UNITED STATES DEPARTMENT OF THE INTERIOR

SURFACE WATER SUPPLY *of the* UNITED STATES 1934

PART 5

HUDSON BAY AND UPPER MISSISSIPPI RIVER BASINS

Prepared in cooperation with the States of
ILLINOIS, INDIANA, IOWA, MINNESOTA, MISSOURI
NORTH DAKOTA, AND WISCONSIN

GEOLOGICAL SURVEY WATER-SUPPLY PAPER 760

UNITED STATES DEPARTMENT OF THE INTERIOR
HAROLD L. ICKES, Secretary
GEOLOGICAL SURVEY
W. C. MENDENHALL, Director

Water-Supply Paper 760

SURFACE WATER SUPPLY *of the* UNITED STATES 1934

PART 5
HUDSON BAY AND UPPER MISSISSIPPI RIVER BASINS

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Prepared in cooperation with the States of
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UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1936

For sale by the Superintendent of Documents, Washington, D. C. - - - - - - Price 30 cents.

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ILLUSTRATION

SURFACE WATER SUPPLY OF HUDSON BAY AND UPPER MISSISSIPPI RIVER BASINS, 1934

AUTHORIZATION AND SCOPE OF WORK

This volume is one of a series of 14 reports presenting results of measurements of flow made on streams in the United States during the year ending September 30, 1934.

The data presented in these reports were collected by the United States Geological Survey under the following authority contained in the organic law (20 Stat. L., p. 394):

Provided, That this officer [the Director] shall have the direction of the Geological Survey and the classification of public lands and examination of the geological structure, mineral resources, and products of the national domain.

The work was begun in 1888 in connection with special studies relating to irrigation. Since the fiscal year ending June 30, 1895, successive appropriation bills passed by Congress have carried the following items:

For gaging the streams and determining the water supply of the United States, and for the investigation of underground currents and artesian wells, and for the preparation of reports upon the best methods of utilizing the water resources.

Annual appropriations for the fiscal years ending June 30, 1895–1934

1895	$12,500.00	1911–17	$150,000.00	1928	$147,000.00
1896	24,500.00	1918	175,000.00	1929	270,500.00
1897–99	50,000.00	1919	148,244.10	1930	275,000.00
1900	70,000.00	1920	175,000.00	1931	565,000.00
1901–2	100,000.00	1921–23	180,000.00	1932	711,000.00
1903–6	200,000.00	1924–25	170,000.00	1933	600,000.00
1907	150,000.00	1926	165,000.00	1934	[1] 540,000.00
1908–10	100,000.00	1927	151,000.00		

In the execution of the work many private and State organizations have cooperated, either by furnishing data or by assisting in collecting data. Acknowledgments for cooperation of the first kind are made in connection with the description of each station affected; cooperation of the second kind is acknowledged on page 10.

Measurements of stream flow have been made at about 6,900 points in the United States and also at many points in Alaska and the Hawaiian Islands. In July 1934, 2,940 gaging stations were being maintained by the Geological Survey and the cooperating organiza-

[1] Only $340,000 available for expenditure.

tions. Many miscellaneous discharge measurements were made at other points. In connection with this work data were also collected in regard to precipitation, evaporation, storage reservoirs, river profiles, and water power in many sections of the country and will be made available in water-supply papers from time to time.

DEFINITION OF TERMS

The volume of water flowing in a stream—the "run-off" or "discharge"—is expressed in various terms each of which has become associated with a certain class of work. These terms may be divided into two groups—(1) those that represent a rate of flow, as second-feet, gallons per minute, miner's inches, and discharge in second-feet per square mile, and (2) those that represent the actual quantity of water, as run-off in inches, acre-feet, and millions of cubic feet. The principal terms used in this series of reports are "second-feet", "second-feet per square mile", "run-off in inches", and "acre-feet." They may be defined as follows:

"Second-feet" is an abbreviation for "cubic feet per second." A second-foot is the rate of discharge of water flowing in a channel of rectangular cross section 1 foot wide and 1 foot deep at an average velocity of 1 foot per second. It is generally used as a fundamental unit from which others are computed.

"Second-feet per square mile" is the average number of cubic feet of water flowing per second from each square mile of area drained, on the assumption that the run-off is distributed uniformly both as regards time and area.

"Run-off in inches" is the depth to which an area would be covered if all the water flowing from it in a given period were uniformly distributed on the surface. It is used for comparing run-off with rainfall, which is usually expressed in inches.

An "acre-foot", equivalent to 43,560 cubic feet, is the quantity required to cover an acre to the depth of 1 foot. The term is commonly used in connection with storage for irrigation.

The following terms not in common use are here defined:

"Stage-discharge relation", an abbreviation for the term "relation of gage height to discharge."

"Control", a term used to designate the natural section or stretch of the channel or artificial structure below the gage which determines the stage-discharge relation at the gage.

EXPLANATION OF DATA

The data presented in this report cover the year beginning October 1, 1933, and ending September 30, 1934. At the beginning of January in most parts of the United States much of the precipitation in the preceding 3 months is stored in the form of snow or ice, or in ponds,

lakes, and swamps, or as underground water, and this stored water passes off in the streams during the spring break-up. At the end of September, on the other hand, the only stored water available for run-off is possibly a small quantity in the ground; therefore the run-off for the year beginning October 1 is practically all derived from precipitation within that year.

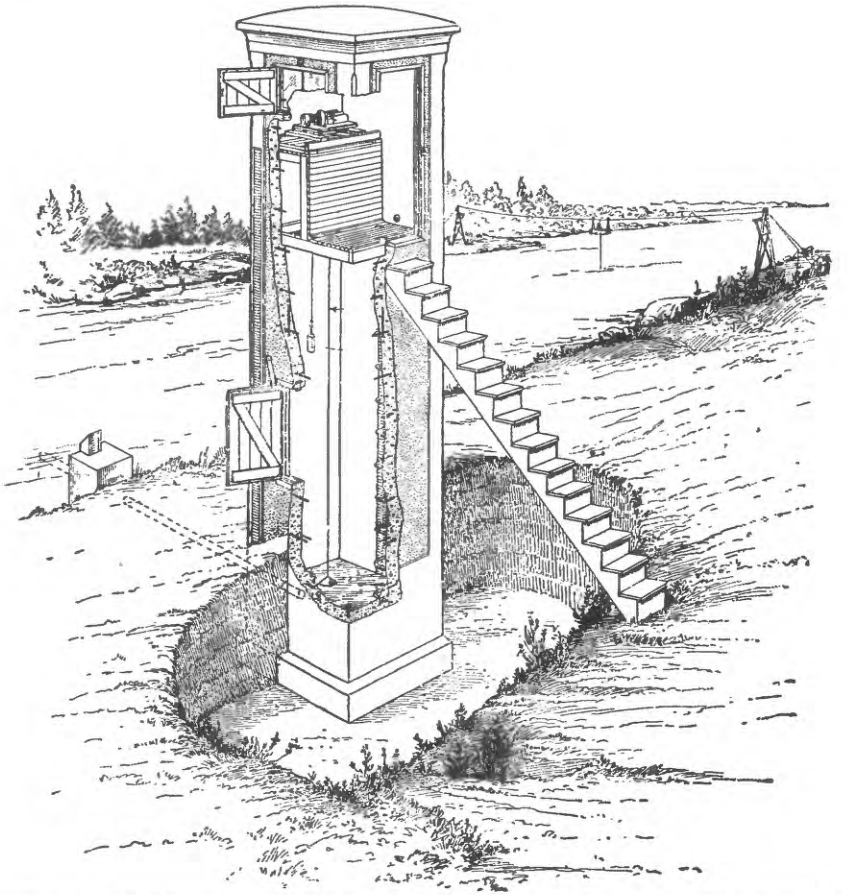

FIGURE 1.—Typical river-measurement station showing concrete well and house for water-stage recorder and staff gages, cable, and car.

The base data collected at gaging stations consist of records of stage, measurements of discharge, and general information used to supplement the gage heights and discharge measurements in determining the daily flow. The records of stage are obtained either from direct readings on a nonrecording gage or from a water-stage recorder that gives a continuous record of the fluctuations. Measurements of discharge are made with a current meter by the general methods outlined

in standard textbooks on the measurement of river discharge. A typical gaging station, equipped with water-stage recorder and measuring cable and car, is shown in figure 1.

Rating tables giving the discharge for any stage are prepared from the discharge measurements. The application of the daily gage height to these rating tables gives the daily discharge from which the monthly and yearly mean discharge is computed.

The data presented for each gaging station in the area covered by this report usually comprise a description of the station, a table showing the daily discharge of the stream, and a table of monthly and yearly discharge and run-off.

The description of the station gives information in regard to the location and type of gage, diversions that decrease the flow at the gage, artificial regulation from pondage or storage, and the accuracy of the records. Under "Average discharge" is given the average discharge for the number of years indicated. It is given only for stations for which there are 10 or more complete years of record. Information under "Extremes" gives the maximum discharge and gage height; the minimum discharge, if there is little or no regulation; the minimum daily discharge, if there is extensive regulation, and also the minimum discharge, if useful; and the minimum gage height except when it is of no importance. Unless otherwise qualified, the maximum discharge corresponds to the crest stage obtained by use of a water-stage recorder or a nonrecording gage read at the time of the crest. Likewise the minimum represents the lowest discharge unless otherwise qualified.

The table of daily discharge gives, for stations equipped with nonrecording gages, the discharge in second-feet corresponding to once-daily or the mean of twice-daily readings of the gage. For stations equipped with water-stage recorders the table gives the discharge corresponding to the mean daily gage height except for stations on streams subject to sudden or rapid fluctuation. For stations subject to such fluctuation the mean daily gage height may not indicate the true mean daily discharge, which must be obtained by averaging the discharge for intervals of the day or by using the discharge integrator, an instrument for obtaining the mean daily discharge from a continuous gage-height graph and containing as an essential element the rating curve of the station.

In the table of monthly discharge the column headed "Maximum" gives the maximum daily discharge and not the discharge when the water surface was at crest height. Likewise, in the column headed "Minimum" the quantity given is the minimum daily discharge. The column headed "Mean" is the average flow in cubic feet per second during the month.

ACCURACY OF FIELD DATA AND COMPUTED RESULTS

The accuracy of stream-flow data depends primarily (1) on the permanency of the stage-discharge relation and (2) on the accuracy of observation of stage, measurements of flow, and interpretation of records.

The station description gives a statement in regard to the general accuracy of the records. "Excellent" indicates that, in general, the daily records are accurate within 5 percent; "good", within 10 percent: "fair", within 15 percent; and "poor", within 20 percent or more.

The monthly means for any station may represent with high accuracy the quantity of water flowing past the gage, but the figures showing discharge per square mile and run-off in inches may be subject to gross errors caused by the inclusion of large noncontributing districts in the measured drainage area, by lack of information concerning water diverted for irrigation or other use, or by inability to interpret the effect of artificial regulation of the flow of the river above the station. "Second-feet per square mile" and "run-off in inches" are therefore not computed if such errors appear probable. The computations are also omitted for stations on streams draining areas in which the annual rainfall is less than 20 inches.

Many gaging stations on streams in the irrigated areas of the United States are situated above most of the diversions from those streams, and the discharge recorded does not show the water supply available for further development, as prior appropriations below the stations must first be satisfied.

The table of monthly discharge gives a general idea of the flow at the station. The table of daily discharge allows more detailed studies of the variation in flow. It should be borne in mind, however, that the observations in each succeeding year may be expected to throw new light on data previously published, and that greater degrees of refinement in computations and records may be warranted with increased data and use of improved equipment.

In order to permit greater refinement in analysis and comparison of records for adjacent stations, the following changes have been made in the computation procedure; (a) Mean monthly discharge above 1,000 second-feet and monthly run-off above 10,000 acre-feet are expressed to four significant figures instead of three significant figures as formerly; (b) monthly run-off in acre-feet is computed from the total second-foot-days for the month and not from the mean discharge for the month; (c) drainage areas above 1,000 square miles, if measured on topographic maps, or if otherwise warranted, are expressed to four significant figures instead of three as formerly. Some of the records in the series of reports for 1934 have been computed in accordance with the modified procedure.

PUBLICATIONS

Investigation of water resources by the United States Geological Survey has consisted in large part of measurements of the volume of flow of streams and studies of the conditions affecting that flow, but it has comprised also investigation of such closely allied subjects as irrigation, water storage, water power, underground waters, and quality of waters. Most of the results of these investigations have been published in the series of water-supply papers, but some have appeared in the bulletins, professional papers, monographs, and annual reports.

The results of stream-flow measurements are now published annually in 12 parts, each part covering an area whose boundaries coincide with the natural drainage features as indicated below:

Part 1. North Atlantic slope basins (St. John River to York River).
2. South Atlantic slope and eastern Gulf of Mexico basins (James River to Mississippi River).
3. Ohio River Basin.
4. St. Lawrence River Basin.
5. Hudson Bay and upper Mississippi River Basins.
6. Missouri River Basin.
7. Lower Mississippi River Basin.
8. Western Gulf of Mexico basins.
9. Colorado River Basin.
10. The Great Basin.
11. Pacific slope basins in California.
12. North Pacific slope basins, in three parts:
    - A. Pacific slope basins in Washington and upper Columbia River Basin.
    - B. Snake River Basin.
    - C. Pacific slope basins in Oregon and lower Columbia River Basin.

Water-supply papers and other publications of the United States Geological Survey containing data in regard to the water resources of the United States may be obtained or consulted as indicated below.

1. Copies may be purchased at nominal cost from the Superintendent of Documents, Government Printing Office, Washington, D. C., who will, on application, furnish lists giving prices.

2. Sets of the reports may be consulted in the libraries of the principal cities in the United States.

3. Sets are available for consultation in the local offices of the water-resources branch of the Geological Survey as follows:

Augusta, Maine, Statehouse.
Boston, Mass., 945 Post Office Building.
Hartford, Conn., 203 Federal Building.
Albany, N. Y., 526 Federal Building.
Trenton, N. J., 228 Federal Building.
Harrisburg, Pa., 490 Education Building.
Charlottesville, Va., University of Virginia.
South Charleston, W. Va., Naval Ordnance Plant.

Asheville, N. C., 220 Post Office Building.
Columbia, S. C., 801 National Loan & Exchange Bank Building.
Ocala, Fla., Post Office Building.
Montgomery, Ala., Post Office Building.
Chattanooga, Tenn., 217 Post Office Building.
Columbus, Ohio, Engineering Experiment Station, Ohio State University.
Indianapolis, Ind., 319 Federal Building.
Urbana, Ill., 302 University New Agricultural Building.
Madison, Wis., 337N State Capitol.
St. Paul, Minn., 808 New Post Office Building.
Iowa City, Iowa, 402 Hydraulic Laboratory, University of Iowa.
St. Louis, Mo., Customhouse, Eighth and Olive Streets.
Rolla, Mo., Missouri Geological Survey Building, Missouri School of Mines and Metallurgy.
Topeka, Kans., 305 Federal Building.
Fort Smith, Ark., Post Office Building.
Austin, Tex., State Highway Building.
Santa Fe, N. Mex., State Capitol.
Tucson, Ariz., 210 Post Office Building.
Denver, Colo., 403 Post Office Building.
Salt Lake City, Utah, 303 Federal Building.
Idaho Falls, Idaho, 228 Federal Building.
Boise, Idaho, 429 Federal Building.
Helena, Mont., 421 New Federal Building.
Tacoma, Wash., 406 Federal Building.
Portland, Oreg., 606 Post Office Building.
San Francisco, Calif., 303 Customhouse.
Los Angeles, Calif., 512 Eighth and Figueroa Building.
Honolulu, Hawaii, 225 Federal Building.

A list of the Geological Survey publications may be obtained by applying to the Director, United States Geological Survey, Washington, D. C.

Stream-flow records have been obtained at about 6,900 points in the United States, and the data obtained have been published in the reports tabulated as follows:

Stream-flow data in reports of the United States Geological Survey

[A = Annual Report; B = Bulletin; W = Water-Supply Paper]

Report	Character of data	Year
0th A, pt. 2	Descriptive information only	
1th A, pt. 2	Monthly discharge and descriptive information	1884 to Sept. 1890.
2th A, pt. 2	do	1884 to June 30, 1891.
3th A, pt. 3	do	1884 to Dec. 31, 1892.
4th A, pt. 2	Monthly discharge (long-time records, 1871-93)	1888 to Dec. 31, 1893.
131	Descriptions, measurements, gage heights, and ratings	1893-94.
5th A, pt. 2	Descriptive information only.	
140	Descriptions, measurements, gage heights, ratings, and monthly discharge (also many data covering earlier years).	1895.
W 11	Gage heights (also gage heights for earlier years)	1896.
8th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge (also similar data for some earlier years).	1895-96.
W 15	Descriptions, measurements, and gage heights, eastern United States. eastern Mississippi River, and Missouri River above junction with Kansas River.	1897.
W 16	Descriptions, measurements, and gage heights, western Mississippi River below junction of Missouri and Platte Rivers, and western United States.	1897.

Stream-flow data in reports of the United States Geological Survey—Continued

Report	Character of data	Year
19th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge (also some long-time records).	1897.
W 27	Measurements, ratings, and gage heights, eastern United States, eastern Mississippi River, and Missouri River.	1898.
W 28	Measurements, ratings, and gage heights, Arkansas River and western United States.	1898.
20th A, pt. 4	Monthly discharge (also for many earlier years)	1898.
W 35 to 39	Descriptions, measurements, gage heights, and ratings	1899.
21st A, pt. 4	Monthly discharge	1899.
W 47 to 52	Descriptions, measurements, gage heights, and ratings	1900.
22d A, pt. 4	Monthly discharge	1900.
W 65, 66	Descriptions, measurements, gage heights, and ratings	1901.
W 75	Monthly discharge	1901.
W 82 to 85	Complete data	1902.
W 97 to 100	do	1903.
W 124 to 135	do	1904.
W 165 to 178	do	1905
W 201 to 214	do	1906.
W 241 to 252	do	1907–8.
W 261 to 272	do	1909.
W 281 to 292	do	1910
W 301 to 312	do	1911.
W 321 to 332	do	1912.
W 351 to 362	do	1913.
W 381 to 394	do	1914.
W 401 to 414	do	1915.
W 431 to 444	do	1916.
W 451 to 464	do	1917.
W 471 to 484	do	1918.
W 501 to 514	do	1919–20.
W 521 to 534	do	1921.
W 541 to 554	do	1922.
W 561 to 574	do	1923.
W 581 to 594	do	1924.
W 601 to 614	do	1925.
W 621 to 634	do	1926.
W 641 to 654	do	1927.
W 661 to 674	do	1928.
W 681 to 694	do	1929.
W 696 to 709	do	1930.
W 711 to 724	do	1931.
W 726 to 739	do	1932.
W 741 to 754	do	1933.
W 756 to 769	do	1934.

The records at most of the stations discussed in these reports extend over a series of years. Miscellaneous measurements at many points other than regular gaging stations have been made each year and are published under "Miscellaneous discharge measurements" at the end of each report in the same relative order as the regular gaging stations. An index of the reports containing records obtained prior to 1904 has been published in Water-Supply Paper 119.

The following table gives, by years and drainage basins, the numbers of the papers on surface-water supply published from 1899 to 1934. The data for any particular station will, as a rule, be found in the reports covering the years during which the station was maintained. For example, data for 1910–20 for any station in the area covered by part 3 are published in Water-Supply Papers 283, 303, 323, 353, 383, 403, 433, 453, 473, and 503, which contain records for the Ohio River Basin for those years.

Numbers of water-supply papers containing results of stream measurements, 1899–1934

[For basins included, see p. 6]

Year	1	2	3	4	5	6	7	8	9	10	11	12-A	12-B	12-C
1899[1]	35	[2] 35, 36	36	36	36	[3] 36, 37	37	37	[4] 37, 38	38, [5] 39	38, [6] 39	38	38	38
1900[7]	47, [8] 48	48	48, [9] 49	49	49	49, [10] 50	50	50	50	51	51	51	51	51
1901	65, 75	65, 75	65, 75	65, 75	[11] 65, 66, 75	66, 75	[11] 65, 66, 75	66, 75	66, 75	66, 75	66, 75	66, 75	66, 75	66, 75
1902	82	[2] 82, 83	83	[12] 82, 83	[11] 83, 85	84	[11] 83, 84	84	85	85	85	85	85	85
1903	97	[2] 97, 98	98	97	[11] 98, 99, [13] 100	99	[11] 98, 99	99	100	100	100	100	100	100
1904	[14]124, [15]125, [16]126	[16] 126, 127	128	129	[11] 128, 130	130, [17] 131	[11] 128, 131	132	133	133, [18] 134	134	135	135	135
1905	[14]165, [15]166, [16]167	[16] 167, 168	169	170	171	172	[11] 169, 173	174	175, [18] 177	176, [18] 177	177	178	178	[20] 177, 178
1906	[14]201, [15]202, [16]203	[16] 203, 204	205	206	207	208	[11] 205, 209	210	211, [19] 213	212, [18] 213	213	214	214	214
1907–8	241	242	243	244	245	246	247	248	249	250, [18] 251	251	252	252	252
1909	261	262	263	264	265	266	267	268	269	270, [18] 271	271	272	272	272
1910	281	282	283	284	285	286	287	288	289	290	291	292	292	292
1911	301	302	303	304	305	306	307	308	309	310	311	312	312	312
1912	321	322	323	324	325	326	327	328	329	330	331	332-A	332-B	332-C
1913	351	352	353	354	355	356	357	358	359	360	361	362-A	362-B	362-C
1914	381	382	383	384	385	386	387	388	389	390	391	392	393	394
1915	401	402	403	404	405	406	407	408	409	410	411	412	413	414
1916	431	432	433	434	435	436	437	438	439	440	441	442	443	444
1917	451	452	453	454	455	456	457	458	459	460	461	462	463	464
1918	471	472	473	474	475	476	477	478	479	480	481	482	483	484
1919–20	501	502	503	504	505	506	507	508	509	510	511	512	513	514
1921	521	522	523	524	525	526	527	528	529	530	531	532	533	534
1922	541	542	543	544	545	546	547	548	549	550	551	552	553	554
1923	561	562	563	564	565	566	567	568	569	570	571	572	573	574
1924	581	582	583	584	585	586	587	588	589	590	591	592	593	594
1925	601	602	603	604	605	606	607	608	609	610	611	612	613	614
1926	621	622	623	624	625	626	627	628	629	630	631	632	633	634
1927	641	642	643	644	645	646	647	648	649	650	651	652	653	654
1928	661	662	663	664	665	666	667	668	669	670	671	672	673	674
1929	681	682	683	684	685	686	687	688	689	690	691	692	693	694
1930	696	697	698	699	700	701	702	703	704	705	706	707	708	709
1931	711	712	713	714	715	716	717	718	719	720	721	722	723	724
1932	726	727	728	729	730	731	732	733	734	735	736	737	738	739
1933	741	742	743	744	745	746	747	748	749	750	751	752	753	754
1934	756	757	758	759	760	761	762	763	764	765	766	767	768	769

[1] Rating tables and index to Water-Supply Papers 35–39 contained in Water-Supply Paper 39. Mouthly discharge for 1899 in 21st Annual Report, part 4.
[2] James River only.
[3] Gallatin River.
[4] Green and Gunnison Rivers and Colorado River above Gunnison River.
[5] Mojave River only.
[6] Kings and Kern Rivers and south Pacific slope basins.
[7] Rating tables and index to Water-Supply Papers 47–52 and data on precipitation, wells, and irrigation in California and Utah contained in Water-Supply Paper 52. Monthly discharge for 1900 in 22d Annual Report, part 4.
[8] Wissahickon and Schuylkill Rivers to James River.
[9] Scioto River.
[10] Loup, Platte, and Elkhorn Rivers, and tributaries below Platte River.
[11] Tributaries of Mississippi River from east.
[12] Lake Ontario and tributaries to St. Lawrence River proper.
[13] Hudson Bay only.
[14] New England rivers only.
[15] Hudson River to Delaware River, inclusive.
[16] Susquehanna River to Yadkin River, inclusive.
[17] Platte and Kansas Rivers.
[18] The Great Basin in California, except Truckee and Carson River Basins
[19] Below junction with Gila River.
[20] Rogue, Umpqua, and Siletz Rivers only.

COOPERATION

The work was done under cooperative agreements as follows: In Illinois with the Department of Registration and Education, John J. Hallihan, director, through the State Water-Survey Division, Arthur M. Buswell, chief; in Indiana with the Department of Public Works, V. M. Simmons, administrative officer; in Iowa with the University of Iowa Institute of Hydraulic Research, F. T. Mavis, associate director, and C. C. Williams, dean of the College of Engineering, State Board of Conservation, M. L. Hutton, chief engineer, State Fish and Game Department, I. T. Bode, fish and game warden; in Minnesota with the Department of Conservation, Division of Drainage and Waters, W. S. Olson, director; in Missouri with the Missouri Geological Survey and Water Resources, H. A. Buehler, State geologist, and with the State Highway Department, T. H. Cutler, chief highway engineer; in North Dakota with the State engineer, Robert E. Kennedy; in Wisconsin with the Public Service Commission, John Damon, chief engineer.

Acknowledgments are due the Corps of Engineers, U. S. Army, for assistance in collecting records. Several stations in the Hudson Bay basins were maintained from funds from the U. S. Department of State.

Full cooperation exists between this organization and the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada. On waters adjacent to the international boundary certain stations are maintained jointly by the United States and Canada under the terms of the Boundary Waters Treaty of 1909, and others are maintained under a subsequent agreement between the two Governments. The records from all these stations are obtained in such a manner as to be equally acceptable and available in either country. These stations are herein designated international gaging stations.

Assistance in collecting records was rendered as follows: In Iowa by Mississippi River Power Co., Interstate Power Co., Iowa Electric Co., Des Moines Waterworks, City of Ottumwa, Decker Packing Co., Boone Water Department, Iowa State College; in Minnesota by the Ford Motor Co.; in Wisconsin by Northern States Power Co., Lake Superior District Power Co., Wisconsin Public Service Corporation.

Funds for rehabilitation of gaging stations, improvement of records, and establishment and operation of new stations on the Mississippi River were allocated by the Public Works Administration from funds made available under the National Industrial Recovery Act.

DIVISION OF WORK

The data were collected under supervision of district engineers as follows: In Illinois, J. H. Morgan; in Indiana, H. E. Grosbach; in Iowa, R. G. Kasel; in Minnesota and North Dakota and for all stations on Mississippi River to Clayton, Iowa, and for Whetstone River near Big Stone, S. Dak., C. L. Batchelder; in Missouri and for Mississippi River at Alton, Ill., H. C. Beckman; in Montana, W. A. Lamb; in Wisconsin and the St. Croix River near Rush City, Minn., S. B. Soule.

HUDSON BAY DRAINAGE BASIN

ST. MARY RIVER BASIN

Upper St. Mary Lake at St. Mary Chalet, Mont.

Location.- Staff gage in NE¼ sec. 4, T. 34 N., R. 14 W., at St. Mary Chalet, half a mile above outlet in Glacier National Park.

Records available.- May 1929 to September 1934 (incomplete).

Extremes.- Maximum stage recorded during year, 5.50 feet May 30; minimum recorded, 0.96 foot Sept. 24.
1929-34: Maximum stage recorded, 6.70 feet June 17, 1933; minimum recorded, 0.00 foot Dec. 12, 29, 30, 1929, and Jan. 1, 1930.

Remarks.- Records excellent. No diversions. No records Oct. 1 to May 27, June 3-26, Sept. 24-30.

Gage height, in feet, 1934

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1									4.95	3.49	2.56	1.58
2									4.60	3.50	2.52	1.54
3										3.50	2.50	1.50
4										3.48	2.46	1.46
5										3.46	2.40	1.46
6										3.42	2.36	1.44
7										3.50	2.30	1.48
8										3.40	2.26	1.46
9										3.36	2.20	1.46
10										3.30	2.18	1.42
11										3.20	2.14	1.36
12										3.15	2.10	1.34
13										3.04	2.06	1.32
14										3.00	2.02	1.30
15										2.96	2.00	1.36
16										3.00	1.96	1.30
17										2.98	1.96	1.26
18										2.98	1.94	1.22
19										2.98	1.90	1.16
20										3.00	1.88	1.12
21										2.90	1.84	1.10
22										2.88	1.80	1.06
23										2.80	1.76	1.00
24										2.70	1.74	.96
25										2.66	1.70	
26										2.60	1.66	
27								5.00	3.62	2.64	1.64	
28								5.12	3.63	2.62	1.64	
29								5.37	3.54	2.60	1.62	
30								5.49	3.50	2.64	1.60	
31								5.25		2.60	1.60	

Lower St. Mary Lake near Babb, Mont.

Location.- Water-stage recorder in NE¼ sec. 3, T. 35 N., R. 14 W., half a mile above outlet and 3 miles southeast of Babb.

Records available.- May 1929 to September 1934 (incomplete).

Extremes.- Maximum stage during year, 5.09 feet June 9; minimum, 0.18 foot Oct. 18. 1929-34: Maximum stage recorded, that of June 9, 1934; minimum recorded, 0.04 foot Oct. 24, 25, 1929.

Remarks.- Records excellent. No diversions. Stage increased by inflow of Swiftcurrent Creek. No records Nov. 3 to Apr. 9.

Gage height, in feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.30	2.31						3.08	3.85	2.08	1.75	0.97
2	.29	2.44						2.94	3.53	2.06	1.74	.88
3	.36							2.76	3.27	2.07	1.73	.81
4	.60							2.63	3.14	2.08	1.71	.75
5	.86							2.65	2.98	2.10	1.70	.72
6	1.00							2.98	2.87	2.08	1.68	.68
7	1.10							3.24	3.56	2.06	1.65	.62
8	.92							3.50	4.79	2.03	1.63	.60
9	.74							3.83	5.03	2.01	1.62	.56
10	.62						1.36	3.99	4.78	2.00	1.62	.52
11	.51						1.38	4.01	4.56	1.98	1.61	.48
12	.45						1.40	3.99	4.55	1.97	1.60	.45
13	.39						1.43	3.86	4.48	1.96	1.59	.42
14	.32						1.48	3.72	4.24	1.95	1.58	.40
15	.30						1.50	3.63	3.90	1.92	1.56	.37
16	.24						1.52	3.79	3.58	1.90	1.55	.32
17	.19						1.56	4.07	3.40	1.89	1.52	.30
18	.20						1.60	4.22	3.20	1.89	1.51	.29
19	.22						1.65	4.17	3.04	1.89	1.50	.30
20	.23						1.74	3.97	2.90	1.88	1.49	.30
21	.23						1.89	3.63	2.74	1.85	1.47	.31
22	.20						2.10	3.37	2.59	1.84	1.44	.33
23	.21						2.38	3.15	2.47	1.81	1.42	.36
24	.23						2.64	2.97	2.32	1.79	1.40	.35
25	.27						2.75	2.92	2.20	1.78	1.36	.36
26	.40						3.00	3.10	2.15	1.76	1.30	.35
27	.60						3.12	3.42	2.17	1.75	1.26	.34
28	.96						3.22	3.70	2.16	1.73	1.20	.30
29	1.40						3.26	3.96	2.15	1.73	1.17	.28
30	1.77						3.23	4.10	2.13	1.75	1.11	.25
31	2.02							4.14		1.75	1.05	

St. Mary River near Kimball, Alberta

(International gaging station)

Location.- Water-stage recorder in SW¼ sec. 25, T. 1 N., R. 25 W. fourth meridian, 1½ miles south of Kimball and 5 miles north of international boundary. During winter a chain gage 3 miles downstream was used.

Drainage area.- 497 square miles.

Records available.- January 1913 to September 1934; September 1902 to December 1912 at point half a mile north of international boundary. Comparable records from 1905 to 1912 obtained by Irrigation Branch, Department of the Interior, Canada, half a mile below present station.

Extremes.- Maximum discharge during year, 4,930 second-feet June 8 (gage height, 6.18 feet); minimum, 167 second-feet Oct. 5 (gage height, 2.03 feet).
1902-34: Maximum discharge (estimated), 18,000 second-feet June 5, 1908; minimum, 27.8 second-feet Dec. 18, 1930.

Remarks.- Records excellent except those during period of ice effect, Dec. 12 to Mar. 19, which are good. St. Mary Canal diverts water near Babb, Mont. to North Fork of Milk River; Alberta Railway & Irrigation Co.'s canal diverts 2 miles below station. Regulation on Swiftcurrent Creek station at Sherburne Lake Reservoir. This station is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	404	1,790	581	*592	*465	*396	478	2,070	2,650	892	591	448
2	400	1,890	556	704	463	407	478	1,930	2,340	857	591	387
3	390	1,800	556	*792	*463	*384	503	1,760	2,100	866	579	360
4	232	1,690	509	*859	463	362	519	1,610	2,130	884	567	328
5	206	1,580	480	894	457	*373	567	1,730	1,940	910	545	352
6	326	1,460	526	*833	*453	384	608	2,110	1,860	910	529	414
7	498	1,290	459	*772	450	*373	693	2,350	3,470	866	508	396
8	683	1,120	459	*711	*448	362	798	2,560	4,790	857	488	391
9	556	1,030	444	650	446	*368	848	2,870	4,670	814	473	374
10	480	975	409	*573	*426	375	892	3,030	4,210	790	468	352
11	428	911	395	496	407	*368	928	2,980	4,000	758	458	336
12	390	872	*383	*492	*396	362	1,000	3,010	3,880	750	448	316
13	368	828	380	489	384	*362	1,100	2,840	3,580	742	434	309
14	359	771	*377	*482	*384	362	1,170	2,720	3,360	742	419	305
15	330	750	375	476	384	*373	1,200	2,720	2,910	728	400	294
16	377	723	*380	*476	*388	384	1,220	2,870	2,500	707	391	284
17	300	716	386	476	393	*373	1,290	3,190	2,260	758	378	273
18	330	703	*397	*467	*390	362	1,340	3,320	2,000	686	369	264
19	377	670	407	457	*387	*415	1,420	3,190	1,790	686	369	273
20	368	663	*417	*455	384	468	1,530	2,980	1,640	686	352	302
21	364	631	426	*452	*384	473	1,700	2,580	1,460	653	424	316
22	355	606	*435	450	384	473	1,870	2,310	1,380	640	405	336
23	355	587	444	*450	*396	458	2,080	2,110	1,270	608	378	340
24	372	581	*447	450	407	453	2,020	1,920	1,110	573	365	324
25	433	593	450	*450	*384	448	2,080	1,870	982	562	352	324
26	503	606	*460	450	362	438	2,210	2,020	973	562	374	336
27	600	593	469	*455	*373	438	2,310	2,340	1,190	556	332	*330
28	850	575	*472	*460	384	434	2,390	2,600	1,070	550	324	*304
29	1,170	575	476	*464		443	2,400	2,800	1,040	550	348	*290
30	1,430	587	*486	469		463	2,260	2,980	982	567	360	277
31	1,600		*498	*467		483		3,000		585	488	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	1,600	206	511	31,410
November	1,890	575	939	55,870
December	581	375	450	27,650
January	894	450	554	34,040
February	465	362	411	22,820
March	483	362	407	25,030
April	2,400	478	1,330	79,140
May	3,320	1,610	2,528	155,400
June	4,790	973	2,318	137,900
July	910	550	719	44,220
August	591	324	436	26,790
September	448	264	331	19,710
The year	4,790	206	912	660,000

*Estimated.

St. Mary Canal at intake near Babb, Mont.

(International gaging station)

Location.- Water-stage recorder in NW¼NE¼ sec. 27, T. 36 N., R. 14 W., 600 feet below intake of canal on Blackfeet Indian Reservation and 1 mile east of Babb.

Records available.- Irrigation season, 1918-34.

Remarks.- Records good except those for period July 16 to Aug. 12, which are fair. Discharge estimated for May 5, 6, June 27. No records Nov. 1 to Apr. 22. This canal diverts from west bank of St. Mary River near Babb and discharges into North Fork of Milk River. The water then flows in the natural channel of Milk River through Canada and is finally used for irrigation in Milk River Valley, east of Havre, Mont. Water may be returned to St. Mary River at St. Mary crossing. This station is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Discharge, in second-feet, 1933-34

Day	Oct.					Apr.	May	June	July	Aug.	Sept.	Oct.
1	54						671	818	799	822	161	4.6
2	54						691	808	822	822	168	5.0
3	190						698	800	817	822	161	5.0
4	366						698	741	817	820	157	4.8
5	470						699	717	818	818	89	4.8
6	457						701	713	818	815	29.4	4.8
7	288						703	604	813	813	18.1	5.0
8	84						705	411	811	813	17.5	4.2
9	84						701	422	815	808	14.2	4.0
10	81						705	519	815	808	13.9	4.2
11	79						703	542	815	804	13.6	4.6
12	78						706	558	817	804	13.6	5.0
13	74						703	578	818	800	13.6	6.6
14	68						706	575	820	802	13.0	5.6
15	67						724	580	822	809	11.5	5.4
16	66						741	611	822	817	10.9	6.2
17	66						755	616	822	817	10.9	5.6
18	28						761	647	822	815	10.9	5.2
19	0						763	676	822	809	10.3	3.8
20	0						763	715	824	781	8.4	4.8
21	0						759	727	822	701	8.0	5.4
22	0						764	729	818	693	8.6	4.8
23	0					106	770	730	818	690	8.2	5.2
24	0					334	772	737	817	683	8.0	21.6
25	0					427	779	752	817	628	6.8	84
26	0					490	788	750	817	564	6.8	52
27	0					538	802	720	818	561	6.2	6.6
28	0					603	809	764	817	514	5.2	6.8
29	0					633	820	790	817	462	5.0	6.2
30	0					644	824	795	822	353	4.8	6.4
31	0						822		822	169		6.0

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1933				
October 1-18	470	28	147	5,250
1934				
April 23-30	644	106	472	7,490
May	824	671	742	45,630
June	818	411	672	39,960
July	824	799	817	50,260
August	822	169	717	44,110
September	168	4.8	33.8	2,010
October	84	3.8	9.81	603
The period				190,100

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

(International gaging station)

Location.- Water-stage recorder in NE¼ sec. 30, T. 37 N., R. 13 W. Montana Meridian, 500 feet east of outlet of St. Mary River siphon, 9 miles northeast of Babb, and 10 miles below intake.

Records available.- Irrigation season, 1918-34.

Remarks.- Records excellent. No records Nov. 1 to Apr. 23. This station is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Discharge, in second-feet, 1933-34

Day	Oct.						Apr.	May	June	July	Aug.	Sept.
1	0							581	694	689	698	146
2	0							606	692	692	698	166
3	16							614	685	700	698	156
4	277							616	664	702	694	152
5	417							618	634	706	692	119
6	424							624	636	706	689	35
7	344							626	624	704	687	13
8	88							628	433	704	685	0
9	72							618	396	704	683	0
10	70							620	491	704	683	0
11	68							624	501	702	681	0
12	68							624	507	702	681	0
13	64							622	532	698	681	0
14	56							620	534	698	683	0
15	50							634	534	698	685	0
16	10							644	559	698	689	0
17	51							658	558	698	689	0
18	31							658	583	698	687	0
19	0							662	596	698	689	0
20	0							664	648	700	683	0
21	0							658	652	698	618	0
22	0							664	644	696	606	0
23	0							666	644	694	606	0
24	0						292	668	644	692	602	0
25	0						405	668	660	694	579	0
26	0						433	675	666	694	509	0
27	0						473	681	612	696	503	0
28	0						526	685	660	696	478	0
29	0						568	692	685	696	428	0
30	0						564	698	687	698	367	0
31	0							696		698	184	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1933				
October 3-18	424	10	132	4,190
1934				
April 24-30	568	292	466	6,470
May	698	581	646	39,690
June	694	396	602	35,810
July	706	689	698	42,950
August	698	184	620	38,150
September 1-7	166	13	112	1,560
The period				164,600

St. Mary Canal at Hudson Bay divide, near Browning, Mont.

(International gaging station)

Location.- Water-stage recorder in sec. 5, T. 37 N., R. 11 W., on Blackfeet Indian Reservation, 3 miles above canal outlet and 30 miles north of Browning.

Records available.- Irrigation season, 1917-34.

Remarks.- Records good. Discharge interpolated for Sept. 27 to Oct. 1. No records Nov. 1 to Apr. 24. This station is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Discharge, in second-feet, 1933-34

Day	Oct.					Apr.	May	June	July	Aug.	Sept.	Oct.
1	0						570	696	683	681	171	3.0
2	0						597	703	683	683	149	2.7
3	0						610	685	687	685	153	2.8
4	24						613	683	690	679	145	2.7
5	283						613	643	698	679	142	2.1
6	397						619	630	701	670	92	1.8
7	376						624	659	698	670	6.6	1.0
8	229						628	551	694	670	.6	1.7
9	90						621	406	690	668	0	1.0
10	68						613	424	690	668	0	.6
11	61						617	490	690	670	.8	.4
12	64						619	507	690	665	.8	.2
13	67						617	526	687	663	.8	.8
14	56						613	532	685	670	.6	1.0
15	51						615	534	692	676	.8	1.4
16	42						637	542	690	681	1.4	2.3
17	6						650	557	687	679	1.3	2.9
18	27						654	568	685	674	1.0	3.0
19	6						659	580	687	681	1.0	3.9
20	0						670	610	692	679	1.8	3.4
21	0						648	648	690	650	1.6	2.5
22	0						657	648	690	597	1.9	2.8
23	0						661	641	687	591	2.0	2.0
24	0						665	648	690	591	2.1	1.6
25	0					290	668	657	690	584	2.4	1.5
26	0					402	670	672	690	542	4.0	1.5
27	0					444	676	668	687	503	3.8	1.7
28	0					494	690	643	685	496	3.6	1.7
29	0					538	698	668	687	450	3.4	2.0
30	0					561	703	681	685	404	3.2	2.4
31	0						698		683	294		2.4

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1933				
October 4-19	397	6	116	3,680
1934				
April 25-30	551	290	453	5,390
May	703	570	642	39,460
June	703	406	603	35,900
July	701	683	689	42,370
August	685	294	619	38,070
September	171	0	29.9	1,780
October	3.9	.2	1.96	121
The period				163,100

Swiftcurrent Creek at Many Glacier, Mont.

(International gaging station)

Location.- Water-stage recorder in sec. 12, T. 35 N., R. 16 W., at outlet of McDermott Lake, at Many Glacier, Glacier National Park, 14 miles southwest of Babb.

Drainage area.- 31.4 square miles.

Records available.- June 1912 to September 1934 (winter records incomplete).

Extremes.- Maximum discharge during year, 1,280 second-feet June 7 (gage height, 4.87 feet); minimum, 21.0 second-feet Sept. 27 (gage height, 1.60 feet).
1912-34: Maximum discharge, 1,550 second-feet June 17, 1916; minimum discharge, 10 second-feet Nov. 6 and 7, 1921 (gage height, 1.22 feet).

Remarks.- Records excellent. Discharge interpolated for June 24-26. No records Nov. 1 to Apr. 9. No diversions or regulation. This station is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	94							407	447	280	140	65
2	87							366	333	286	130	61
3	91							373	256	266	128	59
4	98							373	276	226	120	61
5	105							743	326	223	118	61
6	107							974	336	210	115	61
7	103							748	943	220	106	59
8	101							876	1,010	210	106	61
9	101							866	663	197	102	59
10	98						210	631	613	206	99	53
11	89						213	534	672	210	95	47.2
12	84						213	551	658	194	95	44.4
13	74						259	476	560	176	93	44.4
14	68						294	509	467	165	93	43.0
15	66						259	686	407	156	93	38.2
16	64						236	866	388	165	95	34.6
17	61						246	811	351	188	97	34.6
18	71						297	681	333	197	104	33.4
19	73						322	578	318	185	102	37.0
20	73						407	496	290	170	93	37.0
21	64						530	411	276	167	89	34.6
22	62						617	362	262	159	84	38.2
23	74						686	347	239	140	78	33.4
24	89						686	400	255	125	72	31.0
25	206						667	538	271	120	68	28.0
26	480						640	654	287	122	66	25.0
27	530						644	696	304	135	68	23.0
28	831						714	767	297	151	66	23.0
29	927						691	772	283	162	70	23.0
30	644						517	762	280	159	72	23.0
31	411							631		153	72	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	927	61	194	6.18	7.12	11,950
November						
December						
January						
February						
March						
April 10-30	714	210	445	14.2	11.09	18,540
May	974	347	609	19.4	22.37	37,460
June	1,010	239	413	13.2	14.73	24,600
July	286	120	185	5.89	6.79	11,350
August	140	66	94.5	3.01	3.47	5,810
September	65	23.0	42.5	1.35	1.51	2,530

Sherburne Lake Reservoir at Sherburne, Mont.

Location.- Water-stage recorder in gate house in sec. 35, T. 36 N., R. 15 W., at Sherburne Dam, about 6 miles southwest of Babb. Zero of gage is 4,700.0 feet above mean sea level.

Drainage area.- 64 square miles.

Records available.- May to June 1915, May 1917 to September 1918, June 1921 to September 1934.

Extremes.- Maximum contents during year, 54,065 acre-feet June 8 (water-surface elevation, 4,780.71 feet).
1915, 1917-18, 1921-34: Maximum contents, 60,420 acre-feet June 20, 1925 (water-surface elevation, 4,784.6 feet).

Remarks.- Records good. Some gage height records furnished by U. S. Bureau of Reclamation. No records Nov. 2 to Mar. 30, Sept. 11-21.

Contents, in acre-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12,318	20,120					20,200	40,858	53,210	53,150	33,513	3,366
2	12,426						20,020	41,651	53,180	53,180	32,540	2,882
3	12,188						20,300	42,418	52,760	53,045	31,424	2,882
4	11,380						20,230	43,258	52,568	52,792	30,355	2,882
5	10,405						19,573	44,495	52,568	52,440	29,256	3,276
6	9,443						19,465	48,070	52,552	52,120	28,187	2,820
7	8,614						19,015	49,150	53,750	51,768	27,109	2,820
8	8,887						18,844	50,890	53,945	51,355	25,965	2,826
9	8,986						18,772	52,328	53,555	50,920	24,840	2,901
10	9,123						18,680	53,000	53,525	50,500	23,645	2,950
11	9,240						19,600	53,000	53,675	50,035	22,380	
12	9,451						20,470	52,968	53,450	49,480	21,400	
13	9,513						21,240	52,760	53,984	48,790	20,230	
14	9,474						21,700	52,488	52,744	48,100	19,105	
15	9,513						22,540	52,680	52,680	47,410	17,930	
16	9,584						23,700	53,030	52,712	46,718	16,750	
17	9,607						23,744	53,030	52,680	46,046	15,485	
18	9,708						23,942	52,808	52,696	45,440	14,315	
19	9,794						24,360	52,600	52,648	44,750	13,224	
20	9,946						25,500	52,552	52,584	44,030	11,964	
21	10,011						26,636	52,568	52,680	43,300	10,964	
22	10,019						28,077	52,488	52,792	42,561	9,818	2,932
23	10,019						29,664	52,424	52,648	41,820	8,644	2,785
24	10,019						31,147	52,552	52,760	41,040	7,590	2,643
25	10,860						32,600	53,030	52,856	40,195	6,680	2,454
26	11,940						33,940	53,330	53,000	39,220	5,881	2,175
27	13,336						35,381	53,345	53,105	38,310	5,134	1,735
28	15,089						36,896	53,405	53,105	37,400	4,780	1,144
29	17,304						38,544	53,270	53,060	36,546	4,018	955
30	19,150						39,805	53,330	53,015	35,524	3,635	910
31	20,380					20,200		53,195		34,492	3,353	

Swiftcurrent Creek at Sherburne, Mont.

(International gaging station)

Location.- Water-stage recorder in sec. 35, T. 36 N., R. 15 W., 800 feet below spillway of Sherburne Lake Dam at Sherburne.

Drainage area.- 64 square miles.

Records available.- July 1912 to September 1934 (winter records incomplete).

Extremes.- Maximum discharge during year, 1,770 second-feet June 7 (gage height, 6.98 feet); minimum, 45 second-feet Oct. 29 (gage height, 1.64 feet).
1912-34: Maximum discharge, 2,280 second-feet June 17, 1916 (gage height, 7.83 feet); no flow at various times when gates in dam were closed.

Remarks.- Records good. Discharge interpolated for May 18. No records Nov. 1 to Apr. 9. No diversions. Flow regulated by gate operation at dam. This station is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	74							146	581	307	738	177
2	118							146	630	392	734	172
3	383							146	645	450	722	164
4	597							144	567	478	726	159
5	640							148	495	467	730	116
6	337							147	495	464	726	75
7	366							147	1,070	492	730	67
8	73							329	1,310	502	749	65
9	78							563	1,140	502	765	65
10	74						131	710	804	516	757	63
11	74						131	832	968	538	746	62
12	72						131	864	1,060	592	734	61
13	68						131	856	982	600	738	61
14	66						131	796	753	604	742	60
15	67						131	808	570	589	734	59
16	68						131	990	534	592	738	56
17	67						131	1,110	506	600	726	56
18	67						129	1,010	441	600	718	89
19	67						129	904	484	607	714	170
20	67						131	742	368	596	687	160
21	58						134	574	339	600	657	143
22	54						137	626	373	607	649	130
23	53						140	520	305	604	634	115
24	53						143	417	252	619	615	104
25	54						143	527	252	657	512	91
26	53						144	816	305	664	484	85
27	51						146	917	378	660	488	91
28	48						147	986	383	672	467	78
29	46						146	1,020	392	692	392	71
30	48						146	1,010	341	718	226	91
31	381							836		722	185	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	640	46	149	9,180
November				
December				
January				
February				
March				
April 10-30	147	129	136	5,680
May	1,110	144	638	39,250
June	1,310	252	591	35,150
July	722	307	571	35,130
August	765	185	644	39,600
September	177	56	98.2	5,840

Canyon Creek near Many Glacier, Mont.

(International gaging station)

Location.- Water-stage recorder at edge of heavy timber area, Glacier National Park, half a mile above mouth and 2 miles southeast of Many Glacier.

Drainage area.- 7.0 square miles.

Records available.- July 1918 to September 1934.

