10 miles south of Ellensburg.

Drainage area.--1,590 sq mi, approximately.

Records available.--August 1906 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Datum of gage is 1,300.00 ft above mean sea level, datum of 1929. Prior to Sept. 28, 1911, staff or chain gages at approximately same site at various datums. Sept. 28, 1911, to Nov. 23, 1936, water-stage recorder at site about 300 ft upstream at datum 26.70 ft higher.

Extremes.--1906-60: Maximum discharge, 41,000 cfs Nov. 15 or 16, 1906, (gage height, 41.1 ft, from floodmarks, present datum); minimum recorded, 138 cfs Oct. 3, 1915 (gage height, 2.86 ft, datum then in use).

Remarks.--Flow partly regulated by Keechelus, Kachess, and Cle Elum Lakes (see elsewhere in this report). Water diverted above station for irrigation of about 105,000 acres.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	2,148	2,761	3,651	3,025	4,613	3,373	4,323	5,293	4,182	3,022	3,226	2,405	3,494
1952	1,245	782	870	703	1,033	1,421	2,416	2,929	2,996	2,896	3,253	2,598	1,930
1953	1,212	352	331	1,454	2,367	1,373	2,592	2,779	3,996	2,986	3,204	2,360	2,079
1954	1,294	523	1,641	2,666	2,512	2,216	3,398	4,546	4,661	4,280	3,291	2,853	2,842
1955	1,864	970	903	745	1,091	972	2,713	3,468	6,476	3,690	3,351	2,659	2,411
1956	1,439	2,671	4,025	2,779	1,823	4,465	7,398	7,058	6,694	3,102	3,368	2,413	3,938
1957	1,429	1,001	3,566	1,601	775	1,506	3,260	7,255	3,124	3,384	3,501	2,698	2,777
1958	1,042	475	716	709	1,770	1,460	2,389	3,033	2,634	3,133	3,438	2,539	1,946
1959	1,249	2,012	2,245	2,689	2,951	2,142	3,221	5,433	4,644	2,909	3,346	2,797	2,968
1960	1,873	3,596	5,826	3,050	1,050	1,803	2,985	4,484	3,197	3,159	3,229	2,688	3,089

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	132,100	164,300	224,500	186,000	256,200	207,400	257,200	325,500	248,900	185,800	198,300	143,100	2,529,000
1952	76,560	46,550	53,510	43,200	59,400	87,350	145,700	180,100	178,300	180,000	200,000	154,600	1,401,000
1953	74,510	20,930	20,330	89,400	131,400	84,420	154,200	179,900	237,800	185,600	197,000	140,400	1,505,000
1954	79,580	31,120	100,900	163,900	139,500	136,200	202,200	279,500	289,300	263,200	202,400	169,800	2,058,000
1955	114,600	57,750	55,530	45,820	60,580	59,740	161,400	213,300	385,400	226,900	206,000	158,200	1,745,000
1956	86,500	159,000	247,500	170,900	104,900	274,600	440,200	434,000	398,300	190,700	207,100	143,600	2,859,000
1957	87,850	59,540	219,300	98,460	43,050	92,590	194,000	446,100	185,900	208,100	215,200	160,500	2,011,000
1958	64,040	28,250	44,040	43,560	98,300	89,770	142,200	186,500	156,700	182,700	211,400	151,100	1,409,000
1959	76,780	119,700	138,000	165,400	165,900	131,700	191,700	334,000	276,400	178,800	205,800	166,500	2,149,000
1960	115,100	214,000	358,300	187,500	60,400	110,800	177,600	275,700	190,200	194,200	198,600	160,000	2,242,000

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	-	-	-	-	-	-	3,317	2,402,000
1951	1216	12,000	Feb. 12, 1951	1,280	3,494	2,529,000	3,018	2,185,000
1952	1246	4,220	June 6, 1952	600	1,930	1,401,000	1,847	1,341,000
1953	1266	7,430	June 14, 1953	272	2,079	1,505,000	2,211	1,601,000
1954	1346	6,900	May 19, 1954	436	2,842	2,058,000	2,864	2,074,000
1955	1396	12,800	June 13, 1955	500	2,411	1,745,000	2,780	2,012,000
1956	1446	11,900	Apr. 22, 1956	800	3,938	2,859,000	3,762	2,731,000
1957	1516	12,000	May 10, 1957	540	2,777	2,011,000	2,459	1,780,000
1958	1566	4,890	Apr. 21, 1958	415	1,946	1,409,000	2,219	1,607,000
1959	1636	7,460	May 16, 1959	478	2,968	2,149,000	3,455	2,502,000
1960	1716	19,100	Nov. 23, 1959	600	3,089	2,242,000	-	-

4850. Roza Canal near Moxee City, Wash.

Location.--Lat 46°29'40", long 120°20'20", in SE¼ sec.29, T.12 N., R.20 E., on right bank 4½ miles southeast of Moxee City and at mile 29.3 on Roza Canal.

Records available.--October 1941 to September 1960 (monthly diversion only). Published with Yakima River near Parker as Yakima Ridge Canal prior to 1947 and as Roza Canal at mile 26.9, 1947-50.

Gage.--Water-stage recorder. Datum of gage is 1,144.8 ft above mean sea level (Bureau of Reclamation bench mark). Prior to Oct. 20, 1948, water-stage recorder at mile 26.9, 2.4 miles upstream at datum 6.3 ft higher.

Extremes.--1941-60: Maximum daily discharge, 1,100 cfs July 6, 1958; no flow at times in each year.

Remarks.--Canal diverts water from Yakima River in NW¼ sec.33, T.15 N., R.19 E., for irrigation of 58,000 acres above and below station above Naches River. Capacity of canal at headworks, approximately 2,300 cfs (corrected). Discharge at present site corrected to include the flows of laterals 28.2 and 28.7 to give equivalent records to those published prior to 1949. This is 1 of 5 canals bypassing the Yakima River near Parker gaging station.

Cooperation.--Records collected and prepared in cooperation with Bureau of Reclamation.

Monthly and yearly diversion, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	18,750	0	0	0	0	0	34,870	54,420	47,010	53,250	45,620	28,560	282,500
1952	17,340	0	0	0	0	0	40,170	53,920	51,110	49,870	46,920	30,050	289,400
1953	21,090	0	0	0	0	13,400	30,350	40,090	41,410	56,140	47,470	31,060	281,000
1954	17,510	0	0	0	0	9,450	34,710	51,270	47,230	51,550	49,250	33,990	295,000
1955	18,180	0	0	0	0	8,860	33,860	41,820	52,090	52,810	50,760	37,550	295,900
1956	19,660	0	0	0	0	6,760	32,040	48,570	46,160	58,290	51,540	34,400	297,400
1957	21,180	0	0	0	0	2,270	27,950	53,160	55,400	57,690	53,080	40,220	311,000
1958	15,360	0	0	0	0	11,070	29,830	50,610	57,170	60,520	58,280	38,670	321,500
1959	16,600	0	0	0	0	5,300	43,290	54,560	55,890	63,040	61,140	41,680	341,500
1960	16,370	0	0	0	0	9,230	38,970	54,340	61,700	64,010	62,440	46,760	353,800

4875. Bumping Lake near Nile, Wash.

Location.--Lat 46°52', long 121°18', in SW¼ sec.23 (unsurveyed), T.16 N., R.12 E., at dam on Bumping River at outlet of Bumping Lake, 11½ miles upstream from American River and 19 miles west of Nile.

Drainage area.--68.6 sq mi.

Records available.--June to July 1906, April 1909 to September 1960.

Gage.--Staff gage. Datum of gage is at mean sea level (Bureau of Reclamation bench mark). Prior to Nov. 22, 1909, staff gage at site a quarter of a mile upstream at different datum. Nov. 3, 1910, to Nov. 2, 1922, staff gage on gate tower 100 ft upstream at same datum.

Extremes.--1906, 1909-60: Maximum contents observed, 39,840 acre-ft June 21, 22, 1925 (elevation, 3,430.55 ft); minimum observed, 1,130 acre-ft Feb. 5-9, 1949 (elevation, 3,390.80 ft).

Remarks.--Reservoir is formed on natural lake by earth-fill dam completed in 1910; storage began Nov. 3, 1910. Capacity, 33,700 acre-ft between gate sill (elevation, 3,389.00 ft) and spillway crest (elevation, 3,426.00 ft). Records given herein represent usable contents. Water used for irrigation.

Cooperation.--Records furnished by Bureau of Reclamation and reviewed 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	17,470	32,480	13,420	7,850	12,890	5,150	18,770	35,710	35,550	23,900	11,830	2,980
1952	3,750	5,260	4,450	4,070	5,230	4,740	25,060	35,280	35,470	20,650	9,730	4,850
1953	2,500	2,490	2,530	21,250	14,000	14,680	19,940	35,740	35,750	30,770	18,380	6,600
1954	2,680	5,890	10,880	12,790	12,370	13,580	14,430	33,980	36,410	34,110	22,510	11,420
1955	7,440	7,180	8,060	11,000	15,550	19,610	20,520	35,610	36,500	28,160	14,260	9,040
1956	16,000	15,840	7,000	3,340	3,200	3,220	13,780	36,580	35,370	28,420	17,180	12,370
1957	8,970	4,090	15,540	15,930	20,030	27,110	32,060	34,240	25,640	18,460	14,690	10,070
1958	6,800	5,680	6,830	10,450	18,700	27,140	34,430	35,090	27,480	17,970	13,230	10,160
1959	7,700	19,580	14,110	10,230	5,860	8,170	24,180	28,870	34,530	27,300	12,540	10,700
1960	7,820	18,060	10,000	5,730	7,440	14,370	18,900	30,980	35,430	16,470	9,810	4,930

4880. Bumping River near Nile, Wash.

Location.--Lat 46°52', long 121°18', in NE $\frac{1}{4}$ sec. 23, T.16 N., R.12 E., on left bank a quarter of a mile downstream from spillway of Bumping Lake Dam and 19 miles west of Nile.

Drainage area.--68.6 sq mi.

Records available.--June to July 1906, April 1909 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 3,367.10 ft above mean sea level (Bureau of Reclamation bench mark). June 13 to July 31, 1906, staff gage at site half a mile upstream at different datum. Apr. 27 to Aug. 6, 1909, and June 24, 1912, to June 13, 1913, staff gage at site three-eighths of a mile upstream at different datum.

Average discharge.--51 years (1909-60), 295 cfs (213,600 acre-ft per year), adjusted for storage.

Extremes.--1906, 1909-60: Maximum discharge, 5,180 cfs Dec. 29, 1917 (gage height, 9.33 ft); practically no flow when gates in outlet conduit are closed.

Remarks.--No diversion. Flow regulated by dam at Bumping Lake (see preceding page).

Cooperation.--Records collected and prepared in cooperation with Bureau of Reclamation.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	6.74	157	886	402	349	310	188	680	848	504	305	208	405
1952	178	179	151	96.0	110	92.1	34.4	677	666	480	235	128	253
1953	66.6	31.7	43.6	174	470	107	125	406	774	677	363	227	287
1954	127	101	258	145	128	122	267	545	901	987	428	295	352
1955	198	268	139	62.4	19.7	18.1	66.8	144	1,131	702	374	176	275
1956	199	500	548	295	109	94.6	191	775	1,231	908	352	178	446
1957	193	265	214	110	55.8	56.5	206	1,072	788	273	132	124	292
1958	125	108	105	101	30.4	10.2	154	1,191	786	305	143	105	265
1959	132	302	669	388	235	81.0	99.2	523	808	455	339	182	352
1960	375	262	504	210	172	62.9	320	407	728	543	183	135	326

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	414	9,330	54,500	24,740	19,390	19,050	11,180	41,800	50,480	31,010	18,770	12,370	293,000
1952	10,930	10,640	9,290	5,900	6,320	5,660	2,050	41,610	39,630	29,530	14,420	7,630	183,600
1953	4,100	1,880	2,680	10,720	26,080	6,570	7,420	24,980	46,080	41,620	22,300	13,480	207,900
1954	7,800	6,010	15,860	8,930	7,110	7,500	15,870	35,520	53,640	54,560	26,170	17,580	254,500
1955	12,160	15,940	8,550	3,840	1,100	1,110	3,970	8,820	67,320	43,130	22,990	10,490	199,400
1956	12,220	29,740	33,720	15,700	6,260	5,820	11,370	47,670	73,250	55,840	21,650	10,560	323,800
1957	11,860	15,780	13,150	6,790	3,100	3,470	12,290	65,940	46,910	16,800	8,130	7,360	211,600
1958	7,690	6,420	6,440	6,180	1,690	627	9,170	73,240	46,760	18,760	8,770	6,260	192,000
1959	8,140	17,990	41,120	23,830	13,050	4,980	5,900	32,150	48,070	27,960	20,840	10,850	254,900
1960	23,060	15,610	30,960	12,930	9,870	3,870	19,030	25,040	43,330	33,400	11,270	8,010	236,400

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30											
		Observed						Adjusted					
		Momentary maximum			Mean	Runoff in acre-feet	Mean	Per square mile	Runoff in inches	Calendar year			
		Discharge	Date	Minimum day						Mean	Runoff in acre-feet	Mean	Runoff in inches
1950	-	-	-	-	-	-	-	-	-	449	324,700	446	88.31
1951	1216	-	1,240 June 16, 1951	4.4	405	293,000	403	5.87	79.65	359	259,600	346	68.50
1952	1246	-	1,270 June 6, 1952	16	253	183,600	256	3.73	50.68	222	161,400	220	43.60
1953	1286	-	1,240 June 13, 1953	9.8	287	207,900	290	4.23	57.33	316	228,900	328	64.86
1954	1346	-	1,400 June 23, 1954	61	352	254,500	358	5.22	70.89	361	261,500	357	70.72
1955	1396	-	2,100 June 12, 1955	6.1	275	199,400	272	3.97	53.85	329	238,400	328	64.86
1956	1446	-	2,510 June 1, 1956	86	446	323,800	451	6.57	89.40	398	288,900	410	81.29
1957	1516	-	1,840 May 9-10, 1957	51	292	211,600	289	4.21	57.19	264	191,300	252	49.91
1958	1566	-	2,160 May 26, 1958	8.4	265	192,000	265	3.86	52.51	330	238,700	340	67.23
1959	1636	-	1,450 June 5, 1959	6.7	352	254,900	353	5.15	69.80	355	257,300	350	69.20
1960	1716	-	1,150 June 17, 1960	6.2	326	236,400	318	4.64	63.06	-	-	-	-

4885. American River near Nile, Wash.

Location.--Lat 46°58'30", long 121°10'10", in SW $\frac{1}{4}$ sec.12, T.17 N., R.13 E., on right bank 300 ft upstream from Bumping Lake road crossing, three-quarters of a mile upstream from mouth, and 16 miles northwest of Nile.