Extremes.- Maximum daily discharge during year, 200 second-feet (estimated) June 8; minimum, 2.4 second-feet Sept. 29 (gage height, -0.01 foot.
1918-34: Maximum discharge (estimated), 500 second-feet May 16, 1922 (gage height, 3.34 feet); minimum, 0.7 second-foot Oct. 9, 1932 (gage height, 0.18 foot).

Remarks.- Records good except those estimated for Oct. 1-8, June 1-9, which are fair. No records Nov. 1 to May 6. No diversions. This station is one of the international gaging stations maintained jointly by the United States and Canada under the Boundary Waters Treaty. The records have been collected and compiled jointly with the Dominion Water Power and Hydrometric Bureau, Department of the Interior, Canada.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1									89	48.0	24.6	11.4
2									84	49.0	22.2	11.1
3	22.0								80	42.4	22.2	10.7
4									86	37.0	21.7	10.4
5									96	37.0	20.1	10.4
6									100	35.5	19.6	10.4
7	23.0							118	184	37.8	19.1	10.4
8								131	200	35.5	18.5	11.1
9	23.4							115	113	34.7	16.7	10.7
10	24.1							85	129	37.0	15.8	10.0
11	24.8							88	124	36.2	15.4	9.4
12	22.1							85	109	33.1	14.9	9.4
13	20.3							89	86	32.3	14.9	9.4
14	19.8							111	76	30.0	14.9	8.9
15	18.7							128	70	29.3	14.9	4.8
16	17.1							135	69	30.8	14.9	3.7
17	15.2							125	60	37.0	15.8	3.3
18	14.3							111	58	38.7	16.2	5.5
19	13.9							98	55	33.1	14.9	8.3
20	13.1							86	51	30.0	14.0	7.5
21	13.1							74	50	28.7	13.6	4.1
22	12.6							70	50	26.6	12.9	3.0
23	12.6							72	42.4	24.0	12.5	2.7
24	19.8							83	36.2	22.2	11.8	2.8
25	44.1							99	36.2	21.7	11.1	7.2
26	95							111	43.3	22.2	11.1	5.6
27	89							113	52	25.3	11.4	3.4
28	124							118	51	28.0	11.8	2.5
29	138							121	48.0	29 3	12.2	2.5
30	115							113	47.0	28.7	12.2	3.4
31	77							99		28.0	11.8	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	138	12.6	37.0	5.29	6.10	2,270
November						
December						
January						
February						
March						
April						
May 7-31	135	70	103	14.7	13.67	5,110
June	200	36.2	79.2	11.3	12.61	4,710
July	49.0	21.7	32.6	4.66	5.37	2,000
August	24.6	11.1	15.6	2.23	2.57	959
September	11.4	2.5	7.13	1.02	1.14	424

Ottertail River below Pelican River, near Fergus Falls, Minn.

Location.- Water-stage recorder in SW¼ sec. 20, T. 132 N., R. 44 W., 500 feet below Dayton Hollow Dam, 5 miles southwest of Fergus Falls, and 5 miles below mouth of Pelican River. Prior to Nov. 18, 1933, recorder was located 4 miles downstream in NE¼ sec. 34, T. 132 N., R. 44 W.

Records available.- October 1930 to September 1934.

Extremes.- Maximum discharge during year, about 908 second-feet May 29 (gage height, 2.92 feet); minimum, 1 second-foot May 2 (gage height, 1.00 foot).
1930-34: Maximum discharge, that of May 29, 1934; minimum, that of May 2, 1934.

Remarks.- Records good except those for August and September, which are fair.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	20	16	25	27	23	28	23	10	20	8.6	9.6	10
2	10	14	47	33	25	30	49	10	9.2	22	9.2	12
3	20	15	28	27	25	30	151	17	9.2	17	8.6	8.0
4	21	15	53	27	25	39	29	17	8.6	8.6	27	7.4
5	15	16	57	26	25	28	38	24	18	9.2	15	7.4
6	16	13	27	25	26	36	61	13	15	8.6	43	6.8
7	15	12	18	27	25	35	52	18	17	23	26	7.4
8	15	10	26	28	24	25	45	21	10	6.8	8.6	19
9	11	11	28	26	24	28	64	20	20	6.8	10	8.0
10	16	12	27	27	23	28	44	21	10	6.8	12	8.6
11	14	14	27	24	28	29	74	20	12	7.4	20	9.2
12	13	13	27	26	28	26	56	20	14	10	6.8	9.2
13	13	12	25	26	25	25	49	18	14	14	6.8	9.2
14	10	13	25	16	26	25	80	19	23	14	7.4	9.2
15	8.3	16	25	27	22	25	23	19	6.2	14	6.8	7.4
16	7.2	17	37	24	24	26	22	18	19	14	8.0	6.8
17	12	18	36	26	25	25	21	18	7.4	13	8.6	7.4
18	13	32	32	26	28	24	37	18	8.0	63	11	4.6
19	13	7.4	27	24	28	13	33	22	8.6	26	11	5.0
20	11	13	24	27	26	13	21	14	18	9.2	8.0	5.0
21	14	14	27	27	30	26	32	19	20	10	8.0	5.0
22	13	16	25	24	28	27	21	8.0	20	26	8.0	16
23	11	18	28	24	26	13	37	18	20	7.4	6.8	5.0
24	16	13	28	29	27	27	22	18	9.8	7.4	7.4	5.0
25	8.7	19	29	26	27	22	21	9.2	9.8	23	8.0	5.0
26	14	6.8	28	25	28	23	26	25	26	9.2	8.0	5.0
27	8.9	24	35	45	27	22	21	9.8	9.8	10	6.2	5.0
28	8.3	36	31	30	36	28	21	20	10	9.2	6.2	5.0
29	12	47	29	29		25	2.2	46	24	9.2	12	16
30	12	42	27	28		25	10	8.6	9.2	6.8	11	5.0
31	15		30	44		25		18		8.0	13	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	21	7.2	13.1	806
November	47	6.8	17.5	1,040
December	57	18	30.3	1,860
January	45	16	27.4	1,690
February	36	22	26.2	1,460
March	39	13	25.8	1,590
April	151	2.2	39.5	2,350
May	46	8.0	18.0	1,100
June	26	6.2	14.2	845
July	63	6.8	13.8	849
August	43	6.2	11.5	710
September	19	4.6	7.99	475
The year	151	2.2	20.4	14,780

Red River at Fargo, N. Dak.

Location.- Staff gage in sec. 7, T. 139 N., R. 48 W., just above Island Park Dam, Fargo, and 10 miles above mouth of Sheyenne River. Zero of gage is 870.00 feet above mean sea level (adjustment of 1912).

Drainage area.- 6,420 square miles.

Records available.- May 1901 to September 1934.

Average discharge.- 32 years (1902-34), 468 second-feet.

Extremes.- Maximum discharge recorded during year, 323 second-feet Apr. 10 (gage height, 8.55 feet); no flow for several months; minimum gage height, 4.82 feet June 15.
1901-34: Maximum discharge recorded, 7,740 second-feet July 11, 1916 (gage height, 21.04 feet, present datum); maximum gage height recorded, 23.6 feet Apr. 6, 1916, affected by ice; no flow for many days in 1932, 1933, 1934.
Maximum stage known, 40.1 feet, U. S. Weather Bureau gage, on which zero is 863.5 feet above mean sea level (adjustment of 1912), occurred Apr. 7, 1897.

Remarks.- Records good. Discharge interpolated for days when gage was not read, Oct. 8, 22, Nov. 12, Dec. 17, Jan. 21, Feb. 4, 11, 25, May 6.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	7.9	1.3	13	18	18	43	22	0			
2	0	9.0	2.4	14	15	24	43	24	0			
3	0	6.9	4.3	11	14	47	55	25	0			
4	0	10	5.1	10	14	58	75	31	0			
5	0	9.0	6.0	9.0	15	62	89	35	0			
6	.2	6.9	6.0	9.0	17	47	95	30	0			
7	1.3	5.1	9.0	10	17	49	137	24	0			
8	2.4	5.1	9.0	11	18	45	202	14	0			
9	3.6	3.6	11	11	15	47	249	6.0	0			
10	3.6	3.0	18	14	15	49	323	.4	0			
11	3.0	1.8	19	13	18	41	301	3.6	0			
12	3.0	1.8	25	13	21	41	270	6.9	0			
13	4.3	1.8	27	14	21	45	195	6.9	0			
14	5.1	1.3	28	14	25	43	137	6.0	0			
15	1.3	1.3	30	17	36	38	104	6.9	0			
16	6.9	.2	22	15	31	35	89	3.6	0			
17	9.0	0	18	14	31	38	89	3.0	0			
18	10	0	13	14	25	35	84	1.8	0			
19	11	0	7.9	15	27	38	67	1.3	0			
20	10	0	6.9	17	27	40	78	.2	0			
21	9.0	0	6.9	18	27	47	67	0	0			
22	9.0	0	5.1	19	25	43	45	0	0			
23	9.0	0	13	18	21	45	28	0	13			
24	6.0	0	17	14	19	51	30	0	27			
25	6.9	0	15	15	18	43	35	0	25			
26	4.3	0	14	15	17	47	25	0	17			
27	3.0	0	15	15	13	45	31	0	11			
28	3.6	0	15	15	15	43	27	0	5.1			
29	6.9	0	14	17		41	27	0	1.3			
30	6.9	.1	15	14		45	22	0	0			
31	6.9		14	15		43		0				

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	11	0	4.72	290
November	10	0	2.49	148
December	30	1.3	13.3	819
January	19	9.0	14.0	859
February	36	13	20.5	1,140
March	62	18	43.0	2,640
April	323	22	102	6,070
May	35	0	8.12	499
June	27	0	3.31	197
July	0	0	0	0
August	0	0	0	0
September	0	0	0	0
The year	323	0	17.5	12,660

Note.- No flow during months left blank.

Red River at Grand Forks, N. Dak.

Location.- Water-stage recorder in sec. 34, T. 152 N., R. 50 W., in Grand Forks, 2 miles below mouth of Red Lake River. Staff gage at same site prior to Nov. 31, 1933. Zero of gage is 778.42 feet above mean sea level (adjustment of 1929). Elevation of zero of gage (784.12 feet) published in water-supply Papers 685, 715, 730, 745, is incorrect.

Drainage area.- 25,500 square miles.

Records available.- May 1901 to September 1934 in reports of the U. S. Geological Survey, April 1882 to November 1912 in report of Minnesota State Drainage Commission.

Average discharge.- 52 years, 2,264 second-feet.

Extremes.- Maximum discharge during year, 3,210 second-feet Apr. 12 (gage height, 10.02 feet, affected by ice); minimum, 15 second-feet Sept. 16 (gage height, 1.62 feet, affected by aquatic growth).
1882-1934: Maximum discharge, 43,000 second-feet Apr. 10, 1897 (gage height, 50.2 feet); minimum, 13 second-feet Oct. 19, 1932 (gage height, 1.18 feet, affected by aquatic growth).

Remarks.- Records good except those for period of ice effect, Dec. 11 to Apr. 21, which are fair. Discharge estimated for Jan. 12, 16-18, 21-28, 30, 31, Feb. 5, 15, 16, Feb. 28 to Mar. 5, when no gage-height record was obtained. Stage-discharge relation affected by aquatic growth Oct. 1 to Nov. 3, May 26 to Sept. 30.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	28	50	55	56	37	80	590	529	142	175	37	28
2	28	60	54	55	33	120	687	442	107	142	33	26
3	29	121	54	49	40	200	754	442	81	135	33	27
4	26	135	56	45	34	400	789	499	78	184	30	26
5	23	114	56	45	36	600	935	559	88	244	29	25
6	21	100	57	44	39	622	1,180	499	100	266	28	24
7	22	94	61	46	37	559	1,580	590	142	278	30	24
8	21	88	58	45	34	336	2,140	622	150	336	30	22
9	22	94	57	45	34	361	2,640	590	158	312	28	22
10	22	100	56	50	33	529	2,810	559	166	278	27	21
11	22	94	52	39	37	687	3,040	499	158	234	26	20
12	21	100	49	40	36	720	3,150	470	150	213	24	20
13	22	88	42	42	34	687	2,980	470	150	203	25	19
14	21	81	42	40	39	590	2,700	414	158	184	28	17
15	60	71	45	40	45	529	2,420	361	158	166	31	17
16	58	68	45	41	52	442	2,250	336	158	158	32	16
17	54	71	45	42	58	442	1,980	361	158	158	33	18
18	42	62	48	42	64	361	1,630	336	150	150	31	18
19	38	57	48	42	58	312	1,490	312	135	128	32	17
20	36	66	49	43	48	336	1,400	289	128	121	30	18
21	30	76	49	40	24	387	1,350	278	128	100	29	19
22	29	72	49	36	24	387	1.220	266	175	94	30	19
23	32	71	54	33	29	387	1,050	223	166	78	34	18
24	30	67	60	29	34	387	974	234	158	71	33	19
25	22	68	55	26	39	361	860	234	175	63	36	19
26	27	63	56	22	46	361	824	223	166	63	34	20
27	32	64	55	18	55	361	789	203	175	50	33	20
28	38	61	55	23	60	336	720	203	223	48	33	20
29	38	58	54	27		312	654	203	234	40	31	21
30	40	57	55	30		361	622	184	213	40	30	22
31	48		56	33		442		142		39	29	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	60	21	31.7	1,950
November	135	50	79.0	4,700
December	61	42	52.5	3,230
January	56	18	39.0	2,400
February	64	24	40.7	2,260
March	720	80	419	25,780
April	3,150	590	1,540	91,650
May	622	142	373	22,950
June	234	78	151	8,980
July	336	39	153	9,420
August	37	24	30.6	1,880
September	28	16	20.7	1,230
The year	3,150	16	244	176,400

Bois des Sioux River near Fairmount, N. Dak.

Location.- Staff gage near center of sec. 22, T. 130 N., R. 47 W., at Minneapolis, St. Paul & Sault Ste. Marie Railway bridge 2 miles east of Fairmount, 5 miles west of Tenney, Minn., and 15 miles below Lake Traverse.
Drainage area.- 1,460 square miles.
Records available.- April 1919 to September 1934.
Average discharge.- 14 years (1920-34), 7.69 second-feet.
Extremes.- 1919-34: Maximum discharge recorded, 390 second-feet Apr. 22, 1922 (gage height, 5.7 feet); no flow in several different years.
Remarks.- No flow during the entire year.

Mustinka River above Wheaton, Minn.

Location.- Chain gage on line between secs. 7 and 8, T. 127 N., R. 46 W., 1 mile upstream from Chicago, Milwaukee, St. Paul & Pacific Railway bridge, 1½ miles northeast of Wheaton, and 8 miles above mouth.
Drainage area.- 776 square miles.
Records available.- March to September 1917, June 1919 to September 1924, March 1931 to September 1934. June to November 1918 at a point 3½ miles downstream.
Extremes.- Maximum discharge recorded during year, 9.1 second-feet Apr. 10 (gage height, 1.36 feet); no flow most of year.
1917, 1919-24, 1931-34: Maximum discharge, about 2,340 second-feet Apr. 1, 1917 (gage height, 14.7 feet at former datum; relation to present datum unknown); no flow during several periods.
Remarks.- Records poor. Stage-discharge relation affected by ice Mar. 1 to Apr. 6 and debris on control Apr. 19 to May 12. Discharge estimated for Mar. 1-15, 17-31, Apr. 1.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						0	0.2	0.2	0			
2						0	.7	.8	0			
3						.1	.7	.8	0			
4						.1	1.1	.7	0			
5						0	1.8	.7	0			
6						0	2.0	.5	0			
7						0	1.8	.3	0			
8						0	1.6	0	0			
9						0	2.5	0	0			
10						0	9.1	0	0			
11						0	8.2	0	0			
12						.1	7.1	0	0			
13						0	4.5	0	0			
14						0	3.0	0	0			
15						0	2.5	0	0			
16						0	2.0	0	0			
17						0	1.6	0	0			
18						0	1.5	0	0			
19						.1	1.8	0	0			
20						.1	1.5	0	0			
21						.1	1.5	0	0			
22						0	1.1	0	.7			
23						0	1.0	0	1.1			
24						0	.8	0	.7			
25						0	.7	0	.2			
26						.1	.5	0	0			
27						.1	.5	0	0			
28						.1	.4	0	0			
29						.1	.3	0	0			
30						.1	.2	0	0			
31						.1		0				

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	0	0	0	0
November	0	0	0	0
December	0	0	0	0
January	0	0	0	0
February	0	0	0	0
March	.1	0	.04	2.4
April	9.1	.2	2.07	123
May	.8	0	.13	7.9
June	1.1	0	.09	5.4
July	0	0	0	0
August	0	0	0	0
September	0	0	0	0
The year	9.1	0	.19	139

Note.- No flow during months left blank.

Wild Rice River near Abercrombie, N. Dak.

Location.- Chain gage in SE¼ sec. 25, T. 135 N., R. 49 W., 2 miles northwest of Abercrombie.

Records available.- April 1932 to September 1934.

Extremes.- Maximum discharge recorded during year, 15 second-feet Apr. 7 (gage height, 2.10 feet, affected by ice); no flow for several days.
1932-34: Maximum discharge recorded, 75 second-feet Mar. 13, 1933 (gage height, 4.10 feet, affected by ice); no flow for periods each year.

Remarks.- Records fair. Stage-discharge relation affected by ice or debris on control most of year. Discharge estimated for Apr. 29 to May 1, 6-10, May 12 to June 15. No record Oct. 1 to Mar. 15, July 1 to Sept. 30. Little or no flow during periods of no record.

Discharge, in second-feet, 1934

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							0.6	0	0			
2							3.4	1.2	0			
3							6.4	1.2	0			
4							10	.7	0			
5							11	.1	0			
6							14	.1	0			
7							15	.1	0			
8							12	0	0			
9							9.6	0	0			
10							6.9	0	0			
11							4.8	0	0			
12							3.8	0	0			
13							2.4	0	0			
14							2.4	0	0			
15							1.8	0	0			
16						0.3	1.4	0	5.3			
17						.3	1.1	0	4.6			
18						.2	1.1	0	3.6			
19						.1	.8	0	3.2			
20						0	.6	0	4.4			
21						1.4	.6	0	3.2			
22						.5	.6	0	3.1			
23						.3	.5	0	2.5			
24						1.0	.3	0	2.1			
25						1.1	.2	0	1.6			
26						1.2	.1	0	1.6			
27						.8	0	0	1.6			
28						.4	0	0	1.2			
29						.3	0	0	1.1			
30						.2	0	0	1.4			
31						.2		0				

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October				
November				
December				
January				
February				
March 16-31	1.4	0	0.52	16
April	15	0	3.71	221
May	1.2	0	.11	6.7
June	5.3	0	1.35	80
July				
August				
September				

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Sheyenne River at West Fargo, N. Dak.

Location.- Water-stage recorder in sec. 31, T. 140 N., R. 49 W., about half a mile north of West Fargo, formerly called Haggart.

Records available.- September 1929 to September 1934; at station a quarter of a mile above, March 1902 to June 1907, March to August 1919.

Extremes.- Maximum discharge during year, 336 second-feet Apr. 13 (gage height, 7.22 feet); minimum, 4.2 second-feet Aug. 27 (gage height, 2.11 feet).
1902-7, 1919, 1929-34: Maximum discharge, 2,030 second-feet Apr. 9-11, 1902 (gage height, 18.0 feet, former datum); minimum, that of Aug. 27, 1934.

Remarks.- Records excellent except those for period intake did not operate properly, Nov. 21 to Mar. 31, which are poor. Discharge estimated for periods of ice effect, Nov. 21-25, Dec. 26 to Jan. 1, Jan. 3-31, Feb. 21 to Mar. 5, Mar. 24-29.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.2	22	*16	10	11	20	202	92	23	31	6.8	5.2
2	11	22	16	*10	11	20	192	95	22	27	6.2	5.0
3	8.4	19	17		11	20	184	95	22	23	5.6	4.8
4	8.0	14	18		11	20	188	95	22	21	5.4	5.8
5	9.4	13	20		11	20	197	89	23	20	4.6	6.6
6	9.4	18	18		11	23	206	86	24	18	5.6	6.4
7	9.4	19	17		11	19	211	86	28	17	5.4	7.4
8	9.6	13	15		11	21	236	83	28	16	6.8	8.0
9	10	17	14		12	26	268	77	27	16	12	7.0
10	10	21	14		13	24	301	67	30	15	27	6.8
11	11	20	14		13	25	312	62	27	15	23	8.0
12	11	19	14		13	27	301	60	24	17	16	8.6
13	11	27	13		13	27	312	56	22	16	14	9.6
14	11	18	15		14	27	301	54	21	15	11	10
15	11	15	13	10	14	25	290	55	20	15	9.8	10
16	12	14	13		15	*28	301	52	20	16	9.6	12
17	11	13	14		15	33	231	49	20	16	9.8	11
18	12	13	16		16	36	202	52	21	14	10	10
19	14	13	14		17	37	184	50	26	13	9.6	9.4
20	15	15	12		17	39	170	47	34	12	11	9.0
21	14	15	12		15	44	158	44	31	14	11	8.8
22	13	16	10		15	55	150	41	31	13	9.6	8.2
23	13	16	10		15	74	142	36	31	12	9.8	8.0
24	14	17	11		15	90	136	32	28	9.6	9.8	9.8
25	13	17	10		15	116	125	30	27	7.8	9.4	10
26	15	18	10		15	140	116	28	25	8.0	11	11
27	14	19	10		15	160	110	27	23	8.0	6.6	12
28	13	18	10		15	180	104	26	22	8.0	6.4	14
29	16	18	10			200	98	26	24	7.4	5.4	13
30	18	17	10			221	92	26	31	7.4	5.4	13
31	15		10			221		24		6.8	5.2	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	18	8.0	11.9	735
November	27	13	17.2	1,020
December	20	10	13.4	825
January	10	10	10.0	615
February	17	11	13.6	754
March	221	19	65.1	4,000
April	312	92	201	11,940
May	95	24	56.2	3,460
June	34	20	25.2	1,500
July	31	6.8	14.7	902
August	27	4.6	9.64	593
September	14	4.8	8.95	532
The year	312	4.6	37.1	26,880

*Discharge measurement.

Devils Lake near Devils Lake, N. Dak.

Location.- Staff gage at Lakewood, half a mile from the main Lake on east bank of entrance to Creel Bay, an arm of Devils Lake 2 miles long and half a mile wide, on north side of the lake, about 6 miles southwest of city of Devils Lake.
Records available.- 1901-34 (fragmentary). Single gage heights in 1867, 1879, 1883, 1887, 1890, 1896.
Remarks.- All gage heights published previous to 1921 refer to a gage on which zero was 1,412.21 feet above mean sea level according to levels run by topographic branch of the U. S. Geological Survey in 1928.

Elevation, in feet, 1933-34

Oct. 1	1,408.90	Oct. 20	1,408.88	June 9	1,408.34
Oct. 2	1,408.88	Nov. 2	1,408.88	Aug. 7	1,407.37
Oct. 5	1,408.77	Apr. 25	1,408.82	Sept.13	1,407.05

Buffalo River near Dilworth, Minn.

Location.- Chain gage on line between secs. 6 and 7, T. 140 N., R. 47 W., about 6 miles north of Dilworth.
Records available.- March 1931 to September 1934 (winter months incomplete).
Extremes.- Maximum discharge recorded during year, 374 second-feet Apr. 10, 11; maximum gage height, 9.02 feet Apr. 10 (affected by ice); minimum recorded, 0.2 second-foot Aug. 6, 7 (gage height, 0.34 foot).
1931-34: Maximum discharge, that of Apr. 10, 1934; minimum, that of Aug. 6, 7, 1934.
Remarks.- Records good except those for period of ice effect Nov. 12-16, Mar. 14 to Apr. 13, which are poor. Discharge interpolated May 27 to June 5. No record Nov. 17 to Mar. 13.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.5	20					35	32	12	12	0.5	2.0
2	4.5	19					38	34	12	9.6	.3	2.2
3	5.5	21					47	38	12	9.1	.2	2.1
4	7.3	17					77	40	11	8.6	.4	2.5
5	7.9	16					100	43	11	6.7	.3	3.6
6	8.2	23					124	49	11	6.2	.2	3.4
7	9.8	22					179	47	14	6.2	.2	3.3
8	9.6	17					241	47	14	5.4	.8	1.9
9	12	26					326	49	17	4.8	1.0	2.8
10	13	17					374	40	22	4.1	1.5	2.4
11	15	17					374	38	26	5.2	2.7	2.1
12	15	16					366	36	22	5.4	1.4	1.8
13	16	16					366	40	19	5.2	1.1	1.4
14	16	14				94	318	41	16	5.1	1.6	3.1
15	18	8.6				71	199	32	14	4.5	1.5	3.6
16	18	6.1				47	154	29	12	4.1	1.6	2.6
17	18					38	124	29	12	3.7	1.7	2.8
18	19					32	118	23	14	3.6	1.9	3.2
19	19					28	94	21	14	2.6	1.6	3.4
20	19					36	82	21	16	1.9	1.5	4.7
21	20					36	71	19	14	1.7	1.4	5.5
22	21					35	65	16	18	1.3	1.6	6.0
23	20					36	59	15	18	1.1	1.3	6.0
24	21					36	52	16	15	1.5	2.2	7.6
25	19					40	49	15	16	1.3	2.5	12
26	20					45	47	13	16	1.6	2.2	16
27	20					45	43	13	17	1.3	2.8	16
28	18					41	40	13	15	1.0	2.6	15
29	18					38	40	12	13	.9	1.7	16
30	20					35	38	12	11	.6	2.8	17
31	22					30		12		.6	1.9	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	22	4.5	15.3	941
November 1-16	26	6.1	17.2	547
December				
January				
February				
March 14-31	94	28	42.4	1,510
April	374	35	141	8,410
May	49	12	28.5	1,760
June	26	11	15.1	900
July	12	.6	4.09	252
August	2.8	.2	1.45	89
September	17	1.4	5.73	341

Wild Rice River at Twin Valley, Minn.

Location.- Chain gage in SE¼ sec. 22, T. 144 N., R. 44 W., three-quarters of a mile northeast of Twin Valley.

Drainage area.- 805 square miles.

Records available.- July 1930 to September 1934. June 1909 to September 1917 at station a quarter of a mile downstream.

Extremes.- Maximum discharge recorded during year, 266 second-feet Apr. 11, 12; minimum discharge recorded, 1.9 second-feet Sept. 12 (gage height, 0.52 foot).
1909-17, 1930-34: Maximum discharge (computed by slope-area method), 9,200 second-feet July 22, 1909 (not referred to present gage); minimum, 1 second-foot Aug. 13, 1932 (gage height, 0.24 foot).

Remarks.- Records poor. Stage-discharge relation affected by ice Nov. 11-15, Mar. 20 to Apr. 4, and by aquatic growth or debris on control much of remainder of year. No records Nov. 16 to Mar. 19.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	19	15					83	63	37	*26	2.5	7.7
2	18	16					96	71	35	*22	2.4	6.8
3	15	15					119	74	33	*18	2.5	5.9
4	15	16					155	75	31	*14	2.6	4.2
5	15	16					174	82	39	10	2.6	3.4
6	14	15					184	85	39	9.0	2.7	3.0
7	13	16					194	85	40	10	2.6	*4.0
8	13	17					184	79	43	9.0	2.8	5.0
9	13	18					194	80	42	8.0	2.6	*5.5
10	13	18					253	83	41	8.5	2.5	2.1
11	12	18					266	83	40	9.5	2.5	2.1
12	12	18					266	63	27	9.0	2.4	1.9
13	12	18					*250	65	19	10	2.4	2.1
14	12	18					*200	68	18	10	2.6	2.1
15	12	17					*150	70	17	9.0	2.5	2.3
16	11						119	85	16	7.1	2.9	2.3
17	11						*120	80	19	6.5	3.0	2.5
18	11						*120	73	17	6.2	6.8	2.5
19	11						*120	65	12	5.9	6.8	2.5
20	9.8					27	*120	59	13	5.6	6.2	2.7
21	9.4					24	*100	65	14	5.3	6.2	2.8
22	8.7					*30	*100	71	16	4.0	6.8	3.0
23	7.8					*30	*100	80	16	3.2	6.8	3.4
24	7.5					*30	*100	85	16	2.9	7.1	3.6
25	7.8					*30	*100	73	19	2.8	12	5.3
26	8.4					*30	*90	67	20	3.0	7.4	5.9
27	9.0					*30	*80	59	*30	3.0	7.4	7.1
28	9.8					*30	69	51	*30	3.8	7.7	8.0
29	15					*30	64	48	34	2.8	8.0	11
30	12					40	60	46	*30	2.5	7.4	18
31	15					40		41		2.6	7.7	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	19	7.5	12.0	738
November 1-15	18	15	16.7	498
December				
January				
February				
March 20-31	40	24	30.9	736
April	266	60	141	8,390
May	85	41	70.1	4,310
June	43	12	26.8	1,590
July	26	2.5	8.04	494
August	12	2.4	4.79	294
September	18	1.9	4.56	271

*Estimated.

Goose River at Hillsboro, N. Dak.

Location.- Chain gage in NE¼ sec. 5, T. 145 N., R. 51 W., on north edge of Hillsboro.

Records available.- March 1931 to September 30, 1934 (incomplete).

Extremes.- Maximum discharge recorded during year 1933-34, 107 second-feet Apr. 2 (gage height, 4.95 feet, affected by ice); minimum recorded, 0.8 second-foot at times May to July.

1931-34: Maximum discharge (estimated), 959 second-feet Mar. 3, 1932 (gage height, 15.14 feet, affected by ice); minimum, 0.2 second-foot several days in 1931 and 1932.

Remarks.- Records fair except those for days when discharge exceeds 100 second-feet, which are poor. Stage-discharge relation affected by ice each year from about Nov. 15 to Apr. 15, and frequently by debris on control. No records for periods omitted.

Discharge, in second-feet, 1931

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							13	3.7	12	1.2	1.6	0.7
2							25	4.3	11	1.4	1.8	.7
3							14	4.3	10	1.2	2.0	.5
4							9.2	2.6	9.7	.7	1.6	.6
5							11	3.7	9.4	.3	2.1	.3
6							30	.5	8.9	.4	1.8	.2
7							86	.4	8.3	.4	1.5	.3
8							94	.4	7.2	.6	1.6	.4
9							78	.6	6.7	1.4	1.5	.2
10							78	.6	6.1	1.4	2.0	.3
11							74	.6	5.8	2.0	2.4	.4
12							47	.5	4.8	5.0	1.8	.4
13							33	.5	4.1	9.4	1.4	.3
14							28	.4	3.4	3.0	1.2	.2
15							28	.5	2.1	2.1	1.5	.3
16							21	.4	2.1	1.5	1.8	.2
17						15	19	.7	1.5	.8	1.5	.3
18						*15	18	.7	1.4	.6	1.0	.3
19						*15	15	.7	1.0	.7	1.4	.5
20						*15	9.7	1.4	1.0	.4	1.8	.5
21						*15	8.9	2.0	.8	.7	1.5	.4
22						*15	8.9	3.0	.8	.2	1.0	.2
23						*15	7.8	3.9	.7	.2	.9	.2
24						*15	8.0	4.5	.5	.3	.7	.2
25						*15	8.0	5.0	.2	.4	.5	.2
26						*15	7.8	6.1	.6	.5	.5	.2
27						*15	7.8	7.8	3.0	.3	.6	.2
28						15	6.4	9.7	2.1	.3	.4	.3
29						10	4.8	13	1.5	.5	.2	.2
30						11	4.3	14	.6	.5	.9	.2
31						13		14		1.0	.8	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October				
November				
December				
January				
February				
March 17-31	15	10	14.3	424
April	94	4.3	26.8	1,590
May	14	.4	3.56	219
June	12	.2	4.24	252
July	9.4	.2	1.27	78
August	2.4	.2	1.33	82
September	.7	.2	.33	20
The period				2,660

*Estimated.

Goose River at Hillsboro, N. Dak.

(Continued)

Discharge, in second-feet, 1932

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						743	482	30	14	3.2	*0.3	*0.3
2						911	482	30	15	2.6	.3	*.4
3						899	460	30	18	2.8	*.3	.4
4						803	321	28	17	2.4	.3	*.4
5						482	241	30	17	1.8	*.3	*.4
6							331	48	16	2.1	*.3	.4
7						*400	427	57	16	1.8	*.3	*.4
8							449	65	15	1.5	*.3	*.3
9							416	57	15	1.2	.3	.3
10						*300	394	48	15	.9	.4	*.3
11							482	46	14	.8	.3	*.3
12						*200	537	41	14	.7	*.3	.3
13							*452	36	13	.5	*.3	*.3
14						*100	*326	32	14	.5	*.3	*.3
15							221	28	15	.5	*.3	.3
16							176	27	15	.3	.3	*.3
17							149	26	17	.4	*.3	*.3
18							123	*22	18	.5	*.4	*.3
19						*50	98	17	16	.5	.4	.3
20							70	16	15	.5	*.4	*.6
21							61	15	14	.7	.3	.8
22						23	65	12	12	.7	*.2	*.6
23						26	55	14	10	.4	.2	.3
24						25	54	12	6.9	.4	*.2	*.4
25						25	52	10	6.1	.5	*.2	.4
26						26	49	10	4.8	.5	*.2	*.4
27						98	49	12	3.9	.5	*.2	*.4
28						176	51	12	3.4	.4	*.3	*.5
29						438	50	13	3.0	.3	*.3	*.5
30						482	54	13	3.9	.3	*.3	.5
31						482		12		.3	.3	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October				
November				
December				
January				
February				
March	911	25	272	16,740
April	537	49	239	14,200
May	65	10	27.4	1,680
June	18	3.0	12.6	748
July	3.2	.3	.98	60
August	.4	.2	.29	18
September	.8	.3	.39	23
The period				35,470

*Estimated.

Goose River at Hillsboro, N. Dak.

(Continued)

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*0.5	0.9					231	26	13			
2	*.4	*.8					241	17	14			
3	*.4	.8					261	17	14			
4	.4	*.8					251	16	13			
5	*.4	*.8					231	15	10			
6	*.5	*.8					231	15	9.7			
7	.5	.8					251	15	9.7			
8	*.5	*.8					61	16	8.9			
9	*.5	*.9					48	17	7.8			
10	.5	.9					66	17	5.6			
11	*.6						74	18	5.6			
12	*.6						74	18	6.9			
13	.7						61	19	8.0			
14	*.7						57	20	9.4			
15	*.6						54	21	9.4			
16	*.6						51	21	9.2			
17	*.5					107	43	21	8.0			
18	.5					*90	*44	18	4.3			
19	*.5					74	46	15	2.4			
20	*.5					61	158	12	2.1			
21	.5					57	185	10	1.5			
22	*.5					61	123	12	.9			
23	*.5					36	82	16	.7			
24	*.5					36	65	17	.5			
25	*.5					43	45	16	.9			
26	.5					43	34	16	.9			
27	*.5					43	28	16	.9			
28	*.5					57	26	15	.9			
29	.5					78	25	14	1.2			
30	*.6					94	26	13	1.0			
31	*.8					140		12				

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	0.8	0.4	0.53	32
November 1-10	.9	.8	.83	16
December				
January				
February				
March 17-31	140	36	68.0	2,020
April	261	25	106	6,290
May	26	10	16.5	1,010
June	14	.5	6.01	358
July				
August				
September				

*Estimated.

Goose River at Hillsboro, N. Dak.

(Continued)

Discharge, in second-feet, 1934

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							21	5.6	0.6	0.8	0.9	1.5
2							65	5.6	.8	.9	.9	1.8
3							61	5.3	1.2	1.2	.9	1.8
4							49	4.8	5.6	1.2	.9	1.8
5							52	5.0	6.1	.9	.9	1.8
6							61	4.8	8.0	1.6	.9	1.8
7							61	3.4	8.3	1.6	.9	1.8
8							61	3.0	8.3	1.6	.9	1.8
9							49	2.6	6.1	1.6	1.6	1.8
10							54	2.0	5.3	1.5	1.6	2.4
11							61	1.5	4.1	1.8	1.6	2.4
12							57	1.4	3.2	1.8	1.6	2.4
13							44	1.2	2.2	1.8	1.8	2.4
14							51	1.4	2.1	2.0	1.8	3.7
15							30	1.0	1.8	2.0	1.8	3.4
16							28	1.0	1.8	1.5	1.8	3.4
17						30	28	*1.1	1.8	1.0	1.8	3.4
18						*29	30	*1.1	1.5	.9	1.8	3.4
19						28	24	1.2	1.5	.9	1.8	3.4
20						29	16	1.4	1.5	1.2	1.8	3.4
21						41	11	1.0	1.2	1.0	1.8	3.4
22						30	12	.8	1.2	.8	1.6	3.4
23						23	11	.9	1.2	.9	1.6	3.4
24						23	11	.8	1.0	.9	1.6	3.4
25						23	9.2	.8	1.2	1.0	1.5	3.4
26						24	8.6	.9	1.0	.9	1.5	3.2
27						19	8.0	.8	.9	.9	1.5	3.2
28						16	*7.4	.8	.9	.9	1.5	3.4
29						6.9	6.7	.8	.9	1.2	1.5	3.4
30						12	5.6	.8	.9	1.2	1.5	3.4
31						17		.8		.9	1.5	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October				
November				
December				
January				
February				
March 17-31	41	6.9	23.4	696
April	65	5.6	33.1	1,970
May	5.6	.8	2.05	126
June	8.3	.8	2.75	163
July	2.0	.8	1.24	76
August	1.8	.9	1.45	89
September	3.7	1.5	2.77	165
The period				3,280

*Estimated.

Red Lake near Red Lake, Minn.

Location.- Water-stage recorder in NW¼ sec. 28, T. 152 N., R. 36 W., just above dam at outlet and about 18 miles northwest of Red Lake, Minn. Staff gage at same site prior to Sept. 6, 1934. Zero of gage is 1,170 feet above mean sea level.

Drainage area.- 1,950 square miles.

Records available.- May 1933 to September 1934 at present site, April 1930 to September 1933 at Waskish, June 1930 to November 1932 at Redby.

Extremes.- Maximum water-surface elevation recorded during year, 1,172.90 feet June 25; minimum recorded, 1,171.20 feet Sept. 27.
1930-34: Maximum water-surface elevation, 1,174.85 feet (at Waskish) June 2, 1930; minimum, 1,171.10 feet Sept. 19, 1933.

Remarks.- Records excellent. Water level subject to fluctuation caused by changes in direction and velocity of wind and by seiches.

Elevation, in feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	71.99	71.85	72.00	72.12				72.47	72.36	72.60	72.43	71.83
2	72.04	71.71	71.98				72.36	72.50		72.44	72.40	71.87
3	71.96	71.98	72.00				72.34	72.63		72.60	72.35	71.59
4	71.88	72.18	71.96	72.13			72.37	72.48		72.50	72.32	71.80
5	71.96	71.85	71.96	72.14				72.45		72.60	72.38	71.82
6	72.03	71.80	71.96	72.15						72.65	72.40	71.81
7	72.07	71.88	71.96	72.17						72.63	72.39	71.79
8	72.07	71.89	71.96	72.17			72.34	72.70		72.52	72.10	71.84
9	71.99	71.91	71.96	72.16			72.34	72.29		72.52		71.88
10	71.97	71.92	71.98	72.13			72.34	72.39		72.61	72.18	71.83
11	71.50	71.91	71.98	72.14			72.32	72.59		72.58		71.81
12	71.92	71.91	71.98	72.17			72.31	72.63		72.54	72.01	71.85
13	71.95	71.96	72.00	72.16			72.30	72.51		72.56	72.15	71.86
14	71.98	71.94	72.03				72.30			72.46	72.37	71.70
15	72.04	71.91	72.06	72.12						72.55	72.37	71.74
16	71.81	71.96	72.08	72.10			72.30		72.52	72.63	72.12	71.79
17	71.80	71.97		72.14					72.43	72.53	72.09	71.73
18	71.71	71.97		72.12			72.32	72.65	72.45	72.49	72.04	71.78
19	71.84	71.94	72.12	72.13				72.61	72.60	72.55	71.76	71.71
20	72.25	72.00		72.16				72.56	72.70	72.74	72.02	71.66
21	71.87	71.93	72.08	72.14		72.22	72.39		72.63	72.88	71.96	71.71
22	71.99	71.96	72.08	72.15		72.22	72.25		72.67	72.70	71.98	71.70
23	72.09	71.93	72.08	72.17		72.22	72.30		72.54	72.44	71.90	71.78
24	72.07	71.96	72.06	72.14		72.22	72.32	72.43	72.56	72.40	71.66	71.75
25	72.02	71.91	72.08	72.15		72.22	72.32	72.45	72.88	72.41	71.79	71.72
26	71.94	71.96	72.08	72.16			72.30		72.82	72.40	71.91	71.51
27	71.91	71.94	72.08	72.14			72.30		72.67	72.33	71.93	71.49
28	71.93	71.98	72.09	72.10			72.35	72.55	72.48	72.38	71.97	71.70
29	71.98	72.00	72.11				72.36		72.61		71.90	71.72
30	72.04	71.98	72.11						72.58	72.35	71.92	71.69
31	72.01		72.12					72.36		72.45	71.95	

Note.- Add 1,100 feet to obtain elevation above mean sea level.

Red Lake River near Red Lake, Minn.

Location.- Water-stage recorder in NW¼ sec. 28, T. 152 N., R. 36 W., just below dam at outlet of lower Red Lake, about 18 miles northwest of Red Lake, Minn. Staff gage at same site prior to Sept. 7, 1934. Zero of gage is 1,170 feet above mean sea level.

Drainage area.- 1,950 square miles.

Records available.- May 1933 to September 1934.

Extremes.- Maximum discharge recorded during year, 52 second-feet May 2, 3 (gage height, 2.48 feet); no flow Aug. 31 to Sept. 10.
1933-34: Maximum discharge recorded, that of May 2, 3, 1934; no flow Sept. 19, 1933, and Aug. 31 to Sept. 10, 1934.

Remarks.- Records poor. Stage-discharge relation affected by ice Nov. 1 to Apr. 18, and by aquatic growth or temporary construction work Oct. 1-31, June 18 to Sept. 30. Flow completely regulated by dam at outlet of Red Lake.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.6	4.7	2.4	0.3			*8.0	46	14	12	0.1	0
2	4.0	1.2	2.1	*.3			12	48	*12	5.4	.1	0
3	2.1	7.0	2.4	*.3			14	48	*12	3.8	.1	0
4	1.3	14	1.9	.3			*15	35	*12	3.0	.1	0
5	2.7	3.4	1.9	.4			*16	39	*12	3.2	.1	0
6	4.2	2.1	1.9	.4		*0.5	17	*41	*9.0	3.2	.1	0
7	5.8	2.6	1.9	.5			*18	*42	*9.0	3.2	.4	0
8	6.1	3.2	.9	.5			*19	44	*9.0	2.8	3.4	0
9	4.0	2.6	.4	.4			20	43	*9.0	2.6	*5.1	0
10	3.7	2.7	.4	.3			20	34	*9.0	4.2	6.8	.7
11	3.7	2.6	.4	.4			19	25	*6.0	4.0	*4.4	1.3
12	3.0	1.9	.5	.5			19	24	*6.0	4.0	2.0	2.0
13	3.7	2.6	.6	.4			18	21	*6.0	4.8	5.8	2.2
14	4.7	2.3	.7	*.4		*.7	19	*21	*6.0	4.4	16	1.1
15	6.7	1.2	1.0	.3			18	*21	*6.0	5.2	9.6	1.8
16	1.9	1.9	1.0	.2	*0.4		23	*22	4.2	5.4	6.0	2.8
17	1.7	2.6	*.9	.4		.8	*24	*22	2.6	5.6	5.8	1.6
18	1.9	4.0	*.8	.3		*.8	26	22	2.8	5.2	4.2	2.6
19	2.4	3.2	.7	.3		*.8	*31	22	3.2	6.8	.2	1.3
20	15	4.7	*.6	.4		*.7	*36	22	2.6	18	5.4	1.3
21	3.4	3.0	.5	.4		.7	41	*21	3.4	19	3.6	2.2
22	7.0	3.7	.5	.4		.7	30	*21	3.4	6.8	4.6	2.0
23	10	3.0	.5	.5		.7	33	20	2.0	4.2	3.8	3.6
24	8.2	3.7	.4	.4		.7	35	18	3.2	3.6	.1	3.0
25	8.2	2.7	.5	.4		.7	35	19	3.2	.9	1.3	2.4
26	5.8	4.2	.5	.4		*1.0	33	*17	3.4	.2	3.4	1.1
27	5.0	3.2	.5	.4		*2.0	33	*15	2.8	.2	4.6	.7
28	5.5	4.2	.6	.2		*3.0	37	13	2.2	.4	5.0	4.8
29	7.0	4.7	.7	*.2		*4.0	38	*13	2.4	*.5	3.2	5.2
30	9.0	4.2	.7	*.2		*5.0	*42	*14	1.6	.6	3.6	4.6
31	7.9		.7	*.2		*6.0		14		.2	1.8	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	15	1.3	5.10	314
November	14	1.2	3.57	212
December	2.4	.4	.95	59
January	.5	.2	.35	22
February			*.4	22
March	6.0		1.19	73
April	42	8.0	25.0	1,490
May	48	13	26.7	1,640
June	14	1.6	6.00	357
July	19	.2	4.63	284
August	16	.1	3.57	220
September	5.2	0	1.61	96
The year	48	0	6.61	4,790

*Estimated.

Red Lake River at Highlanding, near Goodridge, Minn.

Location.- Staff gage on line between secs. 28 and 29, T. 153 N., R. 40 W., at bridge at Highlanding, 7 miles south of Goodridge.

Records available.- October 1930 to September 1934.

Extremes.- Maximum discharge recorded during year, 58 second-feet May 3 (gage height, 1.60 feet); no flow for several months.
1930-34: Maximum discharge recorded, 254 second-feet Apr. 3, 1931 (gage height, 3.38 feet, affected by ice); maximum gage height, 4.37 feet, affected by ice, Apr. 9, 1932; no flow for periods in 1931-34.

Remarks.- Records fair. Stage-discharge relation affected by ice Nov. 2 to Apr. 18, and by aquatic growth Oct. 1 to Nov. 1, Apr. 26 to May 1, May 17 to Aug. 5. Discharge estimated for Nov. 14, 15, Mar. 29, Apr. 1.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.2	6.4				0	14	25	16	11	0.3	
2	1.5	3.9				0	16	42	15	16	.1	
3	1.9	3.9				0	32	58	11	15	.1	
4	1.2	2.5				0	34	56	7.3	15	.1	
5	.5	3.2				0	29	52	6.8	12	.1	
6	.4	2.5				0	26	46	4.9	11	.1	
7	.3	2.5				0	29	43	3.9	12	0	
8	.4	3.2				0	32	40	5.9	11	0	
9	.3	3.9				0	29	34	8.8	13	0	
10	.3	3.9				0	26	21	9.8	11	0	
11	.4	3.9				0	25	37	4.9	8.3	0	
12	.4	3.2				0	32	28	6.8	13	0	
13	.3	2.2				0	26	23	6.8	9.8	0	
14	.5	2.0				0	21	19	6.4	7.3	0	
15	1.2	1.0				0	20	20	6.8	6.8	0	
16	2.2	0				0	15	19	5.9	2.9	0	
17	1.9	0				0	24	20	12	1.5	0	
18	3.2	0				0	26	19	11	1.2	0	
19	2.2	0				0	32	18	9.8	.8	0	
20	1.9	0				0	29	18	11	.5	0	
21	2.5	0				0	28	17	9.8	.5	0	
22	2.2	0				0	26	17	21	.5	0	
23	2.2	0				0	25	16	20	.4	0	
24	3.2	0				0	24	17	19	.5	0	
25	3.2	0				0	23	16	21	.5	0	
26	2.9	0				0	26	17	22	.5	0	
27	3.9	0				0	29	16	21	.4	0	
28	5.4	0				0	28	16	20	.4	0	
29	4.9	0				1.0	26	17	17	.3	0	
30	6.4	0				3.9	23	17	16	.2	0	
31	5.4					11		18		.2	0	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	6.4	0.3	2.11	130
November	6.4	0	1.61	96
December	0		0	0
January	0		0	0
February	0		0	0
March	11	0	.51	32
April	34	14	25.8	1,540
May	58	16	26.5	1,630
June	22	3.9	11.9	709
July	16	.2	5.92	364
August	.3	0	.03	1.6
September	0	0	0	0
The year	58	0	6.21	4,500

Note.- No flow during months left blank.

Red Lake River at Crookston, Minn.

Location.- Water-stage recorder in sec. 30, T. 150 N., R. 46 W., at highway bridge in Crookston, a quarter of a mile below dam and power house of Crookston Light, Water & Power Co.

Drainage area.- 5,320 square miles.

Records available.- May 1901 to September 1934.

Average discharge.- 33 years, 984 second-feet.

Extremes.- Maximum discharge during year, 1,490 second-feet Apr. 8 (gage height, 6.89 feet); minimum daily discharge, 7.0 second-feet Oct. 2-4.
1901-34: Maximum discharge, 14,700 second-feet July 5, 1919; minimum, 5 second-feet Aug. 6-8, 1925.

Remarks.- Records good. Stage-discharge relation affected by aquatic growth Oct. 1 to Nov. 20, June 1 to Sept. 30. Flow regulated by power plant above station.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.5	7.0	16	21	9.0	36	31	171	31	54	18	10
2	7.0	7.0	12	18	9.0	50	172	181	31	189	20	9.5
3	7.0	7.5	10	17	8.5	82	391	277	36	71	20	9.5
4	7.0	8.0	10	15	8.5	256	415	159	91	61	17	9.5
5	9.0	9.0	12	15	8.5	436	703	262	67	123	16	9.0
6	9.0	11	15	16	8.5	297	931	335	32	212	17	9.0
7	8.0	12	18	16	8.5	234	1,100	349	121	63	16	9.0
8	7.5	13	21	16	8.5	257	1,160	274	109	25	14	9.5
9	7.0	14	22	13	8.5	229	1,270	220	60	27	10	9.0
10	7.0	14	20	16	8.5	183	951	191	32	28	9.5	8.5
11	7.5	15	18	19	8.5	98	969	245	42	30	10	7.5
12	8.0	16	18	22	9.0	22	693	171	64	22	10	8.5
13	8.0	13	22	28	8.5	39	660	84	82	19	10	9.0
14	10	12	22	22	9.0	54	603	191	86	66	9.5	7.5
15	13	11	24	20	8.5	55	490	208	30	25	8.5	8.0
16	13	12	21	19	9.0	88	434	153	76	21	9.0	8.5
17	12	13	21	18	16	113	291	38	51	21	10	8.5
18	11	14	20	16	39	193	356	131	36	28	10	9.0
19	10	11	20	14	45	119	475	74	139	25	10	8.5
20	10	10	24	14	31	233	440	124	65	25	10	9.0
21	9.0	11	26	13	30	191	329	78	82	22	11	9.0
22	9.0	12	26	13	32	68	280	131	112	22	10	9.0
23	8.0	12	26	11	31	185	264	134	109	24	12	9.5
24	9.0	11	25	11	30	92	280	109	67	24	12	9.5
25	8.0	14	25	12	31	16	280	113	194	22	12	9.5
26	8.0	13	22	12	32	25	280	73	204	24	12	9.0
27	10	11	21	9.5	32	27	274	93	197	24	12	8.5
28	9.0	11	21	12	31	188	250	31	95	20	12	8.0
29	9.0	12	20	14		24	198	92	34	19	11	8.5
30	8.0	18	21	10		24	65	35	36	20	11	9.0
31	7.0		22	10		138		34		17	11	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	13	7.0	8.79	540
November	16	7.0	11.8	899
December	26	10	20.0	1,230
January	28	9.5	15.6	959
February	45	8.5	18.5	1,030
March	436	16	131	8,040
April	1,270	31	501	29,820
May	349	31	154	9,440
June	204	30	80.4	4,780
July	212	17	44.2	2,720
August	20	8.5	12.3	755
September	10	7.5	8.87	528
The year	1,270	7.0	83.6	60,540

Thief Lake near Middle River, Minn.

Location.- Staff gage in SE¼ sec. 20, T. 158 N., R. 41 W., on dam at outlet of Thief Lake, 10 miles east of Middle River.

Records available.- April to September 1933, July to September 1934.

Extremes.- Maximum gage height recorded during period, -4.27 feet July 5; minimum recorded, -5.20 feet Sept. 11, 13.
1933-34: Maximum gage height recorded, -3.47 feet Apr. 25, 1933; minimum, that of September 1934.

Remarks.- Zero of gage is at crest of dam. No outflow during entire year.

Gage height, in feet, 1934

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1												-5.06
2												
3												
4												
5										-4.27		
6												
7											-4.80	
8												
9												
10												
11										-4.32	-4.90	-5.20
12												
13												-5.20
14										-4.42		
15												
16												
17												
18										-4.36		
19												
20												
21										-4.37		
22											-4.98	
23												
24												
25										-4.58	-5.00	
26											-5.04	
27												
28										-4.60		
29												
30												
31												

Thief River near Thief River Falls, Minn.

Location.- Staff gage in sec. 3, T. 154 N., R. 43 W., 5 miles north of Thief River Falls. Chain gage at same site and datum prior to July 3, 1934.

Drainage area.- 1,010 square miles.

Records available.- July 1909 to September 1917, April 1920 to September 1921, October 1922 to September 1924, October 1928 to September 1934.

Average discharge.- 16 years (1909-17, 1922-24, 1928-34), 79.8 second-feet.

Extremes.- Maximum discharge recorded during year, 150 second-feet Apr. 7 (gage height, 5.67 feet, affected by ice); no flow for several months.
1909-17, 1920-21, 1922-24, 1928-34: Maximum discharge recorded, 4,080 second-feet Apr. 23, 1916 (gage height, 14.5 feet); no flow in fall and winter of several years.

Remarks.- Records fair. Stage-discharge relation affected by ice Mar. 20 to Apr. 9. Discharge interpolated for Mar. 21-23, 25-29.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						0	1.2	2.6	0.1	1.1		
2						0	1.4	2.2	0	7.8		
3						0	36	3.4	0	2.8		
4						0	36	3.4	0	5.4		
5						0	45	3.4	.8	4.6		
6						0	89	3.0	.8	5.4		
7						0	133	18	.8	3.7		
8						0	100	16	.6	2.8		
9						0	136	16	.5	2.8		
10						0	131	13	.5	2.8		
11						0	112	8.5	.4	1.8		
12						0	98	10	.2	1.4		
13						0	89	8.5	.4	1.4		
14						0	82	8.5	.3	.9		
15						0	65	6.7	.3	.3		
16						0	53	5.8	.3	.3		
17						0	37	3.6	.3	.3		
18						0	37	3.2	.2	.2		
19						0	31	2.4	.1	.2		
20						.5	24	1.6	.3	.2		
21						.4	19	2.0	.3	.2		
22						.2	16	1.1	.3	.2		
23						.1	16	0	.2	.2		
24						0	9.5	0	.3	.1		
25						1	8.0	.4	.4	.1		
26						.2	6.7	.1	.5	.1		
27						.3	4.0	0	.8	.1		
28						.5	4.0	0	.9	.1		
29						.6	3.6	.1	1.8	0		
30						.7	4.0	.1	1.4	0		
31						.9		0		0		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	0		0	0
November	0		0	0
December	0		0	0
January	0		0	0
February	0		0	0
March	.9	0	.15	8.9
April	136	1.2	47.6	2,830
May	18	0	4.63	285
June	1.8	0	.46	27
July	7.8	0	1.53	94
August	0		0	0
September	0		0	0
The year	136	0	4.48	3,240

Note.- No flow during months left blank.

Clearwater Lake near Leonard, Minn.

Location.- Staff gage in E½SW¼ sec. 12, T. 149 N., R. 36 W., on abutment of dam 8 miles northeast of Leonard, Minn. Zero of gage is 3.00 feet below crest of dam.

Records available.- June to September 1934.

Extremes.- Maximum stage recorded during period, 3.62 feet June 28; minimum stage recorded, 3.20 feet Aug. 24 to Sept. 1.

Remarks.- Records excellent.

Gage height, in feet, 1934

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1										3.56	3.28	3.20
2										3.54	3.28	3.22
3										3.52	3.28	3.22
4										3.54	3.28	3.24
5										3.52	3.28	3.24
6										3.52	3.26	3.24
7										3.48	3.26	3.24
8										3.48	3.26	3.24
9										3.46	3.26	3.24
10										3.50	3.26	3.22
11										3.50	3.24	3.22
12										3.50	3.24	3.22
13										3.50	3.24	3.24
14										3.50	3.24	3.26
15										3.48	3.26	3.26
16										3.46	3.26	3.26
17										3.44	3.26	3.26
18										3.44	3.26	3.26
19										3.44	3.26	3.26
20										3.42	3.26	3.26
21										3.44	3.24	3.26
22										3.40	3.24	3.24
23										3.36	3.22	3.26
24										3.34	3.20	3.34
25										3.34	3.20	3.36
26										3.32	3.20	3.36
27										3.32	3.20	3.36
28									3.62	3.30	3.20	3.38
29									3.60	3.30	3.20	3.38
30									3.58	3.30		3.38
31										3.28	3.20	

Clearwater River near Leonard, Minn.

Location.- Staff gage in E½SW¼ sec. 12, T. 149 N., R. 36 W., 300 feet below dam at outlet of Clearwater Lake and 8 miles northeast of Leonard. Temporary staff gage to independent datum 700 feet below dam used June 28 to Sept. 9.

Records available.- June to September 1934.

Extremes.- Maximum discharge recorded during period, 40 second-feet June 28, 29; minimum discharge recorded, 5.5 second-feet Aug. 29.

Remarks.- Records good. Discharge interpolated for Aug. 30.

Discharge, in second-feet, 1934

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1										34	11	6.7
2										36	12	6.7
3										34	12	7.5
4										34	10	7.5
5										34	10	7.5
6										34	11	8.3
7										33	13	8.3
8										26	13	8.3
9										25	8.7	7.5
10										28	9.5	7.8
11										27	7.9	7.8
12										26	7.1	7.8
13										26	6.4	7.8
14										26	7.1	8.6
15										23	7.1	8.6
16										23	8.7	8.6
17										22	8.7	8.6
18										20	8.7	8.6
19										22	8.7	8.6
20										20	8.7	7.8
21										20	7.9	8.6
22										18	7.9	7.8
23										18	7.9	8.6
24										17	7.1	12
25										16	6.4	14
26										15	6.4	15
27										14	5.8	15
28									40	12	6.1	16
29									40	11	5.5	15
30									38	12	5.8	15
31										11	6.1	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October				
November				
December				
January				
February				
March				
April				
May				
June				
July	36	11	23.1	1,420
August	13	5.5	8.46	520
September	16	6.7	9.53	567
The period				2,510

Forest River near Minto, N. Dak.

Location.- Chain gage on line between secs. 1 and 12, T. 155 N., R. 53 W., 3 miles southwest of Minto.

Records available.- March 1932 to September 1934 (incomplete).

Extremes.- Maximum discharge recorded during year, 90 second-feet Apr. 9 (gage height, 4.95 feet, affected by ice); no flow July 18 to Sept. 30.
1932-34: Maximum discharge recorded, 700 second-feet Apr. 2, 1933 (gage height, 12.95 feet, affected by ice); no flow for many days each year.

Remarks.- Records good. Stage-discharge relation affected by ice Mar. 22 to Apr. 12. Discharge estimated for Mar. 23-27, Mar. 29 to Apr. 3, May 31, June 18, July 1, 16. No records Oct. 1 to Mar. 21.

Discharge, in second-feet, 1934

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							17	16	5.8	2.3		
2							17	15	5.4	2.1		
3							20	14	5.1	2.1		
4							30	13	4.8	2.3		
5							35	13	5.6	2.3		
6							44	13	4.9	2.4		
7							61	12	6.1	2.0		
8							79	11	6.8	2.0		
9							79	11	7.9	2.0		
10							69	11	7.6	1.9		
11							61	11	7.6	1.7		
12							61	11	6.4	1.3		
13							61	11	6.0	1.2		
14							57	11	5.7	1.0		
15							57	9.9	5.3	.1		
16							57	10	5.3	.1		
17							44	10	5.1	.1		
18							38	9.6	4.6	0		
19							36	9.6	4.2	0		
20							38	9.6	4.0	0		
21							35	9.6	3.7	0		
22						29	29	14	4.2	0		
23						27	26	12	3.2	0		
24						25	22	9.9	2.7	0		
25						23	22	9.0	4.0	0		
26						21	19	8.6	4.0	0		
27						19	18	7.9	4.0	0		
28						17	17	7.9	4.0	0		
29						17	16	6.8	4.0	0		
30						17	16	6.4	2.5	0		
31						17		6.1		0		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October				
November				
December				
January				
February				
March 22-31	29	17	21.2	420
April	79	16	39.4	2,340
May	16	6.1	10.6	654
June	7.9	2.5	5.02	299
July	2.4	0	.87	53
August	0	0	0	0
September	0	0	0	0
The period				3,770

Note.- No flow during August and September.

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Park River at Grafton, N. Dak.

Location.- Chain gage in NE¼ sec. 13, T. 157 N., R. 53 W., at Grafton.

Records available.- April 1931 to September 1934 (incomplete).

Extremes.- Maximum discharge recorded during year, 393 second-feet Apr. 9 (gage height, 6.61 feet, affected by ice); no flow for several days in June, July, August, September.
1931-34: Maximum discharge recorded, 2,010 second-feet Apr. 2, 1933 (gage height, 15.18 feet, affected by ice); no flow at times.

Remarks.- Records good except those for period of ice effect, Mar. 22 to Apr. 14, which are fair. Discharge estimated for Mar. 23-27, Mar. 29 to Apr. 1. No records Oct. 1 to Mar. 21.

Discharge, in second-feet, 1934

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							24	6.5	0.3	0		0
2							33	6.5	.2	0		0
3							34	6.5	.1	0		0
4							65	6.5	.1	0		0
5							112	5.5	.5	0		0
6							126	5.5	.2	.1		0
7							185	4.2	.6	.1		0
8							273	3.2	.6	0		0
9							393	2.5	.7	0		0
10							251	1.7	.6	0		0
11							174	.8	.8	0		0
12							126	.7	1.0	0		0
13							90	1.0	1.0	0		0
14							58	1.1	.9	0		0
15							82	1.2	.7	0		0
16							48	1.2	.7	0		0
17							40	1.0	.7	0		0
18							43	1.0	.4	0		0
19							34	1.6	.2	.1		0
20							29	1.4	.2	.1		0
21							26	1.3	.1	0		0
22						32	22	1.0	.1	0		0
23						29	20	.9	.1	0		0
24						27	14	.5	0	0		0
25						24	14	.8	.8	0		0
26						21	12	.6	.3	0		0
27						19	9.0	.6	.3	0		.8
28						16	8.4	.5	.1	0		.8
29						16	7.8	.4	.1	0		.5
30						16	7.1	.3	0	0		.5
31						16		.4		0		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October				
November				
December				
January				
February				
March 22-31	32	16	21.6	428
April	393	7.1	78.0	4,640
May	6.5	.3	2.16	133
June	1.0	0	.41	25
July	.1	0	.01	.79
August	0	0	0	0
September	.8	0	.08	4.8
The period				5,230

Note.- No flow during August.

South Fork of Two Rivers at Pelan, Minn.

Location.- Chain gage in SW¼ sec. 30, T. 160 N., R. 44 W., a quarter of a mile west of Pelan.

Records available.- August 1928 to September 1934 (incomplete).

Extremes.- Maximum discharge recorded during year, 46 second-feet Apr. 8, 9; maximum gage height recorded, 2.44 feet Apr. 8, affected by ice; no flow for several months.

1928-34: Maximum discharge recorded, 1,810 second-feet May 13, 1930 (gage height, 10.18 feet); no flow frequently.

Remarks.- Records good. Stage-discharge relation affected by ice Apr. 4-12 and by beaver dam throughout rest of year. Discharge estimated for Apr. 1-3. No records Nov. 16 to Mar. 31.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0					0	0.4	0.3			
2		0					0	.4	.2			
3		0					0	.4	.2			
4		0					.2	.4	.1			
5		0					19	.4	.1			
6		0					30	.4	.1			
7		0					42	.4	.1			
8		0					46	.6	.1			
9		0					46	.6	0			
10		0					24	.6	0			
11		0					16	.6	0			
12		0					10	.6	0			
13		0					5.8	.6	0			
14		0					3.6	.6	0			
15		0					2.8	.6	0			
16							3.2	.6	0			
17							2.8	.7	0			
18							2.4	.6	0			
19							2.0	.4	0			
20							1.8	.6	0			
21							1.0	.6	0			
22							.7	.4	0			
23							1.2	.4	0			
24							.6	.4	0			
25							.6	.4	0			
26							.4	.4	0			
27							.4	.4	0			
28							.4	.4	0			
29							.4	.3	0			
30							.4	.3	0			
31								.3				

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	0	0	0	0
November				
December				
January				
February				
March				
April	46	0	8.79	523
May	.7	.3	.48	29
June	.3	0	.04	2.4
July	0	0	0	0
August	0	0	0	0
September	0	0	0	0

Note.- No flow during October, July to September.

South Fork of Two Rivers at Bronson, Minn.

Location.- Chain gage in SW¼ sec. 30, T. 161 N., R. 46 W., a quarter of a mile west of Bronson. Zero of gage is 930.46 feet above mean sea level (adjustment of 1928 by Geodetic Survey of Canada).

Records available.- September 1928 to September 1934.

Extremes.- Maximum discharge recorded during year, 64 second-feet Apr. 10 (gage height, 3.00 feet, affected by ice); minimum recorded, 1.2 second-feet for several days in July and August.

1928-34: Maximum discharge recorded, 1,820 second-feet May 15, 1930 (gage height, 8.90 feet); minimum, that of July and August 1934.

Remarks.- Records fair. Stage-discharge relation affected by ice Apr. 1-12 and by debris on control Oct. 1 to Nov. 15, May 1 to Sept. 30. No records Nov. 16 to Mar. 31.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*1.4	*1.6					5.0	4.6	1.9	1.6	1.4	2.0
2	*1.4	*1.6					5.0	4.5	1.9	1.6	1.7	2.0
3	1.4	*1.6					5.4	4.2	1.9	1.6	1.2	2.0
4	*1.4	*1.5					5.8	4.0	1.9	1.5	1.2	1.8
5	*1.4	*1.5					5.8	3.9	1.9	1.5	1.4	1.8
6	1.4	*1.5					7.6	3.8	1.9	1.6	1.6	2.0
7	*1.5	*1.4					6.0	3.7	2.0	1.5	1.6	2.0
8	*1.6	*1.4					56	3.4	2.2	1.4	1.8	2.0
9	*1.6	1.4					62	3.3	2.2	1.4	1.8	2.0
10	1.7	*1.4					64	3.0	2.2	1.5	2.0	2.0
11	*1.7	*1.3					52	2.9	2.8	1.4	2.0	1.7
12	*1.7	*1.3					37	2.8	2.8	1.4	2.0	1.9
13	*1.7	*1.3					37	2.7	2.8	1.4	1.8	1.8
14	1.7	*1.2					48	2.4	2.2	1.2	1.8	2.2
15	*1.7	1.2					34	2.3	1.6	1.2	2.0	2.0
16	1.7						23	2.5	1.4	1.2	2.2	2.2
17	*1.7						20	2.6	1.5	1.4	2.3	2.2
18	*1.7						18	2.7	1.6	1.4	2.2	2.4
19	*1.7						16	2.9	1.6	1.2	2.2	2.2
20	*1.7						14	2.9	1.4	1.2	2.0	2.2
21	1.7						14	2.7	1.4	1.2	2.0	2.2
22	*1.7						11	2.7	1.5	1.2	1.8	2.2
23	*1.7						9.4	2.3	1.6	1.2	1.8	2.0
24	1.7						7.3	2.1	1.6	1.2	1.8	2.0
25	*1.7						7.0	1.9	1.6	1.2	1.6	1.8
26	*1.7						6.6	1.9	1.6	1.2	1.6	2.0
27	*1.7						6.2	1.9	1.6	1.2	1.8	2.0
28	1.7						6.2	1.9	1.5	1.2	1.8	1.8
29	*1.7						5.8	1.9	1.4	1.4	2.0	1.6
30	*1.6						5.0	1.9	1.4	1.6	2.0	1.6
31	*1.6							1.9		1.6	2.0	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	1.7	1.4	1.62	100
November 1-15	1.6	1.2	1.41	42
December				
January				
February				
March				
April	64	5.0	20.0	1,190
May	4.6	1.9	2.85	175
June	2.8	1.4	1.83	109
July	1.6	1.2	1.37	84
August	2.3	1.2	1.82	112
September	2.4	1.6	1.99	118

*Estimated.

Middle Fork of Two Rivers near Hallock, Minn.

Location.- Staff gage in SE¼ sec. 17, T. 161 N., R. 48 W., 1½ miles above mouth and 2½ miles southeast of Hallock.

Records available.- April 1931 to September 1934.

Extremes.- Maximum discharge recorded during year, 12 second-feet Apr. 8 (gage height, 1.70 feet); no flow for several months.
1931-34: Maximum discharge recorded, 265 second-feet Apr. 19, 1932; no flow for several months each year.

Remarks.- Records poor. Stage-discharge relation affected by ice Apr. 5, 6, 11-13, and by debris on control Apr. 21 to May 24. Discharge estimated for Apr. 1-4, May 27 to June 8.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							0	0.2	0			
2							1.0	.2	0			
3							1.0	.2	0			
4							2.0	.2	0			
5							2.9	.1	0			
6							7.3	.1	.1			
7							1.3	.1	.1			
8							8.8	.1	.1			
9							1.3	.1	.1			
10							.3	.1	.1			
11							.3	.1	.1			
12							.3	.1	.1			
13							.3	.1	0			
14							.2	0	.1			
15							.2	0	0			
16							.2	0	0			
17							.2	0	0			
18							.2	0	0			
19							.2	.1	0			
20							.2	0	0			
21							.2	0	0			
22							.2	0	0			
23							.2	0	0			
24							.2	0	0			
25							.2	0	0			
26							.2	0	0			
27							.2	0	0			
28							.2	0	0			
29							.2	0	0			
30							.2	0	0			
31								0				

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	0	0	0	0
November	0	0	0	0
December	0	0	0	0
January	0	0	0	0
February	0	0	0	0
March	0	0	0	0
April	8.8	0	1.01	60
May	.2	0	.06	3.6
June	.1	0	.03	1.6
July	0	0	0	0
August	0	0	0	0
September	0	0	0	0
The year	8.8	0	.09	65.2

Note.- No flow during months left blank.

North Fork of Two Rivers near Lancaster, Minn.

Location.- Staff gage in NW¼ sec. 6, T. 162 N., R. 47 W., 8 miles northeast of Lancaster. Zero of gage is 963.50 feet above mean sea level (adjustment of 1928 by Geodetic Survey of Canada).

Records available.- April 1929 to September 1934.

Extremes.- Maximum discharge recorded during year, 15 second-feet Apr. 9 (gage height, 1.06 feet); no flow for several months.
1929-34: Maximum discharge recorded, 212 second-feet May 12, 1930 (gage height, 3.00 feet); no flow for several months each year.

Remarks.- Records poor. Discharge estimated for Apr. 1-8 and interpolated for days when gage was not read during period Apr. 13 to May 15.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							0	0.1				
2							0	.1				
3							0	0				
4							0	0				
5							0	0				
6							2.0	0				
7							5.0	0				
8							10	0				
9							15	0				
10							.6	0				
11							.5	0				
12							.4	0				
13							.3	0				
14							.3	0				
15							.2	0				
16							.2	0				
17							.1	0				
18							0	0				
19							0	0				
20							0	0				
21							0	0				
22							0	0				
23							0	0				
24							0	0				
25							0	0				
26							0	0				
27							0	0				
28							0	0				
29							0	0				
30							.1	0				
31								0				

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	0	0	0	0
November	0	0	0	0
December	0	0	0	0
January	0	0	0	0
February	0	0	0	0
March	0	0	0	0
April	15	0	1.16	69
May	.1	0	.01	.40
June	0	0	0	0
July	0	0	0	0
August	0	0	0	0
September	0	0	0	0
The year	15	0	.10	69

State Ditch 85 near Lancaster, Minn.

Location.- Staff gage in southwest corner of sec. 6, T. 162 N., R. 46 W., 7 miles northeast of Lancaster. Zero of gage is 969.03 feet above mean sea level (adjustment of 1928 by Geodetic Survey of Canada).

Records available.- April 1929 to September 1934.

Extremes.- Maximum discharge recorded during year, 11 second-feet Apr. 12 (gage height, 1.14 feet); no flow several months of year.
1929-34: Maximum discharge recorded, 202 second-feet Apr. 18, 1932; no flow for several months most years.

Remarks.- Records poor.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							*0	0.5	*0	*0		
2							*0	*.4	*0	*.5		
3							*0	*.4	*0	*1.0		
4							*0	.3	*0	*1.5		
5							*0	.1	*0	*1.5		
6							*.5	*.1	*.5	*1.0		
7							*1.0	*.1	*.5	1.0		
8							*2.0	.1	*.5	.7		
9							2.9	*.1	*.5	*.6		
10							7.6	*.1	*.5	*.4		
11							6.5	.1	*.4	*.3		
12							9.0	*.1	*.4	*.1		
13							*8.1	*.1	*.4	0		
14							*7.2	*0	*.3	0		
15							*6.4	*0	*.2	0		
16							*5.5	0	0	0		
17							4.6	0	*0	0		
18							*3.6	*0	*0	0		
19							2.6	*0	*0	0		
20							*2.5	*0	0	0		
21							*2.4	*0	*0	0		
22							*2.3	0	*0	0		
23							*2.2	0	*.1	0		
24							2.1	0	*.1	0		
25							1.7	*0	.1	0		
26							*1.3	0	*.1	0		
27							.9	*0	.1	0		
28							*.8	*0	0	0		
29							*.7	*0	*0	0		
30							*.6	*0	*0	0		
31								*0		0		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	0	0	0	0
November	0	0	0	0
December	0	0	0	0
January	0	0	0	0
February	0	0	0	0
March	0	0	0	0
April	9.0	0	2.83	169
May	.5	0	.08	5.0
June	.5	0	.16	9.3
July	1.5	0	.28	17
August	0	0	0	0
September	0	0	0	0
The year	9.0	0	.28	200

*Estimated.

Note.- No flow during months left blank.

Pembina River near Manitou, Manitoba

Location.- Chain gage on bridge near Lea's farm 9 miles south of Manitou.

Drainage area.- 2,340 square miles.

Records available.- October 1929 to September 1934 in reports of U. S. Geological Survey, April 1921 to September 1934 in reports of Dominion Water Power and Hydrometric Bureau.

Extremes.- Maximum daily discharge recorded during year, 369 second-feet Apr. 9 (gage height, 93.84 feet); minimum, 0.1 second-foot several days in August and September. 1921-34: Maximum daily discharge, 1,620 second-feet Apr. 19, 1923 (gage height, 99.75 feet), formerly published as 884 second-feet May 25, 1933; minimum, 0.1 second-foot August 1931, August and September 1934.

Remarks.- Records furnished by Dominion Water Power and Hydrometric Bureau. Stage-discharge relation affected by ice Oct. 28-31, and by obstruction on control Sept. 1-30. No records Nov. 1 to Apr. 8.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	52							156	68	17.9	2.2	0.1
2	49.6							154	65	18.2	1.7	.1
3	48.0							152	62	18.5	1.2	.1
4	46.4							150	59	17.0	.8	.1
5	44.8							149	58	15.5	.6	.1
6	43.8							143	56	14.0	.4	.1
7	42.8							140	54	12.2	.3	.1
8	41.8							137	53	10.4	.3	.1
9	41.6						369	134	51	10.0	.3	.1
10	41.4						368	130	49.0	9.6	.3	.1
11	41.1						315	127	47.0	9.2	.3	.1
12	40.1						369	124	46.0	8.7	.3	.1
13	40.6						353	122	45.0	8.0	.2	.1
14	40.2						331	118	43.8	7.2	.2	.1
15	39.7						313	114	42.6	7.0	.2	.1
16	39.2						305	111	40.5	6.9	.3	.1
17	38.8						261	107	38.5	6.7	.2	.1
18	38.3						252	100	36.5	6.5	.2	.2
19	37.9						240	92	34.5	6.3	.2	.2
20	37.4						229	92	31.3	4.0	.2	.2
21	37.0						216	91	31.9	4.5	.1	.2
22	36.4						203	89	32.5	5.1	.1	.2
23	35.8						199	87	30.8	5.7	.1	.3
24	35.4						197	86	29.0	5.0	.1	.3
25	35.0						188	85	26.1	4.3	.1	.3
26	34.6						174	83	23.2	3.6	.1	.4
27	33.7						175	79	21.2	3.0	.1	.4
28	32.8						171	76	19.2	2.8	.1	.5
29	31.9						168	74	17.3	2.6	.1	.5
30	31.1						166	72	17.6	2.5	.1	.6
31	30.3							71		2.4	.1	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	52	30.3	39.3	2,420
November				
December				
January				
February				
March				
April 9-30	369	166	253	11,000
May	158	71	111	6,830
June	68	17.3	41.0	2,440
July	17.9	2.4	8.2	504
August	2.2	.1	.4	25
September	.6	.1	.2	12

Pembina River at Neche, N. Dak.

Location.- Chain gage in sec. 36, T. 164 N., R. 54 W., half a mile north of Neche.

Drainage area.- 2,960 square miles.

Records available.- May 1903 to September 1915, April 1919 to September 1934.

Average discharge.- 15 years (1919-34), 123 second-feet.

Extremes.- Maximum discharge recorded during year, 780 second-feet Apr. 9 (gage height, 9.76 feet, affected by ice); no flow September 15-30.
1903-15, 1919-34: Maximum discharge recorded, 3,870 second-feet May 2, 1904 (gage height, 20.9 feet); no flow on several days in 1932, 1933, and 1934.

Remarks.- Records good except those for period of shifting control, Oct. 1 to Nov. 9, and those for periods of ice effect, Oct. 22-24, Nov. 10 to Apr. 17, which are fair.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	47	35	*15	*5.1	*4.5	*4.8	74	224	88	40	3.5	0.6
2	48	33	14	5.0	*4.5	*4.7	79	224	85	38	3.0	.4
3	52	37	*13	*5.0	4.4	4.6	91	212	85	38	2.4	.3
4	55	37	12	*5.0	*4.4	*5.0	153	212	85	38	1.9	.3
5	52	37	*12	*4.9	*4.4	*10	98	212	82	37	1.7	.3
6	47	35	11	4.9	4.4	*20	88	200	79	36	1.5	.2
7	48	3e	*12	*4.9	*4.4	47	177	200	78	35	1.4	.2
8	45	35	*12	*4.8	*4.5	165	665	168	78	32	1.3	.1
9	50	29	13	4.8	*4.6	91	780	177	82	30	1.3	.1
10	50	28	*12	*4.8	4.6	35	757	177	82	28	1.6	.1
11	48	28	11	4.8	*4.7	29	642	177	85	26	1.5	.1
12	50	*25	*12	*4.8	*4.7	34	553	165	79	24	1.4	.1
13	47	22	12	*4.8	*4.8	*65	511	165	78	23	1.4	.1
14	50	18	*11	*4.7	*4.8	*96	532	165	76	21	2.2	.1
15	51	18	9.6	4.7	*4.9	*126	*500	153	72	19	2.0	0
16	52	18	8.6	*4.7	*5.0	*157	469	150	70	17	1.7	0
17	52	18	*8.6	*4.7	5.0	188	428	143	68	16	1.4	0
18	47	18	*8.6	*4.7	*5.0	120	364	140	64	14	1.2	0
19	50	*18	*8.6	4.7	*5.0	*134	342	138	63	13	.9	0
20	51	*18	8.6	4.6	*5.0	148	319	138	60	13	1.3	0
21	54	*18	*8.5	*4.6	5.0	94	319	130	57	11	1.4	0
22	47	18	*8.3	*4.6	*5.1	80	295	122	57	10	1.2	0
23	47	18	8.2	*4.6	*5.3	*78	295	116	54	9.3	1.0	0
24	47	*18	*7.2	4.6	5.4	76	283	114	52	8.4	.8	0
25	47	*18	6.2	*4.6	*5.3	76	271	112	50	7.4	.7	0
26	41	18	*6.1	*4.6	*5.2	71	259	110	48	6.2	.6	0
27	41	18	*6.0	4.6	*5.0	69	247	106	47	5.8	.5	0
28	37	*18	*5.9	*4.6	*4.9	82	247	101	45	5.4	.4	0
29	37	18	5.8	*4.6		82	236	101	42	5.8	.4	0
30	34	*17	5.4	*4.6		*74	224	96	41	5.2	.4	0
31	39		*5.3	4.6		66		91		4.6	.5	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	55	34	47.2	2,810
November	38	17	24.1	1,440
December	15	5.3	9.60	590
January	5.1	4.6	4.74	292
February	5.4	4.4	4.81	267
March	188	4.6	75.2	4,630
April	780	74	343	20,430
May	224	91	154	9,440
June	86	41	67.7	4,030
July	40	4.6	19.9	1,220
August	3.5	.4	1.37	84
September	.6	0	.10	6.0
The year	780	0	62.6	45,240

*Estimated.

Roseau River at Malung, Minn.

Location.- Staff gage in sec. 18, T. 161 N., R. 39 W., half a mile north of Malung.

Records available.- August 1928 to September 1934 (incomplete during winter).

Extremes.- Maximum discharge recorded during year, 58 second-feet Apr. 6 (gage height, 4.07 feet, affected by ice); no flow during August and September.
1928-34: Maximum discharge recorded, 468 second-feet Apr. 13, 1932; no flow during several periods.

Remarks.- Records poor. Stage-discharge relation affected by ice Nov. 6-15, Apr. 3-12, and by debris on control or aquatic growth Oct. 2 to Nov. 3, June 20, July 16 to Sept. 30. No records Nov. 16 to Mar. 31.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*0.2	*0.2					*2.0	8.8	5.0	13		
2	.3	*.2					*5.0	7.9	5.0	12		
3	*.3	.2					12	8.4	4.6	12		
4	*.2	*.2					16	12	4.3	11		
5	*.2	*.2					42	14	3.6	11		
6	.2	.2					58	13	3.3	11		
7	*.2	*.2					40	12	3.9	9.5		
8	*.3	*.2					45	12	5.3	9.1		
9	.3	.2					48	11	9.5	7.7		
10	*.3	.2					48	11	9.5	7.3		
11	*.3	*.2					38	10	9.5	6.9		
12	*.3	*.2					40	10	9.5	6.5		
13	.3	.2					32	9.5	10	6.5		
14	*.3	*.2					40	9.1	11	6.1		
15	*.2	.2					30	8.2	11	5.3		
16	.2						21	7.3	11	3.4		
17	*.2						18	6.5	11	2.8		
18	*.2						16	7.3	12	2.3		
19	*.1						16	6.1	15	1.8		
20	.1						15	5.7	15	1.3		
21	*.1						13	5.7	20	.8		
22	*.1						13	5.3	21	.8		
23	.1						13	5.3	20	.8		
24	*.1						13	5.3	21	.6		
25	*.2						12	5.3	22	.6		
26	*.2						12	5.3	24	.4		
27	.2						11	5.3	20	.4		
28	*.2						10	5.3	13	.4		
29	*.1						10	5.0	12	.4		
30	.1						9.8	5.0	13	.4		
31	*.1							5.0		.3		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	0.3	0.1	0.20	12
November 1-15	.2	.2	.20	6.0
December				
January				
February				
March				
April	58	2.0	23.3	1,390
May	14	5.0	7.99	491
June	24	3.3	11.8	704
July	13	.3	4.92	302
August	0	0	0	0
September	0	0	0	0

*Estimated.

Note.- No flow during August and September.

Roseau River near Roseau, Minn.

Location.- Staff gage in SW¼ sec. 24, T. 163 N., R. 40 W. fourth principal meridian, on steel highway bridge 5½ miles north of Roseau. Zero of gage is 1,022.94 feet above mean sea level (adjustment of 1928 by Geodetic Survey of Canada.

Records available.- April 1930 to June 1934.

Extremes.- Maximum water-surface elevation recorded during period Apr. 4 to May 17, 1,027.28 feet Apr. 6; minimum recorded, 1,023.80 feet May 17.
1930-34: Maximum water-surface elevation recorded, 1,034.86 feet Apr. 9, 1932; minimum recorded, 1,023.34 feet Sept. 28, 1930.

Remarks.- Records good. Gage heights have been reduced to mean sea level datum. No records during periods omitted.

Elevation, in feet, 1934

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1												
2												
3												
4							25.96					
5							27.06					
6							27.24					
7							27.06					
8							27.08					
9							26.78					
10							26.28					
11							25.70					
12							25.34					
13							25.24					
14							25.01					
15							24.92					
16							24.73					
17							24.58	23.80				
18							24.52					
19							24.48					
20							24.40					
21							24.21					
22							24.18					
23							24.11					
24							24.11					
25							24.04					
26							24.03					
27							23.99					
28							23.91					
29							23.84					
30												
31												

Note.- Add 1,000 feet to obtain elevation above mean sea level.

Roseau River at Ross, Minn.

Location.- Water-stage recorder in SW¼ sec. 27, T. 163 N., R. 41 W., a quarter of a mile north of Ross. Zero of gage is 1,018.44 feet above mean sea level (adjustment of 1928 by Geodetic Survey of Canada).

Drainage area.- 1,030 square miles.

Records available.- July 1928 to September 1934.

Extremes.- Maximum discharge during year, 332 second-feet Apr. 8 (gage height, 7.20 feet, affected by ice); minimum, slightly less than 4 second-feet a few days in August and September.
1928-34: Maximum discharge, 1,550 second-feet Apr. 13, 1932; minimum, 3 second-feet several days in July and August 1933.

Remarks.- Records good. Stage-discharge relation affected by ice Nov. 27 to Apr. 19, and by aquatic growth Oct. 21 to Nov. 9, June 1 to Sept. 11, Sept. 20-30. Discharge estimated for Nov. 10-26, 28, Aug. 6-11, Sept. 12-19.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	13	12	11	8.2	8.2	8.2	10	93	22	45	4.8	5.1
2	12	16	10	7.8	8.2	8.6	12	90	22	41	4.8	5.1
3	12	15	9.6	7.8	8.6	10	13	90	20	37	4.6	5.1
4	11	14	10	8.0	7.8	10	17	88	19	36	4.5	5.3
5	11	16	10	8.4	8.0	10	114	88	20	38	4.3	5.4
6	10	15	10	8.4	8.4	10	206	85	18	40		5.4
7	10	13	11	8.2	7.8	9.4	278	85	16	37		5.3
8	10	13	9.8	7.4	8.2	8.8	321	82	16	32		5.1
9	11	13	9.6	7.6	8.4	8.2	321	78	22	28	4.0	4.8
10	11		9.8	7.6	7.8	8.0	310	80	24	24		4.5
11	12		9.4	8.0	8.2	8.0	310	90	32	22		4.2
12	12		9.0	8.2	8.4	8.0	288	70	48	25	5.3	
13	12		8.8	8.8	8.4	8.4	228	65	68	27	7.2	
14	11		8.8	8.8	8.2	8.2	185	61	72	27	8.0	
15	12		8.4	9.0	8.0	8.2	153	56	72	24	9.2	
16	12		8.2	8.6	8.0	8.2	132	52	68	20	9.6	4.0
17	13		8.0	8.4	8.0	8.2	121	54	65	17	9.4	
18	13	12	8.2	8.0	8.0	8.2	121	48	68	14	9.2	
19	12		8.0	7.6	8.0	8.0	124	47	70	12	9.0	
20	13		8.0	8.2	8.0	8.4	124	45	68	9.6	7.4	5.1
21	12		8.4	8.4	8.2	8.4	118	44	68	7.0	7.6	5.5
22	13		8.6	7.8	8.2	8.6	111	42	70	5.8	7.8	5.2
23	7.6		8.3	8.0	8.0	8.8	114	37	75	5.9	8.4	5.0
24	10		9.0	8.4	8.0	8.8	121	35	80	5.6	8.4	5.5
25	13		8.4	7.8	7.8	8.8	128	32	82	5.0	7.6	6.2
26	13		7.8	7.6	7.6	8.8	121	29	82	4.4	6.8	8.2
27	11	11	8.0	7.6	7.0	8.8	114	27	82	4.4	5.8	9.4
28	10	11	8.0	7.2	7.4	8.8	105	24	80	4.5	5.8	9.4
29	10	11	7.8	7.6		9.0	96	22	68	4.5	5.5	9.2
30	12	11	8.2	7.6		9.4	96	20	54	4.7	5.1	8.8
31	12		8.4	8.0		10		20		4.9	4.9	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	13	7.6	11.5	707
November	16	11	12.5	744
December	11	7.8	8.94	549
January	9.0	7.2	8.03	494
February	8.6	7.0	6.03	446
March	10	8.0	8.75	538
April	321	10	150	8,910
May	93	20	57.1	3,510
June	82	16	52.4	3,120
July	45	4.4	19.8	1,210
August	9.6	4.0	6.28	386
September	9.4	4.0	5.49	327
The year	321	4.0	28.9	20,940

Roseau River near Badger, Minn.

Location.- Water-stage recorder in SW¼ sec. 30, T. 163 N., R. 41 W., 9 miles north of Badger. Zero of gage is 1,016.90 feet above mean sea level (adjustment of 1928 by Geodetic Survey of Canada).

Records available.- August 1928 to September 1934.

Extremes.- Maximum water-surface elevation recorded during year, 1,024.36 feet Apr. 8; minimum recorded, 1,017.80 feet Oct. 20.
1928-34: Maximum water-surface elevation, 1,027.97 feet Apr. 14, 1932; minimum, 1,017.73 feet July 22, 1932, and Sept. 2, 1929.

Remarks.- Records excellent. Gage heights have been reduced to sea-level datum. No records Nov. 28 to Apr. 2.

Elevation, in feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	18.04	18.09						19.51	18.22	19.45	18.35	18.38
2	17.99	18.15						19.49	18.28	19.37	18.35	18.35
3	17.99	18.21					20.11	19.45	18.22	19.31	18.32	18.34
4	17.96	18.19					20.16	19.45	18.19	19.28	18.30	18.37
5	17.95	18.21					21.47	19.42	18.21	19.31	18.27	18.39
6	17.96	18.21					22.96	19.41	18.17	19.36	18.26	18.38
7	17.93	18.17					23.83	19.39	18.12	19.34	18.24	18.37
8	17.91	18.17					24.30	19.35	18.15	19.25	18.21	18.35
9	17.92	18.16					24.20	19.28	18.28	19.17	18.20	18.32
10	17.93	18.18					23.90	19.30	18.34	19.09	18.17	18.29
11	17.98	18.20					23.46	19.28	18.56	19.03	18.19	18.25
12	17.94	18.21					22.85	19.12	18.84	19.04	18.25	18.22
13	17.91	18.18					22.13	19.05	19.25	19.09	18.37	18.16
14	17.91	18.21					21.50	18.99	19.45	19.10	18.49	18.12
15	17.91	18.28					20.87	18.89	19.49	19.06	18.53	18.06
16	17.94	18.33					20.52	18.78	19.47	18.99	18.60	18.01
17	17.94	18.37					20.15	18.71	19.46	18.92	18.62	18.01
18	17.93	18.39					20.10	18.69	19.48	18.85	18.61	18.02
19	17.93	18.39					20.10	18.69	19.57	18.78	18.59	18.03
20	17.88	18.41					19.98	18.55	19.56	18.70	18.55	18.03
21	18.00	18.46					19.91	18.66	19.56	18.60	18.54	17.99
22	18.09	18.50					19.82	18.60	19.63	18.52	18.53	17.98
23	17.99	18.54					19.62	18.60	19.73	18.49	18.55	17.98
24	17.91	18.53					19.88	18.45	19.85	18.45	18.54	18.01
25	18.04	18.55					20.00	18.40	19.90	18.40	18.53	18.04
26	18.08	18.54					19.97	18.33	19.90	18.36	18.51	18.11
27	18.04	18.54					19.84	18.30	19.95	18.31	18.49	18.14
28	18.05						19.71	18.25	19.94	18.28	18.46	18.15
29	18.04						19.59	18.20	19.78	18.28	18.44	18.11
30	18.06						19.56	18.17	19.56	18.29	18.42	18.09
31	18.08							18.17		18.33	18.40	

Note.- Add 1,000 feet to obtain elevation above mean sea level.

Roseau River near Haug, Minn.

Location.- Water-stage recorder in SE¼ sec. 21, T. 163 N., R. 43 W., 8½ miles northwest of Haug and 5 miles south of international boundary. Zero of gage is 1,014.02 feet above mean sea level (adjustment of 1928 by Geodetic Survey of Canada).

Records available.- April 1932 to September 1934 (incomplete).

Extremes.- Maximum water-surface elevation during period Apr. 4 to June 16, 1,021.31 feet Apr. 10; minimum, 1,015.29 May 31.
1932-34: Maximum water-surface elevation recorded, 1,023.19 feet Apr. 14, 1932; minimum recorded, 1,014.74 feet Aug. 8, 1933.

Remarks.- Records excellent. No records Oct. 1 to Apr. 3, Apr. 15-22, June 17 to Sept. 30.

Elevation, in feet, 1934

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1								16.71	15.35			
2								16.63	15.36			
3								16.63	15.36			
4							18.62	16.54	15.37			
5							18.72	16.58	15.36			
6							19.38	16.53	15.37			
7							20.42	16.53	15.37			
8							21.00	16.53	15.31			
9							21.25	16.45	15.37			
10							21.30	16.40	15.43			
11							21.25	16.45	15.61			
12							21.03	16.39	15.72			
13							20.60	16.23	16.08			
14							19.92	16.19	16.36			
15								16.15	16.44			
16								16.08	16.46			
17								16.01				
18								15.95				
19								15.94				
20								15.92				
21								15.89				
22								15.84				
23							16.91	15.80				
24							16.94	16.70				
25							17.02	15.65				
26							17.06	15.58				
27							16.98	15.50				
28							16.89	15.50				
29							16.74	15.43				
30							16.70	15.37				
31								15.34				

Note.- Add 1,000 feet to obtain elevation above mean sea level.

Roseau River at head of State Ditch 51, near Oak Point, Minn.

Location.- Staff gage in NE¼ sec. 18, T. 163 N., R. 44 W. fourth principal meridian, 2½ miles south and 3 miles east of Caribou. Zero of gage is 1,007.88 feet above mean sea level (adjustment of 1928 by Geodetic Survey of Canada).

Records available.- April 1933 to September 1934 (incomplete).

Extremes.- Maximum water-surface elevation recorded during year, 1,015.03 feet Apr. 11; minimum recorded, 1,009.79 feet Aug. 7.
1933-34: Maximum water-surface elevation recorded, 1,016.24 feet Apr. 23, 1933; minimum recorded, 1,009.66 feet Aug. 11, 12, 1933.

Remarks.- Records good. No records Oct. 1 to Mar. 31.

Elevation, in feet, 1934

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							12.03	11.27	10.25	10.09	9.85	9.87
2							12.07	11.23	10.23	10.17	9.83	9.87
3							12.07	11.27	10.25	10.65	9.81	9.87
4							12.09	11.09	10.29	10.57	9.81	9.89
5							12.11	11.11	10.29	10.51	9.83	9.89
6							12.43	11.13	10.31	10.43	9.81	9.87
7							13.23	11.25	10.27	10.41	9.79	9.87
8							14.41	11.23	10.29	10.43	9.81	9.87
9							14.83	11.11	10.27	10.41	9.83	9.87
10							14.97	11.01	10.27	10.39	9.85	9.89
11							15.03	11.13	10.31	10.37	9.87	9.87
12							14.95	11.19	10.87	10.31	9.89	9.89
13							14.63	11.11	10.95	10.25	9.91	9.91
14							14.21	11.03	11.03	10.13	9.93	9.87
15							13.39	10.95	11.07	10.11	9.87	9.89
16							12.53	10.91	11.11	10.09	9.87	9.91
17							12.01	10.89	11.13	10.09	9.91	9.93
18							11.67	10.81	11.15	10.07	9.95	9.95
19							11.56	10.73	11.15	10.07	9.97	9.95
20							11.51	10.71	11.17	10.05	9.93	9.97
21							11.49	10.69	11.19	10.03	9.93	9.97
22							11.37	10.65	11.17	10.01	9.95	9.99
23							11.37	10.61	11.15	10.01	9.91	9.99
24							11.39	10.59	11.13	9.97	9.87	10.01
25							11.33	10.55	11.11	9.95	9.87	10.03
26							11.37	10.53	11.11	9.93	9.89	10.05
27							11.39	10.47	11.09	9.91	9.91	10.07
28							11.33	10.41	11.09	9.91	9.89	10.09
29							11.27	10.35	11.07	9.89	9.89	10.11
30							11.19	10.29	11.05	9.89	9.91	10.13
31								10.27		9.87	9.89	

Note.- Add 1,000 feet to obtain elevation above mean sea level.

Roseau River at Oak Point, Minn.

Location.- Staff gage in SE¼ sec. 36, T. 164 N., R. 45 W., 2 miles east of Caribou. Zero of gage is 1,005.30 feet above mean sea level (adjustment of 1928 by Geodetic Survey of Canada).

Records available.- April 1933 to September 1934 (incomplete).

Extremes.- Maximum water-surface elevation recorded during year, 1,010.92 feet Apr. 8, 12; minimum recorded, 1,006.38 feet Aug. 10.
1933-34: Maximum water-surface elevation recorded, 1,013.17 feet Apr. 19, 1933; minimum recorded, 1,006.38 feet Aug. 14, 1933, and Aug. 10, 1934.

Remarks.- Records good. No records Oct. 1 to Mar. 31 and for other days for which no elevations are given.

Elevation, in feet, 1934

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							7.56	7.36				
2							8.08	7.28	6.66			
3								7.30	6.66			6.44
4							7.96	7.10	6.68			
5							7.88	7.30	6.66		6.40	6.44
6									6.66			
7							8.28	7.30		7.26		6.42
8							10.92	7.40				6.44
9							10.63	7.32				
10							10.80	7.20		6.66	6.38	6.44
11							10.84					
12							10.92	7.48				6.46
13							10.90			6.58		6.46
14							10.60	7.12				
15							10.64	7.22	7.22			
16							9.86	7.08	7.26		6.44	
17							8.34	7.04	7.20	6.50		6.46
18							7.78	7.00			6.42	
19											6.44	6.44
20								6.96			6.46	
21								6.90			6.44	6.48
22							7.54	6.90				
23							7.48	6.90			6.44	6.46
24							7.46	6.86				
25							7.46		7.30		6.44	
26							7.56		7.28			6.48
27							7.54		7.26		6.44	
28								6.74	7.26	6.40		6.48
29								6.72			6.46	
30							7.26		7.12			
31								6.68			6.44	

Note.- Add 1,000 feet to obtain elevation above mean sea level.

Roseau River below Cut-off Ditch, near Caribou, Minn.

(International gaging station)

Location.- Water-stage recorder in SW¼ sec. 34, T. 164 N., R. 45 W., 1 mile west of Caribou and 200 yards below mouth of State ditch 51, locally known as "Caribou Cut-off Ditch." Zero of gage is 1,002.14 feet above mean sea level (adjustment of 1928 by Geodetic Survey of Canada).

Records available.- April 1929 to September 1934.

Extremes.- Maximum discharge during year, 472 second-feet Apr. 13 (gage height, 5.05 feet, affected by ice); minimum, 2.0 second-feet Aug. 10 (gage height, 1.06 feet). 1929-34: Maximum discharge, 1,880 second-feet Apr. 13, 1932 (gage height, 8.80 feet, affected by ice); minimum, that of Aug. 10, 1934.