Drainage area.--78.9 sq mi.

Records available.--April 1909 to March 1912, July to September 1913, June to September 1914, June to September 1915, October 1939 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Datum of gage is 2,700.0 ft above mean sea level (State Highway Department bench mark). Prior to Sept. 12, 1915, staff gage at site 300 ft downstream at different datum. Oct. 12 to Dec. 7, 1939, staff gage at present site and datum.

Average discharge.--23 years (1909-11, 1939-60), 246 cfs (178,100 acre-ft per year).

Extremes.--1909-12, 1913-15, 1939-60: Maximum discharge, 2,600 cfs May 27, 1948 (gage height, 76.6 ft, from high-water mark in well), from rating curve extended above 1,400 cfs; minimum, 20 cfs Nov. 22, 1940.

Remarks.--No regulation or diversion.

Cooperation.--Records collected and prepared in cooperation with Bureau of Reclamation.

Correction.--In WSP 1316, the date of the 1909 maximum discharge is listed in error; it should be June 2, 1909.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	141	272	382	162	296	138	429	821	725	279	81.4	55.9	315
1952	107	102	119	68.6	97.4	92.8	409	639	480	239	74.2	47.0	206
1953	33.3	32.7	33.2	197	206	116	228	608	588	460	111	52.5	222
1954	71.0	96.8	223	133	100	130	298	838	719	649	214	96.7	299
1955	98.2	194	114	80.2	75.7	62.5	103	406	886	375	113	66.3	215
1956	166	526	229	116	72.5	84.6	451	1,172	1,016	624	151	75.0	374
1957	84.9	104	205	73.4	87.3	132	270	861	498	145	84.9	40.9	215
1958	53.1	69.6	75.6	99.8	153	186	243	1,022	589	146	57.5	42.9	226
1959	59.8	229	363	277	142	99.1	325	561	764	341	84.0	86.0	278
1960	141	229	236	106	163	171	348	487	622	227	73.1	52.8	238

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	8,680	16,170	23,460	9,980	16,430	8,490	25,520	50,490	43,140	17,130	5,000	3,330	227,800
1952	6,560	6,070	7,330	4,220	5,600	5,710	24,350	39,270	29,590	14,730	4,560	2,800	149,800
1953	2,050	1,940	2,040	12,110	11,440	7,160	13,550	37,370	34,960	28,290	6,830	3,120	160,800
1954	4,360	5,760	13,730	8,160	5,570	7,970	17,750	51,540	42,800	39,890	13,170	5,750	216,400
1955	6,040	11,570	7,000	4,930	4,200	3,840	6,130	24,990	52,720	23,050	6,970	3,950	155,400
1956	10,220	19,370	14,100	7,130	4,170	5,200	26,830	72,080	60,480	38,370	9,280	4,460	271,700
1957	5,220	6,220	12,600	4,510	4,850	8,100	16,090	52,940	29,610	8,940	3,990	2,430	155,500
1958	3,260	4,140	4,650	6,130	8,500	9,620	14,480	62,830	35,050	8,980	3,530	2,550	163,700
1959	3,680	13,610	22,340	17,010	7,890	6,100	19,330	34,470	45,470	21,000	5,170	5,120	201,200
1960	8,650	13,620	14,490	6,530	9,380	10,500	20,690	29,970	37,040	13,950	4,490	3,140	172,400

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30										Calendar year		
		Momentary maximum		Minimum day	Mean	Fer square mile	Runoff		Mean	Runoff		Mean	Runoff	
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet		Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	329	56.57	238,000			
1951	1216	1,700	May 11, 1951	46	315	3.99	54.14	227,800	276	47.40	199,500			
1952	1246	972	May 20, 1952	37	206	2.61	55.59	149,800	187	32.29	135,900			
1953	1286	1,060	June 13, 1953	26	222	2.81	58.22	160,800	247	42.46	178,700			
1954	1346	1,760	May 19, 1954	49	299	3.79	51.44	216,400	300	51.61	217,200			
1955	1396	1,790	June 12, 1955	51	215	2.72	56.93	155,400	241	41.47	174,500			
1956	1446	2,440	May 20, 1956	56	374	4.74	64.56	271,700	347	59.90	252,000			
1957	1516	1,380	May 9, 1957	36	215	2.72	56.96	155,500	198	34.10	143,500			
1958	1566	1,800	May 25, 1958	35	226	2.86	58.91	163,700	264	45.46	191,300			
1959	1636	1,020	June 5, 1959	32	278	3.52	47.81	201,200	274	47.13	198,300			
1960	1716	1,080	June 4, 1960	43	238	3.02	40.98	172,400	-	-	-			

4896. City of Yakima (Oak Flat) Diversion near Naches, Wash.

Location.--Lat 46°44'50", long 120°47'05", in SE¼NW¼ sec.36, T.15 N., R.16 E., on pipeline half a mile downstream from pumping and chlorination plant and 5 miles west of Naches.

Gage.--Sparling meter in pipeline.

Extremes.--1951-60: Maximum daily discharge, 17 cfs Aug. 18, 1951; no flow Mar. 2, 1960.

Remarks.--Canal diverts from left bank of Naches River above Tieton River in NE¼ sec.34, T.15 N., R.16 E., for domestic water supply of city of Yakima.

Cooperation.--Records furnished by Bureau of Reclamation.

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	825	740	740	696	666	756	827	803	781	869	893	825	9,420
1952	809	706	706	647	587	813	854	892	856	740	815	877	8,500
1953	775	649	635	599	536	585	583	635	645	738	758	809	7,950
1954	732	621	607	587	553	607	597	649	625	682	682	785	7,730
1955	668	545	540	494	454	585	567	603	671	690	708	744	7,270
1956	710	603	575	571	575	595	561	613	587	704	776	847	7,720
1957	756	609	599	591	560	617	565	563	583	748	754	865	7,810
1958	940	585	589	635	538	617	573	670	714	785	761	690	8,100
1959	484	591	555	542	478	538	545	595	647	726	704	686	7,090
1960	700	563	544	551	503	529	547	657	643	609	787	749	7,560

4900. Selah Valley Canal near Naches, Wash.

Location.--Lat 46°44'40", long 120°47'50", in NW¼ sec.35, T.15 N., R.16 E., on left bank 800 ft downstream from headgate and 5 miles west of Naches.

Records available.--May to September 1904, July 1909 to October 1914, July 1920 to September 1960 (monthly diversion only).

Gage.--Water-stage recorder. Altitude of gage is 1,640 ft (from topographic map). Prior to Apr. 17, 1922, staff gages at several sites approximately 1 mile downstream at same site at different datums.

Average discharge.--40 years (1920-60), 63.1 cfs (46,110 acre-ft per year).

Extremes.--1904, 1909-14, 1920-60: Maximum daily discharge, 139 cfs Aug. 20, 1937; no flow at times each year.

Remarks.--Canal diverts from left bank of Naches River above Tieton River in NW¼ sec.35, T.15 N., R.16 E., for irrigation of about 10,000 acres. Canal was constructed in 1890, but no records are available prior to 1904.

Cooperation.--Records furnished by Bureau of Reclamation; those for 1951-60 not previously published by Geological Survey.

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	3,290	0	0	0	0	758	4,780	6,720	7,160	7,950	7,980	6,660	45,300
1952	2,960	0	0	0	0	1,030	5,870	7,490	7,470	7,910	6,370	6,620	45,720
1953	4,170	635	0	0	0	2,240	5,100	6,550	6,770	7,550	7,710	6,990	47,720
1954	3,740	0	0	0	0	500	4,620	6,510	6,690	7,740	8,070	6,170	44,000
1955	2,170	0	0	0	510	1,040	2,490	6,320	6,930	7,750	7,990	6,900	42,100
1956	3,150	0	0	0	0	0	3,330	6,460	7,100	7,810	8,070	6,710	42,630
1957	1,990	0	0	0	0	1,760	5,800	7,040	5,810	8,060	8,280	6,410	45,150
1958	2,340	0	0	0	555	1,230	3,040	6,780	7,560	8,030	8,180	6,080	43,800
1959	3,630	0	0	621	327	1,440	5,460	7,640	7,810	8,160	8,190	5,670	48,950
1960	3,520	0	0	0	614	609	4,390	6,820	7,780	8,160	8,190	6,490	46,570

4910. Rimrock Lake at Tieton Dam, near Naches, Wash.
(Formerly published as Tieton Reservoir at Tieton Dam, near Naches)

Location.--Lat 46°39'10", long 121°07'30", in SW $\frac{1}{4}$ sec.31 (unsurveyed), T.14 N., R.14 E., on face of dam on Tieton River, at spillway at Rimrock, 2,000 ft upstream from Wildcat Creek, 7 $\frac{1}{2}$ miles upstream from headworks of Tieton Canal, and 22 $\frac{1}{2}$ miles southwest of Naches.

Drainage area.--187 sq mi.

Records available.--April 1925 to September 1960. Published as Tieton Reservoir at Tieton Dam, near Naches prior to October 1959.

Gage.--Staff gage. Datum of gage is at mean sea level (Bureau of Reclamation bench mark).

Extremes.--1925-60: Maximum contents observed, 201,380 acre-ft June 21, 1937 (elevation, 2,927.33 ft); minimum observed, 89 acre-ft Oct. 12, 1926 (elevation, 2,766.77 ft).

Remarks.--Reservoir is formed by earth- and gravel-fill dam completed in 1925; storage began Apr. 27, 1925. Capacity, 198,000 acre-ft between sill of tunnel entrance (elevation, 2,766.00 ft) and crest of spillway gates (elevation, 2,926.00 ft). Records given herein represent usable contents. Water used for irrigation.

Cooperation.--Records furnished by Bureau of Reclamation and reviewed 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	115,180	114,660	119,700	101,440	116,540	106,120	142,000	196,360	199,080	167,820	115,240	80,530
1952	91,240	99,180	109,760	111,950	118,250	122,980	156,140	190,320	196,760	157,890	102,130	60,320
1953	49,430	48,340	49,680	86,300	117,150	133,260	151,470	196,460	199,210	180,230	141,440	104,700
1954	100,760	106,770	127,430	124,370	119,970	122,030	128,660	175,500	199,390	188,120	158,710	134,400
1955	134,760	128,020	129,460	131,410	136,840	140,750	141,620	170,720	199,670	188,980	143,190	112,190
1956	127,810	136,120	127,410	108,460	102,340	95,380	120,950	190,250	195,310	181,300	148,140	116,580
1957	114,750	128,920	134,070	133,630	139,840	160,580	189,100	195,910	188,440	128,200	69,650	32,470
1958	37,020	44,810	59,020	75,030	94,840	114,690	146,510	200,020	187,060	125,820	60,880	31,890
1959	37,630	79,070	133,220	136,390	129,830	140,590	165,330	189,290	195,480	160,160	104,270	85,580
1960	94,630	105,780	127,410	134,660	153,090	176,460	187,660	180,730	196,130	142,160	67,080	23,210

4915. Tieton River at Tieton Dam, near Naches, Wash.

Location.--Lat 46°39'30", long 121°07'20", in sec.31, T.14 N., R.14 E. (unsurveyed), on left bank 900 ft upstream from Wildcat Creek, 1,200 ft downstream from Tieton Dam, 19 miles upstream from Oak Creek, and 22 miles southwest of Naches.

Drainage area.--187 sq mi.

Records available.--August 1908 to December 1912, June to September 1914, June 1918 to March 1921, April 1925 to September 1960. Monthly discharge only for some periods, published in WSP 1316. Published as "at McAllister Meadows" 1908-14 and as "at Rimrock" 1918-19.

Gage.--Water-stage recorder. Datum of gage is 2,680.99 ft above mean sea level (Bureau of Reclamation bench mark). Prior to Oct. 1, 1914, staff gage at site a third of a mile upstream at different datum. Oct. 1, 1918, to Mar. 31, 1919, and Apr. 27 to Sept. 4, 1925, staff gage and reference point and Sept. 5, 1925, to Apr. 23, 1933, water-stage recorder, at site about 800 ft downstream at different datum. Apr. 24, 1933, to Dec. 11, 1934, water-stage recorder at present site at datum 2.0 ft higher.

Average discharge.--41 years (1908-12, 1918-20, 1925-60), 496 cfs (359,100 acre-ft per year), adjusted for storage since October 1925.

Extremes.--1908-14, 1918-21, 1925-60: Maximum discharge, 8,450 cfs Dec. 22, 1933 (gage height, 9.24 ft); no flow Apr. 4-6, 10, 1930.

Remarks.--No diversion above station. Flow regulated by Rimrock Lake (formerly Tieton Reservoir), see preceding page.

Cooperation.--Records collected and prepared in cooperation with Bureau of Reclamation.

Correction.--In WSP 1316, the momentary maximum discharge for the water year 1935 is listed in error; it should be 2,090 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	406	689	795	792	527	589	246	588	1,222	1,171	1,198	842	757
1952	231	174	151	172	164	168	151	592	856	1,220	1,233	914	505
1953	331	151	126	19.6	7.01	8.38	150	245	995	1,214	1,081	898	438
1954	285	150	168	384	377	327	518	585	866	1,369	1,012	718	565
1955	279	467	231	190	147	133	246	258	1,121	1,073	1,195	776	511
1956	180	567	876	682	368	396	501	863	1,824	1,442	1,042	830	798
1957	293	43.8	493	244	137	27.4	100	1,346	1,030	1,432	1,214	841	605
1958	152	66.0	36.7	10.5	19.5	10.0	10.0	715	1,227	1,492	1,332	771	490
1959	168	23.5	24.9	601	495	126	190	392	1,048	1,220	1,219	692	517
1960	470	538	126	150	39.0	9.82	583	962	868	1,425	1,555	957	643

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	24,970	40,970	46,880	48,710	29,290	36,200	14,630	36,130	72,710	72,020	73,660	50,120	548,300
1952	14,190	10,340	9,270	10,580	10,610	10,340	8,970	36,380	50,910	75,000	75,790	54,560	366,700
1953	20,360	8,960	7,730	1,210	389	515	8,950	15,050	59,210	74,620	66,470	55,400	318,800
1954	17,500	8,930	10,540	23,590	20,930	20,130	30,830	35,990	51,540	84,180	62,210	42,750	408,900
1955	17,170	27,800	14,210	11,650	8,150	8,200	14,660	15,840	66,680	65,950	73,480	46,150	469,900
1956	11,100	33,730	53,650	41,920	21,190	24,340	29,790	53,040	108,600	88,680	84,050	49,360	579,600
1957	18,010	2,610	30,300	15,000	7,630	1,690	5,970	82,740	61,290	88,070	74,640	50,020	438,000
1958	9,360	3,930	2,260	643	1,080	615	595	43,950	75,000	91,720	81,920	45,880	355,000
1959	10,350	1,400	1,530	36,930	27,480	7,750	11,320	24,120	62,340	75,050	74,980	41,170	374,400
1960	28,870	32,020	7,770	9,240	2,240	604	34,700	59,170	51,640	87,610	95,640	56,920	466,400

Yearly discharge, in cubic feet per second

Year	W.S.P. no.	Water year ending Sept. 30							Calendar year						
		Observed				Adjusted			Observed				Adjusted		
		Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Per square mile in inches	Mean	Runoff in acre-feet	Mean	Runoff in inches	Mean	Runoff in inches	
		Discharge	Date												
1950	-	-	-	-	-	-	-	-	-	-	786	569,100	760	55.17	
1951	1216	2,240	June 10, 1951	9.2	757	548,300	714	3.82	51.80	645	467,300	632	45.84		
1952	1246	1,530	July 17, 1952	84	505	366,700	477	2.55	34.74	510	370,000	427	31.11		
1953	1286	1,600	June 13, 1953	6.0	438	316,800	500	2.67	36.26	437	316,200	545	39.54		
1954	1346	1,750	June 27, 1954	111	565	408,900	606	3.24	43.99	596	431,300	599	43.46		
1955	1396	2,960	June 12, 1955	96	511	369,900	480	2.57	34.87	566	409,400	583	40.86		
1956	1446	2,980	June 9, 1956	10.5	798	579,600	805	4.30	58.56	733	531,900	742	53.98		
1957	1516	2,480	May 9, 1957	7.4	605	438,000	489	2.61	35.48	556	402,600	453	32.85		
1958	1566	2,460	May 26, 1958	10	490	355,000	490	2.62	35.51	497	352,700	590	42.78		
1959	1636	1,610	July 16, 1959	8.4	517	374,400	591	3.16	42.92	584	429,800	586	42.51		
1960	1716	2,080	June 16, 1960	7.2	643	466,400	557	2.98	40.50	-	-	-	-		

4920. Tieton Canal near Naches, Wash.

Location.--Lat 46°40'10", long 121°00'130", in SW $\frac{1}{4}$ sec.30, T.14 N., R.15 E., on left bank 500 ft downstream from canal intake and 16 miles southwest of Naches.

Records available.--May 1910 to September 1929; October 1929 to September 1960 (monthly diversion only).

Gage.--Water-stage recorder. Datum of gage is 2,294.82 ft above mean sea level (Bureau of Reclamation bench mark). Prior to Mar. 18, 1944, float gage at same site and datum.

Extremes.--1910-60: Maximum daily discharge, 349 cfs Sept. 9-13, 1955; no flow at times in each year.

Remarks.--Canal diverts from right bank of Tieton River for irrigation of about 25,000 acres in 1950. Irrigated acreage in 1910 was about 1,650 acres.

Cooperation.--Records furnished by Bureau of Reclamation and reviewed by Geological Survey.

Monthly and yearly diversion, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	0	1,040	0	0	802	323	5,230	17,960	17,750	20,320	20,700	18,220	102,300
1952	0	930	0	0	563	778	4,100	16,920	19,650	20,760	21,040	19,130	103,900
1953	0	899	60	0	778	2,150	4,400	14,560	16,980	20,950	21,210	20,110	102,100
1954	0	1,180	0	0	204	889	3,400	16,900	19,520	20,880	21,250	17,430	101,600
1955	149	1,080	0	0	1,060	819	4,270	11,160	19,810	20,800	21,210	19,760	100,100
1956	161	1,270	369	0	0	242	573	12,560	16,760	20,830	21,020	16,570	90,360
1957	0	1,260	58	6	901	940	2,750	11,170	19,530	21,150	21,220	17,180	96,160
1958	251	194	996	60	744	1,290	1,650	12,800	19,960	20,680	20,890	16,460	95,980
1959	65	322	781	0	476	268	3,090	15,160	18,940	20,910	21,100	16,060	97,170
1960	0	601	589	0	1,060	196	2,820	12,780	19,560	21,020	20,810	17,170	96,610

4925. Tieton River at headworks of Tieton Canal, near Naches, Wash.

Location.--Lat 46°40'10", long 121°00'20", in sec.30, T.14 N., R.15 E. (unsurveyed), on right bank 1,000 ft downstream from headworks of Tieton Canal, 7 miles downstream from Tieton Dam, 12 miles upstream from Oak Creek, and 16 miles southwest of Naches.

Drainage area.--239 sq mi.

Records available.--April 1906 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Datum of gage is 2,280.44 ft above mean sea level, unadjusted. Prior to July 28, 1909, staff gages at same site or sites within 1½ miles downstream referred to same datum.

Average discharge.--54 years (1906-60), 561 cfs (406,100 acre-ft per year), adjusted for diversion since 1910 and for storage since October 1924.

Extremes.--1906-60: Maximum discharge, 8,910 cfs Dec. 22, 1933 (gage height, 9.70 ft); no flow at times in 1926, 1929, 1931-32, 1934, 1945.

Remarks.--Diversion for irrigation by Tieton Canal. Flow regulated by Rimrock Lake (formerly Tieton Reservoir), see page 383).

Cooperation.--Records furnished by Bureau of Reclamation and reviewed by 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	380	702	858	810	617	633	346	455	950	800	865	571	666
1952	253	179	190	195	244	234	226	416	590	901	906	575	410
1953	314	109	133	109	74.8	16.8	169	143	743	824	675	542	322
1954	305	135	211	416	424	383	801	492	621	979	625	332	465
1955	303	479	253	203	147	136	230	210	903	728	783	466	404
1956	186	602	1,008	755	400	480	857	993	1,532	1,121	695	576	768
1957	312	39.4	541	260	146	76.0	180	1,282	741	1,051	923	596	517
1958	155	65.5	58.8	36.5	83.0	47.4	97.5	662	938	1,107	990	558	401
1959	193	105	112	668	544	189	252	231	792	884	864	436	439
1960	483	577	159	172	56.2	86.7	628	829	595	1,075	1,165	652	542

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	23,360	41,780	52,750	49,800	34,290	38,950	20,560	27,960	56,500	49,190	53,170	33,970	482,300
1952	15,570	10,640	11,670	11,980	14,040	14,370	13,440	25,590	35,090	55,410	55,690	34,210	297,700
1953	19,350	6,510	8,180	6,680	4,160	1,030	10,070	8,800	44,210	50,690	41,480	32,230	235,400
1954	18,760	8,020	13,000	25,550	23,540	23,540	35,750	30,260	36,930	60,220	38,450	22,720	336,700
1955	18,660	28,500	15,530	12,490	8,190	8,340	13,670	12,910	53,710	44,760	48,160	27,720	292,600
1956	11,430	35,810	61,950	46,450	23,010	29,530	50,990	61,040	91,130	68,910	42,730	34,300	557,300
1957	13,190	2,340	33,260	15,970	8,130	4,670	10,720	78,840	44,080	64,610	56,770	35,490	374,100
1958	9,550	5,900	2,390	2,290	4,610	2,920	5,800	40,580	55,830	68,040	60,860	33,190	290,000
1959	11,890	6,260	6,870	41,050	30,180	11,650	14,970	14,230	47,140	54,360	53,110	25,940	317,600
1960	29,700	34,320	9,770	10,560	3,230	5,330	37,370	50,940	35,420	66,090	71,600	38,800	393,100

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30										Calendar Year			
		Observed					Adjusted					Observed			
		Momentary		maximum	Minimum	Mean	Runoff		Mean	Per square		Mean	Runoff		Mean
		Discharge	Date	in	in		in	in		mile	inches		in	in	
1950	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1951	1216	-	-	-	-	666	482,300	764	3.20	43.38	556	519,600	824	46.79	683
1952	1248	2,150	June 10, 1951	202	-	410	297,700	525	2.20	29.93	405	402,300	683	38.80	405
1953	1266	1,410	June 13, 1953	6.5	322	233,400	525	2.20	29.83	330	239,100	579	32.87	330	239,100
1954	1348	1,430	June 26, 1954	94	465	336,700	647	2.71	36.71	497	359,600	640	36.34	497	359,600
1955	1396	2,380	June 13, 1955	109	404	292,600	512	2.14	29.06	468	339,200	605	34.34	468	339,200
1956	1446	2,330	June 3, 1956	108	768	557,300	898	3.76	51.16	593	502,900	826	47.04	593	502,900
1957	1516	2,480	May 8, 1957	10	517	374,100	533	2.23	30.31	463	335,100	492	27.97	463	335,100
1958	1566	2,420	May 26, 1958	11.5	401	290,000	532	2.23	30.23	413	299,200	648	36.80	413	299,200
1959	1636	1,280	July 16, 1959	20	439	317,600	647	2.71	36.77	506	366,400	632	35.92	506	366,400
1960	1716	1,740	June 16, 1960	28	542	393,100	589	2.46	33.53	-	-	-	-	-	-

4935. Wapatox Canal near Naches, Wash.

Location.--Lat 46°44'50", long 120°46'20", in NW $\frac{1}{4}$ sec.36, T.15 N., R.16 E., on right bank 100 ft downstream from canal headgate and 3 $\frac{1}{4}$ miles northwest of Naches.

Records available.--May to October 1904; July to October 1905 (gage heights and discharge measurements only); July to September 1909 (monthly diversion only); April to October 1910; April to October 1911, April 1912 to October 1914, and April 1916 to September 1960 (monthly diversion only). Published as "near North Yakima" 1904-5.