Remarks.- Records good. Stage-discharge relation affected by ice Apr. 5-17 and by aquatic growth July 24 to Sept. 30. Discharge estimated for Nov. 29, 30, Apr. 1-4, May 27 to June 12, June 14, 15. No records Dec. 1 to Mar. 31. This station is one of the international gaging stations maintained by the United States under agreement with Canada.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.2	14					10	98		53	3.6	5.8
2	9.6	12					12	94		47	3.4	6.1
3	9.2	10					15	91		38	3.0	6.1
4	7.6	13					20	89		37	2.8	6.1
5	7.9	12					26	86		35	3.0	5.8
6	7.6	13					26	84		34	3.2	5.2
7	7.6	13					60	83	24	30	2.8	4.9
8	7.6	11					206	82		29	3.0	3.8
9	7.9	11					307	84		29	2.6	3.8
10	7.6	10					329	76		26	2.0	4.3
11	8.2	9.2					376	78		23	2.8	4.6
12	7.0	10					376	78		21	3.6	4.9
13	7.9	7.9					377	72	39	19	3.8	5.5
14	9.2	6.1					340	66	48	19	5.2	6.7
15	8.8	8.2					339	62	58	17	4.6	6.1
16	9.2	6.4					252	59	67	17	4.0	5.2
17	8.8	6.1					230	55	72	16	4.0	5.8
18	9.6	7.3					174	52	68	16	4.6	4.9
19	9.6	8.8					161	50	65	15	5.8	4.9
20	8.5	10					144	50	68	14	5.2	4.9
21	13	11					132	49	67	12	6.4	4.0
22	9.6	11					129	48	68	11	5.8	4.9
23	5.4	11					127	46	67	11	6.4	5.2
24	9.6	11					116	42	65	9.4	5.8	6.4
25	10	13					118	38	74	7.4	5.5	7.8
26	9.6	13					127	36	76	6.4	5.2	9.4
27	8.5	13					121		75	5.8	5.8	8.6
28	10	13					114		73	4.6	5.5	8.2
29	11	13					106	30	69	4.6	5.2	9.4
30	12	12					98		63	4.6	4.9	11
31	12									3.4	5.2	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	13	7.0	8.98	552
November	14	6.1	10.7	635
December				
January				
February				
March				
April	377	10	165	9,830
May	98	30	61.2	3,760
June	76	24	49.0	2,920
July	53	3.4	19.8	1,220
August	6.4	2.0	4.35	267
September	11	3.8	6.01	358

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Roseau River at international boundary, near Caribou, Minn.

Location.- Water-stage recorder near center of sec. 29, T. 164 N., R. 45 W., about 400 feet upstream from last international-boundary crossing and about 3 miles northwest of Caribou. Zero of gage is 1,002.59 feet above mean sea level (adjustment of 1928 by Geodetic Survey of Canada).

Records available.- May to August 1933, April to June 1934.

Extremes.- Maximum water-surface elevation during period, 1,004.86 feet Apr. 13; minimum, 1,002.69 feet June 10.
1933, 1934: Maximum water-surface elevation recorded, 1,005.30 feet May 29, 1933; minimum, 1,001.97 feet Aug. 14, 1933.

Remarks.- Records good. No records Apr. 16-23.

Elevation, in feet, 1934

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1								3.31	2.72			
2								3.30	2.71			
3								3.29	2.71			
4								3.25	2.72			
5								3.23	2.73			
6							3.17	3.21	2.70			
7							3.36	3.21	2.71			
8							3.91	3.22	2.72			
9							4.29	3.20	2.70			
10							4.43	3.16	2.69			
11							4.51	3.19	2.80			
12							4.59	3.19	2.81			
13							4.73	3.17	2.89			
14							4.61	3.10	3.07			
15							4.31	3.09	3.13			
16								3.08				
17								3.06				
18								3.02				
19								2.99				
20								2.99				
21								2.99				
22								2.97				
23								2.97				
24							3.39	2.93				
25							3.40	2.89				
26							3.44	2.87				
27							3.41	2.82				
28							3.39	2.79				
29							3.35	2.79				
30							3.30	2.75				
31								2.72				

Note.- Add 1,000 feet to obtain elevation above mean sea level.

South Fork of Roseau River near Malung, Minn.

Location.- Staff gage in center of sec. 7, T. 161 N., R. 39 W., 1 mile northwest of Malung.

Drainage area.- 265 square miles.

Records available.- May 1911 to September 1914, July 1928 to September 1934.

Extremes.- Maximum discharge recorded during year, 46 second-feet Apr. 6 (gage height, 3.60 feet, affected by ice); no flow most of year.
1911-14, 1928-34: Maximum discharge recorded, 1,040 second-feet Oct. 1, 1912 (gage height, 10.3 feet); maximum gage height, 12.00 feet Apr. 7, 1932; no flow at times.

Remarks.- Records fair. Stage-discharge relation affected by ice Apr. 3-11 and by debris on control Apr. 12 to June 26. Discharge estimated for Apr. 1, 2.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							0	0.1	0.1	2.8		
2							2.0	.1	.1	2.5		
3							6.2	.1	.1	2.5		
4							7.0	.1	.1	1.9		
5							20	.1	.1	1.6		
6							46	.1	0	1.1		
7							41	.1	0	.9		
8							41	.1	.1	.8		
9							44	.1	.1	.6		
10							37	.1	.1	.3		
11							31	.1	.1	.2		
12							12	.1	.1	.2		
13							8.8	.1	.2	.2		
14							8.8	.1	.2	.2		
15							6.8	.1	.2	.2		
16							5.2	.1	.3	.1		
17							4.0	.1	.2	0		
18							3.5	.1	.2	0		
19							3.1	.1	.2	0		
20							2.8	.1	.2	0		
21							2.5	.1	.3	0		
22							1.3	.1	.6	0		
23							.9	.1	.6	0		
24							.6	.1	1.3	0		
25							.4	.1	1.9	0		
26							.3	.1	2.5	0		
27							.2	.1	3.1	0		
28							.1	.1	3.1	0		
29							.1	.1	2.8	0		
30							.1	.1	2.8	0		
31								.1		0		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	0	0	0	0
November	0	0	0	0
December	0	0	0	0
January	0	0	0	0
February	0	0	0	0
March	0	0	0	0
April	46	0	11.2	668
May	.1	.1	.10	6.1
June	3.1	0	.72	43
July	2.8	0	.52	32
August	0	0	0	0
September	0	0	0	0
The year	46	0	1.03	749

Note.- No flow during months left blank.

Mud Creek near Sprague, Manitoba

(International gaging station)

Location.- Water-stage recorder in NE¼ sec. 34, T. 164 N., R. 38 W., half a mile south of International boundary, 3½ miles south of Sprague, Manitoba, and 14 miles northeast of Roseau, Minn. Zero of gage is 1,038.4 feet above mean sea level (1928 adjustment by Geodetic Survey of Canada).

Drainage area.- 162 square miles.

Records available.- September 1928 to September 1934.

Extremes.- Maximum discharge during year, 26 second-feet Apr. 7 (gage height, 5.72 feet, affected by ice); no flow Aug. 8-10.
1928-34: Maximum discharge, 1,040 second-feet May 13, 1930 (gage height, 12.34 feet); minimum, that of Aug. 8-10, 1934.

Remarks.- Records fair. Stage-discharge relation affected by ice Oct. 24 to Nov. 8, Apr. 2-21, and by debris on control June 11-14, Aug. 25 to Sept. 30. Discharge estimated for Apr. 1, Apr. 22 to May 11, July 13 to Aug. 1. No records Nov. 9 to Mar. 31. This station is one of the international gaging stations maintained by the United States under agreement with Canada.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.9	4.0					1.0	18	4.2	7.1	.4	1.2
2	1.5	1.3					1.9	18	4.1	7.7	.4	1.2
3	1.4	1.5					3.3	18	3.8	6.1	.1	1.2
4	1.5	1.9					9.4	18	3.7	8.1	.1	.7
5	1.6	1.8					12	18	4.0	6.2	.6	.5
6	1.5	1.5					15	18	3.9	4.8	.1	.4
7	1.4	1.5					21	18	4.4	4.7	.1	.2
8	1.3	1.5					23	18	4.0	4.0	0	.1
9	1.4						17	18	3.6	3.6	0	.1
10	1.4						14	18	3.6	2.9	0	.1
11	1.4						13	18	6.0	2.8	.4	.2
12	1.7						11	15	13	3.0	.8	.2
13	1.8						12	14	18	2.0	.8	.3
14	1.8						16	14	19	2.0	1.8	.2
15	1.9						16	14	19	2.0	1.2	.1
16	1.8						18	11	17	2.0	1.8	.1
17	1.9						20	11	16	2.0	1.3	.1
18	1.9						20	10	18	1.0	.6	.1
19	2.0						20	11	20	1.0	.8	.1
20	2.1						20	12	20	1.0	1.2	.1
21	2.4						21	8.8	15	1.0	.8	.1
22	2.5						20	8.0	15	1.0	1.6	.1
23	2.5						20	8.8	20	1.0	1.5	.1
24	2.3						20	7.1	24	1.0	1.6	.1
25	2.2						20	6.0	21	.5	1.6	.6
26	2.1						20	6.2	19	.5	1.6	1.2
27	2.3						20	5.4	20	.5	1.6	.6
28	2.8						20	4.1	13	.5	1.3	.2
29	2.8						20	4.0	10	.5	1.1	.6
30	2.4						20	4.4	8.4	.5	.9	1.0
31	2.3							5.3		.5	1.0	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	2.8	1.3	1.93	119
November 1-8	4.0	1.3	1.88	30
December				
January				
February				
March				
April	23	1.0	16.2	961
May	18	4.0	12.2	750
June	24	3.6	12.4	735
July	8.1	.5	2.63	162
August	1.8	0	.87	54
September	1.2	.1	.39	23

Pine Creek near Pine Creek, Minn.

(International gaging station)

Location.- Water-stage recorder in NW¼ sec. 35, T. 164 N., R. 41 W., half a mile south of international boundary and 2 miles northeast of Pine Creek. Zero of gage is 1,038.42 feet above mean sea level (adjustment of 1928 by Geodetic Survey of Canada).

Drainage area.- 76 square miles.

Records available.- August 1928 to September 1934.

Extremes.- Maximum discharge during year (estimated), 70 second-feet Apr. 8; minimum, 3.1 second-feet Aug. 6 (gage height, 1.08 feet).
1928-34: Maximum discharge, 500 second-feet May 25, 1933 (gage height, 9.03 feet); minimum, 2.3 second-feet Sept. 2, 1933 (gage height, 1.20 feet, affected by aquatic growth).

Remarks.- Records good except those for periods affected by ice, Nov. 9-27, Apr. 3, 4, 13-15, and by aquatic growth or debris on control Oct. 1 to Nov. 8, Apr. 18-22, June 18 to Sept. 30. Discharge estimated for Apr. 1, 2, 5-12. No records Nov. 28 to Mar. 31. This station is one of the international gaging stations maintained by the United States under agreement with Canada.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.3	8.5					7.0	30	7.5	8.1	3.8	4.6
2	5.3	11					10	29	7.7	8.7	3.8	4.9
3	5.1	10					12	29	7.2	7.7	3.7	5.0
4	4.9	13					12	28	7.1	7.4	3.7	4.9
5	4.9	14					15	28	7.2	9.3	3.7	4.8
6	4.9	11					30	26	7.7	8.3	3.6	4.7
7	4.9	9.8					50	25	7.2	7.9	3.5	4.5
8	4.9	11					70	24	7.1	6.7	3.5	4.1
9	4.9	11					60	23	8.1	5.9	3.4	4.1
10	5.0	10					60	23	11	5.5	3.5	4.1
11	5.1	10					50	21	23	5.4	4.5	4.1
12	5.1	9.5					50	20	44	5.7	7.2	4.4
13	5.3	8.9					48	19	35	5.4	5.6	4.5
14	5.3	9.1					39	18	30	4.9	5.9	4.7
15	5.4	8.3					37	16	28	4.7	6.5	5.0
16	5.4	12					34	16	22	4.6	5.6	5.0
17	5.4	6.9					31	16	23	4.6	4.9	5.1
18	5.3	6.7					30	16	34	4.5	4.6	5.1
19	5.4	6.4					30	16	29	4.5	4.7	5.5
20	5.4	7.5					30	15	25	4.2	4.7	5.5
21	4.9	10					29	14	24	4.4	4.9	5.6
22	5.4	6.9					29	13	24	4.2	5.0	5.6
23	11	6.1					38	12	29	3.8	4.9	5.7
24	7.5	7.7					42	12	22	3.7	4.6	6.5
25	6.7	6.1					39	11	18	3.6	4.6	8.5
26	6.2	8.3					35	10	19	3.5	4.6	9.1
27	7.4	8.1					32	9.1	16	3.5	4.7	9.1
28	7.7						30	9.1	12	3.6	4.7	7.7
29	11						29	8.5	9.8	4.4	4.5	7.2
30	9.3						30	7.9	8.7	4.7	4.2	7.1
31	9.1							7.5		4.1	4.4	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	11	4.9	6.11	376
November 1-27	14	6.1	9.18	492
December				
January				
February				
March				
April	70	7.0	34.6	2,060
May	30	7.5	17.8	1,100
June	44	7.1	18.4	1,100
July	9.3	3.5	5.41	332
August	7.2	3.4	4.56	281
September	9.1	4.1	5.56	331

Badger Creek near Badger, Minn.

Location.- Staff gage in NE¼ sec. 2, T. 161 N., R. 42 W., 1 mile northwest of Badger. Zero of gage is 1,047.5 feet above mean sea level (1928 adjustment by Geodetic Survey of Canada).

Records available.- April 1929 to September 1930, October 1931 to September 1934.

Extremes.- Maximum discharge recorded during year, 8.0 second-feet Apr. 8 (gage height, 1.60 feet); no flow most of year.
1929-30, 1931-34: Maximum discharge recorded, 146 second-feet May 11, 1930 (gage height, 4.88 feet); no flow for several months of each year.

Remarks.- Records fair. Stage-discharge relation affected by ice Apr. 4-6. Discharge estimated for Apr. 1-3.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							0					
2							1.0					
3							3.0					
4							5.3					
5							5.3					
6							3.9					
7							3.9					
8							8.0					
9							7.4					
10							.9					
11							.4					
12							.3					
13							.2					
14							.1					
15							.1					
16							0					
17							0					
18							0					
19							0					
20							0					
21							0					
22							0					
23							0					
24							0					
25							0					
26							0					
27							0					
28							0					
29							0					
30							0					
31												

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	0	0	0	0
November	0	0	0	0
December	0	0	0	0
January	0	0	0	0
February	0	0	0	0
March	0	0	0	0
April	8.0	0	1.33	79
May	0	0	0	0
June	0	0	0	0
July	0	0	0	0
August	0	0	0	0
September	0	0	0	0
The year	8.0	0	.11	79

Note.- No flow during months left blank.

Souris River near Sherwood, N. Dak.

(International gaging station)

Location.- Staff gage in NE¼ sec. 33, T. 164 N., R. 87 W., 16 miles northwest of Sherwood and three-quarters of a mile south of international boundary.

Records available.- March 1930 to September 1934.

Extremes.- Maximum discharge recorded during year, 344 second-feet Mar. 16 (gage height, 7.74 feet, affected by ice); no flow during August and September.
1930-34: Maximum discharge recorded, 1,370 second-feet Mar. 31, 1933 (gage height, 13.10 feet, affected by ice); no flow for several days of each year.

Remarks.- Records fair except those for periods of ice effect, Oct. 21 to Nov. 22, Feb. 14 to Apr. 8, which are poor. Discharge interpolated for Nov. 16-21. No records Nov. 23 to Feb. 13. This station is one of the international gaging stations maintained by the United States under agreement with Canada.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.0	1.9				81	128	32	5.4	2.2		
2	1.0	1.9				195	128	30	4.6	2.0		
3	1.0	1.9				195	128	26	4.6	2.0		
4	.8	1.9				205	128	26	5.0	1.7		
5	.8	2.0				287	137	26	4.6	1.7		
6	1.0	2.0				255	137	25	4.6	1.5		
7	1.0	1.8				245	137	24	5.0	1.5		
8	1.0	1.9				195	155	21	5.4	1.5		
9	1.0	2.0				205	137	19	5.8	1.6		
10	1.3	1.9				185	128	19	4.6	1.8		
11	1.3	1.5				128	114	16	3.8	1.8		
12	1.5	1.8				114	101	14	3.8	1.8		
13	1.3	1.8				97	97	13	3.8	2.1		
14	1.3	1.8			66	119	93	13	3.8	2.1		
15	1.3	1.8			62	235	85	13	3.5	2.1		
16	1.5	1.5			58	344	81	13	3.5	2.1		
17	1.5	1.5			48	320	85	13	3.5	1.8		
18	1.3	1.5			42	276	77	11	3.2	1.6		
19	1.8	1.5			42	245	73	10	2.8	1.4		
20	1.9	1.5			42	215	66	16	2.8	1.1		
21	2.0	1.2			48	205	62	10	2.8	.9		
22	2.0	1.0			73	185	58	9.8	2.5	.9		
23	1.9				128	195	52	9.3	2.5	.9		
24	1.9				34	195	52	9.3	2.2	.8		
25	2.2				24	175	48	8.5	2.2	.8		
26	2.4				13	175	47	8.0	2.2	.6		
27	2.6				9.8	175	40	7.6	2.8	.4		
28	2.2				13	165	37	7.2	2.5	.4		
29	1.9					155	35	6.8	2.2	.4		
30	1.9					146	32	6.4	2.2	.4		
31	1.9					137		6.0		.2		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	2.6	0.8	1.53	94
November 1-22	2.0	1.0	1.71	75
December				
January				
February 14-28	128	9.8	46.9	1,390
March	344	81	195	12,000
April	155	32	89.3	5,310
May	32	6.0	14.9	918
June	5.8	2.2	3.61	215
July	2.2	.2	1.36	84
August	0	0	0	0
September	0	0	0	0

Note.- No flow during August and September.

Souris River at Minot, N. Dak.

Location.- Chain gage at Ann Street foot bridge northeast of Great Northern Railway roundhouse at Minot. Staff gage at same site prior to Nov. 22, 1933.

Drainage area.- 10,270 square miles.

Records available.- May 1903 to March 1924, April 1927 to September 1928, October 1929 to September 1934 in reports of U. S. Geological Survey; May 1903 to September 1930 in reports of Stage engineer.

Average discharge.- 21 years (1913-34), 145 second-feet.

Extremes.- Maximum discharge recorded during year, 328 second-feet Mar. 22-25; maximum gage height recorded, 7.25 feet Mar. 23; minimum discharge (estimated), 0.1 second-foot Oct. 1-10.
1903-24, 1927-28, 1929-34: Maximum discharge, 12,000 second-feet Apr. 20, 1904 (gage height, 21.9 feet); no flow at times during February 1930.

Remarks.- Records fair for period Mar. 1 to May 4 and poor for remainder of year. Flow during low periods consists chiefly of industrial waste water.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						*20	*190	34				
2						*50	*190	*30				
3						86	*190	27				
4						69	188	22				
5	*0.1					62	188	*20	*0.3	*0.3		
6						62	172					
7					*0.2	62	172					*1.5
8		*0.2				62	165	*15				
9						*62	158					
10			*0.4			62	158		†.2			
11						*150	165					
12						205	180					
13						232	188	*10				
14						242	135			*.5		†1.5
15				*0.3		252	*130				*1.5	
16						252	125					
17						242	125					
18						196	115	*5		*1.0		
19		*.3			*.3	152	106					
20						180	98		*.2			
21	*.2					205	83					*1.5
22		†.3				328	69					
23						328	72	*2				
24						328	69					
25		*.3			*2	328	62			*1.5		
26			*.3			*20	306	49				
27						*40	283	*49				
28						*30	252	49				
29		*.4					242	*45	*1			
30							223	37				
31							196					

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	0.2	0.1	0.17	10
November	.4	.2	.26	15
December	.4	.3	.36	22
January	.3	.3	.30	18
February	40	.2	3.50	194
March	328	20	184	11,340
April	190	37	124	7,380
May	34	1	9.65	593
June	.3	.2	.23	14
July	1.5	.3	.87	54
August	1.5	1.5	1.50	92
September	1.5	1.5	1.50	89
The year	328	.1	27.4	19,820

*Estimated.

†Discharge measurement.

Souris River at Towner, N. Dak.

Location.- Staff gage in sec. 10, T. 156 N., R. 76 W., at Great Northern Railway bridge three-quarters of a mile northwest of Towner.

Records available.- March 1933 to September 1934.

Extremes.- Maximum discharge recorded during year, 385 second-feet Apr. 3, 4; maximum gage height recorded, 5.54 feet Mar. 31, affected by ice; no flow for several days June to September.
1933-34: Maximum discharge recorded, 1,080 second-feet Apr. 10, 1933 (gage height, 9.02 feet); minimum, that of 1934.

Remarks.- Records fair. Stage discharge relation affected by ice Mar. 9 to Apr. 10. No records Oct. 1 to Nov. 20, Nov. 22 to Mar. 8.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							370	72	1.6	2.2		
2							370	68	.8	.8		
3							385	56	0	1.0		
4							385	43	0	1.4		
5							370	37	0	*2.0		
6							370	*43	0	2.6		
7							370	49	0	3.0		
8							*370	46	*5.0	2.6		
9						31	370	40	10	1.4		
10						96	340	25	14	1.4		
11						116	*325	25	19	1.4		
12						130	310	5.4	14	1.0		
13						137	242	*5.1	8.0	0		
14						137	216	4.8	6.0	0		
15						123	203	*4.9	8.0	0		
16						123	203	3.0	8.0	0		
17						123	203	3.0	12	0		
18						130	177	3.0	10	0		
19						177	*157	2.8	6.0	0		
20						216	137	*2.5	5.4	0		
21		†12				216	123	2.2	5.1	1.4		
22						229	*112	4.2	4.8	2.6		
23						242	102	3.6	4.2	1.4		
24						242	102	3.6	*4.6	0		
25						*248	102	2.6	3.0	0		
26						255	94	2.2	3.6	0		
27						268	93	*2.2	4.2	0		
28						310	87	2.2	3.0	0		
29						310	*82	2.2	*2.6	0		
30						355	78	1.8	2.2	0		
31						355		2.4		0		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October				
November				
December				
January				
February				
March 9-31	355	31	199	9,060
April	385	78	228	13,580
May	72	1.8	18.3	1,130
June	19	0	5.50	327
July	3.0	0	.85	52
August	0	0	0	0
September	0	0	0	0

*Interpolated.
†Discharge measurement.
Note.- No flow during August and September.

Souris River near Westhope, N. Dak.

(International gaging station)

Location.- Chain gage in T. 163 N., R. 79 W., 2½ miles east of Westhope. Zero of gage is 1,404.72 feet above mean sea level.

Records available.- July 1929 to September 1934.

Extremes.- Maximum discharge recorded during year, 524 second-feet Apr. 7 (gage height, 6.02 feet); no flow July 27 to Sept. 30.
1929-34: Maximum discharge recorded, 1,130 second-feet Mar. 31 to Apr. 2, 1930, and Apr. 19, 1933; maximum gage height, 7.25 feet Apr. 19, 1933; no flow for several periods.

Remarks.- Records good Apr. 7 to May 5; poor for periods affected by ice, Nov. 5-30, Mar. 21 to Apr. 6, and by aquatic growth, Oct. 1 to Nov. 4, May 6 to July 26. Discharge estimated for Nov. 5-22, 24-30, May 9. No records Dec. 1 to Mar. 20. This station is one of the international gaging stations maintained by the United States under agreement with Canada.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.8	31					312	121	8.5	1.5		
2	3.6	30					345	121	10	1.3		
3	3.0	30					369	121	3.8	1.3		
4	2.4	26					411	103	3.8	2.5		
5	5.5						445	98	3.1	1.5		
6	11						467	98	5.3	1.3		
7	9.2	20					524	98	7.3	.9		
8	6.7						494	86	7.9	.7		
9	4.7						467	78	6.5	2.5		
10	4.3						411	70	5.7	1.5		
11	3.8						369	78	4.7	1.4		
12	2.5						369	60	5.9	1.1		
13	2.0	15					357	63	10	1.0		
14	2.8						323	66	6.5	.9		
15	4.5						301	54	4.5	.7		
16	4.5						301	42	6.1	.5		
17	3.8						290	40	2.8	.5		
18	3.1	10					235	38	2.0	.4		
19	2.3						225	34	3.5	.4		
20	2.3						225	35	3.8	.4		
21	10	e				94	205	28	4.7	.4		
22	8.1					103	195	28	5.7	.4		
23	8.5	5.9				112	195	28	2.0	.4		
24	6.9	6				130	175	28	1.1	.2		
25	6.5	6				148	157	30	2.3	.2		
26	4.5					175	148	23	2.5	.1		
27	4.5					195	139	19	3.1	0		
28	4.2	5				225	130	14	2.3	0		
29	10					246	121	12	1.8	0		
30	16					268	130	16	1.3	0		
31	26					279		12		0		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	26	2.0	6.16	379
November	31	5.0	14.0	835
December				
January				
February				
March 21-31	279	94	180	3,980
April	524	121	294	17,520
May	121	12	56.2	3,460
June	10	1.1	4.62	275
July	2.5	0	.77	48
August	0	0	0	0
September	0	0	0	0

Note.- No flow during August and September.

Basswood River near Winton, Minn.

Location.- Staff gage in sec. 9, T. 64 N., R. 11 W., on Jackfish Bay of Basswood Lake used to determine discharge at outlet(in sec. 19, T. 65 N., R. 10 W., on international boundary, about 18 miles northeast of Winton). Zero of gage is 1,299.80 feet above mean sea level.

Drainage area.- 1,920 square miles above outlet of Basswood Lake.

Records available.- January 1931 to September 1934 in reports of U. S. Geological Survey; March to June 1924, August 1925 to December 1930 in reports of Corps of Engineers, U. S. Army.

Extremes.- Maximum discharge recorded during year ending Sept. 30, 1934, 6,680 second-feet May 18-23; maximum gage height recorded, 3.64 feet May 21; minimum discharge recorded, 304 second-feet Sept. 17-24, 28; minimum gage height recorded, -0.52 foot Sept. 21.
1931-34: Maximum discharge recorded, that of May 18-23, 1934; minimum, that of Sept. 17-24, 28, 1934.

Remarks.- Records good. Base data for 1931-33 and gage height record for 1933-34 furnished by Corps of Engineers, U. S. Army. Records computed by U. S. Geological Survey. After Feb. 4, 1933, gage read three times a week and discharge interpolated between readings. Flow affected by storage on Kawishiwi River.

Discharge, in second-feet, 1931

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1				1,050	861	604	500	519	1,240	2,820	974	525
2				1,050	852	591	482	512	1,260	2,630	898	512
3				1,050	843	584	482	500	1,350	2,510	852	531
4				1,040	835	577	482	494	1,470	2,380	852	531
5				1,050	826	563	482	512	1,610	2,220	861	525
6				1,050	817	557	476	525	1,700	2,130	880	519
7				1,050	808	550	476	531	1,750	2,030	871	512
8				1,040	800	543	482	531	1,780	1,930	817	500
9				1,040	791	543	476	543	1,820	1,860	791	494
10				1,030	765	537	471	557	1,880	1,780	782	488
11				1,000	757	531	476	557	2,030	1,710	749	482
12				974	765	525	476	550	2,270	1,650	733	500
13				964	765	512	476	543	2,410	1,610	717	494
14				954	765	500	482	537	2,580	1,560	685	494
15				945	765	494	488	537	2,700	1,520	670	482
16				945	757	494	494	537	2,750	1,480	663	471
17				945	741	494	500	543	2,850	1,420	641	466
18				945	725	494	506	543	2,950	1,390	626	466
19				936	725	494	519	550	3,020	1,370	641	466
20				926	717	494	525	577	3,060	1,320	626	476
21				917	701	500	531	597	3,090	1,270	611	466
22				908	685	494	531	611	3,200	1,250	597	449
23				917	670	494	525	626	3,160	1,200	584	438
24				917	663	494	525	670	3,160	1,140	584	427
25				908	648	500	525	701	3,160	1,080	570	482
26				898	633	500	525	741	3,160	1,060	550	466
27				889	626	506	525	808	3,150	1,060	550	466
28				880	618	500	537	898	3,130	1,070	537	460
29				871		494	525	1,030	3,020	1,020	557	454
30				871		488	525	1,140	2,990	983	543	444
31				871		494		1,210		964	537	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October					
November					
December					
January	1,050	871	962	0.501	0.58
February	861	618	747	.389	.41
March	604	488	521	.271	.31
April	537	471	501	.261	.29
May	1,210	494	636	.331	.38
June	3,200	1,240	2,460	1.28	1.43
July	2,820	964	1,590	.828	.95
August	974	537	695	.362	.42
September	531	427	483	.252	.28
The year					

Basswood River near Winton, Minn.

(Continued)

Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	432	384	454	656	765	791	656	1,670	3,180	1,220	938	843
2	427	379	460	663	774	782	641	1,750	3,040	1,210	945	861
3	444	364	466	670	782	782	626	1,890	2,950	1,180	936	871
4	427	346	471	678	782	791	626	2,000	2,820	1,180	936	836
5	449	346	476	686	782	808	618	2,110	2,680	1,210	908	826
6	466	346	482	701	782	826	626	2,220	2,540	1,180	871	791
7	460	346	482	709	800	843	656	2,350	2,450	1,180	871	766
8	449	342	482	717	800	852	686	2,480	2,320	1,160	871	757
9	438	342	482	733	800	861	693	2,560	2,240	1,140	871	757
10	432	342	488	749	808	852	717	2,650	2,160	1,100	861	741
11	427	342	494	757	808	852	733	2,710	2,030	1,080	861	741
12	422	342	506	765	808	852	765	2,780	1,960	1,140	852	749
13	422	342	519	741	826	843	774	2,830	1,890	1,160	843	749
14	408	342	531	741	826	826	800	2,880	1,820	1,210	817	725
15	393	342	537	749	826	808	843	3,000	1,760	1,170	782	701
16	379	342	537	749	835	800	861	3,200	1,680	1,140	782	709
17	379	342	543	765	835	800	908	3,270	1,620	1,140	774	725
18	376	342	543	749	835	782	945	3,350	1,560	1,120	749	749
19	363	346	543	741	843	782	1,020	3,460	1,490	1,200	725	709
20	358	363	560	749	843	774	1,080	3,610	1,470	1,130	701	709
21	358	384	563	749	817	765	1,130	3,540	1,410	1,110	693	701
22	354	393	577	757	808	757	1,180	3,540	1,360	1,090	685	685
23	354	408	591	765	791	757	1,240	3,620	1,330	1,050	685	678
24	354	417	597	765	791	741	1,270	3,490	1,360	1,040	701	670
25	358	427	611	765	791	725	1,310	3,610	1,360	1,030	765	670
26	358	438	618	749	791	717	1,330	3,510	1,290	1,030	808	655
27	379	444	626	757	800	701	1,360	3,490	1,250	1,030	808	641
28	393	444	626	757	791	685	1,390	3,440	1,220	1,000	817	626
29	393	449	641	757	791	686	1,440	3,370	1,220	964	843	611
30	389	449	648	749		670	1,520	3,320	1,200	954	871	604
31	384		648	765		663		3,280		945	835	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	466	354	401	0.209	0.24
November	449	342	374	.195	.22
December	648	454	542	.282	.33
January	765	655	736	.383	.44
February	843	765	805	.419	.45
March	861	663	780	.406	.47
April	1,520	618	948	.494	.55
May	3,540	1,570	2,920	1.52	1.75
June	3,180	1,200	1,890	.984	1.10
July	1,220	945	1,110	.578	.67
August	945	685	819	.427	.49
September	871	604	728	.379	.42
The year	3,540	342	1,010	.526	7.13

Basswood River near Winton, Minn.

(Continued)

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	591	519	494	648	591	525	482	791	2,520	1,230	626	506
2	584	506	482	655	584	522	482	831	2,510	1,180	626	500
3	577	500	500	641	584	519	482	871	2,470	1,140	626	494
4	563	494	500	626	577	511	497	908	2,420	1,100	626	488
5	550	488	512	633	570	502	512	945	2,380	1,060	619	480
6	550	488	512	648	563	494	516	983	2,360	1,060	611	471
7	543	494	519	655	563	491	519	1,020	2,350	1,050	604	495
8	543	506	519	663	563	488	523	1,060	2,320	1,040	604	519
9	537	537	519	663	566	512	527	1,100	2,290	1,040	604	527
10	537	525	525	670	570	537	531	1,150	2,190	1,030	644	535
11	531	506	537	670	570	517	531	1,180	2,100	1,040	685	543
12	525	488	543	678	570	496	531	1,220	2,000	1,040	670	531
13	531	500	550	663	570	476	537	1,250	1,940	1,010	656	519
14	531	494	550	663	564	476	543	1,270	1,880	974	641	512
15	537	488	557	648	557	476	564	1,300	1,880	958	626	506
16	543	482	570	633	557	474	566	1,340	1,890	942	611	514
17	537	476	584	618	557	471	577	1,380	1,850	926	611	523
18	531	476	591	618	548	467	602	1,440	1,820	898	611	531
19	537	476	591	618	540	464	626	1,500	1,780	871	602	537
20	537	476	597	611	531	460	652	1,540	1,730	862	593	543
21	537	482	604	611	531	446	678	1,590	1,680	852	584	543
22	537	494	611	597	531	432	688	1,630	1,620	840	580	543
23	525	488	611	604	534	432	699	1,840	1,570	829	577	539
24	512	488	626	597	537	432	709	2,050	1,530	817	574	535
25	506	488	626	597	535	434	705	2,200	1,480	791	570	531
26	506	488	626	597	533	436	701	2,350	1,440	765	561	525
27	500	488	626	597	531	438	693	2,400	1,380	733	552	519
28	506	488	618	611	528	446	685	2,460	1,330	701	543	504
29	537	494	626	611		454	720	2,510	1,300	676	528	488
30	543	494	633	597		468	756	2,520	1,270	651	512	479
31	531		648	597		482		2,540		626	509	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	591	500	537	0.280	0.32
November	537	476	494	.257	.29
December	648	482	568	.296	.34
January	678	597	630	.328	.38
February	591	528	556	.290	.30
March	537	432	477	.248	.29
April	756	482	594	.309	.34
May	2,540	791	1,520	.792	.91
June	2,520	1,270	1,910	.995	1.11
July	1,230	626	927	.483	.56
August	685	509	600	.312	.36
September	543	471	516	.269	.30
The year	2,540	432	778	.405	5.50

Basswood River near Winton, Minn.

(Continued)

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	465	685	852	852	611	852	611	2,190	4,060	1,350	648	379
2	454	666	852	875	611	852	611	2,350	3,780	1,310	648	379
3	454	648	852	898	636	852	611	2,520	3,500	1,280	648	379
4	454	660	852	875	660	852	611	2,680	3,220	1,250	636	379
5	440	673	852	852	685	852	630	2,860	3,120	1,200	623	379
6	427	685	852	852	685	875	648	3,040	3,030	1,140	611	368
7	419	685	852	852	685	898	687	3,220	2,860	1,120	594	358
8	411	685	852	852	685	875	726	3,530	2,680	1,110	577	351
9	403	685	852	852	685	852	765	3,840	2,570	1,090	560	345
10	391	685	852	852	685	852	765	4,170	2,460	1,060	543	338
11	379	698	852	830	685	852	765	4,500	2,350	1,040	523	338
12	379	712	852	808	685	852	786	4,890	2,270	992	502	338
13	379	725	852	794	685	852	808	5,280	2,190	945	482	338
14	423	745	852	779	685	852	854	5,670	2,110	945	468	338
15	468	765	852	765	685	852	899	6,040	2,030	945	454	327
16	512	765	852	765	685	852	945	6,420	1,940	945	440	315
17	544	765	852	765	712	837	968	6,550	1,840	922	427	304
18	577	765	852	765	738	823	992	6,680	1,750	898	419	304
19	594	765	852	765	765	808	1,040	5,680	1,750	875	411	304
20	611	765	852	752	765	786	1,090	6,680	1,750	852	403	304
21	611	786	852	738	765	765	1,220	6,680	1,680	823	391	304
22	611	808	852	725	786	745	1,360	6,680	1,620	794	379	304
23	611	808	852	705	808	725	1,490	6,680	1,620	765	379	304
24	611	808	852	685	823	712	1,560	6,420	1,620	765	379	304
25	611	823	852	685	837	698	1,620	6,170	1,620	765	379	321
26	611	837	852	685	852	685	1,680	5,920	1,560	725	379	338
27	611	852	852	673	852	666	1,750	5,680	1,490	685	379	321
28	611	852	852	660	852	648	1,840	5,430	1,460	685	368	304
29	611	852	852	648		630	1,940	5,080	1,430	685	358	305
30	611	852	852	630		611	2,030	4,730	1,390	685	368	305
31	648		852	611		611		4,400		666	379	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	648	379	514	0.268	0.31
November	852	648	750	.391	.44
December	852	852	852	.444	.51
January	898	611	769	.401	.46
February	852	611	725	.378	.39
March	898	611	789	.411	.47
April	2,030	611	1,077	.561	.63
May	6,680	2,190	4,957	2.58	2.97
June	4,060	1,390	2,225	1.16	1.29
July	1,350	666	946	.493	.57
August	648	358	476	.248	.29
September	379	304	332	.173	.19
The year	6,680	304	1,206	.628	8.52

Rainy River near Birchdale, Minn.

Location.- Chain gage in SE¼ sec. 26, T. 160 N., R. 27 W., at head of Long Sault Rapids, about 7 miles northeast of Birchdale. Zero of gage is 1,062.37 feet above mean sea level.

Records available.- October 1932 to September 1934 in reports of U. S. Geological Survey; October 1911 to October 1924 (gage height only), June 1928 to December 1930 in reports of Corps of Engineers, U. S. Army.

Extremes.- Maximum discharge recorded during year ending Sept. 30, 1934, 26,500 second-feet June 13, July 2; maximum gage height recorded, 7.02 feet June 13; minimum discharge recorded, 3,570 second-feet Nov. 13 (gage height, -0.10 feet, ice affected).

1933-34: Maximum discharge recorded, 33,900 second-feet Apr. 22, 1933 (gage height, 8.40 feet); minimum recorded, that of Nov. 13, 1933.

Remarks.- Records poor owing to insufficient gage-height readings and fluctuations from power plant at International Falls. After Feb. 8, 1933, gage read 3 times a week and discharge estimated between readings. Stage-discharge relation affected by ice Nov. 14, 1932, to Mar. 29, 1933; Nov. 8, 1933, to Apr. 4, 1934. Flow regulated by storage in Rainy, Namakan, and Kabetogama Lakes Gage-height record and results of discharge measurements furnished by Corps of Engineers, U. S. Army.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7,020	5,700	6,560	7,500	9,880	7,750	11,000	16,800	10,700	6,120	5,610	4,290
2	7,500	7,750	7,260	7,260	10,400	8,270	11,500	19,000	9,500	5,400	5,910	4,340
3	7,500	7,750	6,790	9,880	10,200	6,800	13,200	21,200	9,050	5,130	6,130	4,570
4	7,500	7,750	6,340	10,700	9,600	9,320	14,000	23,600	7,000	5,220	6,340	4,800
5	7,750	6,790	6,340	9,600	9,050	8,800	14,800	26,100	6,340	5,310	6,560	4,880
6	5,910	4,800	7,260	8,260	8,520	8,520	14,800	28,500	7,300	5,960	6,450	4,960
7	5,700	3,810	7,260	8,260	9,050	9,060	14,800	28,200	8,260	6,610	6,340	5,020
8	5,700	6,790	7,750	5,910	9,050	9,600	14,800	28,000	8,010	7,260	6,680	5,070
9	4,640	8,780	9,050	5,910	9,430	9,970	14,800	23,200	7,750	6,700	7,020	5,130
10	4,340	10,700	9,320	6,340	9,820	10,300	14,800	18,300	7,500	6,560	6,790	4,880
11	5,130	14,800	6,560	7,750	10,200	10,700	14,800	15,700	7,380	6,680	6,570	4,640
12	6,790	15,700	6,340	8,260	9,500	9,480	14,800	13,000	7,260	6,790	6,340	4,880
13	6,560	14,100	5,310	7,750	9,050	8,260	14,500	10,400	7,260	7,030	5,000	5,130
14	6,340	11,600	8,260	7,750	10,000	8,390	14,100	11,300	7,260	7,260	4,490	5,390
15	5,310	8,520	9,600	8,000	11,000	8,520	13,800	12,200	7,260	7,500	5,420	5,650
16	4,200	8,520	10,200	8,000	10,400	8,610	15,300	12,000	7,260	6,400	6,340	5,910
17	3,690	8,260	10,200	8,520	9,880	8,690	16,800	11,900	7,260	5,910	6,270	5,910
18	5,130	10,200	8,000	9,320	9,320	8,780	21,900	11,300	5,500	6,350	6,190	5,910
19	7,500	10,400	6,790	9,600	9,180	7,780	27,000	10,800	5,310	6,790	6,120	6,580
20	8,000	8,520	7,500	9,880	9,050	6,790	29,300	10,200	5,220	6,950	5,000	7,260
21	8,260	6,790	8,780	9,600	9,720	7,270	31,600	11,600	5,130	7,100	4,490	7,030
22	7,500	6,120	9,320	8,780	10,400	7,750	33,900	12,900	5,320	7,260	4,900	6,790
23	5,500	5,500	9,320	8,780	9,690	7,920	29,400	11,800	5,510	6,000	5,310	6,560
24	3,930	6,560	9,600	8,260	8,970	8,090	25,000	10,700	5,700	5,500	5,140	5,200
25	5,310	8,260	7,750	8,000	8,260	8,260	23,600	11,500	5,420	5,920	4,960	4,800
26	6,790	8,000	7,260	8,260	8,500	9,330	22,200	12,400	5,130	6,340	5,130	5,060
27	7,500	7,500	6,790	8,780	9,600	10,400	20,600	13,200	5,520	6,410	4,000	5,310
28	8,260	6,560	6,340	7,500	8,680	8,500	19,100	12,400	5,910	6,490	3,690	5,370
29	7,750	7,500	6,790	7,500		7,750	17,500	11,600	5,980	6,560	3,940	5,440
30	5,130	7,500	7,020	8,260		8,500	17,200	11,900	6,050	5,600	4,200	5,500
31	3,810		7,020	9,320		9,500		12,200		5,310	4,250	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	8,260	3,690	6,192		
November	15,700	3,810	8,384		
December	10,200	5,310	7,699		
January	10,700	5,910	8,306		
February	11,000	8,260	9,514		
March	10,700	6,790	8,699		
April	33,900	11,000	18,700		
May	28,500	10,200	15,610		
June	10,700	5,130	6,802		
July	7,500	5,130	6,336		
August	7,020	3,690	5,535		
September	7,260	4,290	5,409		
The year	33,900	3,690	8,917		

Rainy River near Birchdale, Minn.

(Continued)

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5,100	4,490	4,060	7,750	6,060	8,620	11,200	9,740	22,800	24,600	5,910	8,260
2	4,960	4,650	4,060	8,680	6,430	8,180	10,400	10,700	24,500	26,500	7,410	6,600
3	5,140	4,800	4,000	9,600	6,790	7,750	10,600	12,600	23,800	26,200	8,900	6,340
4	5,310	4,960	3,930	9,330	5,720	7,040	10,700	14,500	23,100	26,000	10,400	6,000
5	5,250	4,960	4,060	9,050	4,640	6,340	10,400	16,400	23,600	24,100	8,500	7,260
6	5,190	4,960	4,200	8,780	5,170	7,700	10,200	16,200	24,000	22,300	8,260	7,750
7	5,130	5,440	4,150	8,260	5,700	9,050	9,880	16,100	23,900	20,400	8,000	8,000
8	4,600	5,910	4,110	7,750	7,200	8,960	9,000	17,800	23,700	21,500	7,750	8,260
9	4,340	5,540	4,060	8,680	8,700	8,870	10,200	19,500	23,600	22,600	7,670	6,500
10	4,490	5,170	3,880	9,600	10,200	8,780	10,600	18,800	23,400	19,000	7,580	6,340
11	4,640	4,800	3,690	9,600	8,850	6,870	11,000	18,200	23,100	15,400	7,500	7,560
12	4,800	4,000	4,020	9,600	7,500	4,960	11,600	17,500	24,800	14,300	4,800	8,780
13	4,970	3,570	4,340	9,320	8,280	6,110	12,300	16,600	26,500	13,300	4,200	9,150
14	5,130	3,880	5,080	8,410	9,050	7,260	12,900	15,700	24,200	12,200	6,760	9,510
15	4,400	4,200	5,820	7,500	9,050	7,750	11,600	18,100	21,800	9,500	9,320	9,886
16	3,930	4,250	6,560	8,140	9,050	7,880	10,200	20,400	19,500	7,750	11,000	7,000
17	4,620	4,290	6,100	8,780	9,050	8,000	11,600	21,200	18,300	8,680	10,200	6,340
18	5,310	4,340	5,910	8,610	9,180	7,400	12,900	21,900	17,100	9,600	9,320	6,800
19	5,440	4,200	6,580	8,430	9,320	6,790	12,700	22,600	18,800	9,870	6,400	7,260
20	5,570	4,060	7,260	8,260	9,460	8,340	12,400	23,800	20,400	10,100	5,910	6,810
21	5,700	4,200	7,180	6,700	9,600	9,880	12,200	25,000	21,800	10,400	6,960	6,360
22	5,500	4,340	7,100	5,130	9,330	9,510	10,800	20,800	23,100	8,000	8,000	5,910
23	5,310	4,290	7,020	5,220	9,050	9,150	9,320	19,100	24,500	6,790	7,750	5,100
24	5,610	4,250	7,640	5,310	8,780	8,780	11,300	19,100	24,500	8,200	7,510	4,800
25	5,910	4,200	8,260	5,960	7,560	8,020	13,200	18,900	24,500	9,600	7,260	5,800
26	5,490	4,060	8,660	6,610	6,340	7,260	13,300	18,700	24,200	8,900	6,200	6,790
27	5,060	3,930	9,050	7,260	7,700	8,570	13,400	20,900	24,000	8,200	5,910	7,540
28	4,640	4,000	9,600	6,110	9,050	9,880	13,500	23,100	23,500	7,500	6,960	8,300
29	4,560	4,060	10,200	4,960		10,600	10,500	21,300	23,100	6,300	8,000	9,050
30	4,490	4,060	10,700	5,330		11,200	8,780	19,500	22,600	5,910	8,090	8,300
31	4,490		9,220	5,700		11,900		21,200		5,910	8,170	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	5,910	3,930	5,003		
November	5,910	3,570	4,462		
December	10,700	3,690	6,145		
January	9,600	4,960	7,691		
February	10,200	4,640	7,958		
March	11,900	4,960	8,303		
April	13,500	8,780	11,290		
May	25,000	9,740	18,580		
June	26,500	17,100	22,890		
July	26,500	5,910	13,860		
August	11,000	4,200	7,632		
September	9,880	4,800	7,278		
The year	26,500	3,570	10,090		

Kawishiwi River near Winton, Minn.

Location.- In lot 3, sec. 20, T. 63 N., R. 11 W., at power plant of Minnesota Power & Light Co., just above Fall Lake and 2½ miles east of Winton.

Drainage area.- 1,300 square miles.

Records available.- June 1905 to June 1907, October 1912 to September 1919, September 1923 to September 1934.

Average discharge.- 17 years (1913-19, 1923-34), 767 second-feet.

Extremes.- Maximum daily discharge during year, 7,210 second-feet May 14; no flow Sept. 16, 22, 23, 29.
1905-7, 1912-19, 1923-34: Maximum daily discharge, that of May 14, 1934; no flow a number of times 1905-7, 1923-28, 1934.

Remarks.- Records good except those for periods of high water, which are fair. Flow is entirely regulated by several reservoirs. Records collected by Minnesota Power & Light Co., under general supervision of the U. S. Geological Survey in connection with a Federal Power Commission project.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	196	430	653	519	482	459	262	1,390	1,220	762	556	116
2	367	398	685	589	482	632	265	1,470	1,280	665	452	65
3	399	607	507	524	482	471	367	1,580	1,230	794	485	129
4	432	520	625	524	514	308	361	2,300	1,150	611	238	218
5	399	495	653	653	482	454	376	2,450	1,340	530	258	165
6	230	398	685	524	482	651	463	3,200	1,260	603	399	207
7	129	430	685	226	482	459	418	4,200	1,270	700	311	206
8	277	571	685	381	450	523	483	4,870	1,120	668	413	165
9	403	635	540	405	450	523	532	5,520	1,120	603	313	147
10	459	588	386	420	482	491	547	5,990	1,150	700	378	153
11	361	357	625	388	482	331	576	6,440	1,110	605	271	165
12	432	340	621	388	486	530	594	6,830	865	603	107	165
13	434	760	685	420	411	384	820	6,620	986	635	243	230
14	440	731	685	420	637	459	820	7,210	889	571	443	133
15	237	731	718	416	867	394	829	7,050	857	423	184	165
16	780	717	534	388	779	409	772	7,050	954	464	346	0
17	829	664	531	388	835	391	793	6,900	857	571	346	57
18	468	621	625	420	835	355	885	6,700	889	603	283	165
19	394	442	589	373	835	297	885	6,370	865	506	99	230
20	398	576	647	374	835	191	885	6,130	830	635	140	133
21	430	649	653	392	867	320	885	5,820	795	635	281	65
22	318	685	653	375	803	280	885	5,350	918	267	370	0
23	427	685	685	457	738	280	1,100	4,680	922	367	217	0
24	430	685	445	485	803	177	1,100	4,320	960	635	346	290
25	476	511	414	438	623	226	1,090	3,500	954	635	174	304
26	505	573	560	482	717	265	1,160	3,280	960	603	32	165
27	463	657	621	482	620	277	1,160	2,850	928	635	172	84
28	430	653	653	482	588	277	1,230	2,600	863	571	330	129
29	495	685	653	450		277	1,270	2,270	802	365	298	0
30	494	644	653	482		309	1,340	1,780	762	496	330	32
31	441		306	482		342		1,380		411	298	

Month	Observed			Gain or loss in storage (equivalent mean)	Corrected for Storage*		
	Maximum	Minimum	Mean		Mean	Per square mile	Run-off in inches
October	829	129	418	+304	722	0.555	0.64
November	760	340	581	+155	736	.566	.63
December	718	306	602	-180	422	.325	.37
January	653	226	443	-65	378	.291	.34
February	867	411	627	-418	209	.161	.17
March	651	177	379	-116	263	.202	.23
April	1,340	262	772	+571	1,343	1.03	1.15
May	7,210	1,380	4,455	+477	4,932	3.79	4.37
June	1,340	762	1,004	-147	857	.659	.74
July	794	267	577	-455	122	.094	.11
August	556	32	294	-310	-16	-.012	-.01
September	304	0	136	-7	129	.099	.11
The year	7,210	0	862	-16	841	.647	8.85

*Corrections have been made for storage in the following lakes, the regulation from some being artificial and from others natural: Garden Farm, Little Farm, White Iron, Birch, Gabbro, Little Gabbro, Bold Eagle, and Camp Six. Negative values indicate the amount by which the evaporation from the reservoir surfaces exceeded the inflow.