Gage.--Water-stage recorder. Altitude of gage is 1,575 ft (from river-profile map). Apr. 16, 1904, to Sept. 30, 1905, July 3, 1909, to October 1914, and April 1916 to December 1939, staff gages at sites approximately 100 ft downstream at same datum. Jan. 1, 1940, to Oct. 17, 1954, staff gage 100 ft downstream at same datum.

Average discharge.--46 years (1912-14, 1916-60), 429 cfs (310,600 acre-ft per year).

Extremes.--1904, 1909-14, 1916-60: Maximum daily discharge, 709 cfs Feb. 4, 1917; no flow at times when gates are closed.

Remarks.--Canal diverts from left bank of Naches River, half a mile upstream from the Naches River below Tieton River, near Naches gaging station, for power development and irrigation of about 3,000 acres.

Cooperation.--Records furnished by Bureau of Reclamation; those for 1951-60 not previously published by Geological Survey.

Monthly and yearly diversion, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	31,470	31,100	30,050	28,510	26,340	29,490	29,660	32,030	30,920	30,770	31,680	30,430	362,400
1952	30,500	30,510	24,270	21,230	24,670	28,690	31,070	24,190	31,690	32,760	23,340	27,830	330,800
1953	21,970	13,520	16,580	20,030	24,840	21,050	26,960	23,350	30,860	31,700	29,880	28,760	289,500
1954	26,610	24,940	30,790	27,060	24,450	26,910	29,960	23,630	30,520	30,580	27,470	29,490	332,400
1955	26,820	21,840	22,950	21,830	19,270	20,270	27,320	23,000	28,270	27,010	28,310	27,240	294,100
1956	29,360	24,980	23,500	22,300	18,500	24,140	21,210	30,450	27,240	28,410	28,020	28,380	306,500
1957	26,840	26,200	26,330	19,820	12,970	25,790	20,880	18,620	21,600	27,400	25,640	26,760	278,800
1958	25,710	20,830	22,970	24,080	24,310	25,690	17,990	30,540	28,810	27,460	28,760	26,530	301,700
1959	19,760	25,600	27,240	26,740	23,920	24,940	18,130	30,950	30,800	32,210	32,260	29,750	322,300
1960	31,870	30,530	29,560	23,330	24,680	23,480	24,010	26,570	31,460	32,460	32,010	29,300	332,300

4940. Naches River below Tieton River, near Naches, Wash.

Location.--Lat 46°44'40", long 120°46'00", in SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.36, T.15 N., R.16 E., on left bank half a mile downstream from Wapatox power canal, three-quarters of a mile downstream from Tieton River, and $3\frac{1}{2}$ miles northwest of Naches.

Drainage area.--941 sq mi.

Records available.--August to October 1905, October 1908 to September 1960. Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Datum of gage is 1,549.67 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Dec. 7, 1916, staff gage and Dec. 7, 1916, to Sept. 9, 1936, water-stage recorder, at site five-eighths of a mile upstream at different datums. Sept. 10 to Oct. 30, 1936, staff gage at present site and datum.

Average discharge.--52 years (1908-60), 1,719 cfs (1,245,000 acre-ft per year), adjusted for diversions by Selah Valley and Tieton Canals since 1909, city of Yakima at Oak Flat since 1929, by Wapatox Canal since 1936, for change in contents in Bumping Lake since November 1910, and in Rimrock Lake (formerly Tieton Reservoir) since October 1924.

Extremes.--1905, 1908-60: Maximum discharge, 32,200 cfs Dec. 22, 23, 1933 (gage height, 14.33 ft, site and datum then in use); minimum, 1 cfs Nov. 7, 1942, and for many days during winter of 1943-44, result of regulation and diversion.

Remarks.--Flow regulated by Bumping Lake and Rimrock Lake, formerly Tieton Reservoir (see elsewhere in this report), by diversion at Oak Flat for municipal supply of city of Yakima below station, and diversion of Selah Valley, Tieton, and Wapatox Canals. Small unmeasured diversions for irrigation of approximately 420 acres 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	273	1,346	2,829	1,650	2,084	1,256	2,518	4,239	3,160	1,313	752	290	1,807
1952	163	140	301	618	344	289	1,506	2,839	1,913	1,301	823	252	838
1953	71.5	55.0	29.5	688	1,011	264	902	2,566	2,920	2,004	758	352	965
1954	118	60.1	643	627	625	671	1,792	4,190	3,514	3,049	1,053	411	1,402
1955	294	797	304	154	86.9	43.0	268	1,718	4,653	1,907	898	276	951
1956	331	1,835	2,155	1,113	528	788	3,831	6,791	5,797	2,908	863	371	2,278
1957	256	218	1,224	340	297	253	1,460	5,428	2,309	1,158	680	246	1,164
1958	24.9	17.6	24.3	63.7	419	326	1,326	4,992	2,566	1,259	710	238	1,001
1959	152	1,000	1,761	1,815	1,019	436	1,642	2,292	3,149	1,472	798	293	1,319
1960	864	1,472	1,074	383	299	601	2,228	2,625	2,504	1,504	909	373	1,237

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	16,770	80,060	174,000	101,400	15,700	77,240	149,800	260,600	188,000	80,750	46,230	17,260	1,308,000
1952	10,000	8,350	18,500	10,360	19,800	17,780	89,620	174,600	13,800	79,970	50,600	14,990	608,400
1953	4,400	2,080	1,810	42,280	56,140	16,240	53,680	157,800	173,800	123,200	46,590	20,950	699,000
1954	7,230	3,570	39,530	38,530	34,710	41,240	106,600	257,600	209,100	187,500	64,740	24,450	1,015,000
1955	18,100	47,430	18,700	9,480	4,830	2,640	15,930	105,600	276,900	117,300	55,230	16,410	688,600
1956	20,330	109,200	132,500	68,430	30,350	48,420	227,900	417,600	344,900	178,800	53,060	22,060	1,654,000
1957	15,760	12,950	75,250	20,920	16,520	15,540	86,880	333,700	137,400	71,180	41,850	14,630	842,600
1958	1,530	1,050	1,490	3,920	23,250	20,020	78,900	307,000	152,700	77,400	43,680	14,350	725,100
1959	9,370	59,530	108,300	11,600	56,600	26,840	97,680	140,900	187,400	90,530	49,060	17,460	955,300
1960	53,100	87,620	66,060	23,540	17,190	36,980	32,600	161,400	149,000	92,490	55,860	22,310	898,200

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30												Calendar year			
		Observed						Adjusted						Observed			
		Momentary maximum		Minimum	Mean	Runoff in acre-feet	Mean square in mile inches	Runoff in acre-feet	Mean square in mile inches	Runoff in acre-feet	Mean square in mile inches	Runoff in acre-feet	Mean square in mile inches	Runoff in acre-feet	Mean square in mile inches	Runoff in acre-feet	Mean square in mile inches
		Discharge	Date														
1950	-	-	-	-	-	-	-	-	-	-	-	-	-	1,962	1,420,000	2,611	37.56
1951	1218	9,370	May 11, 1951	105	1,807	1,308,000	2,478	2.63	35.75	1,483	1,074,000	2,164	31.22	-	-	-	-
1952	1245	4,150	May 20, 1952	56	838	608,400	1,486	1.58	21.50	799	579,800	1,344	19.44	-	-	-	-
1953	1285	5,740	June 13, 1953	24	965	699,000	1,648	1.78	23.78	1,023	741,000	1,801	25.99	-	-	-	-
1954	(a)	7,520	May 19, 1954	36	1,402	1,015,000	2,121	2.25	30.60	1,449	1,049,000	2,102	30.32	-	-	-	-
1955	1396	9,740	June 12, 1955	25	951	688,600	1,530	1.63	22.05	1,197	866,400	1,816	26.16	-	-	-	-
1956	1446	13,300	June 1, 1956	153	2,278	1,654,000	2,904	3.09	42.01	2,060	1,495,000	2,696	39.01	-	-	-	-
1957	1516	10,600	May 10, 1957	67	1,164	842,600	1,635	1.74	23.58	1,026	742,700	1,486	21.41	-	-	-	-
1958	1568	9,350	May 25, 1958	12	1,001	725,100	1,622	1.72	23.39	1,240	898,200	1,982	28.60	-	-	-	-
1959	1658	4,850	May 5, 1959	42	1,319	955,300	2,051	2.18	29.60	1,360	984,800	2,030	29.29	-	-	-	-
1960	1718	9,120	Nov. 23, 1959	30	1,237	898,200	1,818	1.98	26.29	-	-	-	-	-	-	-	-

a 1346, 1396.

5005. North Fork Ahtanum Creek near Tampico, Wash.

Location.--Lat 46°33'40", long 120°55'10", in NW¼ sec.2, T.12 N., R.15 E., on left bank 150 ft downstream from Nasty Creek, 3½ miles upstream from Tampico and confluence with South Fork, and 20 miles west of Yakima.

Drainage area.--68.9 sq mi.

Records available.--August 1907 to September 1960 (no winter records in water years 1808-9, 1916-30). Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Concrete control Nov. 11, 1915, to December 1933, and sharp-crested weir since September 1934. Altitude of gage is 2,450 ft (from topographic map). Prior to Sept. 20, 1934, staff gage or water-stage recorder at site 50 ft upstream at different datum.

Average discharge.--36 years (1909-15, 1930-60), 68.7 cfs (49,740 acre-ft per year).

Extremes.--1907-60: Maximum discharge, 823 cfs May 20, 1956 (gage height, 3.00 ft); minimum, 4.3 cfs Nov. 13 (gage height, 0.13 ft), result of freezeup.

Remarks.--No diversion above station. No regulation.

Cooperation.--Records furnished by Bureau of Indian Affairs and reviewed by 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	32.2	56.1	104	65.9	136	71.4	216	308	232	72.4	35.0	24.9	112
1952	27.8	25.3	51.0	22.0	33.2	49.0	158	204	138	49.6	24.4	19.8	65.1
1953	16.2	13.7	16.4	71.2	61.1	40.9	98.8	209	182	92.1	32.5	21.7	71.3
1954	20.8	22.6	30.6	29.1	45.0	57.6	128	245	298	130	42.2	26.4	82.3
1955	25.6	32.1	23.8	20.9	20.9	22.0	37.7	125	210	59.1	27.7	20.7	52.2
1956	27.0	37.4	65.1	41.9	29.1	72.6	295	427	328	128	47.2	30.8	128
1957	26.6	26.9	35.9	18.7	27.0	50.7	118	271	118	36.5	24.8	18.5	64.7
1958	23.1	19.4	22.9	24.6	74.0	64.1	126	331	162	57.4	27.0	20.7	79.4
1959	20.9	40.3	65.4	61.0	43.1	54.7	141	157	164	57.5	26.6	22.9	71.2
1960	27.5	29.2	23.5	18.3	24.7	60.4	120	156	158	42.0	22.9	17.4	58.3

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	1,980	3,340	6,410	4,050	7,580	4,390	12,840	18,920	13,800	4,450	2,150	1,480	81,390
1952	1,710	1,510	1,910	1,350	1,910	3,010	9,400	12,520	8,220	3,050	1,500	1,180	47,270
1953	994	813	1,010	4,380	3,590	2,520	5,880	12,860	10,800	5,660	2,000	1,290	51,600
1954	1,280	1,540	1,880	1,790	2,500	3,540	7,640	15,060	12,370	8,010	2,590	1,570	59,570
1955	1,580	1,910	1,460	1,290	1,160	1,350	2,240	7,710	12,500	3,630	1,700	1,230	37,760
1956	1,660	2,220	4,000	2,570	1,670	4,460	17,570	26,260	19,540	7,850	2,900	1,830	92,530
1957	1,630	1,600	2,210	1,150	1,500	3,120	7,050	16,650	7,030	2,250	1,530	1,100	46,820
1958	1,420	1,150	1,410	1,520	4,110	3,940	7,510	20,330	9,650	3,530	1,660	1,230	57,460
1959	1,290	2,400	4,020	3,750	2,390	3,370	8,420	9,640	9,770	3,530	1,830	1,360	51,570
1960	1,690	1,740	1,450	1,120	1,420	3,710	7,130	9,620	9,390	2,580	1,410	1,030	42,290

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	
		Discharge	Date				Inches	Acre-feet		Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	94.6	18.65	68,520
1951	1216	655	May 11, 1951	22	112	1.63	22.16	81,590	103	20.35	74,790
1952	1246	293	May 18, 1952	18	65.1	1.945	12.87	47,270	61.9	12.24	44,960
1953	1286	323	Apr. 27, 1953	8.6	71.3	1.03	14.02	51,600	73.8	14.45	53,280
1954	1346	438	May 18, 1954	16	82.3	1.19	16.23	59,570	82.9	16.35	60,020
1955	1396	360	June 5, 1955	13	52.2	1.758	10.29	37,760	56.2	11.09	40,690
1956	1446	823	May 20, 1956	17	128	1.86	25.20	92,530	124	24.53	90,090
1957	1516	520	May 9, 1957	11	64.7	1.939	12.74	46,820	62.6	12.34	45,360
1958	1566	531	May 23, 1958	10	79.4	1.15	15.63	57,460	84.5	16.64	61,190
1959	1656	239	June 3, 1959	17	71.2	1.03	14.02	51,570	67.3	13.25	48,740
1960	1716	364	May 12, 1960	8.9	58.3	1.846	11.51	42,290	-	-	-

5010. South Fork Ahtanum Creek at Conrad Ranch, near Tappico, Wash.

Location.--Lat 46°30'30", long 120°54'50", in SW $\frac{1}{4}$ sec. 23, T.12 N., R.15 E., on left bank at Conrad Ranch, 2 $\frac{1}{2}$ miles upstream from confluence with North Fork, 2 $\frac{1}{4}$ miles southwest of Tappico, and 20 miles southwest of Yakima.

Drainage area.--24.8 sq mi.

Records available.--March 1915 to September 1960 (no winter records prior to water year 1931). Monthly discharge only for some periods, published in WSP 1316.

Gage.--Water-stage recorder. Concrete control effective Sept. 6, 1916, to December 1933. Altitude of gage is 2,400 ft (from topographic map). Prior to Aug. 9, 1918, staff gage at same site at datum 1.00 ft lower. Aug. 9, 1918, to Mar. 22, 1951, staff gage at present site and datum.

Average discharge.--30 years (1930-60), 19.1 cfs (13,830 acre-ft per year).

Extremes.--1915-60: Maximum discharge observed, 424 cfs Dec. 23, 1933 (gage height, 3.10 ft), from rating curve extended above 80 cfs; minimum observed, 2.6 cfs Aug. 23, 25, 1931 (gage height, 0.35 ft).

Revisions.--The momentary maximum discharge for the water year 1918 published in WSP 1316 has been revised to 53 cfs May 4, 1918.

Remarks.--Diversions for irrigation of about 55 acres above station. No regulation.

Cooperation.--Records collected and prepared in cooperation with Bureau of Indian Affairs.

Monthly and yearly mean discharge, in cubic feet per second

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	10.1	17.1	33.5	19.6	56.4	23.0	53.8	79.1	57.8	19.5	11.6	9.23	32.3
1952	9.10	8.52	9.42	6.40	14.3	17.2	40.5	47.0	32.0	13.4	8.68	6.92	17.8
1953	5.85	5.88	6.09	26.7	19.9	12.5	23.4	48.1	49.4	21.5	11.3	8.07	19.9
1954	7.25	7.09	9.05	9.81	15.7	18.8	32.6	58.2	56.7	30.9	13.4	9.46	22.4
1955	8.94	9.79	8.26	7.39	7.37	7.51	11.6	25.6	47.0	14.6	7.70	6.64	13.5
1956	8.37	10.1	24.4	15.1	10.8	38.6	91.9	99.9	85.6	33.8	15.8	11.9	37.2
1957	10.5	10.4	12.7	6.76	10.5	22.0	35.1	56.4	25.3	10.7	8.19	6.81	18.0
1958	8.07	7.08	8.48	9.26	34.9	23.4	38.6	79.2	43.5	18.2	10.9	8.25	24.2
1959	8.38	11.8	14.8	25.8	15.5	23.0	39.9	36.0	36.6	15.9	9.73	8.49	20.5
1960	8.44	8.15	7.64	6.34	7.97	20.2	32.0	39.6	41.2	14.2	8.76	7.23	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	623	1,020	2,060	1,210	3,130	1,420	3,200	4,860	3,440	1,200	716	549	23,430
1952	560	507	579	393	823	1,060	2,410	2,890	1,900	823	534	412	12,890
1953	359	350	375	1,640	1,100	768	1,390	2,960	2,940	1,320	696	480	14,380
1954	446	422	556	603	871	1,160	1,940	3,580	3,380	1,900	826	563	16,250
1955	550	582	508	455	409	462	693	1,590	2,800	898	473	395	9,820
1956	515	598	1,500	930	622	2,370	5,470	6,140	5,100	2,080	974	708	27,010
1957	649	616	784	416	583	1,350	2,090	3,470	1,500	659	503	405	13,020
1958	496	421	522	570	1,940	1,440	2,360	4,870	2,590	1,120	673	550	17,550
1959	515	702	899	1,590	863	1,420	2,380	2,210	2,180	976	598	505	14,840
1960	519	485	469	390	458	1,240	1,900	2,430	2,450	875	539	430	12,180

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30						Calendar year				
		Momentary maximum		Minimum		Mean	Per square mile	Runoff		Mean	Runoff	
		Discharge	Date	day	day			Inches	Acre-feet		Inches	Acre-feet
1950	-	-	-	-	-	-	-	-	-	26.9	-	19,500
1951	1216	a365	Feb. 10, 1951	7.8	32.3	-	-	-	23,430	29.5	-	21,370
1952	1246	70	May 19, 20, 1952	6.0	17.8	-	-	-	12,890	17.0	-	12,330
1953	1286	79	June 6, 1953	5.0	19.9	-	-	-	14,380	20.3	-	14,720
1954	1346	107	May 19, 1954	6.0	22.4	-	-	-	16,250	22.7	-	16,460
1955	1396	84	June 9, 1955	6.0	13.5	-	-	-	9,820	14.9	-	10,790
1956	1446	196	May 20, 1956	6.2	37.2	-	-	-	27,010	36.4	-	26,440
1957	1516	96	May 9, 1957	4.9	18.0	-	-	-	13,020	17.2	-	12,420
1958	1566	168	Feb. 25, 1958	6.3	24.2	-	-	-	17,550	25.2	13.79	18,230
1959	1636	68	Jan. 24, 1959	7.4	20.5	0.827	11.21	14,840	19.6	10.72	-	14,200
1960	1716	85	June 3, 1960	4.6	16.8	.677	9.22	12,180	-	-	-	-

a Maximum observed.

5025. Ahtanum Creek at Union Gap, Wash.

Location (revised).--Lat 46°32'10", long 120°28'20", in SW¼ sec.8, T.12 N., R.19 E., on left bank just upstream from Union Pacific Railroad bridge, a quarter of a mile upstream from mouth and 1 mile south of Union Gap.

Drainage area.--171 sq mi.

Records available.--May to November 1904, August 1907 to July 1908, March to October 1910, April 1911 to September 1914, May 1951 to April 1953, August to September 1960. Published as "near Yakima" 1904, 1907-8, 1910-12. Records for water years 1913-14, published in WSP 1286.

Gage.--Water-stage recorder. Altitude of gage is 940 ft (from topographic map). Prior to Sept. 30, 1914, staff gages at approximately same site at various datums May 12, 1951, to Apr. 23, 1953, water-stage recorder, at same site and datum.

Extremes.--1904, 1907-8, 1910-14, 1951-53: Maximum discharge observed, 1,530 cfs Mar. 3, 1910 (gage height, 8.9 ft, datum then in use); no flow for many days during September and October 1904.

Remarks.--No regulation. Water diverted for irrigation of about 9,000 acres 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	-	-	60.3	51.4	108	120	-	-	272	31.6	19.1	27.6	-
1952	36.6	48.7	-	-	-	-	158	145	106	30.7	20.5	21.8	75.2
1953	20.0	24.8	31.7	152	134	65	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	15.7	20.7	-

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	-	-	-	-	-	-	-	-	16,170	1,940	1,170	1,640	-
1952	2,250	2,900	3,710	3,160	6,190	7,370	9,370	8,890	6,300	1,890	1,260	1,300	54,590
1953	1,230	1,470	1,950	9,330	7,430	4,050	-	-	-	-	-	-	-
1960	-	-	-	-	-	-	-	-	-	-	966	1,230	-

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1951	1216	a780	May 12, 1951	-	-	-	-	-
1952	1246	258	May 20, 21, 1952	11	75.2	54,590	69.4	50,380
1953	1286	-	-	-	-	-	-	-
1960	1716	-	-	-	-	-	-	-

a Maximum during period June to September.

5035. New Reservation Canal near Parker, Wash.

Location.--Lat 46°31'05", long 120°28'40", in NW¼ sec.20, T.12 N., R.19 E., on left bank 1,800 ft (corrected) downstream from intake, three-quarters of a mile northwest of Parker, and 5½ miles northwest of Wapato.

Records available.--April 1904 to September 1921 and October 1921 to September 1960 (monthly diversion only). Published as New Reservation Canal No. 2 in Yakima Indian Reservation 1904, "near Yakima" 1905-12, and "at Parker" 1917-21.

Gage.--Water-stage recorder. Altitude of gage is 920 ft (from topographic map). May 6, 1904, to Sept. 30, 1923, staff gages at various sites in vicinity of canal intake at different datums.

Extremes.--1904-60: Maximum daily discharge, 2,260 cfs May 6, 1937; no flow at times in each year.

Remarks.--Canal diverts water from right bank of Yakima River to irrigate approximately 106,000 acres in Yakima Indian Reservation.

Cooperation.--Records furnished cooperatively by Bureau of Reclamation and Bureau of Indian Affairs and reviewed by Geological Survey.

Monthly and yearly diversion, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	21,290	0	0	0	0	3,790	68,080	123,800	100,800	115,300	106,500	84,120	623,700
1952	19,360	0	0	0	0	6,250	87,630	126,000	111,100	114,700	108,200	84,890	658,100
1953	25,290	0	0	0	0	15,760	83,860	114,000	107,800	121,500	106,500	76,080	650,400
1954	21,750	0	0	0	0	9,750	78,280	123,500	114,500	117,700	109,300	81,860	656,600
1955	20,980	0	0	0	0	9,400	68,630	115,100	114,300	118,400	106,500	84,400	637,700
1956	20,380	0	0	0	0	-	54,270	124,900	117,400	116,000	109,400	80,810	623,200
1957	22,470	0	0	0	0	6,640	47,490	115,800	111,200	119,500	108,500	82,140	613,500
1958	19,530	0	0	0	0	9,270	45,120	115,500	117,800	119,500	107,300	78,560	612,700
1959	19,920	0	0	0	0	11,460	64,300	116,600	118,100	119,500	109,700	78,880	636,400
1960	20,280	0	0	0	0	4,460	62,800	112,100	117,400	119,700	109,300	79,790	625,800

5040. Old Reservation Canal near Parker, Wash.

Location.--Lat 46°29'40", long 120°27'00", in SW $\frac{1}{4}$ sec.28, T.12 N., R.19 E., on left bank 1,200 ft downstream from headgate, $\frac{1}{2}$ miles southeast of Parker, and $\frac{3}{2}$ miles northwest of Wapato.

Records available.--April to May 1904 (monthly diversion only); June to October 1904; May to October 1905 (gage heights and discharge measurements only); April 1906 to September 1921; October 1921 to September 1960 (monthly diversion only). Published as Old Reservation Canal No. 1 in Yakima Indian Reservation 1904-5, "near Wapato" 1906-12, and "at Parker" 1917-21.

Gage.--Water-stage recorder. Altitude of gage is 905 ft (from topographic map). June 7, 1904, to April 1930, staff gages at present site or at sites within half a mile of present site at various datums.

Average discharge.--54 years (1906-60), 48.6 cfs (35,180 acre-ft per year).

Extremes.--1904-60: Maximum daily discharge, 386 cfs May 21, 1919; no flow at times in most years.

Remarks.--Canal diverts water from right bank of Yakima River half a mile upstream from Sunnyside Dam and headworks of Sunnyside Canal. Approximately 1,900 acres on Yakima Indian Reservation are currently irrigated.

Cooperation.--Records furnished cooperatively by Bureau of Reclamation and Bureau of Indian Affairs and reviewed by Geological Survey.

Monthly and yearly diversion, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	97	410	434	1,580	1,040	1,210	4,120	7,150	3,130	3,500	3,150	719	26,540
1952	561	872	612	1,330	3,580	4,020	4,200	4,780	3,470	2,380	704	300	26,810
1953	359	741	826	999	2,130	3,650	2,310	4,810	965	1,630	994	233	19,650
1954	687	756	822	968	907	2,450	3,620	5,670	4,120	2,600	489	292	23,380
1955	268	816	752	712	655	1,230	1,450	3,180	2,330	0	0	0	11,390
1956	188	444	811	623	506	395	1,790	4,570	837	1,960	0	0	12,120
1957	126	475	1,710	1,330	1,240	827	0	1,520	1,500	0	0	0	8,730
1958	165	755	1,580	1,710	1,570	917	166	1,580	2,000	0	0	0	10,440
1959	378	1,850	1,740	1,460	1,010	1,260	1,170	2,580	1,250	0	0	0	12,400
1960	107	666	942	838	705	641	1,070	2,130	1,030	0	0	0	8,130

5045. Sunnyside Canal near Parker, Wash.

Location.--Lat 46°29'40", long 120°25'40", in SW $\frac{1}{4}$ sec.27, T.12 N., R.19 E., on right bank 0.6 mile downstream from intake, $\frac{1}{2}$ miles east of Parker, and $\frac{3}{2}$ miles northwest of Wapato.