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Burntside Lake near Ely, Minn.

Location.- Staff gage in SE¼ sec. 23, T. 63 N., R. 13 W., at Burntside Lake Lodge, 6 miles northwest of Ely. Zero of gage is 1,369.50 feet above mean sea level.

Records available.- August 1933 to September 1934.

Extremes.- Maximum water-surface elevation recorded during year, 1,371.91 feet June 1; minimum recorded, 1,370.50 feet Sept. 20-22, 1934.
1933-34: Maximum water-surface elevation recorded, that of June 1, 1934; minimum recorded, that of Sept. 20-22, 1934.

Remarks.- Records furnished by city engineer of Ely and John Anderson of Burntside Lodge. Gage heights have been reduced to mean sea level datum.

Elevation, in feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		71.10							71.91			
2	70.68	71.12							71.90			
3	70.69	71.14							71.89			
4	70.68	71.16							71.88			
5	70.66								71.86			
6	70.66	71.16							71.84			
7	70.62	71.16							71.86			
8		71.16							71.84			
9	70.60	71.22							71.82			70.55
10	70.59	71.22							71.80			70.56
11	70.60								71.78			70.54
12	70.59								71.78			70.54
13	70.58	71.22							71.76			70.53
14	70.56	71.22										70.53
15		71.22										70.53
16	70.81	71.22										70.52
17	70.94	71.22										70.52
18	70.96	71.22										70.52
19	71.00											70.51
20												70.50
21												70.50
22												70.50
23	71.03											
24	71.06											
25	71.06											
26	71.04											
27	71.05											
28	71.04											
29												
30	71.10											
31	71.11											

Note.- Add 1,300 feet to obtain elevation above mean sea level. No records on days for which no gage heights are given.

Vermilion River below Lake Vermilion, near Tower, Minn.

Location.- Staff gage in sec. 2, T. 63 N., R. 17 W., just below dam at outlet of Lake Vermilion, 4 miles above Twomile Creek, which enters from the west, and about 18 miles across Lake Vermilion from Tower.

Drainage area.- 530 square miles (authority, Corps of Engineers, U. S. Army).

Records available.- May 1911 to September 1917, June 1928 to September 1934.

Average discharge.- 12 years, 265 second-feet.

Extremes.- Maximum discharge recorded during year ending Sept. 30, 1934, 820 second-feet May 11-18; minimum discharge recorded, 34 second-feet Sept. 21 (gage height, -0.10 foot).
1911-17, 1928-34: Maximum discharge recorded, 2,050 second-feet Apr. 29 to May 7, 1916 (gage height, 3.8 feet); minimum discharge recorded, 34 second-feet Oct. 24, 25, 1929, Sept. 21, 1934.

Remarks.- Records good. Discharge records for period June 1928 to June 1932 and gage-height record for period July 1932 to September 1933 furnished by Corps of Engineers, U. S. Army. Gage read three times a week after July 1929, and discharge estimated between readings.

Discharge, in second-feet, 1928

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1										705	500	500
2										705	500	500
3										705	500	500
4										680	478	500
5										680	478	524
6										652	478	524
7										652	455	548
8										652	455	478
9										652	433	500
10										626	410	500
11										626	410	524
12										626	390	524
13										626	390	524
14										600	478	524
15										600	478	575
16										600	478	575
17										600	478	575
18										600	500	600
19										575	500	605
20										575	500	680
21										575	500	680
22										575	500	680
23										575	500	680
24										575	500	680
25										600	500	680
26									652	524	500	680
27									652	548	500	705
28									680	524	500	705
29									680	524	500	705
30									705	524	500	734
31										500	500	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October					
November					
December					
January					
February					
March					
April					
May					
June 26-30	705	652	674	1.27	0.24
July	705	500	606	1.14	1.31
August	500	390	477	.900	1.04
September	734	478	590	1.11	1.24
The year					

Vermilion River below Lake Vermilion, near Tower, Minn.

(Continued)

Discharge, in second-feet, 1928-29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	705	600	442	312	254	175	215	478	410	245	86	54
2	690	600	433	312	245	175	215	455	410	245	81	55
3	746	600	433	312	245	175	230	455	390	245	80	55
4	746	574	410	295	230	163	230	437	390	245	78	56
5	746	574	410	295	230	163	260	455	370	245	78	57
6	746	574	410	295	230	163	260	455	370	260	78	55
7	763	574	410	288	230	163	295	455	370	245	75	53
8	763	574	410	288	230	163	330	455	370	245	71	52
9	763	574	410	277	230	163	330	455	350	240	75	51
10	763	574	410	277	230	163	350	455	350	235	78	50
11	763	575	390	260	230	163	350	455	350	230	76	50
12	763	548	390	260	200	163	370	433	350	225	74	50
13	734	548	390	260	200	163	390	433	350	221	72	49
14	752	548	370	260	200	163	390	433	350	218	71	48
15	752	524	370	260	200	175	410	455	350	215	69	47
16	752	524	370	260	200	175	410	455	330	195	67	46
17	763	524	370	260	200	175	433	455	330	175	67	46
18	763	500	362	260	200	175	433	455	330	153	67	46
19	763	500	362	260	200	175	433	455	312	131	62	45
20	763	500	362	260	200	175	455	455	295	130	57	45
21	763	500	358	260	200	175	455	433	295	129	57	45
22	763	478	350	260	187	175	455	433	295	120	57	45
23	763	478	350	251	187	175	455	433	277	112	57	45
24	763	455	350	251	187	175	455	433	277	112	57	43
25	746	455	350	260	187	175	455	433	277	112	57	42
26	746	455	330	260	187	187	455	433	260	112	56	42
27	734	455	330	260	175	187	455	433	260	112	56	43
28	734	455	330	260	175	187	478	433	260	104	56	42
29	734	442	330	260		200	478	433	260	98	56	42
30	600	442	323	260		200	478	433	245	93	56	42
31	600		312	254		215		433		91	55	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	763	600	740	1.40	1.61
November	600	442	524	.989	1.10
December	442	312	375	.708	.82
January	312	251	271	.511	.59
February	254	175	210	.396	.41
March	215	163	175	.330	.38
April	478	215	380	.717	.80
May	478	433	445	.840	.97
June	410	245	328	.619	.69
July	260	91	179	.338	.39
August	86	55	67.2	.127	.15
September	57	42	48.0	.091	.10
The year	763	42	313	.591	8.01

Vermilion River below Lake Vermilion, near Tower, Minn.

(Continued)

Discharge, in second-feet, 1929-30

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	43	42	45	49	58	75	71	200	595	660	515	141
2	42	40	45	49	58	80	72	205	590	652	501	131
3	42	39	44	50	61	78	74	209	585	626	487	129
4	42	39	43	53	64	77	72	212	579	600	471	127
5	42	40	45	57	64	76	70	215	563	574	455	129
6	41	40	47	56	65	75	74	222	548	548	429	131
7	40	42	47	55	65	75	77	230	561	548	402	127
8	41	43	47	55	64	74	79	245	574	548	366	122
9	42	41	47	55	64	73	82	260	569	600	330	123
10	47	40	48	54	65	73	87	335	564	652	334	125
11	43	40	48	54	65	74	91	410	553	652	338	133
12	42	39	47	53	65	75	94	432	543	652	332	142
13	42	38	47	53	64	74	96	455	522	652	327	136
14	41	38	47	52	64	74	105	478	500	652	302	131
15	40	37	48	51	64	74	114	500	500	666	277	127
16	42	37	48	53	63	74	118	519	500	680	268	122
17	43	40	46	56	63	75	122	538	500	695	260	117
18	41	44	45	55	63	76	123	543	500	710	245	112
19	40	44	44	55	64	72	125	548	488	748	230	111
20	38	43	43	56	65	68	117	574	477	787	218	110
21	37	43	45	56	67	68	110	600	473	746	206	108
22	36	44	48	56	69	69	118	569	469	705	203	119
23	35	44	49	56	69	70	127	538	535	678	200	135
24	34	44	49	56	69	71	137	569	600	652	201	123
25	34	45	50	56	69	72	147	600	613	652	203	112
26	37	46	50	57	70	74	149	600	626	652	189	104
27	40	46	49	59	71	73	151	600	639	626	175	96
28	40	46	49	59	71	71	157	602	652	600	161	96
29	40	45	50	59		73	163	605	660	574	147	96
30	42	45	51	59		75	181	603	668	548	149	100
31	43		50	59		73		600		531	151	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	47	34	40.4	0.076	0.09
November	46	37	41.8	.079	.09
December	51	43	47.1	.089	.10
January	59	49	54.9	.104	.12
February	71	58	65.1	.123	.13
March	80	68	73.6	.139	.16
April	181	70	110	.208	.23
May	605	200	446	.842	.97
June	668	469	558	1.05	1.17
July	787	531	641	1.21	1.40
August	515	147	293	.553	.64
September	142	96	120	.226	.25
The year	787	34	209	.394	5.35

RAINY RIVER BASIN

Vermilion River below Lake Vermilion, near Tower, Minn.

(Continued)

Discharge, in second-feet, 1930-31

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	104	107	227	175	133	109	98	98	268	890	334	121
2	106	106	230	175	131	109	97	114	277	857	334	121
3	108	97	230	175	131	107	96	131	286	825	346	121
4	110	88	230	174	131	106	96	125	295	810	358	121
5	112	92	230	173	130	104	96	120	295	794	346	121
6	112	96	230	168	129	102	97	120	295	778	334	121
7	112	96	227	163	128	101	98	121	302	763	316	121
8	117	96	224	160	127	100	98	123	309	731	298	121
9	121	96	220	158	125	98	98	125	320	700	288	121
10	126	96	215	160	123	96	97	128	330	684	277	121
11	131	88	213	163	123	96	96	131	379	668	273	121
12	124	81	212	157	123	96	97	135	428	662	270	121
13	116	88	209	151	123	96	98	139	459	657	255	121
14	118	96	206	152	123	96	99	135	491	641	239	121
15	121	113	206	153	118	96	100	131	507	626	236	121
16	120	131	206	152	112	96	100	141	524	600	233	114
17	120	116	203	151	112	96	101	151	770	575	219	108
18	121	101	200	151	112	96	106	141	1,020	535	206	114
19	121	122	200	151	112	98	112	131	1,030	495	206	121
20	116	143	200	151	112	99	109	141	1,040	477	206	117
21	112	147	199	151	113	100	106	151	1,070	460	197	112
22	110	151	197	151	114	98	109	178	1,100	438	187	112
23	109	159	197	151	112	98	112	206	1,100	415	180	112
24	108	168	197	150	110	98	109	209	1,100	390	173	112
25	106	171	192	149	109	98	107	212	1,100	366	168	112
26	109	175	187	149	109	98	109	221	1,100	366	163	112
27	112	194	187	149	109	97	112	230	1,080	366	152	112
28	109	212	187	145	109	96	113	230	1,060	358	141	113
29	106	218	184	141		98	114	230	1,050	350	141	114
30	107	224	182	138		99	106	245	1,030	342	141	115
31	108		179	135		98		260		334	131	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	131	104	114	0.215	0.25
November	224	81	129	.243	.27
December	230	179	207	.391	.45
January	175	135	156	.294	.34
February	133	109	119	.225	.23
March	109	96	99.2	.187	.22
April	114	96	103	.194	.22
May	260	98	160	.302	.35
June	1,100	268	680	1.28	1.43
July	890	334	579	1.09	1.26
August	358	131	237	.447	.52
September	121	108	117	.221	.25
The year	1,100	81	226	.426	5.79

Vermilion River below Lake Vermilion, near Tower, Minn.

(Continued)

Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	116	82	116	125	121	116	112	511	702	322	216	216
2	108	85	120	125	121	116	112	553	691	322	202	209
3	101	85	120	125	121	116	117	553	680	322	216	202
4	107	85	121	125	121	118	121	553	674	331	229	190
5	112	86	121	125	120	121	126	558	668	340	216	177
6	110	88	121	125	118	121	131	564	647	323	202	190
7	109	81	121	125	120	121	134	564	626	306	202	202
8	109	75	121	125	121	121	137	564	600	306	202	202
9	109	75	121	125	121	121	139	579	575	306	184	202
10	109	75	121	125	121	121	141	595	565	306	166	202
11	109	75	121	125	121	121	152	595	540	306	160	202
12	105	75	121	125	121	121	163	595	518	306	154	190
13	101	75	121	125	121	121	175	610	496	306	149	177
14	94	75	121	125	121	121	187	623	475	306	144	166
15	88	75	123	125	121	121	201	653	454	306	138	154
16	90	75	125	125	121	120	215	680	475	298	133	154
17	91	70	123	125	121	118	242	701	496	289	128	154
18	90	64	121	125	121	118	270	722	475	289	124	154
19	90	66	123	125	121	118	291	726	454	289	119	154
20	89	68	125	126	121	118	312	734	324	282	114	154
21	88	70	125	127	121	118	351	734	394	274	112	154
22	88	72	125	127	121	118	390	734	376	274	109	149
23	88	78	123	127	120	118	420	707	357	274	126	144
24	85	85	121	126	118	115	450	680	357	259	144	136
25	82	91	121	125	116	112	450	695	357	244	173	127
26	84	108	121	123	114	112	450	711	340	251	202	122
27	85	113	123	121	114	112	460	707	322	258	202	118
28	80	118	125	123	114	112	469	702	322	258	202	116
29	75	115	123	125	114	112	469	702	322	258	230	114
30	77	112	121	123		112	469	702	322	244	258	110
31	80		123	121		112		702		229	237	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	116	75	95.1	0.179	0.21
November	118	64	83.2	.157	.18
December	125	116	122	.230	.27
January	127	121	125	.236	.27
February	121	114	120	.226	.24
March	121	112	117	.221	.25
April	469	112	262	.494	.55
May	734	511	646	1.22	1.41
June	702	322	487	.919	1.03
July	340	229	290	.547	.63
August	258	109	174	.328	.38
September	216	110	165	.311	.35
The year	734	64	224	.423	5.77

Vermilion River below Lake Vermilion, near Tower, Minn.

(Continued)

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	107	93	190	177	144	125	114	376	610	370	112	83
2	104	93	190	172	144	124	114	404	586	363	91	82
3	102	93	190	166	144	124	114	433	594	357	91	80
4	103	93	190	166	144	123	119	454	601	357	91	79
5	104	91	190	166	144	121	124	474	609	357	86	76
6	103	89	190	160	144	120	128	474	634	348	78	72
7	102	94	196	154	138	119	133	474	658	340	72	78
8	100	100	202	154	133	118	133	474	634	334	72	83
9	97	122	202	154	133	118	133	474	609	328	71	83
10	93	144	202	154	133	118	133	474	571	322	73	83
11	89	138	202	154	133	118	131	474	534	306	75	83
12	86	133	202	154	133	118	129	474	496	289	73	82
13	83	144	196	154	133	118	128	474	496	266	72	80
14	84	154	190	154	132	119	127	474	496	244	70	80
15	84	160	190	154	131	120	129	474	518	244	71	80
16	86	166	190	154	129	117	131	485	540	244	72	80
17	89	172	184	154	127	114	133	496	518	244	75	81
18	93	177	177	154	128	112	150	496	496	244	78	81
19	97	177	177	154	130	111	166	496	474	244	84	64
20	94	177	177	154	131	109	184	511	454	236	91	47
21	91	184	177	154	131	109	202	525	433	229	98	48
22	94	190	177	154	131	109	221	540	433	220	104	49
23	97	196	177	154	130	109	239	574	433	211	100	50
24	92	202	177	149	129	104	258	609	420	202	95	50
25	86	202	177	144	129	107	266	634	407	202	90	51
26	84	202	177	144	129	109	274	658	394	202	88	52
27	83	202	172	144	129	112	282	642	394	190	85	53
28	86	202	166	144	127	113	289	625	394	177	83	51
29	90	196	166	144		114	318	609	385	162	84	49
30	92	190	166	144		114	347	622	376	148	84	49
31	93		172	144		114		634		133	84	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	107	83	93.2	0.176	0.20
November	202	89	153	.289	.32
December	202	166	185	.349	.40
January	177	144	154	.291	.34
February	144	127	134	.253	.26
March	125	104	115	.217	.25
April	347	114	178	.336	.37
May	658	376	517	.975	1.12
June	658	376	507	.957	1.07
July	370	133	262	.494	.57
August	112	70	83.6	.158	.18
September	83	47	68.6	.129	.14
The year	658	47	205	.387	5.22

Vermilion River below Lake Vermilion, near Tower, Minn.

(Continued)

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	49	102	166	190	166	144	133	684	562	312	83	51
2	48	107	166	190	166	144	133	710	547	289	83	51
3	48	112	166	190	170	144	138	738	532	289	83	51
4	48	112	166	190	173	144	144	765	517	289	82	50
5	46	112	172	190	177	144	149	783	506	289	82	50
6	44	112	177	186	177	149	154	802	496	289	81	49
7	43	113	177	181	177	154	162	820	475	284	76	48
8	44	114	177	177	177	154	169	792	454	279	72	48
9	44	119	173	177	177	154	177	765	441	274	72	46
10	45	124	170	177	177	154	203	792	427	266	71	47
11	41	131	166	177	177	154	229	820	414	258	70	46
12	43	137	166	177	177	154	244	820	434	184	69	45
13	43	144	166	177	172	154	258	820	454	109	68	45
14	44	144	172	177	166	154	291	820	444	107	68	45
15	41	144	177	177	160	154	324	820	433	104	68	44
16	57	149	173	177	154	154	357	820	427	102	68	44
17	60	154	170	177	154	151	376	820	420	100	67	43
18	66	154	166	177	154	147	394	820	414	97	64	40
19	68	154	172	177	154	144	424	802	404	97	61	38
20	70	154	177	173	154	144	454	783	394	97	58	36
21	69	154	177	170	154	144	468	765	394	94	58	34
22	70	154	177	166	154	149	482	738	394	92	57	35
23	72	154	177	166	154	154	496	710	394	89	54	37
24	73	154	177	166	151	151	529	710	394	88	52	38
25	74	158	177	166	147	147	562	710	394	87	52	37
26	76	162	177	166	144	144	574	685	394	86	52	36
27	78	166	177	166	144	144	586	659	394	86	52	36
28	84	166	177	166	144	144	610	634	376	85	52	35
29	90	166	177	166		138	634	622	357	84	51	35
30	96	166	181	166		133	658	609	334	83	51	35
31	99		186	166		133		586		83	51	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	99	41	60.4	0.114	0.13
November	166	102	140	.264	.29
December	186	166	173	.326	.38
January	190	166	176	.332	.38
February	177	144	163	.308	.32
March	154	133	148	.279	.32
April	658	135	350	.660	.74
May	820	586	749	1.41	1.63
June	562	334	434	.819	.91
July	312	83	164	.309	.36
August	83	51	65.4	.123	.14
September	51	34	42.5	.080	.09
The year	820	34	222	.419	5.69

Little Fork River at Little Fork, Minn.

Location.- Chain gage in NW¼ sec. 9, T. 68 N., R. 25 W., at bridge on State highway 65 at Little Fork, 1½ miles above mouth of Beaver Creek.

Drainage area.- 1,620 square miles, revised (authority, Corps of Engineers, U. S. Army).

Records available.- June 1909 to September 1917, June 1928 to September 1934.

Average discharge.- 12 years (1911-17, 1928-34), 779 second-feet.

Extremes.- Maximum discharge recorded during year ending Sept. 30, 1934, 7,660 second-feet May 6 (gage height, 18.90 feet); minimum discharge recorded, 42 second-feet Aug. 31, Sept. 1 (gage height, 4.60 feet).
1909-17, 1928-34: Maximum discharge recorded, 19,300 second-feet Apr. 18, 1916 (gage height, 37 feet); minimum discharge recorded, 37 second-feet Aug. 13, 1930 (gage height, 4.50 feet).

Remarks.- Records good except those for periods of ice effect, Nov. 19, 1928, to Apr. 19, 1929; Nov. 17, 1929, to Apr. 14, 1930; Nov. 24, 1930, to Apr. 13, 1931; Nov. 25, 1931, to Apr. 7, 1932; Nov. 11, 1932, to Apr. 22, 1933; Nov. 3, 1933, to Apr. 27, 1934, which are fair. Stage-discharge relation affected by shifting control July 15 to Sept. 30, 1934. Discharge estimated for Apr. 5, 1931, Oct. 23, Nov. 12-14, 16-18, Dec. 25, 1933, Jan. 1, 5, Mar. 2, 3, 18, 1934. Gage heights and results of discharge measurements for period June 1928 to September 1933 furnished by Corps of Engineers, U. S. Army.

Discharge, in second-feet, 1928

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1										1,500	986	2,230
2										1,310	954	2,190
3										1,200	920	1,980
4										954	854	1,730
5										988	756	1,640
6										988	661	1,310
7										1,020	630	1,200
8										1,020	692	1,060
9										1,650	724	954
10										1,860	661	954
11										1,940	569	1,160
12										1,690	510	1,270
13										1,500	455	1,460
14										1,270	429	1,570
15										1,090	920	2,360
16										954	2,490	2,760
17										954	2,110	3,300
18										887	1,690	3,560
19										954	1,980	3,340
20										854	2,270	2,980
21										788	1,650	3,070
22									5,150	756	1,610	3,710
23									5,000	821	1,610	3,800
24									4,660	821	1,690	3,800
25									4,280	756	1,730	3,660
26									3,710	724	1,610	3,710
27									2,980	854	1,420	3,070
28									2,440	854	1,240	3,160
29									2,110	887	1,310	2,400
30									1,770	821	1,900	2,110
31										788	2,060	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October					
November					
December					
January					
February					
March					
April					
May					
June 22-30	5,150	1,770	3,570	2.20	0.74
July	1,940	724	1,080	.667	.77
August	2,490	429	1,260	.778	.90
September	3,800	954	2,380	1.47	1.64
The year					

RAINY RIVER BASIN

Little Fork River at Little Fork, Minn.

(Continued)

Discharge, in second-feet, 1928-29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,940	1,160	455	222	132	132	630	1,570	1,380	327	94	73
2	1,730	1,060	455	211	141	132	630	1,540	1,350	327	88	70
3	1,570	1,020	455	211	141	132	821	1,380	1,310	314	86	73
4	1,540	1,020	429	211	141	132	1,690	1,350	1,060	302	85	75
5	2,060	1,020	403	180	141	124	1,860	1,240	988	302	86	69
6	2,320	1,020	429	180	141	124	1,570	1,130	821	290	83	60
7	3,430	988	429	180	141	124	3,070	1,090	539	302	79	56
8	3,300	954	455	170	141	124	3,560	1,020	692	377	76	61
9	3,070	887	455	170	141	132	2,940	954	630	403	80	67
10	2,710	821	455	160	132	132	2,710	887	599	455	79	76
11	2,440	756	429	150	132	132	2,110	920	569	510	76	98
12	2,190	756	403	132	132	141	1,690	954	1,020	482	75	108
13	2,060	788	377	141	132	150	1,610	1,060	1,090	482	79	108
14	1,820	821	377	150	132	150	1,310	1,130	1,160	455	81	108
15	1,860	920	377	150	132	211	1,380	1,310	1,090	403	83	108
16	2,440	954	377	132	132	278	1,500	1,380	954	352	76	124
17	2,980	954	352	132	132	278	1,650	1,540	788	314	70	132
18	2,980	920	327	132	132	314	1,690	1,650	692	266	72	132
19	2,580	887	327	132	132	403	1,770	1,610	661	233	76	141
20	2,620	821	327	132	124	539	1,860	1,500	569	211	75	150
21	2,440	756	290	132	124	692	1,860	1,310	661	200	75	170
22	2,270	756	290	132	124	821	1,860	1,240	482	190	76	170
23	2,020	724	290	124	116	1,090	1,900	1,160	455	160	75	170
24	2,020	539	278	116	124	920	1,940	1,060	429	160	76	160
25	1,820	510	278	116	132	756	1,940	988	403	150	82	150
26	1,690	510	266	116	132	630	2,020	954	377	141	87	150
27	1,610	510	255	116	132	630	2,020	920	352	132	83	132
28	1,540	510	255	116	132	630	2,020	887	352	124	79	132
29	1,460	482	255	116		630	1,690	1,020	352	108	75	116
30	1,380	455	233	124		630	1,690	1,200	352	101	76	116
31	1,240		233	124		630		1,270		98	75	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	3,430	1,240	2,170	1.34	1.54
November	1,160	455	809	.499	.56
December	455	233	355	.219	.25
January	222	116	149	.092	.11
February	141	116	133	.082	.09
March	1,090	124	385	.238	.27
April	3,560	630	1,830	1.13	1.26
May	1,850	887	1,200	.741	.85
June	1,380	352	739	.456	.51
July	510	98	280	.173	.20
August	94	70	79.3	.049	.06
September	170	56	112	.069	.08
The year	3,560	56	689	.425	5.78

Little Fork River at Little Fork, Minn.

(Continued)

Discharge, in second-feet, 1929-30

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	150	87	75	81	73	160	116	569	1,160	1,420	352	70
2	160	101	77	85	74	170	132	692	954	1,310	314	81
3	160	132	79	87	75	160	222	920	887	854	255	81
4	150	160	79	86	74	170	327	1,090	692	920	233	81
5	141	190	79	80	74	150	352	1,090	692	821	211	81
6	141	211	79	75	79	150	692	1,060	692	724	150	87
7	141	233	81	75	80	141	1,310	1,160	661	756	116	94
8	132	233	85	74	77	132	1,610	1,570	630	788	101	87
9	132	233	85	68	70	132	1,690	2,230	630	599	101	87
10	150	244	87	67	70	132	2,400	2,800	569	1,540	65	87
11	150	233	86	69	70	124	2,440	4,380	569	1,860	56	75
12	160	222	87	70	70	132	3,340	5,600	539	1,860	46	101
13	132	222	90	69	72	116	3,250	5,810	599	1,820	37	101
14	101	211	91	73	72	116	2,710	5,660	692	1,820	56	150
15	87	190	94	72	70	116	1,610	5,150	920	1,820	54	150
16	132	180	95	69	70	116	1,380	4,810	988	1,500	60	190
17	180	170	93	68	70	132	1,270	4,380	1,090	1,310	56	200
18	190	160	87	70	65	116	1,130	2,980	988	1,500	65	222
19	190	160	91	72	68	116	1,020	2,490	920	1,500	70	222
20	190	160	93	75	68	116	988	2,110	788	1,420	75	200
21	190	150	95	75	67	116	920	1,860	630	1,310	75	170
22	180	116	86	73	73	116	854	1,690	630	1,160	75	170
23	150	87	83	74	77	124	788	1,540	724	954	160	150
24	160	93	81	75	79	116	756	1,380	1,380	887	160	150
25	160	100	75	75	79	116	692	1,240	2,230	756	150	141
26	150	101	75	77	82	116	630	1,130	3,200	821	70	132
27	150	93	75	85	87	124	630	1,090	3,520	788	70	132
28	150	88	81	86	132	132	692	1,240	3,200	661	60	116
29	141	79	81	76		124	539	1,540	3,070	569	56	101
30	141	72	79	76		124	510	1,540	1,980	482	56	101
31	108		77	73		116		1,310		403	60	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	190	87	150	0.093	0.11
November	244	72	157	.097	.11
December	95	75	83.9	.052	.06
January	87	67	75.2	.046	.05
February	132	65	75.6	.047	.05
March	180	116	130	.080	.09
April	3,340	116	1,170	.722	.81
May	5,810	569	2,330	1.44	1.66
June	3,520	539	1,210	.747	.83
July	1,860	403	1,130	.698	.80
August	352	37	112	.069	.08
September	222	70	127	.078	.09
The year	5,810	37	564	.348	4.74

Little Fork River at Little Fork, Minn.

(Continued)

Discharge, in second-feet, 1930-31

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	116	160	482	50	42	49	180	446	960	527	139	43
2	108	170	377	48	42	49	266	392	900	554	97	41
3	116	180	327	48	42	48	290	392	840	473	104	48
4	116	180	302	47	43	48	255	366	870	446	100	65
5	124	170	278	45	44	50	329	366	780	392	114	59
6	124	170	278	45	42	50	403	340	780	366	250	67
7	124	170	222	45	42	50	455	366	780	340	237	68
8	132	170	190	45	42	50	482	392	693	314	212	69
9	132	170	180	44	41	50	482	419	665	327	163	80
10	141	170	160	43	39	49	482	446	637	327	139	73
11	150	160	141	42	39	50	455	500	609	314	122	67
12	150	150	124	43	39	60	429	500	665	301	114	63
13	180	150	116	42	39	56	403	554	2,300	263	107	69
14	200	150	108	42	39	60	419	637	3,930	225	94	67
15	211	160	101	42	42	62	366	609	4,210	187	73	67
16	211	170	95	43	42	65	340	581	3,650	183	73	67
17	211	180	93	43	42	70	340	554	2,770	179	71	63
18	211	190	87	43	42	72	366	554	2,770	175	73	62
19	200	190	88	43	43	80	392	554	2,650	139	63	71
20	190	233	83	42	43	85	419	527	2,410	144	65	83
21	190	302	85	42	44	85	554	554	1,650	131	63	83
22	180	403	86	43	45	87	581	581	1,450	122	58	85
23	190	821	83	43	47	93	609	665	1,320	111	61	94
24	190	954	74	43	48	108	609	721	1,160	100	61	91
25	190	821	71	43	50	101	609	780	1,030	94	61	94
26	190	724	68	43	50	87	581	840	960	85	50	97
27	190	630	56	42	49	82	554	810	930	118	49	100
28	190	599	57	42	49	77	554	721	840	114	48	100
29	190	599	52	41		93	500	721	780	114	50	107
30	190	510	53	41		95	446	810	609	114	48	122
31	180		50	41		124		840		118	47	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	211	108	168	0.104	0.12
November	954	150	327	.202	.23
December	482	50	147	.091	.10
January	50	41	43.5	.027	.03
February	50	39	43.2	.027	.03
March	124	48	70.2	.043	.05
April	609	180	438	.270	.30
May	840	340	566	.349	.40
June	4,210	609	1,490	.920	1.03
July	554	85	239	.148	.17
August	250	47	97.0	.060	.07
September	122	41	75.5	.047	.05
The year	4,210	39	308	.190	2.58

Little Fork River at Little Fork, Minn.

(Continued)

Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	175	139	840	98	53	139	237	1,800	990	637	314	1,360
2	212	139	750	94	53	151	237	2,050	930	554	340	1,090
3	224	153	637	91	52	158	250	2,150	870	554	314	930
4	200	175	609	90	51	163	262	2,100	810	500	288	810
5	175	187	554	88	50	163	366	2,150	780	473	262	721
6	158	187	527	86	50	200	527	2,300	780	446	250	581
7	149	187	473	85	50	200	780	2,410	721	554	224	500
8	175	175	446	83	49	187	1,160	2,890	1,030	721	187	446
9	163	163	419	80	48	187	1,400	3,860	900	810	163	392
10	163	163	392	79	48	175	3,790	4,420	810	750	153	327
11	200	153	366	78	48	163	5,310	4,280	693	665	151	301
12	262	153	301	75	48	158	6,300	3,860	581	581	139	275
13	262	149	237	74	49	156	6,460	3,510	527	581	122	237
14	237	149	237	73	50	151	6,700	2,710	500	581	111	224
15	212	146	224	72	50	149	7,020	2,470	500	609	104	212
16	200	139	200	71	51	146	7,180	2,300	500	609	100	200
17	175	139	200	69	51	144	7,500	2,830	527	392	85	200
18	175	144	212	68	52	141	5,690	3,190	554	446	79	187
19	149	144	212	67	53	139	3,860	3,310	554	392	78	187
20	144	158	200	66	53	149	3,580	3,010	527	340	78	175
21	135	200	200	64	54	156	3,510	2,470	554	327	71	175
22	139	250	200	63	57	163	3,370	2,050	500	288	56	175
23	135	340	200	62	58	175	3,190	2,000	448	275	71	175
24	126	500	200	61	60	175	2,950	1,550	419	500	80	175
25	128	581	200	60	61	187	2,830	1,320	448	340	97	175
26	135	780	175	58	71	200	2,470	1,160	500	250	104	175
27	122	960	163	58	78	200	2,150	1,090	610	262	149	175
28	116	990	163	57	94	212	1,900	1,030	840	237	609	175
29	111	960	128	56	114	212	1,700	1,060	780	237	960	156
30	131	900	113	55		224	1,750	1,060	721	275	1,650	149
31	131		100	54		224		1,060		288	1,700	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	262	111	168	0.104	0.12
November	990	139	320	.198	.22
December	840	100	319	.197	.23
January	98	54	72.1	.045	.05
February	114	48	57.1	.035	.04
March	224	139	172	.106	.12
April	7,500	237	3,150	1.94	2.16
May	4,420	1,030	2,370	1.46	1.68
June	1,030	419	670	.414	.46
July	810	237	467	.288	.33
August	1,700	56	293	.181	.21
September	1,360	149	369	.228	.25
The year	7,500	48	701	.433	5.87

Little Fork River at Little Fork, Minn.

(Continued)

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	139	301	810	61	54	66	1,090	3,580	1,400	960	67	47
2	131	301	750	61	56	71	1,360	5,990	1,280	637	65	46
3	126	301	721	58	56	73	1,280	6,380	1,160	581	59	44
4	126	288	721	58	58	77	1,450	5,910	1,090	392	58	43
5	122	288	665	59	56	79	1,500	5,010	960	366	54	43
6	118	327	609	62	56	81	1,500	4,280	870	554	67	44
7	116	693	581	59	56	85	1,450	3,510	900	581	69	43
8	111	1,500	527	60	52	90	1,360	2,950	870	366	65	44
9	114	2,200	473	57	53	91	1,360	2,590	930	392	53	43
10	113	3,510	446	55	53	94	1,320	2,200	990	419	53	47
11	109	6,380	419	55	53	94	1,320	1,950	930	473	51	48
12	114	5,910	392	53	51	96	1,240	1,800	870	473	53	54
13	113	3,650	327	51	49	97	1,200	1,650	750	446	54	61
14	111	3,250	301	44	48	94	1,200	1,550	637	419	53	97
15	109	2,770	262	43	46	91	1,280	1,500	581	540	52	88
16	111	2,590	237	46	44	86	1,700	1,500	527	262	50	88
17	122	2,590	212	48	43	83	3,010	1,400	500	224	50	88
18	135	2,590	187	50	43	85	5,760	1,320	473	167	50	91
19	144	2,350	156	50	43	85	8,140	1,450	446	163	50	88
20	153	1,950	137	56	44	85	7,980	1,650	419	139	50	85
21	163	1,750	135	54	53	88	7,740	1,650	366	131	51	83
22	187	1,550	118	52	56	86	7,660	1,600	340	126	51	88
23	212	1,450	104	50	58	90	6,780	1,450	314	118	53	91
24	237	1,240	94	50	58	91	5,010	1,800	288	114	53	91
25	237	1,130	78	51	58	91	4,860	2,710	392	107	51	97
26	237	960	74	52	58	92	4,000	3,070	473	94	50	100
27	250	960	83	52	60	94	3,440	3,010	419	88	53	91
28	288	930	74	54	63	96	3,130	2,590	366	88	53	85
29	301	870	75	55		111	2,650	2,200	392	83	48	71
30	301	810	67	53		366	2,770	2,050	693	73	46	69
31	301		62	53		750		1,600		69	47	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	301	109	166	0.102	0.12
November	6,380	288	1,850	1.14	1.27
December	810	62	319	.197	.23
January	62	43	53.6	.033	.04
February	63	43	52.8	.033	.03
March	750	66	118	.073	.08
April	8,140	1,090	3,150	1.94	2.16
May	6,380	1,320	2,640	1.63	1.88
June	1,400	288	688	.425	.47
July	960	69	305	.188	.22
August	69	46	54.2	.033	.04
September	100	43	69.9	.043	.05
The year	8,140	43	788	.486	6.59

Little Fork River at Little Fork, Minn.

(Continued)

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	80	554	200	91	107	104	109	2,470	398	454	60	42
2	85	527	187	94	111	104	107	2,650	398	482	60	46
3	88	527	187	94	114	104	104	4,210	398	454	60	49
4	88	527	175	94	114	104	118	5,010	372	225	60	52
5	85	527	163	94	118	107	446	5,090	398	182	60	50
6	85	527	163	94	122	111	780	7,660	398	173	56	54
7	83	500	153	100	128	107	1,090	5,090	398	156	60	53
8	85	473	135	107	122	104	1,280	3,720	296	148	60	54
9	83	446	126	114	118	100	1,750	3,190	320	148	54	54
10	85	419	122	122	114	104	2,050	2,710	346	192	54	54
11	88	392	118	122	111	107	2,530	2,300	454	192	53	52
12	85	392	118	126	114	111	3,130	1,800	570	192	53	50
13	83	392	111	126	111	114	3,130	1,700	540	182	56	53
14	83	392	107	131	107	122	3,130	1,700	482	164	55	51
15	88	392	100	135	104	126	3,070	1,650	398	156	60	53
16	91	392	97	144	100	118	3,070	1,600	333	127	60	51
17	104	392	94	144	102	122	2,830	1,600	308	120	56	49
18	114	392	91	144	107	120	2,710	1,320	272	113	54	47
19	693	392	88	135	111	118	2,650	1,200	260	100	60	47
20	870	392	85	135	107	114	2,650	1,130	272	100	60	47
21	930	360	83	131	104	109	2,890	990	398	100	60	47
22	930	327	80	126	100	107	2,830	920	454	100	60	46
23	812	327	80	126	100	109	2,770	820	510	94	56	47
24	693	327	83	122	97	107	2,770	750	510	84	54	60
25	693	327	84	118	97	105	2,590	630	454	74	51	64
26	721	301	85	118	100	104	2,200	630	482	69	49	64
27	593	288	85	114	100	109	2,100	600	372	60	47	56
28	693	237	88	111	104	107	2,150	600	398	56	44	56
29	665	237	88	107		105	2,200	482	372	60	43	51
30	581	212	88	104		104	2,350	482	398	64	43	53
31	554		88	107		111		398		56	42	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	930	80	358	0.221	0.25
November	554	212	396	.244	.27
December	200	80	115	.071	.08
January	144	91	117	.072	.08
February	126	97	109	.067	.07
March	126	100	110	.068	.08
April	3,130	104	2,053	1.27	1.42
May	7,660	398	2,100	1.30	1.50
June	570	260	399	.246	.27
July	482	56	157	.097	.11
August	60	42	548	.034	.04
September	64	42	51.7	.032	.04
The year	7,660	42	502	.310	4.21

Big Fork River at Big Falls, Minn.

Location.- Staff gage in sec. 36, T. 155 N., R. 25 W., at Big Falls, ¼ mile downstream from bridge on U. S. Highway 71 and 500 feet below falls. Gage at same site and datum as used 1911-12.

Drainage area.- 1,520 square miles (revised by Corps of Engineers, U. S. Army).

Records available.- August 1909 to December 1912, June 1928 to September 1934.

Extremes.- Maximum discharge recorded during year ending Sept. 30, 1934, 2,340 second-feet May 5 (gage height, 6.08 feet); minimum discharge recorded, 19 second-feet Sept. 1, 13, 15 (gage height, 2.50 feet).
1909-12, 1928-34: Maximum discharge recorded, 5,440 second-feet Apr. 20, 1933 (gage height, 8.71 feet); minimum discharge recorded, that of Sept. 1, 13, 15, 1934.

Remarks.- Records good except those for periods of ice effect Nov. 20, 1928, to Apr. 5, 1929, Nov. 20, 1929, to Apr. 7, 1930, Nov. 1-10, 1930, Nov. 25, 1930, to Apr. 10, 1931, Nov. 26, 1931, to Apr. 10, 1932, Nov. 12, 1932 to Apr. 15, 1933, Nov. 1, 1933, to Apr. 14, 1934, which are fair. Stage-discharge relation affected by aquatic growth July 28 to Sept. 30, 1934. Gage heights and results of discharge measurements furnished for period June 1928 to September 1933 by Corps of Engineers, U. S. Army. Gage read three times a week from Feb. 1, 1933, to Sept. 30, 1933, and Jan. 9 to Sept. 30, 1934; discharge interpolated for days when gage was not read.

Discharge, in second-feet, 1928

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1										852	427	1,660
2										817	494	1,560
3										733	477	1,390
4										750	433	1,230
5										657	385	1,090
6										703	345	1,040
7										723	350	887
8										770	335	777
9										894	345	710
10										1,000	340	866
11										922	335	730
12										817	285	845
13										730	290	972
14										638	285	1,140
15										552	330	1,360
16										488	657	1,570
17										460	1,010	1,730
18										638	1,240	1,920
19										613	1,160	1,820
20										517	1,030	1,760
21										483	694	2,110
22									2,560	540	866	2,330
23									2,640	600	950	2,610
24									2,430	517	1,280	2,640
25									2,120	477	1,520	2,610
26									1,780	517	1,350	2,550
27									1,510	385	1,320	2,060
28									1,280	380	1,230	1,800
29									1,160	380	1,290	1,660
30									1,010	360	1,480	1,520
31										380	1,650	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October					
November					
December					
January					
February					
March					
April					
May					
June 22-30	2,640	1,010	1,830	1.20	0.40
July	1,000	360	624	.411	.47
August	1,650	285	787	.518	.60
September	2,640	710	1,560	1.03	1.15
The year					

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Big Fork River at Big Falls, Minn.

(Continued)

Discharge, in second-feet, 1928-29

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,450	1,030	756	345	241	164	540	1,260	1,010	255	112	80
2	1,360	986	743	330	231	168	588	1,240	1,000	246	100	78
3	1,280	965	716	325	226	164	677	1,250	950	241	94	80
4	1,250	1,010	677	315	226	164	950	1,260	797	231	88	80
5	1,630	1,020	632	308	226	173	1,240	1,210	670	335	88	78
6	1,570	1,020	600	295	221	178	1,540	1,080	619	265	85	78
7	2,240	986	606	290	226	183	1,790	1,030	522	280	85	78
8	2,090	994	651	280	221	187	1,900	972	483	330	85	78
9	2,080	994	651	275	216	187	2,080	908	438	488	83	80
10	2,050	979	619	270	216	226	1,360	866	417	677	85	83
11	1,770	986	594	255	216	300	1,220	873	455	670	88	85
12	1,680	979	582	250	207	370	1,100	859	558	644	88	85
13	1,570	972	564	236	207	390	1,040	901	528	638	91	88
14	1,520	986	546	265	207	417	1,010	958	444	619	91	91
15	1,530	1,020	522	265	202	455	1,030	1,070	401	558	88	91
16	1,490	1,000	517	270	202	540	1,080	1,220	335	505	85	88
17	1,440	994	500	265	202	632	1,390	1,380	315	422	83	88
18	1,660	1,020	488	270	197	922	1,730	1,410	330	350	80	91
19	1,960	1,010	488	270	192	1,080	1,640	1,360	300	300	78	88
20	1,880	986	477	270	197	1,220	1,570	1,330	360	260	78	88
21	1,760	965	483	275	187	1,070	1,550	1,300	345	231	76	91
22	1,670	950	483	265	187	1,030	1,400	1,170	335	211	78	85
23	1,570	915	471	275	183	1,110	1,330	1,030	305	183	88	78
24	1,570	873	471	265	173	1,080	1,360	979	290	145	85	78
25	1,530	866	455	255	178	838	1,350	936	275	168	94	80
26	1,420	845	427	250	173	588	1,320	915	265	150	100	80
27	1,360	831	406	241	168	466	1,330	810	260	154	94	80
28	1,310	817	396	236	168	396	1,350	887	290	145	91	91
29	1,280	790	375	226		422	1,330	994	255	126	88	126
30	1,170	777	365	221		438	1,300	1,070	255	117	88	126
31	1,130		355	236		505		1,070		121	83	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	2,240	1,130	1,590	1.05	1.21
November	1,030	777	952	.626	.70
December	756	355	536	.353	.41
January	345	221	271	.178	.21
February	241	168	203	.134	.14
March	1,220	164	518	.341	.39
April	2,080	540	1,300	.855	.95
May	1,410	810	1,080	.711	.82
June	1,010	255	460	.303	.34
July	677	117	325	.214	.25
August	112	76	87.7	.058	.07
September	126	78	86.4	.057	.06
The year	2,240	76	620	.408	5.55

Big Fork River at Big Falls, Minn.

(Continued)

Discharge, in second-feet, 1929-30

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	121	159	91	47	85	360	211	670	638	644	140	63
2	117	173	80	45	108	325	236	777	790	540	135	63
3	112	197	73	45	104	290	241	880	736	505	131	63
4	112	216	67	44	104	250	241	929	703	471	126	63
5	108	226	65	51	97	241	300	950	831	438	117	65
6	117	231	69	51	91	231	355	958	929	406	104	65
7	121	236	65	59	78	241	1,070	1,100	901	380	100	65
8	126	231	63	65	73	236	1,130	1,360	824	345	91	63
9	121	226	67	67	67	241	929	1,670	736	315	83	61
10	126	221	67	71	61	250	943	2,010	644	295	83	61
11	135	211	63	65	58	250	958	3,610	594	320	80	61
12	140	211	59	71	59	255	1,110	4,160	558	320	78	88
13	145	164	56	65	61	255	1,580	4,470	588	325	73	88
14	154	178	59	69	61	270	1,230	4,440	670	310	73	85
15	164	187	56	65	61	295	1,100	3,900	696	295	73	88
16	178	183	69	67	65	310	1,020	3,330	730	270	71	76
17	183	192	63	76	69	295	929	2,900	710	300	71	80
18	178	207	69	71	76	270	873	2,540	657	370	69	78
19	168	117	63	63	76	270	866	2,100	588	375	67	76
20	159	100	65	78	80	275	873	1,840	534	370	65	76
21	159	76	63	80	94	260	831	1,700	477	350	63	76
22	154	78	63	91	192	320	810	1,630	449	340	61	76
23	154	100	59	100	187	320	804	1,510	466	305	59	73
24	154	78	56	73	154	325	797	1,500	477	270	59	71
25	145	97	53	73	187	300	730	1,500	483	246	61	71
26	150	97	54	67	290	280	677	1,710	831	226	58	71
27	145	94	51	80	401	260	600	1,430	1,200	211	54	71
28	140	83	51	108	380	250	594	1,520	1,230	202	58	71
29	135	94	48	76		246	588	1,460	943	187	61	69
30	135	94	45	80		241	632	1,260	783	168	63	67
31	154		47	91		231		986		150	65	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	183	108	142	0.093	0.11
November	236	76	159	.105	.12
December	91	45	61.9	.041	.05
January	108	44	69.5	.045	.05
February	401	58	122	.080	.08
March	360	231	272	.179	.21
April	1,580	211	775	.510	.57
May	4,470	670	1,960	1.29	1.49
June	1,230	449	720	.474	.53
July	644	150	331	.218	.25
August	140	54	80.3	.053	.06
September	88	61	71.5	.047	.05
The year	4,470	44	399	.262	3.57

Big Fork River at Big Falls, Minn.

(Continued)

Discharge, in second-feet, 1930-31

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	65	58	159	83	69	51	83	150	150	71	36	29
2	67	65	140	83	69	51	80	131	145	59	45	29
3	69	67	126	78	69	53	80	117	121	41	48	30
4	71	58	94	73	69	54	83	117	104	36	48	31
5	71	40	73	73	69	54	88	126	88	41	47	30
6	71	45	67	73	69	51	108	117	83	40	45	29
7	73	65	65	78	71	53	154	108	83	50	44	29
8	76	61	61	76	71	51	183	121	83	61	41	28
9	76	73	65	76	71	50	246	140	78	59	40	28
10	78	88	65	76	69	51	241	135	73	56	40	27
11	78	97	65	83	78	51	221	126	91	54	39	26
12	80	94	65	80	85	50	310	135	126	54	37	25
13	83	97	65	80	80	54	226	145	197	56	35	26
14	85	100	65	80	73	51	178	140	375	56	33	29
15	85	108	61	80	78	51	173	131	750	54	32	30
16	85	117	67	80	73	50	164	126	613	54	31	30
17	88	121	67	78	69	53	173	126	471	58	29	29
18	88	121	67	73	65	51	187	140	365	54	34	30
19	83	135	67	73	65	51	207	140	295	50	32	33
20	83	159	65	73	65	54	202	135	250	47	30	35
21	80	183	67	73	61	54	211	135	211	42	30	37
22	88	192	69	73	61	58	221	150	183	40	29	35
23	100	197	71	71	59	65	221	159	173	37	27	33
24	85	131	69	71	58	73	202	164	159	35	25	35
25	100	126	69	69	51	154	187	168	150	34	24	37
26	108	108	69	69	51	197	178	164	150	32	24	40
27	100	117	67	69	51	150	164	154	150	28	24	39
28	94	183	67	69	51	150	154	150	121	28	24	39
29	88	183	69	69		117	154	145	94	32	25	35
30	76	159	69	69		94	164	135	83	34	27	34
31	65		78	69		83		140		34	28	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	108	65	81.9	0.054	0.06
November	197	40	112	.074	.08
December	159	61	75.3	.050	.06
January	83	69	74.8	.049	.06
February	85	51	66.8	.044	.05
March	197	50	71.9	.047	.05
April	310	80	175	.115	.13
May	168	108	138	.091	.10
June	750	73	200	.132	.15
July	71	28	46.0	.030	.03
August	48	24	34.0	.022	.03
September	40	25	31.6	.021	.02
The year	750	24	92.0	.061	.82

Big Fork River at Big Falls, Minn.