Records available.--April 1904 to September 1921, October 1921 to September 1960 (monthly diversion only). Published as "near Yakima" 1904-6, and "near Wapato" 1907-14.

Gage.--Water-stage recorder. Datum of gage is 890.10 ft above mean sea level, datum of 1929. Apr. 22, 1904, to Apr. 19, 1909, staff gages and Apr. 20, 1909, to April 1935, water-stage recorder, at sites within 1,000 ft of canal headworks at various datums.

Extremes.--1904-60: Maximum daily discharge, 1,320 cfs occurred usually on several days during 1925, 1931, 1933, 1935, 1947, 1949-52, 1958, 1960; no flow at times in most years.

Remarks.--Canal diverts water from left bank of Yakima River just upstream from gaging station half a mile downstream from intake of Old Reservation Canal. Approximately 80,000 acres are irrigated currently.

Cooperation.--Records furnished by Sunnyside Valley Irrigation District and Bureau of Reclamation and reviewed by Geological Survey.

Monthly and yearly diversion, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	29,450	0	0	0	0	10,820	59,800	78,770	76,700	78,270	78,210	61,230	473,200
1952	29,450	0	0	0	0	10,660	59,030	78,820	77,560	79,630	74,990	63,150	473,300
1953	30,360	0	0	0	0	18,780	56,490	75,100	73,550	78,980	77,250	61,550	472,100
1954	28,360	0	0	0	0	14,520	60,890	75,550	73,790	75,340	77,580	60,510	466,300
1955	31,000	0	0	0	0	12,690	55,580	76,540	76,130	78,390	78,110	61,340	469,800
1956	26,550	0	0	0	0	8,040	52,610	74,780	72,650	77,890	77,750	61,510	451,800
1957	30,790	0	0	0	0	4,440	40,560	73,060	74,340	77,600	77,760	60,850	439,400
1958	19,400	0	0	0	0	6,840	36,430	70,690	75,630	79,860	78,270	60,670	427,800
1959	24,620	0	0	0	0	7,290	52,070	76,380	75,870	78,850	77,850	60,100	453,000
1960	24,360	0	0	0	0	6,030	47,480	72,200	76,670	79,820	77,380	61,600	445,500

5050. Yakima River near Parker, Wash.

Location.--Lat 46°29'40", long 120°26'10", in sec.28, T.12 N., R.19 E., on left bank 700 ft (revised) downstream from Sunnyside diversion dam, 1½ miles east of Parker, and 3 miles downstream from Ahtanum Creek.

Drainage area.--3,650 sq mi, approximately.

Records available.--April 1908 to September 1960. Monthly discharge only for some periods, published in WSP 1316. Prior to October 1916, published as "near Wapato."

Gage.--Water-stage recorder. Datum of gage is 886.23 ft above mean sea level (Bureau of Reclamation bench mark). Prior to Jan. 1, 1909, hook gage at site 25 ft above headgate of Sunnyside Canal at different datum. Jan. 1, 1909, to Dec. 31, 1913, chain gage at site 500 ft downstream from Sunnyside Canal at datum 1.82 ft higher than present datum. Jan. 1, 1914, to Aug. 16, 1915, chain or staff gage and Aug. 17, 1915, to Feb. 2, 1919, water-stage recorder, at site 500 ft downstream from headgate of Sunnyside Canal at datum 0.18 ft lower than present datum. Feb. 3, 1919, to Oct. 20, 1940, water-stage recorder at present site at datum 0.18 ft lower than present datum. Oct. 21, 1940, to Aug. 9, 1953, water-stage recorder at site 1,000 ft downstream from headgate of Sunnyside Canal at datum 0.18 ft lower than present datum.

Extremes.--1908-60: Maximum discharge, 65,000 cfs Dec. 23, 1933 (gage height, 15.0 ft, from high-water marks); minimum, less than 10 cfs for several days during latter part of irrigation season in most years prior to 1936.

Remarks.--Diversion above station for irrigation of about 200,000 acres above and 220,000 acres below station. Roza, Sunnyside, and New and Old Reservation Canals (see elsewhere in this report), and Union Gap Canal (which carries an estimated mean annual discharge of 20 cfs), bypass the station. During the irrigation season as much as 18 cfs, depending upon the stage of the canal, is released from Sunnyside Canal ahead of the fish screens and passes river and canal gaging stations unmeasured. Some regulation by diversions and by Keechelus, Kachess, Cle Elum, and Bumping Lakes, and Rimrock Lake (formerly Tieton Reservoir), see elsewhere in this report. Records of water temperatures for the period September 1959 to September 1960 are published in reports of 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	2,184	4,917	7,517	5,733	8,238	5,468	5,138	5,962	4,198	364	318	191	4,159
1952	1,051	1,708	1,784	1,341	2,118	2,115	1,450	1,901	1,353	387	501	207	1,324
1953	580	884	865	2,841	4,218	1,281	1,004	2,108	3,795	948	396	224	1,574
1954	950	1,257	3,018	3,685	3,731	3,045	2,824	4,927	4,773	3,590	718	858	2,775
1955	1,652	2,450	1,815	1,538	1,752	991	790	1,568	7,144	1,746	458	410	1,851
1956	1,369	5,251	7,082	4,710	2,942	6,581	10,640	10,760	9,344	2,104	384	278	5,118
1957	1,162	1,953	5,261	2,418	1,782	2,478	3,542	9,327	1,598	347	347	283	2,555
1958	893	1,096	1,339	1,404	3,184	2,242	2,780	4,860	1,318	286	328	247	1,655
1959	947	3,689	4,535	5,513	4,631	3,012	2,758	4,208	4,060	275	368	620	2,912
1960	2,537	5,828	7,578	4,096	2,090	2,768	3,176	3,512	1,722	452	297	318	2,870

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	134,300	292,600	462,200	352,500	457,500	336,200	305,700	356,600	249,800	22,370	19,560	11,380	3,011,000
1952	64,630	101,600	109,700	82,470	121,800	130,000	86,290	116,900	80,510	23,770	30,830	12,300	960,800
1953	34,420	52,630	53,270	174,700	234,200	78,780	59,720	129,600	225,800	58,300	24,370	13,330	1,139,000
1954	58,440	74,800	185,600	226,600	207,200	187,200	168,000	303,000	284,000	220,800	44,140	49,720	2,010,000
1955	101,600	145,800	111,600	94,550	97,330	60,960	46,990	96,400	425,100	107,500	28,140	24,430	1,340,000
1956	84,210	12,400	35,500	289,600	169,200	404,700	633,000	661,500	556,000	129,400	23,580	16,570	3,716,000
1957	71,470	16,200	32,500	148,700	98,960	152,400	210,700	573,500	95,060	21,360	21,360	16,830	1,850,000
1958	54,890	65,200	82,330	86,340	176,800	137,900	165,400	298,800	78,290	17,600	20,190	14,670	1,198,000
1959	58,240	19,500	29,300	339,000	268,300	185,200	164,000	258,800	241,600	16,910	22,520	36,890	2,108,000
1960	156,000	46,800	466,000	251,900	120,200	170,200	189,000	215,900	102,500	27,800	18,260	18,940	2,084,000

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	-	-	-	-	-	-	4,024	2,913,000
1951	1216	19,300	Feb. 12, 1951	52	4,159	3,011,000	3,312	2,398,000
1952	1246	6,570	Aug. 10, 1952	38	1,324	960,800	1,137	825,200
1953	1286	10,200	Feb. 1, 1953	54	1,574	1,139,000	1,820	1,318,000
1954	1346	10,700	May 19, 1954	71	2,775	2,010,000	2,851	2,050,000
1955	1396, 1516	18,400	June 12, 1955	204	1,851	1,340,000	2,505	1,813,000
1956	1446	19,600	May 20, 1956	92	5,118	3,716,000	4,676	3,395,000
1957	1516	18,300	May 10, 1957	53	2,555	1,850,000	2,129	1,541,000
1958	1566	9,210	Feb. 25, 1958	49	1,655	1,198,000	2,170	1,571,000
1959	1636	11,000	Jan. 25, 1959	38	2,912	2,108,000	3,456	2,502,000
1960	1716	27,400	Nov. 24, 1959	74	2,870	2,084,000	-	-

5105. Yakima River at Kiona, Wash.

Location.--Lat 46°15'10", long 119°28'50", in sec.19, T.9 N., R.27 E., on left bank just upstream from highway bridge at Kiona, 3½ miles downstream from intake of Kiona Canal and 25 miles upstream from mouth.

Drainage area.--5,600 sq mi, approximately.

Records available.--August to December 1895 (gage heights only, fragmentary), August 1896 to March 1915, February 1933 to September 1960.

Gage.--Water-stage recorder. Datum of gage is 454.41 ft above mean sea level, datum of 1929, supplementary adjustment of 1947. Prior to Mar. 31, 1915, several staff or chain gages at approximately same site and datum. Feb. 6, 1933, to July 26, 1934, tape gage at present site and datum.

Extremes.--1896-1915, 1933-60: Maximum discharge, 67,000 cfs Dec. 23, 1933 (gage height, 21.57 ft, from high-water marks); minimum observed, 105 cfs Sept. 11, 1906 (gage height, 2.35 ft, datum then in use).

Remarks.--Water diverted above station for irrigation of about 424,000 acres. Some regulation by diversions and by Keechelus, Kachess, Cle Elum, and Bumping Lakes, and Rilmrock Lake (formerly Tleton Reservoir), see elsewhere in this report. The Kiona Canal bypasses station with a mean flow of approximately 23 cfs for irrigation of about 1,100 acres below station. Records of water temperatures for the period December 1952 to September 1960 are published in reports of 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	3,598	5,855	9,015	7,031	10,080	6,908	7,150	8,101	6,722	1,839	1,722	1,961	5,801
1952	2,811	2,739	2,747	2,125	3,656	3,309	3,144	3,740	3,275	1,912	1,992	1,899	2,775
1953	1,976	1,843	1,678	4,681	5,623	2,714	2,154	4,012	5,999	2,313	1,837	1,761	3,030
1954	2,503	2,162	5,717	4,419	5,002	4,819	4,872	6,896	6,920	5,396	2,266	2,509	4,289
1955	3,224	3,317	2,633	2,225	2,434	1,861	1,998	3,249	8,520	3,525	1,809	2,062	3,068
1956	2,965	6,133	9,099	6,860	4,166	8,452	13,190	13,090	12,730	3,729	2,019	2,235	7,055
1957	2,823	2,965	6,017	3,118	2,542	3,856	5,662	11,190	3,121	1,418	1,590	1,886	3,864
1958	2,720	2,088	2,199	2,392	4,410	3,919	4,810	5,985	2,607	1,225	1,436	1,814	2,957
1959	2,445	4,701	5,945	6,748	6,090	4,633	4,419	5,855	5,560	1,415	1,503	2,539	4,307
1960	4,128	6,293	8,306	4,988	3,108	3,691	4,874	4,963	3,171	1,224	1,500	1,939	4,020

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1951	221,200	348,400	554,300	432,300	559,600	424,700	425,500	498,100	400,000	113,100	105,900	116,700	4,200,000
1952	172,900	163,000	168,900	130,700	210,300	203,500	187,100	220,000	194,900	117,600	122,500	113,000	2,014,000
1953	121,500	109,700	103,200	287,800	312,400	186,900	128,200	246,700	357,000	142,200	113,000	104,800	2,135,000
1954	141,600	128,600	228,500	271,700	277,800	296,300	289,900	424,000	411,800	531,900	339,300	449,300	3,091,000
1955	198,200	197,400	161,900	136,800	135,200	115,600	118,900	199,800	507,000	16,800	111,200	122,700	2,222,000
1956	182,300	365,000	559,500	421,800	239,600	519,700	784,900	805,000	757,200	229,300	124,100	133,000	5,121,000
1957	173,600	176,400	370,000	191,700	141,200	237,100	336,900	687,900	185,700	87,170	97,790	112,200	2,798,000
1958	167,200	124,200	135,200	147,100	244,900	241,000	286,000	368,000	155,100	75,290	88,300	108,000	2,140,000
1959	150,300	279,700	385,600	414,900	338,200	284,800	263,000	560,000	330,900	87,010	92,390	151,100	3,118,000
1960	253,800	374,500	510,700	306,700	178,600	226,900	290,000	305,600	168,700	75,290	92,210	115,400	2,919,000

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	-	-	-	-	-	-	5,511	3,990,000
1951	1216	20,900	Feb. 13, 1951	1,550	5,801	4,200,000	4,946	3,581,000
1952	1246	5,270	Mar. 28, 1952	1,390	2,775	2,014,000	2,540	1,844,000
1953	1286	11,500	June 15, 1953	1,240	3,030	2,193,000	3,257	2,358,000
1954	1346	12,000	May 21, 1954	1,650	4,269	3,091,000	4,350	3,150,000
1955	1396	18,300	June 14, 1955	1,180	3,068	2,222,000	3,827	2,771,000
1956	1446	20,100	May 22, 1956	1,760	7,055	5,121,000	6,522	4,735,000
1957	1516	19,600	May 12, 1957	1,080	3,864	2,798,000	3,459	2,504,000
1958	1566	10,200	Feb. 26, 1958	914	2,957	2,140,000	3,466	2,509,000
1959	1636	10,800	Jan. 26, 1959	1,050	4,307	3,118,000	4,781	3,461,000
1960	1716	18,700	Nov. 25, 1959	959	4,020	2,919,000	-	-

5110. Kennewick Canal near Chandler, Wash.

Location.--Lat 46°15'55", long 119°34'10", SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.16, T.9 N., R.26 E., at outlet of Yakima River siphon, $\frac{1}{2}$ miles east of Chandler.

Gage.--Sparling meter totalizer.

Extremes.--1956-60: Maximum daily discharge, 325 cfs July 23, 1960; no flow during non-irrigation seasons.

Remarks.--Canal diverts from left bank of Yakima River at Prosser power dam in NE $\frac{1}{4}$ of sec.2, T.8 N., R.24 E., for irrigation.

Cooperation.--Records collected and prepared in cooperation with Bureau of Reclamation.

Monthly and yearly discharge, in acre-feet

Water year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	The year
1956	-	-	-	-	-	-	-	-	-	-	546	2,560	3,110
1957	778	3,000	0	0	234	3,220	5,680	8,660	10,590	12,070	11,640	9,240	65,120
1958	2,610	0	0	0	0	2,130	6,570	12,380	14,560	15,020	13,090	11,180	77,540
1959	4,750	0	0	0	0	0	8,860	11,540	14,970	16,250	14,490	4,215	75,080
1960	4,520	0	0	0	0	577	10,340	12,750	17,060	17,730	16,290	13,720	92,990

ESQUATZEL COULEE BASIN

5125. Providence Coulee at Cunningham, Wash.

Location.--Lat 46°49'20", long 118°48'30", near township line in NW $\frac{1}{4}$ sec.4, T.15 N., R.32 E., on right bank on upstream side of Northern Pacific Railway bridge at Cunningham.

Drainage area.--27.8 sq mi.

Records available.--October 1952 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 1,160 ft (from topographic map).

Average discharge.--8 years (1952-60), 0.33 cfs (239 acre-ft per year).

Extremes.--1952-60: Maximum discharge, 2,160 cfs Feb. 21, 1956 (gage height, 10.04 ft); no flow for most of each year.

Remarks.--No known regulation or diversion 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													
1952													
1953	0	0	0	0	0	0	0	0	0	0	0	0	0
1954	0	0	0	0	0	0	0	0	0	0	0	0	0
1955	0	0	0	0	2.09	0	0	0	0	0	0	0	.160
1956	0	0	.66	3.07	24.6	0	0	.09	0	0	0	0	2.27
1957	0	0	0	0	1.96	0	0	0	0	0	0	0	.15
1958	0	0	0	0	0	0	0	0	0	0	0	0	0
1959	0	0	0	.87	0	0	0	0	0	0	0	0	.07
1960	0	0	0	0	0	0	0	0	0	0	0	0	0

* Not previously published; estimated on basis of weather records.

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	0	0	0	0	0	0	0	0	0	0	0
1954	0	0	0	0	0	0	0	0	0	0	0	0	0
1955	0	0	0	0	116	0	0	0	0	0	0	0	116
1956	0	0	41	189	1,410	0	0	5.4	0	0	0	0	1,650
1957	0	0	0	0	109	0	0	0	0	0	0	0	109
1958	0	0	0	0	0	0	0	0	0	0	0	0	0
1959	0	0	0	54	0	0	0	0	0	0	0	0	54
1960	0	0	0	0	0	0	0	0	0	0	0	0	0

* Not previously published; estimated on basis of weather records.

Yearly 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	1286	0	-	0	0	0	0	0	0	-	-
1954	1346	0	-	0	0	0	0	0	0	0	0
1955	1396	106	Feb. 7, 1955	0	0.1600	.0058	0.08	116	0.22	0.11	157
1956	1446	2,160	Feb. 21, 1956	0	2.27	.082	1.11	1,650	2.21	1.08	1,600
1957	1516	250	Feb. 24, 1957	0	.15	.0054	.07	109	.151	.07	109
1958	1568	0	-	0	0	-	-	-	-	-	-
1959	1636	83	Jan. 24, 1959	0	.07	.0032	.04	54	.074	.04	54
1960	1716	0	-	0	0	-	-	-	-	-	-

5130. Esquatzel Coulee at Connell, Wash.

Location.--Lat 46°39'30", long 118°52'10", in SE¼ sec. 36, T.14 N., R.31 E., on right bank 400 ft below outlet of local sewage plant and half a mile southwest of Connell.

Drainage area.--240 sq mi.

Records available.--October 1952 to September 1960.

Gage.--Water-stage recorder. Concrete control since Aug. 7, 1959. Altitude of gage is 840 ft (from topographic map). Prior to Aug. 7, 1959, at site half a mile upstream at different datum.

Extremes.--1952-60: Maximum discharge, 5,560 cfs Feb. 21, 1956 (gage height, 12.68 ft); no flow for most of each year.

Remarks.--No known regulation or diversion above station. Since August 1959, all of flow is discharge from local sewage plant.

Monthly and yearly 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	±0	±0	0	0	0	0	0	0	0	0	0	0
1954	0	0	0	0	0	0	0	0	0	0	0	0	0
1955	0	0	0	0	2.1	0	0	0	0	0	0	0	.2
1956	0	0	1.39	16.5	91.6	0	0	8.3	0	.16	0	0	9.49
1957	0	0	0	0	11.5	0	0	0	0	0	0	0	.88
1958	0	0	0	0	0	0	0	0	0	0	0	0	0
1959	0	0	0	.31	0	0	0	0	0	0	.11	.10	.043
1960	.10	.10	.10	.12	.10	.10	.10	.10	.10	.10	.09	.09	.10

* Not previously published; estimated on basis of weather records.

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	0	0	0	0	0	0	0	0	0	0	0
1954	0	0	0	0	0	0	0	0	0	0	0	0	0
1955	0	0	0	0	117	0	0	0	0	0	0	0	117
1956	0	0	86	1,010	5,270	0	0	512	0	9.7	0	0	6,890
1957	0	0	0	0	640	0	0	0	0	0	0	0	640
1958	0	0	0	0	0	0	0	0	0	0	0	0	0
1959	0	0	0	19	0	0	0	0	0	0	6.5	6.0	32
1960	6.0	6.0	6.1	7.3	6.0	6.1	6.0	6.1	6.0	6.1	5.4	5.2	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	Mean	Runoff		
		Discharge	Date						Inches	Acre-feet	
1950											
1951											
1952											
1953	1286	0	-	0	0	0	0	0	0	0	0
1954	-	0	-	0	0	0	0	0	0	0	0
1955	1398	229	Feb. 7, 1955	0	0.2	0.00083	0.009	117	0.28	0.016	203
1956	1446	5,560	Feb. 21, 1956	0	9.49	.040	.5378	6,890	9.37	.5308	6,800
1957	1518	1,350	Feb. 24, 1957	0	0.88	.0037	.050	640	0.88	.050	640
1958	1568	0	-	0	0	.0018	.002	0	0	0	0
1959	1636	16	Jan. 24, 1959	0	.043	.00018	.002	32	.07	.0035	50
1960	1716	a.2	(b)	0	.10	.00042	.0058	72	-	-	-

a Maximum daily.

b Jan. 25-30, Feb. 1, 1960.

5135. Esquatzel Coulee at Eltopia, Wash.

Location.--Lat 46°27'40", long 119°01'00", in SE¼ sec. 2, T.11 N., R.30 E., on left bank on upstream side of Northern Pacific Railway bridge at Eltopia.

Drainage area.--394 sq mi.

Records available.--October 1952 to September 1960.

Gage.--Water-stage recorder. Altitude of gage is 580 ft (from topographic map).

Average discharge.--8 years (1952-60), 0.94 cfs (681 acre-ft per year).

Extremes.--1952-60: Maximum discharge, 3,740 cfs Feb. 22, 1956 (gage height, 18.23 ft); no flow for most of each year.

Remarks.--No flow for water years 1953-55 and 1957-60. Considerable regulation by natural pondage in Esquatzel Coulee near Mesa. No known 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
1956	0	0	0	2.87	91.4	0	0	0	0	0	0	0	7.48

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	177	5,260	0	0	0	0	0	0	0	5,440

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	1446	3,740	Feb. 22, 1956	0	7.48	5,440	7.48	5,440	

175. Johns River near Markham, Wash.

Drainage area.--19.2 sq mi (revised).

180. Newskah Creek near Aberdeen, Wash.

Drainage area.--7.44 sq mi (revised).

185. Charlies Creek near Aberdeen, Wash.

Drainage area.--5.93 sq mi (revised).

190. Chehalis River near Pe Ell, Wash.

Drainage area.--56.2 sq mi (revised).

195. Rock Creek near Pe Ell, Wash.

Drainage area.--14.0 sq mi (revised).

210. South Fork Chehalis River at Boistfort, Wash.

Drainage area.--48.0 sq mi (revised).

215. Halfway Creek near Boistford, Wash.

Drainage area.--13.7 sq mi (revised).

220. Bunker Creek near Adna, Wash.

Drainage area.--20.6 sq mi (revised).

225. Stearns Creek near Napavine, Wash.

Drainage area.--16.2 sq mi (revised).

265. Hanaford Creek near Centralia, Wash.

Drainage area.--13.8 sq mi (revised).

280. Scatter Creek near Grand Mound, Wash.

Drainage area.--19.9 sq mi (revised).

285. Wadell Creek near Little Rock, Wash.

Drainage area.--16.8 sq mi (revised).

290. Black River at Little Rock, Wash.

Drainage area.--63.7 sq mi, revised (includes Black Lake which may overflow at times through artificial channel to Percival Creek).

309. Porter Creek at Porter, Wash.

Drainage area.--35.3 sq mi (revised); at site prior to August 1944, 35.6 sq mi.

320. Wildcat Creek near Elma, Wash.

Drainage area.--20.5 sq mi (revised).

335. East Fork Satsop River near Matlock, Wash.

Drainage area.--25.6 sq mi (revised).

340. Bingham Creek near Matlock, Wash.

Drainage area.--33.7 sq mi (revised).

345. Middle Fork Satsop River near Satsop, Wash.

Drainage area.--58.9 sq mi (revised).

365. Wynoochee River near Montesano, Wash.

Drainage area.--107 sq mi (revised); at measuring site $2\frac{1}{2}$ miles downstream, 112 sq mi.

375. Wynoochee River below Black Creek, near Montesano, Wash.

Drainage area.--180 sq mi (revised).

380. Wishkah River near Wishkah, Wash.

Drainage area.--56.7 sq mi (revised).

400. Clearwater River near Clearwater, Wash.

Drainage area.--142 sq mi (revised).

430. Calawa River near Forks, Wash.

Drainage area.--129 sq mi (revised).

440. Lyre River at Piedmont, Wash.

Drainage area.--48.6 sq mi (revised).

485. Dungeness River below Canyon Creek, near Sequim, Wash.

Drainage area.--172 sq mi (revised).

550. Hamma Hamma River near Hoodsport, Wash.

Drainage area.--83.5 sq mi (revised).

680. Tahuya River near Tahuya, Wash.

Drainage area.--42.2 sq mi (revised).

690. Anderson Creek near Holley, Wash.

Drainage area.--5.17 sq mi (revised).

695. Stavis Creek near Seabeck, Wash.

Drainage area.--5.91 sq mi (revised).

705. Clear Creek near Silverdale, Wash.

Drainage area.--7.46 sq mi (revised).

795. Spurgeon Creek near Olympia, Wash.

Drainage area.--10.8 sq mi (revised).

820. Nisqually River near Ashford, Wash.

Drainage area.--66.4 sq mi (revised).

840. Nisqually River near Alder, Wash.

Drainage area.--249 sq mi (revised).

875. Lynch Creek near Eatonville, Wash.

Drainage area.--16.9 sq mi (revised).

890. Tanwax Creek near McKenna, Wash.

Drainage area.--26.0 sq mi (revised).

900. Muck Creek near Loveland, Wash.

Drainage area.--14.5 sq mi (revised).

910. Chambers Creek at Steilacoom Lake, near Steilacoom, Wash.

Drainage area.--89.4 sq mi (revised).

945. Wilkeson (formerly Gale) Creek at Wilkeson, Wash.

Drainage area.--24.4 sq mi (revised).

955. Voight Creek near Crooker, Wash.

Drainage area.--23.2 sq mi (revised).

960. Fennel Creek near McMillin, Wash.

Drainage area.--11.8 sq mi (revised).

995. Boise Creek near Enumclaw, Wash.

Drainage area.--12.3 sq mi (revised).