(Continued)

Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	33	45	69	53	42	40	131	804	511	433	173	1,020
2	34	48	65	51	42	58	140	831	477	417	164	965
3	33	51	61	51	42	73	150	852	449	370	145	817
4	35	51	61	51	42	83	154	859	427	340	131	670
5	42	50	59	51	41	88	164	873	390	310	117	570
6	40	50	58	50	41	94	183	1,100	355	370	108	458
7	36	48	58	50	41	100	211	1,270	406	444	108	370
8	37	47	58	50	41	112	250	1,660	444	477	104	315
9	39	44	58	50	41	126	320	1,860	511	500	97	270
10	39	42	58	50	40	126	1,700	2,070	528	433	94	241
11	37	44	58	48	40	126	2,220	2,020	517	390	88	211
12	37	45	54	48	40	126	1,790	1,890	460	365	83	173
13	39	45	53	48	40	126	1,480	1,670	380	350	80	159
14	39	44	53	48	40	126	1,350	1,450	345	340	76	154
15	39	44	55	48	39	126	1,420	1,290	315	330	73	150
16	37	45	55	47	39	126	1,460	1,260	305	320	69	145
17	39	44	53	47	39	126	1,700	1,340	477	280	65	140
18	39	44	51	47	39	126	1,360	1,400	804	236	65	135
19	39	45	48	47	39	126	1,180	1,330	790	246	65	135
20	37	48	45	47	37	126	1,180	1,220	777	265	63	135
21	36	67	44	45	37	126	1,270	1,120	651	246	63	135
22	40	78	44	45	37	126	1,260	1,020	505	216	61	140
23	41	80	44	45	37	126	1,260	922	458	192	61	140
24	41	78	44	45	36	126	1,270	831	411	178	80	135
25	40	67	47	45	36	126	1,210	743	613	164	88	135
26	39	56	51	44	36	126	1,200	696	670	164	91	159
27	37	54	51	44	36	126	1,100	657	736	168	100	154
28	39	63	51	44	35	126	1,020	619	613	168	131	150
29	40	76	53	44	35	126	943	594	528	164	185	150
30	41	73	53	44		126	950	564	449	154	310	150
31	42		53	42		126		534		164	736	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	42	33	38.3	0.025	0.03
November	80	42	53.9	.035	.04
December	69	44	53.7	.035	.04
January	53	42	47.4	.031	.04
February	42	35	39.0	.026	.03
March	126	40	114	.075	.09
April	2,220	131	1,000	.658	.73
May	2,070	534	1,140	.750	.86
June	804	305	510	.336	.37
July	500	154	297	.195	.22
August	736	61	125	.082	.09
September	1,020	135	289	.190	.21
The year	2,220	33	309	.203	2.75

Big Fork River at Big Falls, Minn.

(Continued)

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	145	226	216	65	43	32	1,320	2,960	1,230	266	44	46
2	145	221	216	58	41	32	2,200	3,370	1,080	246	43	44
3	145	226	216	54	39	33	3,080	3,340	936	226	42	43
4	140	231	207	56	37	34	3,960	3,300	889	207	42	43
5	140	231	202	58	36	35	3,880	3,000	843	216	41	42
6	140	246	192	56	34	36	3,790	2,690	797	226	42	43
7	140	270	173	54	33	37	2,990	2,490	790	254	43	44
8	135	390	159	54	31	40	2,190	2,300	783	241	44	49
9	131	696	164	54	29	44	1,980	2,100	824	222	44	54
10	126	1,400	159	53	28	46	1,770	1,960	866	202	44	56
11	126	2,240	154	53	27	48	1,560	1,810	786	183	43	59
12	126	1,820	135	51	27	49	1,380	1,740	705	168	42	61
13	126	1,000	117	58	28	50	1,190	1,660	625	154	42	63
14	126	710	97	63	28	51	1,080	1,570	542	131	41	65
15	131	546	85	58	30	50	965	1,490	460	108	41	66
16	135	477	88	56	31	50	1,830	1,400	418	100	42	67
17	145	690	88	54	34	50	2,690	1,300	375	91	42	69
18	154	619	85	50	36	51	3,550	1,200	345	83	43	71
19	159	546	80	50	36	57	4,970	1,180	315	80	44	73
20	159	606	80	47	36	63	5,440	1,170	285	78	43	74
21	164	725	78	45	36	51	5,330	1,140	260	72	42	76
22	173	750	80	45	36	52	5,110	1,100	236	65	41	76
23	183	783	83	44	35	53	4,400	1,070	224	61	43	76
24	192	657	83	45	34	54	3,690	1,380	211	58	47	77
25	202	690	85	47	34	54	3,280	1,700	202	54	46	77
26	211	750	85	45	34	53	2,840	1,720	192	52	45	78
27	221	644	83	45	33	51	2,610	1,730	183	51	45	78
28	226	488	80	45	33	50	2,380	1,600	219	50	44	78
29	226	396	76	47		118	2,150	1,470	255	48	44	79
30	221	280	71	48		187	2,560	1,340	285	47	46	80
31	221		71	45		754		1,280		45	47	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	226	126	162	0.107	0.12
November	2,240	221	652	.429	.48
December	216	71	122	.080	.09
January	65	44	51.7	.034	.04
February	43	27	35.5	.022	.02
March	754	32	76.3	.050	.06
April	5,440	965	2,870	1.89	2.11
May	3,370	1,070	1,860	1.22	1.41
June	1,230	183	539	.355	.40
July	266	45	131	.086	.10
August	47	41	45.4	.029	.03
September	80	42	65.6	.042	.05
The year	5,440	27	549	.361	4.91

Big Fork River at Big Falls, Minn.

(Continued)

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	81	107	86	63	76	53	52	860	222	162	42	19
2	81	122	81	60	76	52	56	1,240	198	152	38	20
3	83	107	79	51	76	50	60	1,620	193	143	36	21
4	83	103	76	45	71	52	62	2,150	189	120	35	22
5	81	99	74	45	65	54	65	2,340	184	96	33	23
6	81	96	81	44	60	56	68	2,160	180	88	31	24
7	81	96	107	48	58	53	70	1,970	175	85	31	24
8	81	107	126	56	56	50	560	1,790	180	97	30	23
9	83	107	118	81	54	52	1,050	1,540	184	109	28	22
10	83	92	111	74	53	55	1,540	1,300	192	121	28	21
11	86	83	103	67	54	51	1,460	1,180	199	148	27	20
12	86	96	92	66	54	47	1,380	1,070	207	175	27	20
13	83	88	88	65	55	43	1,300	1,000	202	155	28	19
14	83	86	92	67	55	45	1,220	930	198	118	28	19
15	86	83	111	70	55	47	930	860	182	103	28	19
16	92	86	122	72	53	46	895	808	167	89	27	20
17	107	83	107	76	53	44	825	756	154	74	26	20
18	115	86	103	81	54	48	790	706	141	68	24	21
19	118	83	99	76	54	52	756	657	128	63	24	21
20	122	74	99	72	55	56	756	616	158	56	24	21
21	122	72	88	74	56	56	756	575	189	59	24	22
22	111	83	83	77	56	56	837	534	191	55	22	22
23	103	86	81	79	56	58	918	506	193	51	21	24
24	88	96	70	76	56	60	1,000	450	183	47	21	26
25	107	103	62	74	57	60	1,040	410	173	42	21	27
26	88	122	60	74	57	60	1,070	370	163	40	21	27
27	118	103	63	74	58	60	965	337	169	36	21	25
28	126	88	65	75	56	58	860	304	175	31	21	26
29	118	76	63	75		55	860	270	173	36	21	27
30	103	88	60	76		52	860	258	171	40	21	27
31	107		62	76		48		246		45	20	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	126	81	96.4	0.063	0.07
November	122	72	93.4	.061	.07
December	126	60	87.5	.058	.07
January	81	44	68.0	.045	.05
February	76	53	58.5	.038	.04
March	60	43	52.5	.035	.04
April	1,540	52	769	.506	.56
May	2,340	246	962	.633	.73
June	222	128	180	.118	.13
July	175	31	87.2	.057	.07
August	42	20	26.7	.018	.02
September	27	19	22.4	.015	.02
The year	2,340	19	209	.138	1.87

Lake Itasca at Lake Itasca, Minn.

Location.- Staff gage in sec. 2, T. 143 N., R. 36 W., on east shore of Lake Itasca, one-eighth mile above outlet and about one-eighth mile from Lake Itasca post office.

Records available.- May 1933 to September 1934.

Extremes.- Maximum stage recorded during year, 1,474.44 feet July 14; minimum, 1,473.76 feet Oct. 1-15.
1933-34: Maximum stage recorded, that of July 14, 1934; minimum, 1,473.76 feet Sept. 5-7, Oct. 1-15, 1933.

Remarks.- Records furnished by Minnesota Division of Forestry. Elevation of lake regulated by dam at outlet and by storage in lakes above.

Elevation, in feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	73.76											74.03
2	73.76		74.28						74.20			
3		74.04			74.30	74.30						
4	73.76		74.28								74.20	
5		74.06						74.40				
6	73.76											
7		74.10					74.34			74.36		
8	73.76											74.01
9		74.12							74.36			
10						74.30						
11	73.76		74.32								74.15	
12								74.36				
13		74.16		74.38								
14	73.76						74.32			74.44		
15	73.76											74.01
16		74.18	74.39						74.36			
17			74.39		74.30	74.30						
18				74.38							74.15	
19	73.78							74.28				
20		74.22										
21	73.78						74.38			74.34		
22	73.78											74.05
23									74.42			
24	73.80				74.28	74.30						
25				74.34							74.07	
26	73.84							74.22				
27			74.42									
28	73.96						74.32		74.42	74.24		
29	73.98											74.05
30	74.00		74.38						74.38			
31	74.02					74.32						

Note.- Add 1,400 feet to obtain elevation above mean sea level.

Mississippi River below Sandy River, near Libby, Minn.

Location.- Water-stage recorder in sec. 25, T. 50 N., R. 24 W., 600 feet below mouth of Sandy River and three-quarters of a mile northwest of Libby. Zero of gage is 1,204.55 feet above mean sea level (adjustment of 1912).

Drainage area.- 5,060 square miles.

Records available.- April 1930 to September 1934.

Extremes.- Maximum discharge during year, 2,100 second-feet Apr. 20 (gage height, 5.80 feet); minimum, 131 second-feet Sept. 19 (gage height, 1.53 feet).
1930-34: Maximum discharge, 3,690 second-feet May 23, 1933 (gage height, 8.74 feet); minimum, 104 second-feet Dec. 29, 1932 (gage height, 2.08 feet, ice affected).

Remarks.- Records excellent except those for periods of ice effect, Nov. 13-24, Dec. 10 to Apr. 9, which are fair. Discharge estimated for Dec. 7, 8, Aug. 18-20. Flow regulated by Government reservoirs above.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	564	340	443	362	267	295	263	1,340	605	695	163	238
2	596	520	488	331	291	287	295	1,340	484	650	172	241
3	560	605	524	214	299	267	344	1,400	412	592	188	244
4	407	628	497	259	303	323	520	1,500	515	596	190	244
5	430	695	443	340	380	307	605	1,500	448	605	193	224
6	416	695	394	358	331	311	672	1,500	380	484	211	178
7	407	510	391	353	295	279	745	1,540	398	394	220	178
8	420	402	387	398	295	279	920	1,270	420	389	168	227
9	466	384	384	353	279	299	1,240	1,240	506	470	172	238
10	407	420	407	279	287	279	1,500	1,400	592	434	190	238
11	323	538	461	340	252	259	1,540	1,400	945	412	190	202
12	362	582	425	344	271	287	1,500	1,340	870	470	211	157
13	376	605	295	291	291	291	1,540	1,400	720	430	267	165
14	394	497	340	259	275	255	1,600	1,440	628	416	180	205
15	402	425	311	299	331	259	1,600	1,240	628	384	145	190
16	488	434	275	394	420	259	1,640	1,200	605	416	170	180
17	452	456	319	327	448	267	1,600	1,300	551	366	193	205
18	425	452	461	384	307	259	1,500	1,340	560	283	193	175
19	533	456	425	353	255	227	1,700	1,300	438	279	230	139
20	587	466	259	275	255	263	2,000	1,300	348	295	240	155
21	578	479	259	275	252	319	1,940	1,240	402	303	224	168
22	564	394	303	331	327	263	1,700	845	425	295	157	143
23	605	407	319	291	340	224	1,640	795	560	311	175	168
24	605	434	340	267	335	291	1,500	920	596	299	211	241
25	448	456	362	291	366	362	1,440	845	628	227	217	214
26	470	488	323	319	407	380	1,540	672	569	217	266	172
27	533	587	248	344	371	438	1,500	600	528	205	315	193
28	438	569	227	362	267	353	1,500	605	574	190	212	244
29	438	425	248	348		448	1,500	461	672	202	157	227
30	550	425	319	267		510	1,500	502	745	267	172	190
31	551		366	263		353		720		224	205	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	650	323	480	0.095	0.11
November	695	340	492	.097	.11
December	524	227	363	.072	.08
January	398	214	318	.063	.07
February	448	252	314	.062	.06
March	510	224	306	.060	.07
April	2,000	263	1,303	.258	.29
May	1,540	461	1,145	.226	.26
June	945	348	558	.110	.12
July	695	190	381	.075	.09
August	315	145	200	.040	.05
September	244	139	199	.039	.04
The year	2,000	139	505	.100	1.35

Mississippi River near Royalton, Minn.

Location.- In lot 2, sec. 20, T. 39 N., R. 32 W., at power plant of Minnesota Power & Light Co. 5 miles northwest of Royalton and 5 miles below mouth of Swan River.

Drainage area.- 11,600 square miles.

Records available.- March 1924 to September 1934.

Average discharge.- 10 years, 2,443 second-feet.

Extremes.- Maximum daily discharge during year, 4,090 second-feet Apr. 18; minimum, 298 second-feet July 31.
1924-1934: Maximum daily discharge, 12,600 second-feet Apr. 22, 1927; minimum, that of July 31, 1934.

Remarks.- Records good. Flow regulated by Government reservoirs on headwaters. Records collected by Minnesota Power & Light Co., under general supervision of the U. S. Geological Survey in connection with a Federal Power Commission project. Daily discharge determined from power-house records furnished by Minnesota Power & Light Co. Results of discharge measurements on Sept. 3, 1931, and Oct. 13, 1932, checked determinations from power-house records within 2½% and 3½%, respectively.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,020	1,440	1,080	967	941	963	1,600	2,770	1,170	613	592	550
2	1,120	1,270	1,390	900	946	900	1,680	2,650	1,020	843	396	550
3	1,240	1,380	1,160	867	922	1,140	2,130	2,800	1,470	1,050	325	467
4	1,290	1,260	1,060	900	909	1,200	1,920	2,870	1,100	1,290	575	533
5	1,270	1,310	1,000	850	732	1,060	2,120	2,290	1,170	1,050	425	356
6	1,270	1,070	839	950	956	1,370	2,510	2,440	1,100	900	377	469
7	1,160	1,340	1,120	925	865	1,240	2,500	2,760	1,280	1,140	400	518
8	1,170	1,280	996	828	820	1,080	2,930	2,670	1,770	1,020	407	583
9	845	810	1,160	750	765	1,110	3,340	3,070	1,610	968	553	483
10	775	892	1,070	867	918	1,180	4,040	2,770	1,440	1,170	342	400
11	1,080	1,040	876	933	995	1,220	3,680	2,320	1,460	932	400	429
12	1,160	1,030	1,040	892	793	1,170	3,060	2,430	1,490	654	346	488
13	1,050	474	1,010	917	933	1,150	3,090	2,280	1,860	482	424	444
14	1,090	1,180	852	1,040	828	1,270	3,250	2,470	1,860	750	388	533
15	995	1,110	988	883	798	1,230	3,290	2,370	2,080	717	408	529
16	989	943	1,040	928	733	1,250	3,660	2,600	1,740	799	365	560
17	1,330	1,090	1,090	993	779	1,230	3,780	2,570	1,420	760	368	450
18	1,190	1,220	806	1,020	783	1,220	4,090	2,270	1,120	515	564	433
19	1,380	1,390	1,050	917	788	1,220	3,520	2,160	1,170	705	441	446
20	1,220	1,560	988	1,010	851	1,310	3,410	2,120	1,290	733	531	474
21	1,440	1,370	836	1,130	743	1,370	2,790	1,750	1,620	725	600	415
22	1,040	1,270	913	994	893	1,300	2,810	1,980	1,020	512	388	454
23	1,100	1,250	1,010	1,170	724	1,420	3,380	2,090	967	754	575	478
24	1,450	1,170	990	1,060	624	1,380	3,370	1,940	800	508	504	708
25	1,450	1,130	905	1,060	638	1,380	2,930	1,560	873	383	596	883
26	1,400	1,180	833	998	599	1,380	2,630	1,510	800	538	554	726
27	1,220	1,130	833	1,100	682	1,430	2,560	1,420	1,100	607	404	708
28	1,280	963	794	967	721	1,520	2,960	1,500	1,560	520	467	650
29	1,130	1,160	933	904		1,400	2,750	1,350	1,240	483	400	674
30	777	1,190	1,100	1,000		1,500	3,280	1,330	683	304	400	665
31	1,310		998	995		1,640		1,140		298	417	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	1,450	775	1,169	0.101	0.12
November	1,500	474	1,161	.100	.11
December	1,390	794	992	.086	.10
January	1,170	750	959	.083	.10
February	995	599	810	.070	.07
March	1,640	900	1,266	.109	.13
April	4,090	1,600	2,969	.256	.29
May	3,070	1,140	2,202	.190	.22
June	2,080	683	1,309	.113	.13
July	1,290	298	733	.063	.07
August	600	325	449	.039	.04
September	883	356	535	.046	.05
The year	4,090	298	1,213	.105	1.43

Mississippi River at Elk River, Minn.

Location.- Water-stage recorder in SE¼ sec. 34, T. 33 N., R. 26 W. fourth principal meridian, in Elk River, 2,500 feet below mouth of Elk River. Zero of gage is 847.92 feet above mean sea level (adjustment of 1912).

Drainage area.- 14,500 square miles.

Records available.- July 1915 to September 1934.

Average discharge.- 19 years, 4,268 second-feet.

Extremes.- Maximum discharge during year, 5,160 second-feet Apr. 11 (gage height, 4.26 feet); minimum, 278 second-feet Nov. 15 (gage height, 1.43 feet, affected by ice). 1915-34: Maximum discharge, 27,000 second-feet Apr. 7, 1916 (gage height, 10.8 feet); minimum, that of Nov. 15, 1933.

Remarks.- Records excellent except those for periods of ice effect, Nov. 10-20, Dec. 9-14, Dec. 24 to Mar. 19, and for estimated period, June 3-17, which are good. Flow partly regulated by Government reservoirs on head waters.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,420	1,180	1,370	1,160	1,190	818	2,200	3,970	1,310	1,260	590	506
2	1,100	1,680	1,470	1,390	1,120	916	2,290	3,440	1,120	1,030	580	693
3	1,090	1,850	1,470	1,190	1,250	968	2,150	3,130	1,320	1,160	580	981
4	1,300	1,360	1,600	1,180	1,220	818	2,910	3,550	1,160	1,160	650	770
5	1,390	1,630	1,030	1,090	1,050	1,220	2,820	3,440	1,700	1,060	726	770
6	1,330	1,360	929	1,180	1,100	1,490	2,620	3,020	1,150	1,090	560	640
7	1,520	1,340	1,220	961	830	1,490	2,520	3,020	1,300	1,090	580	542
8	1,550	1,530	794	1,150	955	1,390	3,020	2,820	1,490	1,100	590	515
9	1,200	1,340	974	1,100	1,050	1,250	3,760	3,340	1,950	1,090	640	488
10	1,030	1,500	842	1,030	1,360	1,240	4,180	3,240	2,220	1,150	620	580
11	916	1,190	890	890	1,120	1,400	4,940	3,130	1,890	1,180	650	715
12	942	1,240	929	1,090	1,150	1,660	4,830	2,620	1,490	1,240	640	533
13	1,260	846	704	1,280	1,220	1,630	3,970	2,310	1,580	890	533	479
14	1,160	982	866	1,160	842	1,440	3,860	3,240	1,700	1,010	524	704
15	1,190	610	1,080	1,340	1,130	1,550	3,760	2,720	2,030	890	524	620
16	1,390	830	1,120	1,240	994	1,820	3,970	2,720	2,020	890	640	650
17	1,260	1,050	1,130	1,080	1,120	1,920	4,720	2,460	2,200	806	640	748
18	1,190	955	1,340	1,200	1,020	1,770	4,610	2,820	1,720	726	580	640
19	1,500	1,200	1,280	1,200	890	1,500	4,940	2,620	1,630	682	560	570
20	1,610	1,310	1,030	1,310	916	1,820	4,610	2,150	1,630	671	515	560
21	1,470	2,010	1,220	1,260	929	1,830	4,390	2,390	1,570	770	640	462
22	1,300	1,940	1,050	1,470	955	1,800	3,760	2,190	1,280	916	600	438
23	1,570	1,440	1,100	1,490	1,020	1,680	3,660	1,800	1,150	1,020	660	497
24	968	1,360	1,080	1,130	1,050	1,830	4,280	2,280	1,020	842	682	1,060
25	1,620	1,750	1,120	1,310	806	1,700	4,180	2,080	830	806	515	916
26	1,610	1,310	1,100	1,150	640	1,920	3,760	1,950	1,010	794	497	955
27	1,570	1,720	971	1,100	832	1,700	3,240	1,390	1,160	693	506	1,100
28	1,580	1,130	994	1,250	715	1,970	3,130	1,450	1,010	806	488	866
29	1,360	1,310	942	1,160		1,950	3,340	1,610	1,660	782	533	748
30	1,100	1,120	1,160	1,260		1,850	3,440	1,600	1,570	759	515	878
31	1,150		1,010	1,190		1,830		1,330		715	542	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	1,620	916	1,311	0.090	0.10
November	2,010	610	1,336	.092	.10
December	1,600	704	1,091	.075	.09
January	1,490	890	1,194	.082	.09
February	1,360	640	1,017	.070	.07
March	1,970	818	1,554	.107	.12
April	4,940	2,150	3,662	.253	.28
May	3,970	1,330	2,575	.178	.21
June	2,220	830	1,496	.103	.11
July	1,260	671	938	.065	.07
August	726	488	584	.040	.05
September	1,100	438	687	.047	.05
The year	4,940	438	1,454	.100	1.34

Mississippi River near Anoka, Minn.

Location.- Water-stage recorder in SW¼ sec. 12, T. 119 N., R. 21 W., half a mile below Coon Creek, 1½ miles downstream from Coon Rapids hydroelectric plant of Northern States Power Co., and 6½ miles downstream from Anoka.

Drainage area.- 19,100 square miles.

Records available.- June 1931 to September 1934.

Extremes.- Maximum discharge during year, 5,970 second-feet Apr. 11 (gage height, 3.34 feet); minimum, 586 second-feet Sept. 13 (gage height, 0.37 foot).
1931-34: Maximum discharge, 12,500 second-feet June 5, 1933 (gage height, 5.56 feet); minimum, that of Sept. 13, 1934.

Remarks.- Records excellent except those during periods of ice effect, Nov. 11-16, Dec. 10 to Mar. 2, Mar. 6-14, 17, 18, which are good. Discharge determined from power-house records during periods of ice effect. Flow partly regulated by Government reservoirs on headwaters.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,470	1,280	1,470	1,210	1,140	992	2,190	3,950	1,350	1,280	779	670
2	1,430	1,700	1,680	1,340	1,140	1,120	2,500	4,030	1,360	1,120	736	733
3	1,150	1,970	1,590	1,340	1,280	1,420	2,640	3,310	1,370	1,150	673	1,140
4	1,430	1,600	1,890	1,260	1,310	1,230	2,920	3,580	1,280	1,230	664	970
5	1,500	1,730	1,320	1,090	1,200	1,380	3,280	3,770	1,820	1,150	800	899
6	1,490	1,530	1,200	1,340	1,220	1,530	3,270	3,590	1,290	1,120	772	829
7	1,530	1,410	1,320	1,180	1,120	1,580	2,810	3,010	1,430	1,120	646	718
8	1,660	1,640	1,140	1,140	1,120	1,540	3,340	3,140	1,690	1,150	736	641
9	1,370	1,270	1,040	1,250	1,080	1,540	3,970	3,560	2,140	1,170	736	637
10	1,240	1,580	1,320	1,140	1,100	1,450	4,470	3,470	2,600	1,320	727	602
11	1,070	1,420	990	1,150	1,130	1,540	5,240	3,380	2,130	1,170	736	854
12	1,050	1,360	1,100	1,030	1,130	1,650	5,460	2,990	1,670	1,360	834	797
13	1,370	811	1,020	1,370	1,280	1,810	4,440	2,600	1,720	1,120	733	651
14	1,300	844	970	1,230	1,110	1,690	4,100	3,330	1,900	954	664	791
15	1,430	914	1,170	1,240	1,160	1,620	4,030	2,970	2,330	1,080	646	894
16	1,700	761	1,120	1,380	1,210	1,810	4,050	2,930	2,250	1,000	691	739
17	1,520	1,420	1,200	1,150	1,110	1,820	4,910	2,780	2,450	952	813	931
18	1,480	1,600	1,290	1,140	1,180	1,630	4,800	2,780	1,700	898	756	890
19	1,510	1,660	1,410	1,280	1,090	1,790	5,100	3,050	1,730	880	761	754
20	1,700	1,630	1,150	1,300	1,200	1,610	4,980	2,500	1,840	828	628	776
21	1,730	1,850	1,200	1,320	1,020	1,960	4,640	2,410	1,710	802	763	673
22	1,410	2,140	1,260	1,420	1,150	1,960	4,150	2,470	1,580	772	727	615
23	1,720	1,710	1,120	1,410	1,090	1,740	3,800	2,070	1,260	1,060	736	646
24	1,390	1,600	1,180	1,390	1,100	1,960	4,420	2,200	1,120	962	841	1,300
25	1,460	1,740	1,110	1,400	1,020	1,880	4,250	2,300	1,010	932	712	1,380
26	1,880	1,640	1,100	1,320	905	1,990	4,180	2,160	1,060	890	610	1,140
27	1,740	1,770	911	1,350	895	1,760	3,400	1,770	1,270	841	610	1,440
28	1,760	1,510	1,090	1,310	926	1,980	3,390	1,550	1,120	792	610	1,300
29	1,580	1,430	858	1,260		2,040	3,390	1,500	1,360	872	646	1,000
30	1,260	1,330	1,020	1,280		1,930	3,780	1,910	1,850	870	637	1,220
31	1,360		1,290	1,210		2,040		1,630		840	736	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	1,880	1,050	1,474	0.077	0.09
November	2,140	761	1,495	.078	.09
December	1,890	858	1,211	.063	.07
January	1,420	1,030	1,265	.066	.08
February	1,310	895	1,122	.059	.06
March	2,040	992	1,677	.088	.10
April	5,460	2,190	3,930	.206	.23
May	4,030	1,500	2,796	.146	.17
June	2,600	1,010	1,646	.086	.10
July	1,360	772	1,022	.054	.06
August	841	610	715	.037	.04
September	1,440	602	888	.046	.05
The year	5,460	602	1,603	.084	1.14

Mississippi River at St. Paul, Minn.

Location.- Staff gage in St. Paul, 6 miles below mouth of Minnesota River. Zero of gage is 684.16 feet above mean sea level (adjustment of 1912).

Drainage area.- 36,800 square miles.

Records available.- March 1887 to September 1934.

Average discharge.- 42 years (1892-1934), 9,210 second-feet.

Extremes.- Maximum daily discharge during year, 7,460 second-feet Apr. 12; minimum, 632 second-feet Aug. 26.
1887-1934: Maximum discharge, 80,800 second-feet Apr. 6, 1897 (gage height, 18.0 feet); minimum, that of Aug. 26, 1934.
Maximum known discharge, 107,000 second-feet Apr. 29, 1881 (gage height, 19.6 feet); revised determination by Corps of Engineers, U. S. Army, superseding figure of 117,000 second-feet on July 22, 1867, as previously published.

Remarks.- Records fair. Discharge determined from records of Mississippi River above Minnesota River and of Minnesota River at mouth. Partial regulation by Government reservoirs on headwaters. Regulation negligible during summer of 1934. Gage in backwater of Hastings Dam.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,570	1,580	1,640	1,500	1,560	1,240	2,480	4,170	1,550	1,430	979	842
2	1,800	1,950	2,190	1,660	1,580	1,200	3,130	4,480	1,510	1,560	929	983
3	1,400	2,060	1,920	1,600	1,640	1,220	3,630	3,720	1,360	1,100	795	1,360
4	1,490	2,220	2,250	1,570	1,650	1,570	2,960	4,050	1,460	1,350	672	1,210
5	1,620	1,950	1,570	1,580	1,700	1,540	3,790	4,200	2,160	1,540	870	1,010
6	1,700	2,070	1,330	1,450	1,610	1,720	4,010	4,140	1,640	1,270	1,030	1,120
7	1,720	1,740	1,690	1,620	1,650	1,750	3,830	3,200	1,810	1,390	836	807
8	1,920	1,680	1,690	1,460	1,420	2,040	4,830	3,560	2,140	1,320	1,230	736
9	1,790	1,790	1,340	1,460	1,420	2,310	5,810	3,970	2,320	1,790	826	761
10	1,490	1,700	1,730	1,580	1,440	1,690	6,260	3,670	2,740	1,660	898	770
11	1,490	1,800	1,260	1,500	1,440	1,720	7,280	3,720	2,630	1,580	867	999
12	1,210	1,770	1,240	1,330	1,510	2,190	7,460	3,350	1,980	1,590	1,000	1,160
13	1,210	1,130	1,460	1,520	1,450	2,200	6,300	2,980	1,950	1,430	1,000	836
14	1,650	1,400	1,240	1,580	1,690	2,170	5,280	3,440	2,510	1,290	794	949
15	1,600	1,470	1,360	1,580	1,220	1,860	5,200	3,160	2,860	1,330	830	1,250
16	2,400	1,070	1,350	1,620	1,520	1,590	4,900	3,160	2,910	1,350	759	891
17	1,810	1,630	1,520	1,570	1,430	2,220	5,660	3,020	3,130	1,270	997	1,110
18	1,490	2,020	1,470	1,420	1,370	1,910	5,620	2,810	2,250	1,150	959	1,120
19	1,690	1,990	1,690	1,560	1,470	2,060	5,670	3,450	2,500	1,110	1,040	971
20	1,920	1,940	1,600	1,590	1,390	1,820	5,820	2,720	2,440	1,130	742	1,100
21	2,200	1,720	1,430	1,730	1,400	2,390	5,080	2,570	2,320	1,010	807	811
22	1,550	2,480	1,500	2,120	1,300	2,090	4,990	2,860	1,870	800	866	862
23	1,940	2,170	1,390	1,780	1,290	2,050	4,440	2,390	1,630	1,200	876	776
24	2,020	1,980	1,450	1,840	1,310	2,060	4,670	2,240	1,460	1,220	935	2,010
25	1,260	2,100	1,390	1,750	1,310	2,210	4,670	2,730	1,440	1,140	897	2,270
26	2,210	1,980	1,420	1,890	1,190	2,340	4,830	2,380	1,200	1,240	632	1,480
27	2,060	2,150	1,280	1,790	1,100	2,040	3,780	2,190	1,530	988	779	1,690
28	1,920	1,890	1,250	1,700	1,170	2,380	3,760	1,610	1,440	993	737	1,720
29	1,870	1,790	1,270	1,810		2,380	3,550	1,780	1,260	1,090	671	1,310
30	1,740	1,810	1,170	1,760		2,360	4,420	2,110	1,400	1,070	707	1,390
31	1,500		1,590	1,770		2,430		1,810		1,010	821	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	2,400	1,210	1,717	0.047	0.05
November	2,480	1,070	1,834	.050	.06
December	2,250	1,170	1,509	.041	.05
January	2,120	1,330	1,635	.044	.05
February	1,700	1,100	1,437	.039	.04
March	2,430	1,200	1,960	.053	.06
April	7,460	2,480	4,804	.131	.15
May	4,480	1,610	3,085	.084	.10
June	3,130	1,200	1,980	.054	.06
July	1,790	800	1,272	.035	.04
August	1,230	632	864	.023	.03
September	2,270	736	1,143	.031	.03
The year	7,460	632	1,935	.053	.72

Mississippi River at Prescott, Wis.

Location.- Water-stage recorder in sec. 9, T. 26 N., R. 20 W., in Prescott, 200 feet below mouth of St. Croix River. Zero of gage is 669.28 feet above mean sea level (adjustment of 1912).

Drainage area.- 45,000 square miles.

Records available.- June 1928 to September 1934.

Extremes.- Maximum discharge, 15,000 second-feet Apr. 13 (gage height, 5.32 feet, affected by backwater from Lake Pepin); minimum discharge, 2,210 second-feet Aug. 18, 24, 25, 29, 30; minimum gage height, -4.20 feet Aug. 29.
1928-34: Maximum discharge, 49,600 second-feet Mar. 25, 1929 (gage height, 12.3 feet); minimum, that of August 1934.

Remarks.- Records excellent except those for periods of backwater from ice, Nov. 14 to Mar. 19, which are good, and of backwater from Lake Pepin Apr. 6-22, Sept. 29, 30, which are fair. Discharge estimated for Dec. 25 to Jan. 1, Jan. 8-13, 29-31. Flow partly regulated by reservoirs and power plants above.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,580	4,250	3,950	3,090	3,850	3,170	5,170	7,920	4,470	3,670	2,420	2,350
2	3,410	4,250	4,050	3,410	4,250	3,330	5,290	8,070	4,050	3,580	2,420	2,350
3	3,490	4,150	4,360	3,490	4,360	3,410	9,200	7,920	3,950	3,490	2,420	2,420
4	3,410	4,250	4,360	3,670	4,250	3,580	11,300	7,770	3,950	3,400	2,420	2,500
5	3,330	4,360	4,250	3,950	3,850	3,850	12,900	7,770	3,950	3,400	2,580	2,580
6	3,410	4,360	3,760	4,050	3,670	3,760	11,900	7,620	3,950	3,310	2,740	2,580
7	3,490	4,250	3,950	3,580	3,580	3,760	10,500	7,320	3,850	3,140	2,660	2,660
8	3,410	4,250	3,670	3,410	3,250	3,760	9,200	6,760	4,360	3,060	2,580	2,660
9	3,410	4,250	3,410	3,330	3,170	3,850	10,700	7,180	4,250	3,220	2,580	2,580
10	3,410	4,250	3,170	3,330	3,330	4,250	12,100	7,040	4,470	3,950	2,500	2,580
11	3,490	4,150	3,010	3,410	3,670	4,250	13,600	6,900	4,360	3,950	2,420	2,580
12	3,330	4,150	2,800	3,670	4,050	4,250	14,300	6,760	4,470	3,950	2,350	2,660
13	3,170	3,950	2,730	3,850	3,950	4,360	14,800	6,900	4,360	3,950	2,350	2,740
14	3,170	3,580	2,940	3,490	3,950	4,360	14,300	6,480	4,360	3,760	2,350	2,740
15	3,330	3,170	3,010	3,300	4,150	4,580	13,100	6,340	4,470	3,490	2,350	2,740
16	3,670	2,800	3,170	3,090	4,050	4,470	12,100	6,060	4,580	3,490	2,350	2,820
17	3,760	2,940	3,410	3,170	3,950	4,470	11,900	6,340	4,810	3,220	2,280	2,820
18	3,850	3,250	3,670	3,330	3,490	4,580	11,900	6,200	4,690	3,140	2,210	2,900
19	3,950	3,410	3,760	3,490	3,010	4,470	12,300	6,340	4,580	3,140	2,280	2,900
20	3,950	3,670	3,760	3,580	3,170	4,470	12,100	6,340	4,690	3,140	2,280	2,900
21	4,250	3,850	3,760	3,670	3,090	4,690	11,700	6,060	4,580	3,060	2,230	2,900
22	4,250	3,850	3,670	3,850	2,940	4,690	11,100	5,800	4,250	2,980	2,280	2,820
23	4,150	3,760	3,330	4,050	2,800	4,930	10,500	5,800	4,150	2,820	2,280	2,820
24	4,360	3,760	2,870	3,330	2,800	4,930	9,560	5,540	3,850	2,740	2,210	2,900
25	4,150	3,950	2,520	3,330	2,870	4,810	9,560	5,410	3,760	2,740	2,210	3,850
26	4,250	3,850	2,590	3,490	2,940	4,930	9,560	5,290	3,760	2,740	2,280	4,690
27	4,360	3,950	2,660	3,580	3,010	4,810	9,020	5,170	3,670	2,660	2,280	4,810
28	4,250	4,050	2,800	2,940	3,090	4,930	8,700	4,810	3,670	2,580	2,280	5,410
29	4,470	3,950	2,940	3,090		5,290	8,380	4,690	3,580	2,420	2,210	5,050
30	4,250	4,050	3,250	3,410		5,290	8,070	4,470	3,670	2,420	2,210	4,580
31	4,360		3,170	3,670		5,170		4,470		2,500	2,280	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	4,360	3,170	3,778	0.084	0.10
November	4,360	2,800	3,890	.086	.10
December	4,360	2,520	3,379	.075	.09
January	4,050	2,940	3,487	.077	.09
February	4,360	2,800	3,519	.078	.08
March	5,290	3,170	4,369	.097	.11
April	14,800	5,170	10,830	.241	.27
May	8,070	4,470	6,370	.142	.16
June	4,810	3,580	4,185	.093	.10
July	3,950	2,420	3,197	.071	.08
August	2,740	2,210	2,366	.053	.06
September	5,410	2,350	3,096	.069	.08
The year	14,800	2,210	4,367	.097	1.32

Mississippi River at Wabasha, Minn.

Location.- Staff gage in sec. 29, T. 111 N., R. 10 W., on sheer fence above highway bridge at Wabasha, about 3 miles below mouth of Chippewa River.

Drainage area.- 56,600 square miles.

Records available.- April to September 1934.

Extremes.- Maximum discharge recorded during period April to September, 45,100 second-feet Apr. 8 (gage height, 7.10 feet); minimum discharge recorded, 4,250 second-feet Aug. 29, 30; minimum gage height recorded, -3.40 feet Aug. 30.

Remarks.- Records good. Gage-height record furnished by Corps of Engineers, U. S. Army. Flow partly regulated by reservoirs and power plants.

Discharge, in second-feet, 1934

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							8,240	15,000	8,680	7,600	5,000	4,550
2							8,240	14,800	8,460	7,400	5,000	4,550
3							8,680	14,500	8,460	7,200	5,000	4,700
4							18,100	14,200	8,240	7,000	4,850	4,700
5							29,900	14,000	8,020	7,000	4,850	4,850
6							40,300	14,000	7,800	7,000	4,850	5,160
7							43,500	13,800	7,400	7,400	4,850	5,330
8							45,100	13,200	7,600	6,410	4,850	5,330
9							44.300	13,200	8,240	6,220	5,330	5,000
10							42,700	13,500	8,460	6,410	5,160	4,850
11							41,900	13,000	8,460	6,410	5,000	5,000
12							41,100	12,300	8,240	6,600	5,000	5,000
13							39,500	12,500	8,020	6,600	5,000	5,000
14							37,100	12,300	7,800	6,600	4,850	5,160
15							34,800	11,800	7,800	6,600	4,700	5,500
16							32,000	11,400	7,600	6,410	4,700	5,330
17							29,300	11,160	7,600	6,220	4,850	5,160
18							27,500	10,900	7,800	6,220	4,700	5,330
19							26,300	10,900	7,600	6,220	5,330	5,330
20							24,500	10,900	7,600	6,220	5,160	5,500
21							23,500	10,900	7,800	6,040	4,850	5,330
22							22,500	10,400	7,600	6,040	4,700	5,330
23							21,600	10,200	7,600	5,860	4,700	5,160
24							20,000	10,200	7,400	5,860	4,700	5,330
25							18,800	10,000	7,200	5,860	4,700	7,200
26							18,100	9,780	7,400	5,680	4,550	9,780
27							17,800	9,780	7,200	5,680	4,400	11,400
28							17,000	9,560	7,400	5,500	4,400	13,200
29							16,400	9,340	7,400	5,330	4,250	15,800
30							15,500	9,120	7,600	5,160	4,250	18,800
31								8,900		5,000	4,400	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October					
November					
December					
January					
February					
March					
April	45,100	8,240	27,140	0.480	0.54
May	15,000	8,900	11,790	.208	.24
June	8,680	7,200	7,816	.138	.15
July	7,600	5,000	6,315	.112	.13
August	5,330	4,250	4,804	.085	.10
September	18,800	4,550	6,622	.117	.13
The year					

Mississippi River at Winona, Minn.

Location.- Staff gage in sec. 23, T. 107 N., R. 7 W., on stone pier at right end of highway bridge at Winona. Zero of gage is 640.12 feet above mean sea level by adjustment of 1912 and 639.64 feet above mean sea level by adjustment of 1929.

Drainage area.- 59,200 square miles.

Records available.- June 1928 to September 1934.

Extremes.- Maximum discharge recorded during year, 55,500 second-feet Apr. 8 (gage height, 9.10 feet); minimum discharge recorded, 2,250 second-feet Dec. 29 (gage height, -1.18 feet, affected by ice); minimum stage recorded, -3.38 feet August 31. 1928-34: Maximum discharge, 78,300 second-feet Apr. 3, 4, 1929 (gage height, 11.50 feet); minimum, that of Dec. 29, 1933.

Remarks.- Records excellent except those for period of ice break-up, Mar. 3-12, which are poor. Stage-discharge relation affected by ice Nov. 16, 18, Dec. 10 to Mar. 4, Mar. 9-12. Flow partly regulated by reservoirs and power plants above.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6,800	7,400	7,810	3,970	7,600	7,400	9,300	16,400	9,300	8,230	5,630	5,060
2	6,800	7,400	7,810	4,150	8,230	7,600	9,520	15,800	9,300	8,020	5,630	5,250
3	6,800	7,600	7,810	7,000	8,440	8,230	10,200	15,200	9,080	8,020	5,630	5,630
4	6,600	7,600	7,610	8,020	9,080	7,400	19,600	15,000	8,860	7,600	5,440	5,630
5	6,600	7,400	7,810	8,440	9,300	8,230	34,300	15,000	8,860	7,600	5,440	5,440
6	6,600	7,400	8,020	8,860	9,520	8,440	42,500	14,700	8,650	8,230	5,250	5,630
7	6,600	7,600	8,020	8,860	9,300	8,650	52,000	14,500	8,440	8,020	5,440	5,630
8	6,600	7,600	8,020	8,650	9,520	8,440	55,500	14,200	8,020	7,400	5,440	5,630
9	6,600	7,600	8,020	8,440	7,810	8,020	54,600	13,700	8,650	7,000	5,630	5,630
10	6,600	7,810	8,020	8,440	7,200	8,440	52,800	13,400	9,300	7,000	5,820	5,630
11	6,400	7,600	7,810	8,440	8,440	8,230	50,500	13,700	9,080	7,200	5,630	5,630
12	6,600	7,600	7,200	8,230	9,520	8,860	46,800	13,200	8,860	7,200	5,630	5,820
13	6,400	7,810	4,330	8,440	9,740	9,300	44,300	13,000	8,650	7,200	5,440	5,820
14	6,200	7,600	4,510	8,230	9,740	9,300	42,500	13,000	8,650	7,200	5,440	6,010
15	6,200	7,600	5,250	8,020	9,300	9,300	40,100	12,500	8,440	7,200	5,250	6,200
16	6,400	7,400	6,400	7,810	9,300	9,520	37,700	12,200	8,230	7,200	5,250	6,400
17	7,000	7,200	6,400	6,800	8,440	9,960	34,900	11,800	8,230	7,200	5,250	6,200
18	6,800	7,000	6,600	7,200	8,020	9,960	32,100	11,500	8,230	7,000	5,250	6,010
19	6,800	7,000	6,800	7,200	8,020	9,960	29,400	11,300	8,020	7,000	5,250	6,200
20	6,800	6,800	7,200	7,600	8,020	9,960	27,200	11,300	8,020	7,000	5,820	6,200
21	6,600	6,800	7,000	7,810	7,810	9,960	25,600	11,300	8,020	7,000	5,630	6,400
22	7,000	6,800	7,000	8,230	6,400	9,960	24,100	11,100	8,230	6,800	5,440	6,200
23	7,000	6,800	7,000	8,650	6,200	9,740	23,100	10,900	8,020	6,800	5,250	6,200
24	6,800	7,000	7,000	9,520	6,010	9,520	22,200	10,600	8,020	6,600	5,440	6,200
25	7,200	7,200	5,820	8,020	5,820	9,520	20,400	10,600	8,020	6,400	5,440	7,400
26	7,000	7,200	5,060	8,650	6,010	9,520	19,600	10,400	8,020	6,400	5,250	11,300
27	7,200	7,400	3,970	9,300	6,400	9,300	18,800	10,200	8,020	6,400	5,250	14,500
28	7,200	7,600	2,420	11,100	6,800	9,300	18,100	10,200	8,020	6,200	5,250	16,400
29	7,200	7,600	2,250	5,060		9,300	17,400	9,960	8,020	6,010	5,060	16,700
30	7,200	7,600	2,590	5,440		9,300	17,000	9,740	8,230	6,010	4,870	18,400
31	7,400		3,100	6,800		9,080		9,520		5,820	4,690	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	7,400	6,200	6,774	0.114	0.13
November	7,810	6,800	7,367	.124	.14
December	8,020	2,250	6,286	.106	.12
January	11,100	3,970	7,786	.131	.15
February	9,740	5,820	8,071	.136	.14
March	9,960	7,400	9,023	.152	.18
April	55,500	9,300	31,070	.525	.59
May	16,400	9,520	12,450	.210	.24
June	9,300	8,020	8,450	.143	.18
July	8,230	5,820	7,063	.119	.14
August	5,820	4,690	5,391	.091	.10
September	18,400	5,060	7,512	.127	.14
The year	55,500	2,250	9,742	.165	2.23

Mississippi River at La Crosse, Wis.

Location.- Staff gage in sec. 31, T. 16 N., R. 7 W., on left pier of wagon bridge in La Crosse. Zero of gage is 625.65 feet above mean sea level (adjustment of 1929).

Drainage area.- 62,800 square miles.

Records available.- June 1929 to September 1934.

Extremes.- Maximum discharge recorded during year, 69,800 second-feet Apr. 9 (gage height, 10.43 feet); minimum discharge recorded, 3,300 second-feet Dec. 30, 31; minimum gage height recorded, -2.43 feet Aug. 30, Sept. 1.
1929-34: Maximum discharge, that of Apr. 9, 1934; minimum, that of Dec. 30, 31, 1933.
Maximum stage known, 16.2 feet June 19, 1880.
Minimum stage known, that of Aug. 30, Sept. 1, 1934.

Remarks.- Records good except those for period of ice effect, Nov. 17-25, Dec. 14 to Mar. 14, which are fair. Flow partly regulated by reservoirs and power plants above.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7,640	8,300	8,490	3,660	7,580	8,030	10,300	19,200	10,600	13,500	6,920	5,400
2	7,640	8,300	8,720	4,400	8,260	8,260	10,800	18,500	10,300	12,500	6,700	5,820
3	7,640	8,300	8,950	5,610	9,180	8,490	13,000	17,400	10,100	11,300	6,480	6,260
4	7,420	8,300	8,950	6,920	9,410	8,950	20,000	17,100	9,870	10,300	6,480	7,360
5	7,420	8,260	8,720	8,030	9,870	9,640	36,400	16,800	9,870	9,870	6,480	7,360
6	7,420	8,260	8,950	8,720	10,100	10,800	44,600	16,500	9,640	11,500	6,260	7,360
7	7,420	8,260	8,950	8,950	10,300	10,800	52,400	15,900	9,410	12,000	6,260	7,140
8	7,420	8,490	8,950	9,180	10,600	10,300	64,600	15,600	8,950	11,300	6,260	7,140
9	7,640	8,490	8,720	9,180	10,300	8,490	69,800	15,600	9,410	10,100	6,260	7,140
10	7,640	8,490	8,950	8,950	9,410	8,260	67,000	15,300	10,100	9,870	6,700	6,920
11	7,420	8,490	8,260	8,950	8,490	9,180	62,200	14,800	10,800	11,500	6,700	7,140
12	7,420	8,490	7,800	8,950	9,180	11,300	57,000	14,800	10,300	10,100	6,480	7,140
13	7,420	8,490	6,480	8,950	9,870	11,800	52,400	14,800	10,100	9,410	6,260	7,140
14	7,210	8,490	5,400	8,950	9,870	11,500	49,200	14,800	9,870	9,180	6,260	7,140
15	7,210	8,490	5,820	8,720	9,870	11,500	46,800	14,200	9,410	8,950	6,260	7,140
16	7,420	8,260	7,360	8,720	10,100	11,300	43,900	14,000	9,180	8,720	6,040	7,360
17	7,860	8,030	7,580	8,490	10,300	11,300	41,200	13,800	8,950	8,720	5,820	7,580
18	8,300	7,800	7,580	7,580	10,300	11,300	38,200	13,200	8,950	8,720	5,820	7,360
19	8,080	7,800	7,580	7,800	10,300	11,300	35,800	13,000	8,950	8,720	6,040	7,360
20	7,860	7,800	7,580	8,030	9,180	11,300	32,200	12,800	8,950	9,410	6,040	7,580
21	7,860	7,800	7,580	8,260	8,720	11,300	30,000	12,800	8,950	8,490	7,140	7,580
22	7,640	7,800	7,580	9,180	9,180	11,300	28,000	12,500	8,720	8,260	6,700	7,580
23	7,860	8,030	7,360	9,410	8,260	11,100	26,500	12,300	8,720	8,030	6,260	7,580
24	8,080	8,030	7,360	11,100	6,700	11,100	25,000	12,300	9,180	7,800	6,040	8,030
25	7,860	8,030	6,700	11,100	6,260	10,800	24,000	12,000	9,180	7,360	5,820	8,260
26	8,080	8,030	5,610	9,870	7,360	10,800	23,200	11,800	9,640	7,800	5,820	10,800
27	8,080	8,260	5,000	8,950	8,030	10,800	22,000	11,500	9,640	9,870	5,820	15,300
28	8,080	8,490	3,840	9,410	8,260	10,600	20,800	11,300	10,600	9,410	5,610	17,400
29	8,300	8,490	3,480	10,600		10,800	20,400	11,300	11,500	7,800	5,400	20,800
30	8,300	8,490	3,300	7,580		10,600	19,600	11,100	13,000	7,360	5,400	27,500
31	8,300		3,300	6,480		10,100		10,800		7,140	5,400	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	8,300	7,210	7,740	0.123	0.14
November	8,490	7,800	8,235	.131	.15
December	8,950	3,300	7,126	.113	.13
January	11,100	3,660	8,409	.134	.15
February	10,600	6,260	9,116	.145	.15
March	11,800	8,030	10,420	.166	.19
April	69,800	10,300	36,240	.577	.64
May	19,200	10,800	14,120	.225	.26
June	13,000	8,720	9,761	.155	.17
July	13,500	7,140	9,516	.152	.18
August	7,140	5,400	6,191	.099	.11
September	27,500	5,400	9,056	.144	.16
The year	69,800	3,300	11,300	.180	2.43

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Mississippi River at Clayton, Iowa

Location.- Staff gage in NE¼ sec. 1, T. 93 N., R. 3 W., a quarter of a mile downstream from railroad station in Clayton. Zero of gage is 602.60 feet above mean sea level (adjustment of 1912).

Drainage area.- 79,200 square miles.

Records available.- April 1930 to September 1934.

Extremes.- Maximum discharge recorded during year, 82,500 second-feet Apr. 14, 15 (gage height, 11.4 feet); minimum discharge recorded, 5,540 second-feet Dec. 13, 14; minimum stage recorded, -1.82 feet Aug. 29, 30.
1930-34: Maximum discharge, 95,200 second-feet Apr. 18, 1932 (gage height, 12.36 feet); minimum, that of Dec. 13, 14, 1933.

Remarks.- Records good except those for period of ice effect, Dec. 11 to Mar. 15, which are poor. Flow partly regulated by reservoirs and power plants.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12,800	13,000	13,400	10,800	14,900	10,900	15,700	32,800	16,600	16,300	12,800	10,200
2	12,600	13,000	13,600	11,300	14,700	11,300	17,600	32,300	15,400	19,000	12,200	10,200
3	12,400	13,000	13,600	11,700	14,400	11,500	20,000	29,300	14,900	19,700	12,000	10,400
4	12,400	13,000	13,900	11,800	14,700	11,700	26,500	27,400	14,900	18,600	11,700	11,300
5	12,400	13,000	14,100	12,000	14,700	12,000	33,300	26,100	14,700	17,200	11,500	12,400
6	12,400	13,000	14,100	12,400	14,700	12,200	39,500	25,600	14,700	16,900	11,500	13,000
7	12,200	13,400	13,900	13,200	15,200	12,400	43,700	26,100	14,400	16,300	11,500	13,000
8	12,200	13,400	13,900	13,600	15,200	12,600	46,900	26,100	14,400	17,900	11,100	12,800
9	12,400	13,400	13,600	14,100	15,400	12,600	50,100	26,100	14,400	18,300	11,100	12,600
10	12,600	13,400	13,400	14,700	15,700	12,600	54,600	24,400	14,400	19,000	11,100	13,000
11	12,600	13,400	11,300	14,700	15,400	12,600	61,800	22,800	14,400	19,700	11,100	13,000
12	12,800	13,400	8,960	14,400	15,200	13,200	69,500	21,200	14,400	21,200	11,300	14,100
13	12,600	13,400	6,620	14,400	14,700	14,900	76,600	21,200	14,400	21,600	11,300	13,200
14	12,400	13,400	5,540	14,400	14,700	16,600	82,400	21,200	14,400	19,300	11,500	12,600
15	12,400	13,000	6,260	14,700	14,700	19,700	82,500	22,000	14,400	17,200	11,800	12,800
16	12,400	11,700	7,160	14,700	15,200	20,800	82,300	22,800	14,100	16,300	12,000	13,200
17	12,600	11,100	8,420	14,700	15,200	19,300	81,000	21,600	13,900	16,000	11,500	13,200
18	12,800	10,800	9,500	13,900	15,400	17,900	73,500	21,200	14,100	14,900	10,900	13,400
19	13,000	10,900	10,800	13,400	14,700	17,200	68,500	20,000	13,900	15,700	10,600	13,200
20	13,200	11,700	12,000	12,800	13,900	17,200	63,600	19,000	13,900	15,200	10,400	13,200
21	13,200	12,600	12,400	12,800	13,000	17,200	59,100	18,600	14,100	16,300	10,800	13,400
22	13,200	14,100	12,200	13,200	12,000	16,900	54,600	19,000	14,100	16,000	10,800	13,400
23	13,000	15,400	13,000	16,600	11,300	16,900	50,100	18,300	13,600	14,900	10,900	13,400
24	12,800	14,700	12,200	17,900	11,300	16,300	46,900	17,600	13,900	13,600	10,900	14,400
25	12,800	13,400	10,600	18,600	10,900	16,300	44,500	17,200	13,600	13,200	10,800	14,700
26	12,800	13,200	9,860	18,300	10,600	16,300	41,600	16,900	13,600	12,800	10,400	15,700
27	13,000	13,000	8,420	17,900	10,400	16,000	38,800	16,600	13,600	13,000	10,200	16,000
28	13,000	13,200	8,240	16,600	10,600	15,400	37,500	16,300	13,900	15,200	10,000	18,600
29	13,000	13,400	9,680	16,300		15,700	35,700	17,600	14,100	16,600	9,860	20,800
30	13,000	13,400	10,400	16,000		16,000	33,900	19,000	14,900	15,200	9,860	22,800
31	13,000		10,400	15,400		16,000		17,900		13,600	10,000	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	13,200	12,200	12,710	0.160	0.18
November	15,400	10,800	13,030	.165	.18
December	14,100	5,540	11,010	.140	.16
January	18,600	10,800	14,430	.182	.21
February	15,700	10,400	13,890	.175	.18
March	20,800	10,900	15,100	.191	.22
April	82,500	15,700	51,080	.645	.72
May	32,800	16,300	22,070	.279	.32
June	16,600	13,600	14,340	.181	.20
July	21,600	12,800	16,670	.210	.24
August	12,800	9,860	11,080	.140	.16
September	22,800	10,200	13,800	.174	.19
The year	82,500	5,540	17,480	.220	2.96

Mississippi River at Le Claire, Iowa

Location.- Water-stage recorder at foot of Dodge Street in Le Claire, 7 miles below mouth of Wapsipinicon River and 15 miles above Davenport. Prior to June 1 a staff gage in stilling well at same site and datum was used. Zero of gage is 562.61 feet above mean sea level.

Drainage area.- 88,600 square miles.

Records available.- October 1933 to September 1934.

Average discharge.- 61 years (1873-1934), 48,200 second-feet. (Mean yearly flows for years 1873-1933 taken from records computed by Mississippi River Power Co.)

Extremes.- Maximum discharge recorded during year, 81,400 second-feet Apr. 19, 20 (gage height, 6.4 feet); minimum not determined, occurred during winter.
Maximum discharge since 1873, 250,000 second-feet June 25, 1880 (gage height, 14.5 feet).

Remarks.- Records excellent except those for period December to March, which are fair. Stage-discharge relation estimated because of ice effect, Dec. 24 to Jan. 12, Jan. 25, 26, Jan. 29 to Mar. 13. Gage-height record furnished by U. S. Weather Bureau.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	13,900	13,900	13,900	9,000	15,000	13,000	17,400	37,800	19,000	15,300	16,700	10,500
2	13,900	13,900	13,900	10,000	19,000	14,000	18,200	35,800	19,400	15,600	15,000	11,100
3	13,900	13,900	14,600	11,000	20,000	14,900	18,200	34,800	18,600	17,000	15,300	11,400
4	13,200	13,900	14,600	12,000	20,000	15,600	19,800	32,800	17,800	18,200	13,900	13,900
5	13,200	13,900	15,300	12,500	19,500	16,300	22,200	31,800	17,000	21,400	13,900	17,400
6	13,200	13,900	15,300	13,000	18,500	17,100	26,400	30,000	16,700	24,600	13,200	17,000
7	13,200	13,900	15,300	12,500	17,500	17,100	30,900	28,200	16,000	30,000	13,200	15,600
8	13,200	13,900	15,300	11,000	15,000	16,300	31,800	26,400	16,000	28,200	13,600	15,300
9	13,200	13,900	14,600	11,500	11,500	14,800	40,900	26,400	16,400	23,800	13,200	15,300
10	13,200	13,900	14,600	12,500	13,000	13,700	44,200	27,300	16,400	22,200	12,500	15,000
11	13,200	13,900	14,600	13,000	14,000	14,000	47,500	27,300	16,000	24,600	12,500	14,600
12	13,200	14,600	13,900	14,000	15,000	15,000	51,100	25,500	16,000	29,100	12,500	14,600
13	13,200	14,600	11,100	14,600	16,200	17,000	55,900	24,600	15,600	28,200	12,500	15,000
14	13,200	15,300	9,300	16,000	16,600	18,200	61,100	23,800	15,600	25,500	12,800	15,300
15	13,200	14,600	7,500	17,400	16,700	19,800	66,500	23,000	16,000	24,600	13,200	16,000
16	13,200	14,600	8,700	19,000	16,800	21,400	70,700	22,200	16,000	23,000	13,900	16,400
17	13,200	12,500	10,500	19,000	16,800	21,400	78,200	22,200	15,600	21,400	15,600	16,700
18	13,200	12,500	10,500	19,800	16,000	21,400	79,800	23,000	15,600	20,200	15,600	17,000
19	12,500	12,500	9,900	19,800	14,000	21,400	81,400	23,000	15,300	19,400	14,600	16,000
20	13,200	12,500	9,300	18,200	15,000	21,400	81,400	22,200	15,600	19,400	13,200	16,000
21	13,900	11,800	11,100	16,700	16,500	19,800	79,800	21,400	16,000	18,600	11,800	16,400
22	13,900	11,800	9,900	15,300	15,000	19,800	75,200	21,400	15,600	18,200	11,400	16,400
23	13,900	11,800	9,900	15,300	13,000	19,000	70,700	20,600	15,300	17,800	11,400	16,700
24	13,900	13,200	9,000	14,600	11,000	19,000	67,900	19,800	15,300	17,400	11,400	16,400
25	13,900	14,600	8,500	14,900	9,000	18,200	59,800	19,800	14,600	17,400	11,400	16,400
26	13,900	15,300	8,500	19,000	10,000	18,200	54,700	19,800	15,000	16,700	11,400	16,700
27	13,900	15,300	6,500	20,600	11,000	18,200	49,900	19,000	15,300	16,000	11,100	16,700
28	13,900	14,600	7,000	20,600	11,000	17,400	45,300	18,200	15,000	15,300	11,100	17,400
29	13,900	13,900	8,000	17,000		17,400	43,100	18,200	15,000	14,600	10,800	18,200
30	13,900	13,900	8,500	11,000		17,400	39,800	18,200	15,300	15,300	10,500	19,400
31	13,900		9,000	11,000		17,400		18,200		16,400	10,500	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	13,900	12,500	13,490	0.152	0.18
November	15,300	11,800	13,760	.155	.17
December	15,300	6,500	11,120	.126	.15
January	20,600	9,000	14,900	.168	.19
February	20,000	9,000	15,090	.170	.18
March	21,400	13,000	17,600	.199	.23
April	81,400	17,400	50,990	.576	.64
May	37,800	18,200	24,600	.278	.32
June	19,400	14,600	16,100	.182	.20
July	30,000	14,600	20,500	.231	.27
August	16,700	10,500	12,930	.146	.17
September	19,400	10,500	15,690	.177	.20
The year	81,400	6,500	18,870	.213	2.90

Mississippi River at Louisiana, Mo.

Location.- Staff gage in sec. 20, T. 54 N., R. 1 W., on Alton Railroad bridge at Louisiana. Zero of gage is 437.11 feet above mean sea level (adjustment of 1929).

Drainage area.- 140,700 square miles (authority, U. S. Weather Bureau).

Records available.- March to September 1934. Daily gage heights have been published in reports of the Signal Service, U. S. Army, April 1873 to July 1874 and April 1885 to December 1889; in reports of the U. S. Weather Bureau January 1890 to December 1895 and since August 1915.

Extremes.- Maximum discharge recorded during period, 84,200 second-feet Apr.23 (gage height, 7.8 feet); minimum discharge, 12,500 second-feet Aug. 31, Sept. 1; minimum gage height, -2.2 feet Aug. 28, 29.
Maximum stage known, 21.6 feet in 1851.

Remarks.- Records fair. Gage-height record furnished by U. S. Weather Bureau.

Discharge, in second-feet, 1934

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						16,700	26,400	54,400	21,700	20,700	19,700	12,500
2						19,200	24,700	51,900	21,200	18,700	19,200	13,000
3						27,100	23,200	47,100	20,700	17,400	18,700	13,900
4						35,000	23,700	43,900	20,200	17,200	17,700	14,100
5						25,400	26,600	43,900	19,700	17,200	18,200	14,100
6						20,700	33,600	45,500	20,200	17,200	17,300	15,800
7						24,800	43,000	40,400	20,200	17,700	16,800	18,700
8						27,200	43,000	37,100	20,200	19,200	17,700	21,200
9						29,000	38,800	37,100	20,700	19,700	17,700	22,800
10						30,000	36,700	37,100	22,200	21,700	17,700	22,200
11						30,400	43,300	35,700	21,200	27,200	18,200	20,200
12						27,600	53,200	33,600	21,200	30,800	17,900	20,200
13						25,400	58,600	31,000	20,700	29,000	15,600	19,200
14						26,100	61,400	31,400	20,700	27,200	15,600	23,900
15						27,400	61,400	27,600	19,200	27,800	15,600	25,400
16						27,400	64,200	27,700	19,200	32,600	15,000	23,200
17						23,800	69,200	27,700	19,200	35,300	16,400	27,600
18						21,700	72,200	27,700	18,700	38,100	19,700	27,100
19						21,200	76,300	27,600	18,700	42,200	22,700	25,900
20						22,200	79,600	26,600	20,700	40,400	20,200	24,200
21						25,600	80,800	26,400	21,200	37,600	18,700	23,200
22						27,100	82,000	24,200	20,200	34,400	18,200	23,200
23						27,600	84,200	25,400	20,200	30,200	18,700	25,000
24						27,600	82,000	25,900	19,200	27,400	18,700	28,400
25						26,500	78,700	25,400	20,200	28,000	18,200	26,000
26						24,200	76,300	25,900	20,700	28,000	17,400	24,700
27						21,700	72,200	25,800	20,700	26,400	15,700	24,200
28						23,700	70,200	24,700	20,200	25,800	13,100	23,200
29						25,800	63,400	22,200	21,700	24,700	13,100	24,300
30						26,400	58,900	22,200	21,200	22,700	13,000	36,300
31						26,400		22,700		19,700	12,500	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October				
November				
December				
January				
February				
March	35,000	16,700	25,510	1,569,000
April	84,200	23,200	56,330	3,387,000
May	54,400	22,200	32,450	1,995,000
June	22,200	18,700	20,400	1,214,000
July	42,200	17,200	26,520	1,631,000
August	22,700	12,500	17,250	1,061,000
September	36,300	12,500	22,120	1,316,000
The period				12,170,000

Mississippi River at Alton, Ill.

Location.- Wire gage in sec. 14, T. 5 N., R. 10 W., at Missouri & Illinois Bridge & Belt Railroad bridge at Alton, 7⅛ miles above mouth of Missouri River. Zero of gage is 395.48 feet (revised) above mean sea level (adjustment of 1929).

Drainage area.- 171,500 square miles (authority, Mississippi River Commission).

Records available.- March 1933 to September 1934. Daily gage heights have been published in reports of Mississippi River Commission since January 1904, in reports of U. S. Weather Bureau December 1890 to September 1893 and since January 1917. Results of discharge measurements made intermittently by Corps of Engineers, U. S. Army, and by Mississippi River Commission since 1880 at Grafton, 15 miles upstream, are contained in reports of those organizations.

Extremes.- Maximum discharge recorded during year, 97,200 second-feet Apr. 24 (gage height, 9.5 feet); minimum, 15,000 second-feet Dec. 30 (gage height, -1.7 feet).
1933-34: Maximum discharge recorded, 265,000 second-feet May 17, 1933 (gage height, 23.3 feet); minimum, that of Dec. 30, 1933.
Maximum stage known, 37.0 feet June 1844.

Remarks.- Records good. Stage-discharge relation affected by backwater from Missouri River. Discharge determined on basis of slope as obtained by use of auxiliary gages located at Grafton, Ill., and at the mouth of Missouri River maintained by the Corps of Engineers, U. S. Army. Stage-discharge relation affected by ice Feb. 23-25. Gage-height record furnished by U. S. Weather Bureau.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	40,200	35,600	29,300	19,400	28,500	21,800	40,200	74,800	33,700	31,900	32,300	23,900
2	43,900	34,600	30,400	25,100	31,700	24,700	39,800	70,000	33,800	31,400	30,300	24,800
3	43,100	34,600	31,600	25,900	32,300	28,800	38,800	66,300	33,100	31,100	29,900	27,200
4	38,900	33,900	32,200	24,300	30,300	33,400	38,400	63,200	31,700	29,600	29,400	28,400
5	35,700	34,600	31,400	24,000	30,300	42,900	37,800	59,400	31,600	28,000	28,600	28,500
6	33,900	34,900	31,700	24,900	29,400	50,400	38,900	58,100	31,400	28,200	28,100	29,000
7	32,800	34,600	31,000	26,200	29,100	43,200	42,200	58,300	30,600	28,300	28,600	30,000
8	33,900	34,000	31,700	27,900	29,000	38,000	51,800	56,200	30,800	28,400	28,100	32,300
9	33,700	32,700	32,300	29,500	30,300	39,700	58,000	52,000	31,300	29,800	28,100	34,400
10	33,300	32,100	32,900	27,600	33,500	41,700	58,400	49,200	33,900	30,500	29,200	35,300
11	32,400	31,200	32,200	26,600	34,300	42,300	55,400	49,200	32,800	31,100	29,500	37,200
12	30,900	31,800	32,000	28,800	34,600	46,500	55,000	48,000	33,000	34,400	30,300	35,900
13	30,900	31,700	31,000	29,300	34,300	44,200	62,600	46,400	33,300	38,900	30,300	34,600
14	31,500	31,200	30,400	28,100	32,500	40,100	70,400	45,800	33,100	39,300	29,500	33,100
15	32,100	30,700	30,900	28,900	29,800	37,200	75,900	43,500	30,900	41,600	27,800	38,800
16	32,700	30,800	28,900	30,300	31,500	38,200	77,200	42,100	31,200	40,000	30,700	42,300
17	32,500	30,700	27,100	29,700	35,300	39,600	79,200	41,000	31,600	43,700	32,900	41,800
18	30,800	30,500	26,800	29,600	38,400	39,900	83,600	40,000	30,200	48,000	33,700	41,000
19	29,200	30,400	26,400	30,700	41,800	36,900	87,800	38,900	29,800	51,600	36,100	41,200
20	29,700	30,500	26,400	31,700	40,400	34,300	89,900	38,500	29,100	53,100	36,900	40,300
21	31,400	29,900	25,500	32,800	36,700	33,000	91,700	38,800	29,700	54,900	34,700	39,300
22	33,700	29,400	25,900	33,900	34,300	34,300	94,000	38,200	31,300	51,400	32,400	38,000
23	40,400	29,000	25,700	34,100	30,500	38,600	96,200	36,600	31,600	47,800	30,900	36,900
24	39,000	28,800	26,000	33,400	32,200	39,000	97,200	36,600	32,200	45,200	30,600	36,600
25	34,000	29,400	26,200	33,200	32,200	39,300	97,100	36,200	31,800	41,900	30,900	40,100
26	32,100	29,900	27,000	36,100	32,400	39,600	95,100	36,800	31,600	40,600	30,500	40,900
27	32,500	29,100	25,500	37,200	25,900	40,500	91,500	37,200	31,500	39,900	30,000	40,100
28	32,700	28,000	20,000	36,800	24,400	39,900	87,900	38,300	31,300	38,200	28,800	38,400
29	33,900	27,600	17,000	36,100		38,900	84,300	37,500	31,300	36,800	26,900	39,900
30	35,200	27,400	15,000	32,500		41,100	79,800	35,600	32,500	35,700	24,500	47,900
31	35,600		15,500	30,100		41,400		34,400		34,700	24,000	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	43,900	29,200	34,280	2,108,000
November	35,600	27,400	31,320	1,864,000
December	32,900	15,000	27,610	1,698,000
January	37,200	19,400	29,830	1,834,000
February	41,800	24,400	32,350	1,797,000
March	50,400	21,800	38,370	2,359,000
April	97,200	37,800	69,870	4,156,000
May	74,800	34,400	46,680	2,870,000
June	33,900	29,100	31,720	1,887,000
July	54,900	28,000	38,260	2,352,000
August	36,900	24,000	30,150	1,854,000
September	47,900	23,900	35,940	2,139,000
The year	97,200	15,000	37,180	26,920,000

Crow Wing River at Nimrod, Minn.

Location.- Chain gage in sec. 32, T. 137 N., R. 33 W., on highway bridge half a mile north of Nimrod.

Drainage area.- 1,010 square miles.

Records available.- April 1910 to September 1914, July 1930 to September 1934.

Extremes.- Maximum discharge recorded during year, 480 second-feet Apr. 12, 13; maximum gage height recorded, 4.30 feet Apr. 9, affected by ice; minimum discharge recorded, 85 second-feet Aug. 1 (gage height, 2.42 feet, affected by aquatic growth).
1910-14; 1930-34: Maximum discharge, 2,000 second-feet June 9, 1914; minimum, 59 second-feet Aug. 25, 1930 (gage height, 2.52 feet).

Remarks.- Records good. Stage-discharge relation affected by aquatic growth Oct. 1 to Nov. 7, May 29 to Sept. 30, and by ice Nov. 8-30 and Apr. 9. Discharge estimated for Nov. 30, July 3, 4. No records Dec. 1 to Apr. 8.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	144	178						255	156	113	85	113
2	148	182						288	148	113	99	113
3	148	187						332	152	113	92	113
4	144	174						310	152	113	96	113
5	148	178						299	140	113	96	120
6	144	169						310	140	110	96	116
7	148	156						310	245	110	96	116
8	152	148						266	196	110	106	116
9	148	164					420	255	200	196	99	116
10	144	178					450	235	192	169	96	116
11	144	164					420	225	182	152	96	120
12	144	156					480	266	169	144	96	120
13	148	169					480	277	160	132	92	120
14	152	164					450	266	148	124	92	128
15	164	160					420	255	140	124	88	124
16	178	160					420	255	140	120	88	124
17	178	160					365	245	144	120	113	128
18	174	156					354	215	136	120	132	132
19	187	148					343	205	128	116	124	128
20	182	148					332	205	128	116	124	128
21	178	144					321	205	128	110	124	132
22	178	144					310	205	128	106	124	132
23	187	132					299	205	128	106	144	169
24	178	132					299	205	128	106	136	178
25	162	128					310	196	136	106	128	164
26	178	120					321	187	136	106	120	160
27	160	120					332	178	132	102	116	156
28	205	120					321	169	132	102	116	148
29	215	128					299	156	124	120	116	148
30	192	125					266	152	116	106	116	144
31	178							156		99	113	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	215	144	166	0.164	0.19
November	187	120	153	.151	.17
December					
January					
February					
March					
April 9-30	480	266	364	.360	.29
May	332	152	235	.233	.27
June	245	116	149	.148	.17
July	196	99	119	.118	.14
August	144	85	108	.107	.12
September	178	113	131	.130	.15
The year					

Little Sand Lake outlet near Dorset, Minn.

Location.- Staff gage in NE¼ sec. 36, T. 141 N., R. 34 W., 2 miles northeast of Dorset.

Records available.- July 1930 to September 1934.

Extremes.- Maximum discharge recorded during year, 74 second-feet Apr. 8 (gage height, 2.66 feet, affected by ice); no flow for several days in August and September. 1930-34: Maximum discharge, that of Apr. 8, 1934; no flow for several days in August and September 1934.

Remarks.- Records good. No record Nov. 16 to Apr. 3. Stage-discharge relation affected by ice Apr. 4-8, and by aquatic growth June 20 to Aug. 29.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	0.2						32	16	11	1.6	
2	.2	.2						38	15	10	1.4	
3	.1	.1						35	14	9.6	1.4	
4	.1	.2					20	36	14	9.0	1.2	
5	.1	.2					25	35	14	8.6	1.2	
6	.1	.1					33	33	13	8.2	1.2	
7	.1	.1					49	32	16	7.2	1.0	
8	.1	.1					70	31	16	6.2	1.4	
9	.1	.1					64	32	16	7.2	1.3	
10	0	.1					58	30	16	9.0	1.1	
	.1											
11	0	.1					58	28	16	9.0	1.0	
12	0	.2					52	27	15	8.6	.9	
13	0	.3					49	26	14	8.2	.7	
14	.1	.2					49	26	14	7.9	.6	
15	.1	.3					46	25	14	7.2	.5	
16	.1						46	24	13	6.5	.4	
17	.1						43	24	13	6.0	.3	
18	.1						43	22	12	5.8	.5	
19	.2						40	22	12	5.5	.7	
20	.1						40	23	14	5.0	.4	
21	.1						40	22	13	4.5	.3	
22	.1						39	21	12	3.8	.2	
23	.1						38	20	12	3.6	.4	
24	.2						36	19	12	3.4	.3	
25	.2						36	18	12	3.1	.2	
26	.2						35	18	12	3.0	.1	
27	.1						34	17	12	2.6	.1	
28	.1						33	17	12	2.4	.1	
29	.2						32	16	12	2.2	0	
30	.2						32	16	12	2.0	0	
31	.2							16		1.8	0	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	0.2	0	0.12		
November 1-15	.3	.1	.17		
December					
January					
February					
March					
April 4-30	70	20	42.2		
May	38	16	25.2		
June	16	12	13.6		
July	11	1.8	6.07		
August	1.6	0	.66		
September	0	0	0		
The year					

Note.- No flow in September.

Platte River at Royalton, Minn.

Location.- Chain gage in sec. 35, T. 39 N., R. 32 W., on highway bridge at east edge of Royalton, 6 miles above junction with Mississippi River.

Drainage area.- 338 square miles.

Records available.- May 1929 to September 1934.

Extremes.- Maximum discharge recorded during year, 272 second-feet Apr. 7 (gage height, 3.72 feet, affected by ice); minimum, 0.8 second-foot Aug. 17 (gage height, 1.35 feet, affected by aquatic growth).
1929-34: Maximum discharge, 1,330 second-feet May 30, 1931 (gage height, 5.90 feet); minimum, 0.6 second-foot Aug. 15, 1933.

Remarks.- Records fair. Stage-discharge relation affected by ice Nov. 9-15, Mar. 14 to Apr. 7, and by aquatic growth Oct. 1 to Nov. 8, May 2 to Sept. 30. Discharge estimated for Mar. 14-22, 24-31, May 27-31, July 5, 7, 8. No records Nov. 16 to Mar. 13.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11	15					38	32	1.8	14	2.2	2.2
2	9.5	13					48	29	2.0	14	2.2	3.0
3	10	12					64	32	2.8	12	1.9	3.2
4	9.0	13					84	36	4.8	11	1.8	3.0
5	8.6	16					127	37	6.8	9.0	1.4	3.2
6	9.0	16					198	29	6.4	6.8	1.2	2.8
7	8.6	15					251	35	7.2	6.8	1.0	2.4
8	7.7	16					240	35	12	6.8	1.3	2.4
9	8.2	19					230	32	16	6.8	1.6	2.0
10	7.2	20					188	26	24	9.5	1.6	1.8
11	7.2	18					167	28	42	12	1.9	2.2
12	6.8	18					167	29	52	9.5	1.9	2.5
13	6.4	20					157	29	66	8.2	1.4	3.0
14	6.4	18				25	157	25	68	8.2	1.3	3.2
15	6.4	16				25	137	25	64	7.2	1.0	4.0
16	7.7					25	137	27	58	10	.9	3.5
17	7.7					25	118	29	53	6.4	.8	3.0
18	7.2					25	102	29	48	8.2	1.0	3.2
19	7.2					25	86	27	40	7.2	1.2	2.8
20	8.2					25	76	23	40	6.6	1.6	2.4
21	8.2					25	64	22	34	5.4	1.9	2.4
22	8.6					25	58	19	26	5.0	1.6	2.4
23	9.5					26	54	15	22	4.5	2.6	2.5
24	11					30	52	15	19	6.8	1.9	3.8
25	10					30	51	12	19	5.9	1.8	12
26	11					30	47	10	21	8.2	1.6	15
27	11					30	41	8.6	21	5.9	1.6	13
28	12					30	35	7.0	21	4.5	1.3	11
29	13					30	32	5.0	20	3.2	1.6	14
30	14					30	34	3.0	17	2.5	2.0	15
31	15					30		2.0		2.5	1.8	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	15	6.4	9.14	0.027	0.03
November 1-15	20	12	16.3	.048	.03
December					
January					
February					
March 14-31	30	25	27.4	.081	.05
April	251	32	108	.320	.36
May	37	2.0	23.0	.068	.08
June	68	1.8	27.8	.082	.09
July	14	2.5	7.57	.022	.03
August	2.8	.8	1.59	.0047	.005
September	15	1.8	4.90	.014	.02
The year					

Sauk River near St. Cloud, Minn.

Location.- Chain gage in sec. 8, T. 124 N., R. 28 W., on highway bridge 3 miles west of St. Cloud and 4 miles above junction with Mississippi River.

Drainage area.- 816 square miles.

Records available.- July 1909 to December 1913, May 1929 to September 1934.

Extremes.- Maximum discharge during year, 62 second-feet Sept. 25 (gage height, 2.20 feet, affected by aquatic growth); minimum, 1.1 second-feet July 31 (gage height, 2.01 feet); minimum daily discharge recorded, 1.5 second-feet July 31, Aug. 1. 1909-13, 1929-34: Maximum daily discharge, 1,620 second-feet May 11, 1912 (gage height, 8.7 feet, old datum); minimum, that of July 31, 1934.

Remarks.- Records fair. Stage-discharge relation affected by ice or aquatic growth throughout period of record except Apr. 8 to May 12. Diurnal fluctuation caused by power plants above. No records Nov. 16 to Mar. 22.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.5	5.1					23	10	3.9	14	1.5	16
2	4.5	6.6					21	11	4.2	13	10	33
3	5.7	3.9					22	9.0	4.8	12	9.0	27
4	7.8	6.0					14	16	6.0	16	11	19
5	9.6	7.2					16	13	7.2	12	11	16
6	4.2	10					24	9.6	11	12	8.4	9.0
7	6.6	7.2					23	8.4	28	11	12	7.2
8	5.1	9.0					23	9.0	47	10	38	8.4
9	4.2	6.0					30	8.4	40	13	35	9.6
10	5.4	5.7					24	8.4	37	20	38	11
11	7.8	6.6					20	8.4	15	23	16	15
12	5.1	7.2					20	5.4	13	8.4	18	16
13	3.6	4.5					19	7.2	14	5.1	14	15
14	4.5	4.8					20	10	16	3.3	11	24
15	9.6	5.7					18	8.4	13	8.4	11	24
16	8.4						16	7.8	12	8.4	12	19
17	16						9.6	7.8	9.6	11	12	11
18	8.4						14	5.1	21	21	11	11
19	9.6						19	6.0	13	12	14	8.4
20	5.7						9.6	7.2	20	9.6	6.6	9.6
21	4.2						15	8.4	12	8.4	6.6	11
22	3.9						12	7.8	14	4.2	6.6	16
23	5.1					19	14	7.2	7.2	11	10	7.8
24	3.3					22	12	6.6	7.2	33	12	32
25	5.4					15	10	5.1	11	10	10	61
26	4.8					20	9.6	6.6	18	7.2	13	57
27	5.7					22	12	6.0	18	3.6	11	43
28	6.0					15	9.0	5.7	16	3.6	9.6	21
29	6.6					19	7.8	4.8	19	2.7	10	21
30	7.2					18	9.0	4.2	19	1.6	12	9.0
31	4.2					19		4.5		1.5	11	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	16	3.3	6.22	0.0076	0.009
November 1-15	10	3.9	6.37	.0078	.004
December					
January					
February					
March 25-31	22	15	18.8	.023	.008
April	30	7.8	16.5	.020	.02
May	16	4.2	7.84	.0096	.01
June	47	3.9	15.9	.019	.02
July	33	1.5	10.6	.013	.01
August	38	1.5	13.3	.016	.02
September	61	7.2	19.6	.024	.03
The year					

Elk River near Big Lake, Minn.

Location.- Water-stage recorder in sec. 23, T. 33 N., R. 27 W., on highway bridge 4 miles east of Big Lake and 4 miles below mouth of St. Francis River. Chain gage at same site prior to July 27, 1934.

Drainage area.- 615 square miles.

Records available.- April 1911 to September 1917, April 1931 to September 1934.

Extremes.- Maximum discharge during year, 144 second-feet Sept. 26 (gage height, 1.74 feet); minimum, 3.6 second-feet July 31 (gage height, 0.84 foot).
1911-17, 1931-34: Maximum discharge, 5,100 second-feet May 7, 1912 (gage height, 10 feet); minimum, that of July 31, 1934.

Remarks.- Records excellent except those previous to July 15, which are fair. No records Nov. 16 to Feb. 28. Stage-discharge relation affected by ice Nov. 4-15, Mar. 1-25. 30. and by aquatic growth Oct. 1 to Nov. 3, June 20 to July 6. Discharge estimated for period July 7-14, during which artificial control was being built.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	18	46				85	73	51	14	13	4.0	12
2	18	49				89	81	53	14	11	4.3	18
3	18	49				91	87	49	13	11	5.0	23
4	19	49				79	93	59	14	15	5.0	19
5	21	49				64	97	63	16	14	5.0	19
6	19	48				68	101	56	17	14	5.0	17
7	21	42				49	105	57	22	12	5.0	15
8	22	36				43	110	56	42	10	7.3	14
9	22	36				48	105	53	53	9.5	8.4	13
10	22	37				53	105	49	35	10	8.9	13
11	22	35				59	103	46	28	10	9.4	16
12	22	39				66	99	43	28	10	9.4	20
13	23	35				59	93	38	26	10	9.4	20
14	23	39				59	79	33	24	10	8.9	23
15	25	39				49	73	30	22	11	8.9	28
16	48					46	70	35	20	9.9	8.9	31
17	54					40	66	29	18	8.9	8.9	30
18	54					46	64	30	18	9.9	9.4	27
19	49					35	66	30	17	9.4	8.9	25
20	45					38	66	28	18	9.9	9.9	25
21	45					42	59	29	17	8.4	10	23
22	42					40	59	36	17	6.2	9.9	22
23	39					48	56	30	14	6.2	12	22
24	39					48	57	26	13	5.0	12	45
25	39					51	56	26	14	5.0	12	114
26	39					46	54	28	12	5.0	12	125
27	39					93	46	25	15	5.0	12	97
28	39					63	46	21	19	5.0	10	83
29	42					70	46	19	18	4.3	10	70
30	43					77	49	19	16	4.3	11	61
31	42					79		17		4.3	10	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	54	18	32.7	0.053	0.06
November 1-15	49	35	41.9	.068	.04
December					
January					
February					
March	93	35	58.8	.096	.11
April	110	46	75.5	.123	.14
May	63	17	37.5	.061	.07
June	53	12	20.5	.033	.04
July	15	4.3	8.94	.015	.02
August	12	4.0	8.74	.014	.02
September	125	12	35.7	.058	.06
The year					

Crow River at Rockford, Minn.

Location.- Water-stage recorder in sec. 29, T. 119 N., R. 24 W., at Rockford, 1 mile below junction of North and South Forks. Chain gage 600 feet upstream, to same datum, used prior to Aug. 22, 1934. Zero of gage is 893.65 feet above mean sea level(adjustment of 1912).

Drainage area.- 2,520 square miles.

Records available.- June 1909 to September 1917, April 1929 to September 1934.

Extremes.- Maximum discharge during year, 107 second-feet Apr. 9 (gage height, 1.02 feet); minimum recorded, 3.8 second-feet Aug. 4-6 (gage height, 0.50 foot).
1909-17, 1929-34: Maximum discharge, 10,600 second-feet Apr. 2, 3, 1916; minimum, that of Aug. 4-6, 1934.

Remarks.- Records good except those prior to Aug. 22, which are poor. No records Nov. 16 to Feb. 28. Stage-discharge relation affected by shifting control Mar. 1-22, Apr. 1-15, May 1-15, June 7 to Aug. 16. Discharge estimated for Nov. 14, 15.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11	19				15	45	33	11	6.4	4.0	6.4
2	11	19				15	45	33	11	6.4	4.0	8.6
3	11	19				15	84	33	11	6.4	4.0	10
4	11	23				15	74	51	11	5.8	3.8	10
5	11	26				15	79	45	11	5.8	3.8	10
6	11	23				21	79	45	11	5.8	3.8	10
7	11	23				21	79	45	18	5.8	4.3	9.6
8	11	23				21	79	39	28	5.2	6.1	9.4
9	11	19				18	102	39	28	5.2	6.7	9.0
10	12	19				18	98	39	25	5.2	6.7	9.0
11	12	23				21	88	33	21	5.2	8.8	10
12	12	23				21	79	33	18	5.5	8.8	10
13	12	26				25	69	30	18	5.8	7.0	11
14	13	25				25	65	30	18	6.1	6.7	13
15	19	25				25	57	28	18	6.1	6.7	14
16	26					25	54	26	18	7.6	6.7	15
17	23					25	51	23	18	6.7	6.4	16
18	23					28	48	23	18	7.6	6.4	15
19	23					28	48	19	18	7.6	6.4	15
20	23					33	42	19	18	6.7	5.8	14
21	23					33	42	19	15	6.4	5.8	14
22	23					36	36	19	15	6.1	6.0	14
23	19					36	36	16	12	4.6	6.2	14
24	19					36	36	16	11	4.3	6.4	24
25	19					30	36	15	8.8	4.3	6.0	55
26	19					33	36	15	7.6	4.3	5.8	61
27	19					30	36	15	7.0	5.5	5.6	67
28	19					26	30	12	7.0	5.5	5.6	48
29	19					28	30	11	7.0	5.5	5.8	54
30	19					30	30	11	7.0	4.9	5.8	57
31	19					30		11		4.3	6.2	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	26	11	16.6	0.0066	0.008
November 1-15	26	19	22.3	.0088	.005
December					
January					
February					
March	36	15	25.1	.010	.01
April	102	30	57.1	.023	.03
May	51	11	26.7	.011	.01
June	28	7.0	14.8	.0059	.007
July	7.6	4.3	5.76	.0023	.003
August	8.8	3.8	5.87	.0023	.003
September	67	6.4	21.1	.0084	.009
The year					

Mille Lacs Lake at Wealthwood, Minn.

Location.- Staff gage in sec. 20, T. 45 N., R. 26 W. fourth principal meridian, in Wealthwood.

Records available.- June 1931 to September 1934.

Extremes.- Maximum elevation recorded during year, 1,247.35 feet May 21, June 10; minimum recorded, 1,246.17 feet Sept. 22, 30.
1931-34: Maximum elevation recorded, 1,249.36 feet June 20, 1931; minimum recorded, that of Sept. 22, 30, 1934.

Remarks.- Records fair. No records Nov. 10 to May 20.

Elevation, in feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	47.20	47.06							47.24	47.19	46.75	46.38
2	47.14	47.06							47.24	47.15	46.73	46.36
3	47.10	47.06							47.20	47.15	46.71	46.36
4	47.06	47.06							47.18	47.13	46.71	46.35
5	47.04	47.06							47.18	47.11	46.71	46.34
6	47.02	47.06							47.16	47.12	46.69	46.34
7	47.00								47.24	47.12	46.69	46.34
8	47.00								47.30	47.10	46.69	46.32
9	47.00	47.03							47.34	47.12	46.69	46.32
10	47.00								47.35	47.12	46.67	46.30
11	47.02								47.33	47.10	46.67	46.30
12	47.02								47.31	47.10	46.65	46.28
13	47.02								47.29	47.10	46.65	46.26
14	47.02								47.25	47.10	46.63	46.26
15	47.02								47.25	47.08	46.63	46.24
16	47.02								47.23	47.06	46.63	46.24
17	47.04								47.23	47.06	46.61	46.22
18	47.04								47.23	47.04	46.61	46.20
19	47.04								47.25	47.04	46.59	46.20
20	47.06								47.25	47.02	46.57	46.18
21	47.06							47.35	47.25	47.02	46.55	46.19
22	47.06							47.29	47.23	46.96	46.55	46.17
23	47.04							47.25	47.23	46.94	46.53	46.19
24	47.06							47.31	47.23	46.92	46.51	46.23
25	47.06							47.30	47.23	46.90	46.51	46.23
26	47.04							47.30	47.21	46.88	46.48	46.21
27	47.04							47.28	47.21	46.86	46.46	46.21
28	47.04							47.28	47.19	46.84	46.44	46.19
29	47.04							47.26	47.19	46.90	46.42	46.19
30	47.04							47.26	47.19	46.76	46.40	46.17
31	47.04							47.26		46.74	46.38	

Note.- Add 1,200 feet to obtain elevation above mean sea level (adjustment of 1912).

Rum River near St. Francis, Minn.

Location.- Water-stage recorder in sec. 19, T. 33 N., R. 24 W., 5 miles south of St. Francis and 15¾ miles above junction with Mississippi River. Prior to Nov. 9, 1933, chain gage at practically same site. Zero of gage is 861.12 feet above mean sea level (adjustment of 1912).

Drainage area.- 1,360 square miles.

Records available.- May 1929 to September 1934.

Extremes.- Maximum discharge during year, 260 second-feet Apr. 10 (gage height, 2.80 feet); minimum, 29 second-feet Aug. 18 (gage height, 1.91 feet).
1929-34: Maximum discharge, 3,760 second-feet May 18, 1930 (gage height, 6.53 feet); minimum, that of Aug. 18, 1934.

Remarks.- Records good except those during periods of ice effect, Nov. 13-16, 26, 28, 30, Dec. 1 to Apr. 4. Discharge estimated for Nov. 14-16.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	59	77	81	55	52	68	111	100	36	33	32	45
2	59	77	77	54	50	77	108	97	35	31	32	56
3	59	77	77	50	50	83	134	102	34	31	30	55
4	59	77	77	50	50	*77	140	114	35	32	31	52
5	59	77	74	55	49	77	161	114	35	33	32	52
6	59	77	72	58	48	75	175	105	33	34	32	50
7	59	77	74	49	47	74	190	100	39	33	31	52
8	59	73	74	48	48	72	236	94	52	33	33	52
9	59	72	62	47	49	66	248	88	52	33	33	55
10	59	66	60	47	49	60	256	81	50	35	32	56
11	59	68	55	48	52	64	252	83	49	35	33	55
12	59	70	48	54	55	68	232	79	55	36	33	54
13	59	*67	42	55	56	74	205	83	56	36	32	54
14	59	68	44	54	60	77	182	79	54	36	33	52
15	59	68	44	54	66	79	168	77	50	36	34	50
16	59	68	44	54	74	83	158	72	49	38	33	52
17	59	68	45	48	81	70	147	70	50	38	32	52
18	61	64	45	49	74	64	140	68	52	37	35	54
19	64	62	46	50	74	74	140	64	48	38	46	55
20	68	64	47	50	72	81	134	62	52	37	45	56
21	70	68	48	54	70	81	127	58	48	37	44	56
22	68	70	50	52	64	74	124	56	45	35	41	55
23	73	70	52	49	58	79	114	56	41	34	45	55
24	75	77	49	50	62	72	117	55	40	34	44	81
25	75	72	48	52	61	85	111	52	39	35	42	137
26	75	77	47	54	58	85	108	50	39	36	41	147
27	77	74	47	54	66	83	105	48	37	33	45	144
28	77	74	48	52	62	81	100	46	36	32	45	144
29	82	77	48	49		79	100	45	37	33	44	150
30	82	79	50	52		70	97	44	34	33	45	137
31	77		56	50		97		39		33	46	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	82	59	65.4	0.048	0.06
November	79	62	71.8	.053	.06
December	81	42	55.8	.041	.05
January	58	47	51.5	.038	.04
February	81	47	59.2	.044	.05
March	97	60	75.6	.056	.06
April	256	97	154	.113	.13
May	114	39	73.6	.054	.06
June	56	33	43.7	.032	.04
July	38	31	34.5	.025	.03
August	46	30	37.3	.027	.03
September	150	45	72.2	.053	.06
The year	256	30	66.1	.049	.67

*Discharge measurement.

Minnesota River near Montevideo, Minn.

Location.- Chain gage in sec. 19, T. 117 N., R. 40 W., at highway bridge 500 feet below mouth of Chippewa River and 1 mile south of Montevideo. Zero of gage is 910.87 feet above mean sea level (adjustment of 1912).

Drainage area.- 6,300 square miles.

Records available.- July 1909 to September 1934.

Average discharge.- 25 years, 514 second-feet.

Extremes.- Maximum discharge during year, 27 second-feet Dec. 6-9 (gage height, 1.60 feet, affected by ice); no flow for several days.
1909-34: Maximum discharge, about 22,000 second-feet June 25, 1919 (gage height, about 18.85 feet); no flow for several days in 1933 and 1934.

Remarks.- Records poor. Stage-discharge relation affected by ice Nov. 14 to Mar. 26.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	1.6	25	0.7	0.7	2.7	9.2	5.4	1.1	0.2	17	0
2	0	1.2	24	.7	.9	6.0	9.2	4.8	1.1	.2	13	0
3	0	1.0	23	1.1	.9	8.0	10	3.9	1.3	.3	10	0
4	.1	1.0	25	1.1	.9	9.2	10	3.0	1.6	.2	6.0	0
5	.2	.8	25	1.6	.7	6.8	11	2.4	2.2	0	2.7	0
6	.3	.8	27	2.2	1.0	4.8	11	2.0	2.6	0	.9	0
7	.3	.8	27	3.0	1.3	3.8	12	1.8	3.0	0	.5	0
8	.4	1.0	27	2.8	1.1	3.3	13	7.6	4.8	0	.5	0
9	.6	1.2	27	2.1	.9	2.6	12	4.8	3.9	0	.7	0
10	.6	1.4	25	2.6	1.2	2.6	12	1.8	3.0	0	.9	.2
11	.4	.7	21	2.2	1.5	4.8	8.8	3.6	2.4	0	.9	.2
12	.7	.4	19	2.0	1.6	4.8	6.0	3.3	2.0	.1	.9	.2
13	.7	.4	18	2.1	1.6	4.8	8.4	3.3	2.4	.5	2.7	.2
14	.6	.4	21	1.5	2.1	4.2	10	3.0	2.1	1.3	8.4	.2
15	.6	.5	20	1.2	2.8	3.3	13	4.5	1.5	2.0	6.8	.2
16	.8	.4	18	.9	2.2	3.0	11	3.9	1.0	2.7	5.4	.2
17	.8	.4	16	1.1	1.8	3.0	10	3.0	.7	20	4.2	.2
18	.8	.4	13	.7	1.8	3.0	8.4	3.0	.4	25	3.0	.2
19	1.0	.8	14	.5	1.5	3.6	4.2	3.0	.4	25	1.8	.2
20	1.0	1.3	15	1.1	1.3	3.6	3.6	3.6	.7	23	.9	.2
21	1.0	1.3	14	1.5	1.5	6.0	3.9	3.0	.7	21	.9	.2
22	.9	1.1	14	1.6	1.5	6.0	4.2	2.7	.5	19	.9	.2
23	.9	1.1	2.7	2.1	1.5	5.4	3.6	2.4	.4	16	.5	.4
24	.7	1.3	2.1	2.1	1.2	5.4	3.6	2.4	.4	21	.3	2.1
25	.9	1.3	1.5	1.8	1.3	5.4	3.6	2.4	.4	21	.1	6.8
26	1.2	1.3	1.2	1.8	.9	5.7	3.6	2.8	.4	22	0	6.0
27	1.3	1.3	1.2	2.2	.9	5.4	4.8	2.8	.3	22	0	3.0
28	1.5	7.6	1.2	1.5	.8	5.4	4.8	2.2	.3	21	0	2.1
29	1.8	20	1.2	1.2		6.0	4.8	1.8	.3	19	0	1.8
30	1.8	22	.9	1.0		9.2	4.8	1.5	.2	17	0	1.1
31	1.8		.7	.8		9.2		1.4		17	0	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	1.8	0	0.76	0.00012	0.0001
November	22	.4	2.49	.00040	.0004
December	27	.7	15.2	.0024	.003
January	3.0	.5	1.57	.00025	.0003
February	2.8	.7	1.34	.00021	.0002
March	9.2	2.6	5.06	.00080	.0009
April	13	3.6	7.82	.0012	.001
May	7.6	1.4	3.13	.00050	.0006
June	4.8	.2	1.40	.00022	.0002
July	25	0	10.2	.0016	.002
August	17	0	2.90	.00046	.0005
September	6.8	0	.86	.00014	.0002
The year	27	0	4.43	.000703	.01

Minnesota River at Mankato, Minn.

Location.- Water-stage recorder in sec. 7, T. 108 N., R. 26 W., at Main Street Bridge, in Mankato, 2 miles below mouth of Blue Earth River. Zero of gage is 747.925 feet above mean sea level (adjustment of 1929).

Drainage area.- 14,600 square miles.

Records available.- March 1922 to September 1934 at present site; May 1903 to October 1921, comparable records 1,000 feet below mouth of Blue Earth River.

Average discharge.- 31 years (1903-34), 2,323 second-feet.

Extremes.- Maximum discharge during year, 2,170 second-feet Apr. 7 (gage height, 5.51 feet); minimum, 26 second-feet Aug. 4 (gage height, 1.72 feet).
1903-34: Maximum discharge, 43,800 second-feet June 26, 1908 (gage height at old site, 21.2 feet); minimum, that of Aug. 4, 1934.
Maximum known stage, about 27 feet at old site in 1881 (discharge, about 65,000 second-feet).