1020. Clark Creek at Puyallup, Wash.

Drainage area.--1.88 sq mi (revised).

1025. Wapato Creek near Tacoma, Wash.

Drainage area.--6.46 sq mi (revised).

1030. Hylebos Creek near Tacoma, Wash.

Drainage area.--7.33 sq mi (revised).

1075. Green River near Black Diamond, Wash.

Drainage area--285 sq mi (revised).

1080. Newaukum Creek near Enumclaw, Wash.

Drainage area--12.9 sq mi (revised).

1090. Burns Creek near Black Diamond, Wash.

Drainage area--1.73 sq mi (revised).

1095. Little Soos Creek near Kent, Wash.

Drainage area--6.08 sq mi, revised (includes Shadow Lake and excludes Youngs Lake).

1100. Big Soos Creek above Jenkins Creek, near Auburn, Wash.

Drainage area--20.9 sq mi, revised (includes Shadow Lake and excludes Youngs Lake).

1105. Jenkins Creek near Auburn, Wash.

Drainage area--13.5 sq mi (revised).

1120. Covington Creek near Auburn, Wash.

Drainage area--21.6 sq mi (revised).

1160. Cedar River at Cedar Lake, near North Bend, Wash.

Drainage area--78.4 sq mi (revised).

1180. Rock Creek diversion near Landsburg, Wash.

Drainage area--11.1 sq mi, revised (includes an undetermined area drained by Taylor ditch which diverts into Issaquah Creek basin).

1205. Juanita Creek near Kirkland, Wash.

Drainage area--6.43 sq mi (revised).

1215. East Fork Issaquah Creek at Issaquah, Wash.

Drainage area--8.31 sq mi (revised).

1225. Bear Creek near Redmond, Wash.

Drainage area--13.9 sq mi (revised).

1235. Evans Creek near Redmond, Wash.

Drainage area--10.9 sq mi (revised).

1255. Bear Creek at Woodinville, Wash.

Drainage area--14.3 sq mi (revised).

1270. Swamp Creek near Bothell, Wash.

Drainage area--21.1 sq mi (revised).

1275. McAleer Creek near Bothell, Wash.

Drainage area--6.92 sq mi (revised).

1280. Thornton Creek near Seattle, Wash.

Drainage area--12.1 sq mi (revised).

1285. Powder Creek near Mukilteo, Wash.

Drainage area--2.11 sq mi (revised).

1300. Foss River near Skykomish, Wash.

Drainage area--54.0 sq mi (revised).

1320. Miller River at Miller River, Wash.

Drainage area--45.6 sq mi (revised).

1340. North Fork Skykomish River at Index, Wash.

Drainage area--146 sq mi (revised).

1355. Olney Creek near Gold Bar, Wash.

Drainage area--8.31 sq mi (revised).

1360. Olney Creek near Startup, Wash.

Drainage area--10.3 sq mi (revised).

1365. May Creek near Gold Bar, Wash.

Drainage area--3.80 sq mi (revised).

1385. McCoy Creek near Sultan, Wash.

Drainage area--5.87 sq mi (revised).

1390. Elwell Creek near Sultan, Wash.

Drainage area--22.1 sq mi (revised).

1395. Roesiger Creek near Machias, Wash.

Drainage area--3.73 sq mi (revised).

1400. Woods Creek below Roesiger Creek, near Monroe, Wash.

Drainage area--19.5 sq mi (revised).

1405. Carpenter Creek near Machias, Wash.

Drainage area--10.8 sq mi (revised).

1420. North Fork Snoqualmie River near Snoqualmie Falls, Wash.

Drainage area.--64.0 sq mi (revised).

Revisions.--Revised records for water years 1932-35, 1938, 1943-45, and 1947, superseding those published in WSP 1316, are given herewith.

Month	Mean	Per square mile	Inches	Acre-feet	Momentary maximum	
					Discharge (cfs)	Date
Water year 1931-32.....	-	-	-	-	15,800	Feb. 26, 1932
Water year 1932-33.....	-	-	-	-	10,100	Nov. 17, 1932
Water year 1933-34.....	-	-	-	-	10,300	Nov. 2, 1933
October 1934.....	962	-	-	59,140	-	-
Calendar year 1934.....	531	-	112.33	384,100	-	-
Water year 1934-35.....	547	8.53	115.73	395,700	13,400	Oct. 25, 1934
Water year 1937-38.....	-	-	-	-	10,100	Apr. 17, 1938
Water year 1942-43.....	-	-	-	-	12,000	Nov. 23, 1942
Water year 1943-44.....	-	-	-	-	11,400	Dec. 3, 1943
Water year 1944-45.....	-	-	-	-	13,400	Jan. 7, 1945
Water year 1946-47.....	-	-	-	-	8,720	Dec. 11, 1946

Note.--Figure of daily discharge for Oct. 25, 1934, has been revised to 11,300 cfs, superseding that published in WSP 792 and 1346.

1425. North Fork Snoqualmie River at cable bridge, near North Bend, Wash.

Drainage area.--84.5 sq mi (revised).

1430. North Fork Snoqualmie River near North Bend, Wash.

Drainage area.--95.7 sq mi (revised).

1435. South Fork Snoqualmie River near Garcin, Wash.

Drainage area.--45.8 sq mi (revised).

1440. South Fork Snoqualmie River at North Bend, Wash.

Drainage area.--81.7 sq mi (revised).

1450. Tokul Creek near Snoqualmie, Wash.

Drainage area.--32.2 sq mi (revised).

1465. Patterson Creek eight-tenths mile above mouth, near Fall City, Wash.

Drainage area.--19.9 sq mi (revised).

1495. Harris Creek near Tolt (Carnation), Wash.

Drainage area.--8.39 sq mi (revised).

1500. Ames Creek near Tolt (Carnation), Wash.

Drainage area.--2.77 sq mi (revised).

1505. Cherry Creek near Duvall, Wash.

Drainage area.--19.2 sq mi (revised).

1510. Evans Creek near Snohomish, Wash.

Drainage area.--4.84 sq mi (revised).

1515. French Creek near Monroe, Wash.

Drainage area.--5.53 sq mi (revised).

1540. Stevens Creek at Lake Stevens, Wash.

Drainage area--14.2 sq mi (revised).

1545. Dubuque Creek near Lake Stevens, Wash.

Drainage area--7.16 sq mi (revised).

1550. Panther Creek near Lake Stevens, Wash.

Drainage area--5.33 sq mi (revised).

1560. Wood Creek near Everett, Wash.

Drainage area--1.89 sq mi (revised).

1565. Allen Creek at Marysville, Wash.

Drainage area--7.33 sq mi (revised).

1585. South Fork Stillaguamish River at Silverton, Wash.

Drainage area--37.2 sq mi (revised).

1590. South Fork Stillaguamish River below Bender Creek, near Silverton, Wash.

Drainage area--39.6 sq mi (revised).

1595. South Fork Stillaguamish River near Silverton, Wash.

Drainage area--43.7 sq mi (revised).

1600. Boardman Creek near Silverton, Wash.

Drainage area--9.42 sq mi (revised).

1605. Benson Creek near Granite Falls, Wash.

Drainage area--2.16 sq mi (revised).

1615. Canyon Creek near Granite Falls, Wash.

Drainage area--55.3 sq mi (revised).

1630. Jim Creek near Oso, Wash.

Drainage area--9.85 sq mi (revised).

1635. Cub Creek near Oso, Wash.

Drainage area--6.44 sq mi (revised).

1645. South Fork Stillaguamish River near Arlington, Wash.

Drainage area--251 sq mi (revised).

1660. Boulder Creek near Oso, Wash.

Drainage area--25.6 sq mi (revised).

1665. Deer Creek at Oso, Wash.

Drainage area.--65.9 sq mi (revised).

1690. Portage Creek near Arlington, Wash.

Drainage area.--8.97 sq mi (revised).

1700. Church Creek near Stanwood, Wash.

Drainage area.--7.42 sq mi (revised).

1715. Skagit River above Devils Creek, near Newhalem, Wash.

Drainage area.--655 sq mi, revised (includes 400 sq mi in Canada).

1720. Beaver Creek near Newhalem, Wash.

Drainage area.--63.2 sq mi (revised).

1725. Skagit River near Newhalem, Wash.

Drainage area.--780 sq mi, revised (includes 400 sq mi in Canada).

1730. Granite Creek near Newhalem, Wash.

Drainage area.--71.0 sq mi (revised).

1745. Skagit River below Ruby Creek, near Newhalem, Wash.

Drainage area.--999 sq mi, revised (includes 400 sq mi in Canada).

1760. Thunder Creek near Marblemount, Wash.

Drainage area.--114 sq mi (revised).

1770. Skagit River at Reflector Bar, near Newhalem, Wash.

Drainage area.--1,125 sq mi, revised (includes 400 sq mi in Canada).

1795. Alma Creek near Marblemount, Wash.

Drainage area.--8.37 sq mi (revised).

1815. Marble Creek near Marblemount, Wash.

Drainage area.--17.1 sq mi (revised).

1830. Clark Creek at Marblemount, Wash.

Drainage area.--1.42 sq mi (revised).

1835. Jordan Creek at Marblemount, Wash.

Drainage area.--12.0 sq mi (revised).

1850. North Fork Sauk River near Barlow Pass, Wash.

Drainage area.--76.4 sq mi (revised).

1855. South Fork Sauk River near Barlow Pass, Wash.

Drainage area.--33.1 sq mi (revised).

1865. Whitechuck River near Darrington, Wash.

Drainage area.--77.9 sq mi (revised).

1885. Big Creek near Mansford, Wash.

Drainage area.--21.0 sq mi (revised).

1945. Finney Creek near Concrete, Wash.

Drainage area.--51.6 sq mi (revised).

1950. Grandy Creek near Concrete, Wash.

Drainage area.--17.4 sq mi (revised).

1955. O'Toole Creek near Hamilton, Wash.

Drainage area.--5.41 sq mi (revised).

1970. Jones Creek near Lyman, Wash.

Drainage area.--8.12 sq mi (revised).

1975. Gilligan Creek near Lyman, Wash.

Drainage area.--6.76 sq mi (revised).

1980. Cool Creek near Sedro Woolley, Wash.

Drainage area.--1.88 sq mi (revised).

1985. Hansen Creek near Sedro Woolley, Wash.

Drainage area.--9.66 sq mi (revised).

1990. Skagit River near Sedro Woolley, Wash.

Drainage area.--3,015 sq mi, revised (includes 400 sq mi in Canada).

1995. Nookachamps Creek near Mount Vernon, Wash.

Drainage area.--22.5 sq mi (revised).

2025. Whatcom Creek near Bellingham, Wash.

Drainage area.--56.1 sq mi (revised).

2045. Nooksack River at Excelsior, Wash.

Drainage area.--95.1 sq mi (revised).

2075. Middle Fork Nooksack River at ranger station, near Deming, Wash.

Drainage area.--25.3 sq mi (revised).

3070. Moyie River at Snyder, Idaho

Revisions.--Revised records for water years 1915-16, superseding those published in WSP 1316, are given herewith.

Month	Maximum observed		Mean	Per square mile	Inches	Acre-feet
	Discharge	Date				
February 1915.....	-	-	150	-	-	8,330
March.....	-	-	310	-	-	19,100
April.....	-	-	1,600	-	-	95,200
May.....	-	-	2,100	-	-	129,000
June.....	-	-	1,000	-	-	59,500
July.....	-	-	520	-	-	32,000
August.....	-	-	250	-	-	15,400
September.....	-	-	170	-	-	10,100
Water year 1914-15.....	2,700	Apr. 19, 1915	615	0.938	12.53	445,000
October 1915.....	-	-	210	-	-	12,900
November.....	-	-	280	-	-	16,700
December.....	-	-	260	-	-	16,000
Calendar year 1915.....	-	-	586	-	12.10	424,000
April 1916.....	-	-	2,100	-	-	125,000
June.....	-	-	6,200	-	-	369,000
July.....	-	-	1,800	-	-	111,000
August.....	-	-	330	-	-	20,300
September.....	-	-	210	-	-	12,500
Water year 1915-16.....	-	-	1,370	2.09	27.65	995,000

Note.--Only monthly figures revised; revised daily figures not available.

3330. East Fork Rock Creek near Phillipsburg, Mont.

Corrections.--In WSP 1316, the monthly mean discharge and runoff for July 1935 are listed in error; they should be 58.8 cfs and 3,610 acre-ft, respectively. The water-supply paper number listed in table 3 for water year 1935 is listed in error; it should be 1286 instead of 1246.

3650. Stillwater River near Whitefish, Mont.

Drainage area.--524 sq mi (revised).

Note.--Previously published figures of discharge in cubic feet per square mile and runoff in inches are in error and should not be used. Corrected figures can be computed by using the revised drainage area.

3655. Stillwater River near Kalispell, Mont.

Drainage area.--537 sq mi (revised).

Note.--Previously published figures of discharge in cubic feet per square mile and runoff in inches are in error and should not be used. Corrected figures can be computed by using the revised drainage area.

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