Remarks.- Records good. Stage-discharge relation affected by ice Dec. 25 to Mar. 3.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	63	93	74	65	207	108	249	144	50	50	33	40
2	63	76	126	65	92	115	143	128	52	47	32	47
3	65	95	147	67	78	110	1,190	133	53	47	31	55
4	65	102	124	68	72	95	1,190	149	55	46	31	50
5	65	80	95	70	70	98	1,390	170	58	54	36	48
6	65	74	68	68	68	98	1,980	165	62	123	48	48
7	63	82	90	92	68	108	1,980	106	86	98	46	47
8	63	102	59	67	102	110	1,670	145	188	69	38	44
9	63	54	94	65	116	135	1,350	160	192	66	38	40
10	62	78	110	65	82	135	1,040	121	174	71	35	40
11	60	100	92	62	117	125	905	104	137	58	38	44
12	56	104	70	62	84	98	761	98	536	65	38	42
13	53	48	70	60	78	128	722	100	884	101	35	44
14	55	60	72	58	82	129	494	94	664	86	35	58
15	58	54	109	55	120	152	391	90	539	84	35	64
16	78	58	76	90	122	136	372	101	303	73	34	62
17	91	63	74	68	125	141	376	103	235	71	33	58
18	76	68	70	63	125	98	309	92	162	69	33	57
19	94	70	70	63	102	92	302	102	227	64	34	50
20	65	89	72	65	90	130	288	73	147	53	35	53
21	74	109	68	70	88	149	282	73	179	50	36	53
22	65	86	72	95	112	176	287	71	166	44	35	50
23	62	95	72	227	116	163	161	80	148	38	42	48
24	65	95	72	240	115	100	196	96	94	36	46	55
25	60	92	68	254	111	108	224	71	65	35	44	64
26	62	58	70	105	84	130	223	65	65	35	41	76
27	63	120	65	86	78	144	188	64	73	36	40	86
28	65	97	63	105	76	155	219	60	101	35	38	94
29	68	110	63	110		164	172	57	60	35	36	94
30	63	92	65	110		173	133	53	57	35	41	86
31	79		67	100		275		50		34	42	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	94	53	66.1	0.0045	0.005
November	120	48	83.5	.0057	.006
December	147	59	80.9	.0055	.006
January	254	55	91.6	.0063	.007
February	207	68	99.2	.0068	.007
March	275	92	132	.0090	.01
April	1,980	133	640	.044	.05
May	180	50	101	.0069	.008
June	884	50	194	.013	.01
July	123	34	58.3	.0040	.005
August	48	31	37.4	.0026	.003
September	94	40	56.6	.0039	.004
The year	1,980	31	136	.0093	.12

Whetstone River near Big Stone, S. Dak.

Location.- Chain gage in sec. 18, T. 121 N., R. 46 W., 1½ miles west of Big Stone. Zero of gage is 996.96 feet above mean sea level (adjustment of 1912).

Drainage area.- 420 square miles.

Records available.- March 1931 to September 1934 (incomplete during winter), September 1909 to November 1912 at a site 2 miles downstream, in reports of U. S. Geological Survey; April 1899 to May 1904, September 1909 to November 1912, in "Report of Water Resources Investigations of Minnesota" for 1909-12 by State Drainage Commission.

Extremes.- Maximum discharge during year, 90 second-feet June 9 (gage height, 3.32 feet); no flow for several days during period May to September.
1909-12, 1931-34: Maximum discharge, 1,320 second-feet May 28, 1931 (gage height, 7.1 feet); no flow frequently during summer months.

Remarks.- Records fair. Stage-discharge relation affected by ice Nov. 10-15, Mar. 6 to Apr. 8. No records Nov. 16 to Mar. 5.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.6	*1.6					4.0	*1.1	0	0.2		0
2	.4	1.4					*4.6	1.1	*0	.2		0
3	.2	1.4					5.3	2.8	*0	*.2		0
4	.4	1.2					*5.6	*2.2	*.3	*.1		0
5	.4	1.1					5.8	1.6	1.3	.1		0
6	.3	1.4				1.1	*6.8	1.9	.5	*.1		0
7	.2	1.8				*1.2	7.8	*1.9	7.2	.1		0
8	.6	1.4				*1.4	10	1.9	63	.1		0
9	.7	1.4				*1.5	*8.6	*1.5	56	0		0
10	.7	1.3				1.6	7.2	*1.2	30	0		0
11	.6	1.2				1.6	5.8	.8	10	0		0
12	.7	*1.1				2.8	4.4	.8	*7.6	0		0
13	.9	1.0				*2.4	*4.0	.7	5.3	0		0
14	.6	.8				2.0	3.6	.5	*3.9	0		0
15	1.1	.9				2.0	*2.9	.5	*2.6	0		0
16	1.1					2.8	2.2	*.4	1.3	0		0
17	1.1					2.8	2.2	.4	*1.2	0		0
18	.9					*8.4	1.9	*.4	*1.0	0		0
19	.9					14	1.8	*.3	.8	0		0
20	1.1					11	*1.7	.3	1.1	0		0
21	1.1					*9.1	1.6	.3	1.1	0		0
22	1.1					7.2	1.6	.3	1.3	0		0
23	1.2					*5.8	*1.4	.2	1.0	0		0
24	1.2					4.4	1.3	*.2	.5	0		26
25	*1.1					*3.8	1.2	*.2	.4	0		5.3
26	1.1					3.2	1.1	.2	.3	0		1.3
27	1.4					*3.2	*1.1	*.1	.3	0		1.0
28	1.8					3.2	1.1	.1	.2	0		.7
29	1.8					4.0	*1.1	.1	.2	0		*.6
30	2.0					*3.1	1.1	0	.2	0		.5
31	1.8					2.2		0				

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	2.0	0.2	0.94	0.0022	0.003
November 1-15	1.8	.8	1.27	.0030	.002
December					
January					
February					
March 6-31	14	1.1	4.07	.0097	.009
April	10	1.1	3.63	.0086	.01
May	2.8	0	.77	.0018	.002
June	63	0	6.62	.016	.02
July	.2	0	.04	.000095	.0001
August	0	0	0	0	0
September	26	0	1.18	.0028	.003
The year					

*Estimated.

Note.- No flow during August.

Pomme de Terre River near Appleton, Minn.

Location.- Staff gage in NE¼ sec. 1, T. 120 N., R. 43 W., 3 miles northeast of Appleton and 5 miles above mouth.

Drainage.- 950 square miles.

Records available.- March 1931 to September 1934 (incomplete during winter).

Extremes.- Maximum discharge during year, 130 second-feet Apr. 7 (gage height, 2.70 feet, affected by ice); no flow Aug. 3-5.
1931-34: Maximum discharge, 212 second-feet Feb. 29, 1932 (gage height, 3.66 feet, affected by ice); minimum, that of Aug. 3-5, 1934.

Remarks.- Records fair. Stage-discharge relation affected by ice Nov. 6-15, Mar. 1 to Apr. 7, and by aquatic growth Oct. 1 to Nov. 5, Apr. 8 to May 8, May 14 to Sept. 30. No records Nov. 16 to Feb. 28.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.0	8.0				6.1	16	11	1.1	1.2	0.2	1.1
2	3.0	6.9				5.8	24	12	1.1	1.0	.1	1.4
3	3.0	6.9				5.4	31	14	1.1	.8	0	1.6
4	3.0	6.5				5.8	40	18	1.3	.7	0	2.0
5	3.1	6.9				6.9	48	19	1.3	.6	0	1.9
6	3.3	6.1				5.4	68	16	1.3	.5	.1	1.8
7	3.0	6.1				2.3	61	14	2.8	.5	.1	1.7
8	3.1	4.8				2.5	45	13	3.1	.5	.2	1.6
9	3.3	7.3				1.8	23	11	6.5	.4	.2	1.4
10	3.6	7.3				3.0	20	9.2	20	.4	9.2	2.5
11	3.6	6.1				4.6	16	9.6	11	.5	11	2.5
12	3.8	5.4				6.1	14	10	8.0	1.2	4.8	2.8
13	4.8	6.1				5.1	17	9.6	6.9	1.6	4.1	2.8
14	4.4	5.6				4.8	11	11	6.9	1.1	2.6	4.4
15	5.4	5.8				5.0	13	10	4.8	.9	2.2	3.8
16	5.6					5.6	12	8.8	4.1	.9	2.0	3.4
17	5.4					4.8	11	7.3	3.6	.8	1.9	3.4
18	5.1					3.8	13	6.1	3.3	.8	1.8	3.0
19	5.1					5.1	14	5.6	2.8	.6	1.1	3.1
20	5.1					5.4	13	5.1	3.0	.4	.9	3.1
21	5.6					4.6	11	4.6	2.2	.3	.9	3.0
22	6.9					5.1	13	4.1	2.2	.2	.7	3.3
23	5.1					6.5	12	3.8	1.8	.2	1.1	3.3
24	5.1					6.9	13	3.4	1.5	.2	.8	8.4
25	6.9					8.0	10	3.1	1.2	.5	.7	11
26	4.8					8.0	12	2.6	.9	.5	.8	15
27	8.0					7.3	12	2.5	.6	.6	.7	16
28	6.9					5.4	11	2.2	.6	.4	.7	14
29	6.5					9.2	12	1.6	1.4	.3	.6	13
30	6.9					12	12	1.4	1.1	.2	.8	9.6
31	8.8					11		1.2		.2	1.2	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	8.8	3.0	4.88	0.0051	0.006
November 1-15	8.0	4.8	6.39	.0067	.004
December					
January					
February					
March	12	1.8	5.78	.0061	.007
April	68	10	20.9	.022	.02
May	19	1.2	8.09	.0085	.01
June	20	.6	3.58	.0038	.004
July	1.6	.2	.61	.00064	.0007
August	11	0	1.66	.0017	.002
September	16	1.1	4.86	.0051	.006
The year					

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Lac qui Parle River near Lac qui Parle, Minn.

Location.- Staff gage on line between secs. 27 and 28, T. 118 N., R. 42 W., 1 mile southwest of Lac qui Parle.
Drainage area.- 1,040 square miles.
Records available.- March 1931 to September 1934. April 1910 to November 1914 comparable record at station 2 miles downstream.
Extremes.- 1910-14, 1931-34: Maximum discharge, 1,550 second-feet May 5, 6, 1912 (gage height, 7.6 feet at old station); no flow in several different years.
Remarks.- No flow during entire year.

Chippewa River near Watson, Minn.

Location.- Chain gage on line between secs. 22 and 15, T. 118 N., R. 41 W., 1½ miles northeast of Watson, 2 miles below Dry Weather Creek, and 10 miles above mouth. Zero of gage is 931.82 feet above mean sea level (1912 adjustment).
Drainage area.- 1,650 square miles.
Records available.- April 1910 to September 1917, March 1931 to September 1934 (incomplete during winter).
Extremes.- Maximum discharge recorded during year, 20 second-feet Apr. 14 (gage height, 3.14 feet); no flow most of time from May 31 to Sept. 30.
1910-17, 1931-34: Maximum discharge, 9,600 second-feet Apr. 4, 1917 (gage height, 17.86 feet, old datum); no flow for several months in 1933 and 1934.
Remarks.- Records good. Stage-discharge relation affected by ice Nov. 7-15, Apr. 1-3. No records Nov. 16 to Mar. 31.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.8	8.8					5.7	3.9	0			0
2	.6	7.8					5.7	2.7	0			0
3	.5	7.8					8.3	4.5	0			0
4	.8	7.0					9.0	5.1	0			0
5	1.1	7.8					8.3	5.1	0			0
6	1.2	7.8					8.3	6.4	0			0
7	1.9	7.8					9.8	6.4	0			0
8	1.9	5.4					9.8	7.7	11			0
9	2.3	5.4					9.0	6.4	3.3			0
10	3.0	3.4					8.3	5.1	1.5			0
11	3.7	2.8					7.7	4.5	.7			0
12	3.0	2.8					6.4	3.9	.4			0
13	4.4	2.8					5.7	2.4	.2			0
14	5.8	1.7					20	2.7	0			0
15	5.8	1.6				*0.1	12	2.7	0			0
16	7.4						7.7	2.4	0			0
17	7.4						7.0	1.8	0			0
18	7.4						5.7	1.2	0			0
19	7.4						7.7	1.0	0			0
20	8.3						7.0	.9	0			0
21	9.2						7.0	1.0	0			0
22	8.3						6.4	1.2	0			0
23	10						6.4	1.2	0			0
24	9.2						5.7	.9	0			0
25	8.3						3.9	.7	0			7.0
26	8.8						5.1	.7	0			5.7
27	7.0						4.5	.4	0			1.8
28	8.8						3.3	.2	0			.9
29	7.8						3.9	.2	0			.6
30	8.8						3.9	.1	0			.1
31	9.6							0				

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	10	0.5	5.50	0.0030	0.003
November 1-15	8.8	1.6	5.38	.0029	.002
December					
January					
February					
March					
April	20	3.3	7.31	.0040	.004
May	7.7	0	2.69	.0015	.002
June	11	0	.57	.00031	.0003
July	0	0	0	0	0
August	0	0	0	0	0
September	7.0	0	.54	.00029	.0003
The year					

*Discharge measurement.

Note.- No flow in July and August.

Yellow Medicine River near Granite Falls, Minn.

Location.- Chain gage in sec. 35, T. 115 N., R. 39 W., 6 miles above mouth and 8 miles south of Granite Falls.

Drainage area.- 540 square miles.

Records available.- March 1931 to September 1934 (incomplete during winter).

Extremes.- Maximum discharge recorded during year, 38 second-feet Sept. 24 (gage height, 2.54 feet); minimum daily discharge, 0.1 second-foot (estimated) Aug. 1-10.

1931-34: Maximum discharge, 476 second-feet Mar. 1, 1932 (gage height, 4.20 feet); no flow July 26, Aug. 27, 1931, and several days in 1933.

Remarks.- Records poor. Discharge estimated between measurements except for period Sept. 24-30. No records Nov. 17 to Mar. 15.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.8	2.5					4.7	1.3	0.4	0.2	0.1	1.0
2	.9	2.4					4.1	*1.3	.4	.2	.1	1.2
3	1.0	2.3					4.0	2.0	.6	.2	.1	1.2
4	1.1	2.4					4.1	1.6	1.0	.2	.1	1.2
5	1.2	2.5					4.2	1.0	1.5	.2	.1	1.3
6	1.3	2.6					4.0	.9	2.5	.2	.1	1.1
7	1.4	2.7					3.2	1.1	5.0	.2	.1	.8
8	1.6	2.6					2.9	1.9	*5.5	.2	.1	.7
9	1.7	2.4					2.8	1.8	4.5	.4	*.1	.8
10	1.9	2.1					2.7	1.5	3.0	.3	.1	2.2
11	2.0	1.9					2.6	1.3	2.2	.2	.2	3.1
12	2.2	1.6					2.5	1.1	1.6	.5	.3	2.8
13	2.4	1.4					2.3	.9	1.2	.8	.6	3.0
14	2.7	1.2					2.2	.8	1.0	.9	.9	3.3
15	3.0	1.2					2.0	.7	.8	.7	1.0	2.4
16	3.3	*1.1				*2.0	1.8	.7	.6	.6	.8	1.5
17	3.7					2.0	1.7	.7	.4	.5	.6	1.1
18	3.9					2.1	1.7	.8	.3	1.0	.4	1.0
19	3.6					2.4	2.2	1.1	.2	.6	.4	1.1
20	2.8					2.6	2.7	2.3	.3	.3	.3	1.2
21	2.2					2.8	2.8	2.4	.2	.2	.3	1.1
22	2.3					2.9	2.6	1.9	.2	.2	.3	1.0
23	2.5					2.9	1.8	1.5	.2	.2	.4	1.0
24	2.7					2.8	1.7	1.2	.3	.2	.4	37
25	2.9					2.4	2.0	1.0	.3	.2	.4	14
26	3.2					1.3	2.2	.8	.3	.2	.5	5.0
27	3.6					1.3	1.9	.7	.3	.2	.6	8.0
28	3.3					3.6	1.5	.7	.3	.2	.5	3.5
29	3.0					4.4	1.3	.6	.2	.2	.5	2.1
30	2.7					4.8	1.3	.5	.2	.2	.6	2.1
31	2.5					4.9		.4		.2	.8	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October 1-16	3.9	0.8	2.37	0.0044	0.005
November 1-16	2.7	1.1	2.06	.0038	.002
December					
January					
February					
March 16-31	4.9	1.3	2.82	.0052	.003
April	4.7	1.3	2.58	.0048	.005
May	2.4	.4	1.18	.0022	.003
June	5.5	.2	1.18	.0022	.002
July	1.0	.2	.34	.00063	.0007
August	1.0	.1	.38	.00070	.0008
September	37	.7	3.56	.0068	.007
The year					

*Discharge measurement.

Redwood River near Redwood Falls, Minn.

Location.- Chain gage in NE¼ sec. 9, T. 112 N., R. 36 W., 3 miles west of Redwood Falls.

Drainage area.- 703 square miles.

Records available.- July 1909 to September 1914, August 1930 to September 1934 (incomplete during winter).

Extremes.- Maximum discharge recorded during year, 30 second-feet Apr. 3 (gage height, 1.82 feet); minimum recorded, 0.1 second-foot July 25-31, Aug. 4, 5, 9.
1909-14, 1930-34: Maximum discharge, 781 second-feet (discharge measurement) July 2, 1909 (gage height, 3.98 feet, present datum); minimum, that of July and August 1934.

Remarks.- Records good except those affected by debris on control, Oct. 26 to Nov. 10, and by ice on control Nov. 11-30, Mar. 4-22,-29, which are poor. Discharge interpolated for May 6, 27, Aug. 7, 21. No records Dec. 1 to Mar. 3.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.2	1.8					24	3.6	0.3	0.3	0.2	1.2
2	1.3	1.8					19	3.3	.3	.3	.2	1.8
3	1.4	1.6					27	3.6	.5	.2	.2	1.4
4	1.5	1.4				1.3	24	3.6	.7	.2	.1	1.3
5	1.6	1.4				1.6	19	3.0	.7	.3	.1	1.3
6	2.0	1.3				1.5	19	3.0	1.0	.4	.2	1.1
7	2.1	1.3				1.5	19	3.0	2.1	.4	.2	.6
8	2.1	1.1				1.3	22	7.2	8.4	.4	.2	.5
9	2.4	1.3				1.4	24	9.0	2.1	.4	.1	.5
10	2.4	.9				1.3	24	6.0	1.3	.5	.2	3.9
11	2.4	1.2				1.3	23	5.4	.9	.4	.4	5.4
12	2.4	1.0				1.3	22	4.5	.8	.7	.4	2.0
13	2.4	1.0				2.2	19	3.3	.7	1.4	.3	1.2
14	2.7	1.0				1.6	16	3.0	.9	1.3	.6	1.6
15	8.4	.8				1.8	17	2.6	1.0	.9	.7	1.5
16	8.4	.7				2.0	15	2.4	.9	.9	.6	1.2
17	3.0	.8				1.5	13	2.7	.9	.8	.6	1.0
18	2.7	.9				1.3	12	2.4	.8	.8	.8	.7
19	2.7	.9				1.4	12	2.1	.9	.6	.7	.7
20	2.7	.9				1.8	8.4	1.5	.7	.5	.6	.6
21	2.7	.9				2.7	9.6	1.3	.6	.4	.6	.7
22	2.7	.7				3.0	7.2	1.0	.6	.4	.5	.7
23	2.8	.7				3.0	6.0	1.3	.6	.2	.6	.9
24	2.7	.7				2.8	8.4	1.0	.4	.2	.5	8.4
25	2.4	.6				3.0	6.0	1.1	.3	.1	.6	4.8
26	2.4	.6				3.3	4.8	1.0	.4	.1	1.0	2.7
27	2.4	.8				3.0	4.8	.9	.4	.1	.9	2.0
28	2.2	.6				3.0	5.4	.8	.4	.1	.9	1.3
29	2.1	.6				11	4.8	.6	.4	.1	.8	1.2
30	2.0	.6				7.8	3.3	.5	.3	.1	.9	1.0
31	1.8					16		.4		.1	1.0	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	8.4	1.2	2.64	0.0038	0.004
November	1.8	.6	1.00	.0014	.002
December					
January					
February					
March 4-31	16	1.3	3.02	.0043	.004
April	27	3.3	14.6	.021	.02
May	9.0	.4	2.75	.0039	.004
June	8.4	.3	1.01	.0014	.002
July	1.4	.1	.44	.00063	.0007
August	1.0	.1	.51	.00073	.0008
September	8.4	.5	1.77	.0025	.003
The year					

Cottonwood River near New Ulm, Minn.

Location.- Chain gage in sec. 31, T. 110 N., R. 30 W., 2 miles southwest of New Ulm and 4 miles above mouth. Zero of gage is 810.50 feet above mean sea level (adjustment of 1912).

Drainage area.- 1,190 square miles.

Records available.- March 1931 to September 1934 (incomplete during winter). July 1909 to December 1913 comparable records at station 2 miles downstream.

Extremes.- Maximum discharge during year, 146 second-feet Apr. 6 (gage height, 3.80 feet); minimum, 0.6 second-foot Aug. 1 (gage height, 2.12 feet).
1909-13, 1931-34: Maximum discharge, 4,580 second-feet Feb. 29, 1932 (gage height, 11.20 feet, affected by ice); minimum, that of Aug. 1, 1934.

Remarks.- Records fair. Stage-discharge relation affected by debris on control Oct. 13 to Nov. 8 and by ice Nov. 9-17, Mar. 1-27, 30, 31. Discharge interpolated for Nov. 16. No records Nov. 18 to Feb. 28.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.2	6.2				13	50	12	1.5	1.8	0.6	1.0
2	3.2	7.0				20	45	8.8	1.5	1.8	.9	1.8
3	4.0	8.2				24	80	11	1.3	1.5	1.3	2.3
4	3.2	7.0				19	70	12	1.8	1.3	.8	1.8
5	4.7	9.4				25	80	7.7	1.0	1.5	.9	1.0
6	4.7	9.4				20	133	12	1.5	5.5	1.0	1.0
7	3.2	8.2				24	102	14	2.6	2.3	1.0	.8
8	4.0	7.0				22	75	17	70	4.2	.9	.8
9	4.7	7.0				21	59	18	55	3.6	.9	1.0
10	4.7	5.9				22	58	21	31	2.3	.8	2.0
11	4.0	4.3				16	53	17	33	1.8	1.0	4.2
12	3.2	4.3				14	41	12	45	5.5	.9	2.9
13	3.6	4.3				12	35	4.9	35	34	1.3	7.7
14	4.7	5.1				19	32	6.6	24	8.8	.9	11
15	5.1	5.1				15	28	7.7	15	7.7	1.0	9.9
16	5.5	5.0				18	25	5.5	11	9.9	.9	7.7
17	5.9	5.0				21	27	4.2	11	8.8	.8	5.5
18	5.1					16	28	3.6	8.8	7.7	.8	4.2
19	4.3					17	26	4.2	7.7	4.2	1.0	4.2
20	4.3					26	25	4.2	7.7	2.3	.9	2.9
21	4.7					26	22	4.2	6.8	2.3	.9	3.6
22	5.5					26	20	3.6	5.5	2.3	.7	2.3
23	5.9					24	18	2.9	4.2	1.8	1.0	4.2
24	5.9					35	16	2.9	3.6	2.3	1.5	6.6
25	4.3					50	14	4.2	4.2	4.2	1.8	12
26	5.1					26	16	2.3	3.6	1.0	1.3	11
27	5.1					45	14	2.3	4.2	.8	1.8	8.8
28	4.3					41	14	2.9	2.9	1.3	1.0	5.5
29	4.7					42	13	2.3	2.3	1.0	.8	5.5
30	5.5					47	11	1.8	1.8	1.3	1.3	4.9
31	5.5					57		2.0		.8	1.8	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	5.9	3.2	4.57	0.0038	0.004
November 1-17	9.4	4.3	5.38	.0054	.003
December					
January					
February					
March	57	12	25.9	.022	.03
April	133	11	41.0	.034	.04
May	21	1.8	7.57	.0064	.007
June	70	1.0	13.6	.011	.01
July	34	.8	4.37	.0037	.004
August	1.8	.6	1.05	.00088	.001
September	12	.8	4.60	.0039	.004
The year					

St. Croix River near Danbury, Wis.

(Formerly published as St. Croix River at Swiss, Wis.)

Location.- Chain gage in sec. 33, T. 42 N., R. 15 W., at bridge on State Trunk Highway 35, 10 miles northeast of Danbury. Namakagon River enters 3½ miles above station.

Drainage area.- 1,550 square miles.

Records available.- March 1914 to September 1934.

Average discharge.- 20 years, 1,144 second-feet.

Extremes.- Maximum discharge recorded during year, 6,320 second-feet Apr. 8 (gage height, 5.45 feet); minimum, 393 second-feet Aug. 6, 13 (gage height, -0.20 foot). 1914-34: Maximum discharge, 8,480 second-feet Apr. 22, 1916 (gage height, 6.73 feet); minimum, that of Aug. 6, 13, 1934.

Remarks.- Records good except those for period of ice effect, Nov. 14 to Apr. 7, which are fair.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	518	887	710	675	606	575	1,710	1,180	606	606	434	450
2	492	960	745	675	606	606	1,900	1,180	606	575	434	471
3	518	960	780	675	606	606	2,230	1,180	575	544	434	492
4	518	960	815	710	606	640	2,570	1,180	544	575	434	492
5	492	887	815	745	640	640	3,160	1,180	575	544	434	518
6	544	887	815	710	606	675	3,660	1,180	606	544	405	518
7	518	960	815	745	606	710	4,429	1,030	675	544	434	492
8	518	815	815	780	606	710	6,040	1,110	745	518	418	492
9	471	815	815	815	606	780	3,160	1,110	745	544	434	471
10	544	815	815	815	606	745	3,040	1,030	745	606	434	450
11	518	780	815	815	640	861	2,920	960	710	606	434	492
12	518	887	861	815	675	815	2,690	1,030	675	606	434	492
13	518	640	861	815	780	887	2,570	1,110	675	606	405	492
14	518	745	887	861	745	1,030	2,460	1,110	675	575	434	492
15	606	815	861	815	710	1,030	2,230	1,110	640	544	418	492
16	960	815	887	780	745	1,030	2,110	1,110	606	492	405	492
17	1,260	815	887	887	745	1,030	1,800	1,030	606	518	405	471
18	1,180	815	887	887	745	1,030	1,710	960	575	518	418	492
19	1,110	815	815	887	675	1,110	1,520	887	544	492	460	518
20	1,030	815	815	887	606	1,110	1,520	960	544	492	434	518
21	1,030	815	815	887	575	1,110	1,430	960	518	492	450	492
22	960	780	815	887	575	1,110	1,340	960	544	471	434	492
23	960	745	780	887	575	1,180	1,430	815	575	418	450	518
24	960	710	780	861	575	1,180	1,340	815	544	450	434	640
25	861	675	780	887	575	1,260	1,340	780	606	434	450	1,030
26	815	675	710	745	575	1,260	1,340	745	710	434	434	1,260
27	815	675	675	745	575	1,260	1,180	745	675	434	450	1,340
28	780	675	675	675	575	1,340	1,180	710	675	434	434	1,180
29	815	675	675	575		1,430	1,110	675	640	450	434	1,110
30	887	675	675	518		1,430	1,180	675	606	434	450	1,110
31	887		675	575		1,610		675		434	434	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	1,260	471	746	0.481	0.55
November	960	640	800	.516	.58
December	887	675	793	.512	.59
January	887	518	775	.500	.58
February	780	575	634	.409	.43
March	1,610	575	993	.641	.74
April	6,040	1,110	2,210	1.43	1.60
May	1,180	675	974	.628	.72
June	745	518	626	.404	.45
July	606	418	514	.332	.38
August	450	405	432	.279	.32
September	1,340	450	632	.408	.46
The year	6,040	405	843	.544	7.40

St. Croix River near Grantsburg, Wis.

Location.- Chain gage near center of sec. 30, T. 40 N., R. 18 W., at Norway Point ferry, half a mile below mouth of Sand Creek and 10 miles north of Grantsburg.

Drainage area.- 2,820 square miles.

Records available.- April 1923 to September 1934.

Average discharge.- 11 years, 1,777 second-feet.

Extremes.- Maximum discharge recorded during year, 6,020 second-feet Apr. 9 (gage height, 7.84 feet); minimum, 510 second-feet Aug. 14, 17 (gage height, 3.26 feet). 1923-34: Maximum discharge, 13,300 second-feet Mar. 18, 1927 (gage height, 11.4 feet); minimum, that of Aug. 14, 17, 1934.

Remarks.- Records fair except those for period of ice effect, Nov. 11 to Apr. 8, which are poor.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	870	1,480	1,240	1,170	1,020	835	1,170	1,570	1,020	1,020	572	800
2	870	1,480	1,240	1,170	1,020	870	1,240	1,570	1,020	945	572	835
3	870	1,480	1,400	1,240	1,020	945	1,320	1,570	945	945	572	870
4	870	1,480	1,570	1,240	1,020	945	1,570	1,570	945	870	572	870
5	870	1,480	1,570	1,240	1,020	1,090	1,850	1,660	945	870	572	870
6	870	1,480	1,400	1,240	1,090	1,020	2,420	1,850	945	870	572	870
7	870	1,480	1,240	1,240	1,090	1,020	3,310	1,750	1,020	870	540	870
8	870	1,400	1,090	1,320	1,020	1,020	4,730	1,660	1,240	870	572	870
9	870	1,480	1,020	1,320	1,020	1,020	6,020	1,570	1,320	835	605	835
10	835	1,480	1,020	1,320	1,020	1,020	5,690	1,480	1,320	945	572	835
11	945	1,480	1,020	1,320	1,020	945	5,050	1,400	1,320	945	572	870
12	870	1,480	1,020	1,320	1,020	945	4,580	1,400	1,240	870	572	945
13	870	1,400	1,090	1,320	1,020	945	3,990	1,660	1,170	870	540	870
14	870	1,400	1,090	1,320	1,020	1,020	3,710	1,850	1,170	800	510	870
15	945	1,400	1,170	1,320	1,020	1,090	3,450	1,960	1,090	800	572	945
16	1,090	1,400	1,090	1,320	1,020	1,170	3,180	1,960	1,020	768	572	945
17	1,570	1,320	1,090	1,240	1,090	1,170	2,790	1,850	1,020	735	540	945
18	1,660	1,320	1,090	1,320	1,090	1,170	2,540	1,660	1,020	768	540	870
19	1,660	1,320	1,020	1,320	1,020	1,170	3,180	1,660	1,020	768	638	945
20	1,660	1,240	1,090	1,400	1,020	1,090	2,300	1,660	1,020	768	638	945
21	1,660	1,240	1,090	1,320	1,020	1,170	2,180	1,660	945	702	702	945
22	1,570	1,240	1,090	1,320	1,020	1,240	2,070	1,480	870	735	702	945
23	1,480	1,240	1,170	1,400	945	1,240	1,960	1,850	870	702	702	945
24	1,570	1,170	1,090	1,400	870	1,170	1,960	1,400	945	605	702	1,090
25	1,480	1,240	1,090	1,320	870	1,170	1,850	1,320	945	670	702	1,660
26	1,480	1,320	1,090	1,320	835	1,090	1,850	1,320	1,090	670	702	1,960
27	1,480	1,320	1,090	1,240	800	1,090	1,750	1,240	1,090	605	670	2,070
28	1,480	1,320	1,090	1,240	800	1,090	1,750	1,240	1,020	605	670	2,070
29	1,400	1,320	1,090	1,170		1,170	1,660	1,170	1,090	605	702	1,850
30	1,400	1,320	1,170	1,020		1,170	1,570	1,170	1,020	605	702	1,850
31	1,480		1,170	945		1,170		1,090		605	735	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	1,660	835	1,200	0.426	0.49
November	1,480	1,170	1,374	.487	.54
December	1,570	1,020	1,155	.410	.47
January	1,400	945	1,271	.451	.52
February	1,090	800	994	.352	.37
March	1,240	835	1,073	.380	.44
April	6,020	1,170	2,756	.977	1.09
May	1,960	1,090	1,556	.552	.64
June	1,320	870	1,056	.374	.42
July	1,020	605	782	.277	.32
August	735	510	616	.218	.25
September	2,070	800	1,102	.391	.44
The year	6,020	510	1,243	.441	5.99

St. Croix River near Rush City, Minn.

Location.- Chain gage in SW¼ sec. 8, T. 37 N., R. 20 W., at Northern Pacific Railway bridge 5 miles east of Rush City and 10 miles below mouth of Snake River.

Drainage area.- 5,120 square miles.

Records available.- April 1923 to September 1934.

Average discharge.- 11 years, 2,573 second-feet.

Extremes.- Maximum discharge recorded during year, 8,510 second-feet Apr. 9 (gage height, 5.73 feet); minimum recorded, 680 second-feet Aug. 18 (gage height, 2.38 feet).
1923-34: Maximum discharge, 26,700 second-feet Mar. 18, 1927 (gage height, 10.2 feet); minimum, 630 second-feet Aug. 14, 23, 1933.

Remarks.- Records good except those for period of ice effect, Nov. 13 to Apr. 7, which are fair.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	920	1,460	1,360	1,170	1,460	1,050	2,000	2,350	1,460	1,000	840	952
2	920	1,670	1,360	1,460	1,460	1,260	2,120	2,350	1,460	1,000	840	936
3	920	1,460	1,360	1,560	1,460	1,460	2,230	2,350	1,260	1,000	840	968
4	920	1,460	1,560	1,670	1,260	1,670	2,470	2,120	1,260	1,000	840	968
5	920	1,460	1,560	1,670	1,260	2,120	2,730	2,350	1,260	1,000	840	1,000
6	920	1,460	1,560	1,460	1,460	2,120	3,300	2,600	1,260	1,000	840	984
7	920	1,460	1,360	1,460	1,460	1,890	4,860	2,600	1,260	840	840	968
8	920	1,460	1,360	1,460	1,260	1,890	7,410	2,350	1,460	840	840	968
9	770	1,460	1,360	1,670	1,260	1,670	8,510	2,350	1,670	1,000	840	952
10	770	1,460	1,360	1,670	1,260	1,460	8,280	2,350	1,670	1,170	840	952
11	920	1,460	1,360	1,460	1,460	1,670	8,050	2,120	1,670	1,000	840	952
12	920	1,460	1,360	1,670	1,260	1,460	7,410	1,890	1,670	1,000	840	952
13	920	1,260	1,360	1,670	1,460	1,460	6,780	2,120	1,670	1,000	840	968
14	920	1,260	1,360	1,360	1,460	1,460	5,860	2,350	1,670	1,000	840	1,020
15	1,080	1,260	1,360	1,260	1,460	1,460	5,610	2,860	1,460	1,000	840	968
16	1,260	1,360	1,560	1,260	1,460	1,460	5,370	2,860	1,460	1,000	700	1,000
17	1,460	1,360	1,560	1,260	1,460	1,460	4,860	2,600	1,460	1,000	700	1,020
18	1,460	1,360	1,560	1,260	1,460	1,460	4,220	2,350	1,260	1,000	680	936
19	1,670	1,360	1,560	1,260	1,260	1,460	4,060	2,350	1,260	1,000	770	952
20	1,890	1,360	1,460	1,260	1,070	1,460	3,750	2,120	1,260	1,000	840	968
21	1,670	1,360	1,460	1,260	1,070	1,460	3,750	1,890	1,260	1,000	812	968
22	1,670	1,360	1,780	1,260	1,070	1,670	3,450	1,890	1,050	1,000	856	952
23	1,670	1,360	1,670	1,460	1,070	1,670	3,450	1,890	1,260	1,000	812	1,000
24	1,460	1,360	1,560	1,460	1,070	1,670	3,150	1,890	1,050	840	812	1,360
25	1,460	1,360	1,460	1,460	1,070	1,460	2,860	1,670	1,050	840	812	2,120
26	1,460	1,360	1,360	1,460	1,070	1,460	2,860	1,670	1,050	840	812	2,600
27	1,460	1,360	1,260	1,460	1,070	1,460	2,860	1,670	1,260	840	784	2,600
28	1,460	1,360	1,360	1,460	1,070	1,560	2,860	1,460	1,260	840	784	2,470
29	1,460	1,560	1,360	1,460		1,670	2,600	1,460	1,260	840	826	2,230
30	1,460	1,560	1,360	1,260		1,780	2,350	1,460	1,260	840	812	2,120
31	1,460		1,260	1,460		1,890		1,460		840	872	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	1,890	770	1,229	0.240	0.28
November	1,670	1,260	1,410	.275	.31
December	1,780	1,260	1,438	.281	.32
January	1,670	1,170	1,433	.280	.32
February	1,460	1,070	1,285	.251	.26
March	2,120	1,050	1,585	.310	.36
April	8,510	2,000	4,336	.847	.94
May	2,860	1,460	2,123	.415	.48
June	1,670	1,050	1,354	.264	.29
July	1,170	840	954	.186	.21
August	872	680	816	.159	.18
September	2,600	936	1,260	.246	.27
The year	8,510	680	1,599	.312	4.22

St. Croix River near St. Croix Falls, Wis.

Location.- In sec. 18, T. 34 N., R. 18 W., at power plant of Northern States Power Co. near St. Croix Falls.

Drainage area.- 5,930 square miles.

Records available.- January 1910 to September 1934.

Average discharge.- 24 years, 3,140 second-feet.

Extremes.- Maximum daily discharge during year, 12,100 second-feet Apr. 12; minimum, 697 second-feet Nov. 19.
1910-34: Maximum daily discharge, 35,800 second-feet Mar. 26, 1920; no flow Sept. 30, 1929.

Remarks.- Records good. Flow controlled by operation of gates of power plant and by regulation at Never's dam, 10 miles upstream. Records of discharge, computed from power-house records, furnished by Northern States Power Co.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,110	1,590	1,960	885	1,520	1,530	1,700	2,880	1,460	1,280	783	955
2	1,100	1,720	2,010	1,460	1,720	1,280	2,080	3,020	1,380	1,230	808	1,060
3	1,100	1,980	950	1,630	1,390	1,660	4,020	2,690	1,380	1,120	743	1,070
4	1,100	1,930	1,990	1,760	888	950	3,230	2,600	1,360	1,120	719	1,070
5	1,100	790	1,970	1,520	1,800	1,990	2,130	2,990	1,340	1,160	776	1,110
6	1,160	2,100	2,030	1,590	1,570	2,310	3,200	1,900	1,300	1,100	762	1,070
7	1,120	1,970	1,910	859	1,580	2,210	3,010	3,000	1,260	1,070	735	1,030
8	1,140	2,080	1,940	1,730	1,550	2,080	5,880	3,160	1,600	1,030	735	1,090
9	1,050	1,750	1,560	1,660	1,360	1,920	6,200	2,940	1,600	1,080	855	1,040
10	1,100	1,510	972	1,380	1,300	1,850	8,780	2,750	1,600	1,300	771	1,060
11	1,100	1,190	1,760	1,850	833	937	8,280	2,590	1,600	1,130	759	1,090
12	1,140	896	1,500	1,700	1,500	2,200	12,100	2,400	2,040	1,180	762	1,070
13	1,030	1,620	1,350	1,260	1,700	2,080	6,120	1,540	1,900	1,090	757	1,080
14	1,120	1,280	1,520	953	1,640	2,020	5,420	2,540	1,990	1,080	750	1,100
15	1,260	1,180	1,360	1,310	1,580	1,870	4,390	2,680	1,600	1,060	755	1,220
16	1,830	1,100	1,370	2,010	1,340	1,880	5,830	2,920	1,600	1,040	746	1,110
17	1,750	1,220	1,040	1,730	1,240	1,610	4,840	2,950	1,600	934	748	1,140
18	2,100	1,570	1,860	1,730	937	798	4,830	2,710	1,610	1,010	813	1,100
19	2,230	697	1,450	1,560	1,720	2,170	5,570	2,850	1,640	1,160	785	1,110
20	2,100	1,810	1,610	1,100	1,650	1,980	4,830	1,900	1,520	995	771	1,120
21	2,080	1,740	1,460	1,210	1,560	2,150	3,820	2,890	1,520	982	908	1,100
22	1,940	1,850	1,540	1,760	1,150	2,000	2,220	2,470	1,290	990	805	1,100
23	2,000	1,760	1,420	1,890	1,550	2,250	3,690	2,200	1,180	922	1,130	1,100
24	1,960	1,660	1,130	1,670	1,190	1,840	3,820	2,260	1,170	878	1,180	1,760
25	1,850	1,830	1,090	1,930	876	1,110	3,620	2,260	1,330	893	1,120	3,410
26	1,770	969	1,640	1,790	1,040	2,860	3,530	1,880	1,220	812	1,220	3,080
27	2,030	1,930	1,740	1,430	1,050	2,580	3,400	1,600	1,260	826	805	1,820
28	1,700	1,990	1,590	1,070	1,660	1,660	2,940	1,860	1,390	726	666	2,260
29	1,800	1,760	1,700	2,030		1,880	1,910	1,690	1,330	745	805	3,110
30	1,950	1,150	1,380	2,020		1,670	3,080	1,700	1,350	726	859	1,610
31	1,920		1,050	1,670		1,630		1,500		751	968	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	2,230	1,030	1,540	0.260	0.30
November	2,100	697	1,554	.262	.29
December	2,030	950	1,544	.260	.30
January	2,030	859	1,554	.262	.30
February	1,800	833	1,589	.234	.24
March	2,860	798	1,844	.311	.36
April	12,100	1,700	4,482	.756	.84
May	3,160	1,500	2,430	.410	.47
June	2,040	1,170	1,481	.250	.28
July	1,300	726	1,014	.171	.20
August	1,220	719	839	.141	.16
September	3,410	955	1,402	.236	.26
The year	12,100	697	1,754	.296	4.00

Namakagon River near Trego, Wis.

Location.- In SW¼ sec. 17, T. 40 N., R. 12 W., at power house of Wisconsin Hydroelectric Co. 5 miles northwest of Trego.

Drainage area.- 476 square miles.

Records available.- October 1927 to September 1934.

Extremes.- Maximum daily discharge during year, 867 second-feet Apr. 7; minimum, 148 second-feet Oct. 8.
1927-34: Maximum daily discharge, 1,360 second-feet Sept. 14, 1928; minimum, 113 second-feet Aug. 17, Sept. 7, 1930.

Remarks.- Records good. Extremes caused by regulation. Discharge computed from hourly records of load and head on the power plant.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	179	276	280	257	264	255	334	466	285	279	207	225
2	217	359	359	243	262	246	315	502	263	237	207	225
3	251	310	350	256	266	303	511	445	194	260	207	227
4	253	294	280	256	255	225	579	493	266	220	206	247
5	274	280	385	255	249	352	666	441	264	223	172	247
6	201	307	372	254	248	279	746	304	342	264	207	247
7	201	320	258	269	248	282	867	400	357	265	207	241
8	148	320	240	256	262	303	692	413	341	224	207	241
9	232	277	255	256	262	309	736	413	346	244	207	202
10	220	260	328	256	264	281	784	414	346	258	207	222
11	219	239	239	255	271	239	784	416	346	256	207	243
12	211	209	241	255	250	279	747	430	348	256	173	243
13	211	239	241	221	250	316	750	339	328	256	209	244
14	211	236	241	250	250	311	742	406	300	256	197	231
15	161	201	256	287	250	281	633	433	301	223	153	232
16	424	228	257	330	250	280	505	410	303	258	189	210
17	432	234	270	300	249	280	640	400	200	258	183	213
18	435	205	346	334	334	227	504	401	230	202	191	248
19	310	250	285	296	240	287	561	434	230	227	209	222
20	332	314	314	261	250	291	561	364	209	227	215	224
21	302	317	286	319	251	298	561	506	208	313	216	228
22	339	310	287	257	251	277	612	392	211	153	209	235
23	279	383	268	326	251	276	413	400	206	231	209	235
24	311	332	295	373	251	236	521	327	255	217	208	249
25	276	334	254	250	240	303	502	327	217	218	198	438
26	276	314	241	283	241	244	492	327	262	209	198	458
27	276	271	241	263	255	271	497	327	295	209	198	407
28	276	339	241	292	255	299	464	278	295	209	198	412
29	297	313	241	250		299	455	285	237	209	198	418
30	257	366	241	285		299	459	285	278	208	198	351
31	276		270	287		299		285		208	208	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	435	148	267	0.561	0.65
November	383	201	288	.605	.68
December	385	239	277	.582	.67
January	373	221	277	.582	.67
February	334	240	256	.538	.56
March	352	225	282	.592	.68
April	667	315	588	1.24	1.38
May	506	278	389	.817	.94
June	357	194	276	.580	.65
July	313	153	235	.494	.57
August	216	153	200	.420	.48
September	458	202	269	.565	.63
The year	867	148	300	.630	8.56

Apple River near Somerset, Wis.

Location.- In sec. 21, T. 31 N., R. 19 W., at power plant of Northern States Power Co. 3½ miles below Somerset.

Drainage area.- 550 square miles.

Records available.- January 1901 to September 1934.

Average discharge.- 33 years, 300 second-feet.

Extremes.- Maximum daily discharge during year, 1,670 second-feet Apr. 1; minimum, 18 second-feet Aug. 11.
1904-34: Maximum daily discharge, 2,280 second-feet in June 1905; no flow Sept. 30, 1929, and Aug. 2, 1933.

Remarks.- Records fair. Regulation at power plant. Records or discharge, computed from power plant records, furnished by Northern States Power Co.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	162	145	113	97	144	132	160	137	60	142	62	62
2	116	158	168	95	132	160	190	182	68	51	53	79
3	98	168	178	115	144	154	939	166	77	64	80	115
4	48	232	146	120	126	132	1,580	172	54	77	62	116
5	68	209	128	126	115	160	1,670	173	89	48	62	87
6	98	45	82	155	126	166	1,030	216	60	33	50	70
7	123	86	174	122	126	164	776	160	107	30	68	111
8	81	116	178	132	97	172	701	156	87	60	103	91
9	122	83	143	140	97	144	561	190	107	98	65	138
10	133	103	128	126	141	166	284	150	101	106	68	68
11	150	122	64	138	103	144	321	150	104	85	18	132
12	130	133	72	138	117	144	341	173	118	91	59	97
13	109	78	140	134	129	160	275	156	96	79	43	97
14	102	128	128	115	109	182	237	120	87	71	81	107
15	143	122	110	158	126	168	238	144	75	71	82	118
16	108	111	140	94	137	132	284	150	77	107	45	142
17	143	128	100	132	126	152	206	136	101	60	27	124
18	234	140	97	144	103	120	203	132	54	36	83	206
19	244	116	129	138	140	150	193	116	54	122	120	177
20	126	122	149	144	140	171	232	132	89	126	110	124
21	145	146	107	144	120	169	175	144	60	44	84	60
22	127	164	120	172	115	160	172	144	89	33	82	118
23	120	134	144	190	97	184	210	138	101	38	103	193
24	160	137	115	160	132	137	202	138	71	81	73	164
25	168	167	50	126	120	115	190	138	42	70	97	308
26	171	142	85	150	88	144	159	109	83	85	94	428
27	130	118	126	172	97	144	172	91	101	62	82	512
28	151	173	109	135	122	116	158	91	66	56	120	368
29	97	150	126	102		161	144	97	83	57	110	269
30	117	130	144	152		161	156	91	89	26	38	74
31	151		132	147		132		48		59	78	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	244	48	131	0.238	0.27
November	232	45	135	.245	.27
December	178	50	123	.224	.26
January	190	94	136	.247	.28
February	144	88	120	.218	.23
March	184	115	151	.275	.32
April	1,670	144	405	.736	.82
May	216	48	140	.255	.29
June	118	42	81.7	.149	.17
July	142	26	69.9	.127	.15
August	120	18	74.2	.135	.16
September	512	60	158	.287	.32
The year	1,670	18	144	.262	3.54

Cannon River at Welch, Minn.

Location.- Water-stage recorder in sec. 28, T. 113 N., R. 16 W., at Welch, 3 miles above mouth of Belle Creek.

Drainage area.- 1,290 square miles.

Records available.- June 1909 to January 1914, November 1930 to September 1934.

Extremes.- Maximum discharge during year, 3,980 second-feet Apr. 3 (gage height, 7.38 feet); minimum, 31 second-feet May 31 (gage height, 1.63 feet).
1909-14, 1930-34: Maximum discharge, 7,490 second-feet Jan. 22, 1933 (gage height, 11.44 feet); minimum, 29 second-feet Sept. 6, 1933 (gage height, 1.69 feet).

Remarks.- Records good except those for periods of ice effect Dec. 9-20, Dec. 23 to Feb. 3, Feb. 20-28, and for periods of shifting control, Mar. 2 to Apr. 2, Sept. 25-30, which are fair. Discharge estimated for Nov. 22 to Dec. 3, July 12-26.
Discharge regulated by power plants above.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	39	72		41	109	401	112	131	66	41	66	69
2	42	66	60	39	124	321	178	106	73	36	64	77
3	87	94		91	209	362	2,640	51	71	59	64	53
4	86	76	42	91	173	242	1,130	96	41	66	59	53
5	67	45	80	92	214	215	1,630	193	64	42	59	84
6	84	90	66	54	356	292	1,320	174	69	71	44	84
7	75	109	44	42	298	312	944	51	69	68	64	101
8	36	79	71	46	322	245	811	75	216	61	342	82
9	41	87	96	112	364	209	682	117	252	55	175	66
10	73	73	86	107	475	214	604	90	99	231	162	43
11	62	64	120	103	225	112	388	128	59	134	165	62
12	64	57	45	105	76	116	317	124	86	100	143	62
13	75	119	67	94	99	192	329	106	84	75	46	62
14	70	99	103	80	98	155	344	50	80	75	159	66
15	34	86	105	48	86	256	249	77	78	75	208	69
16	56	69	99	71	84	146	157	77	73	45	97	69
17	91	80	80	75	96	138	240	77	71	70	91	44
18	78	89	51	64	98	117	237	77	47	70	50	41
19	76	55	67	50	72	112	265	73	66	70	45	82
20	60	46	71	66	102	164	270	71	71	70	61	82
21	73	48	45	98	101	160	262	46	69	70	101	82
22	34		62	295	110	162	166	40	69	70	97	82
23	57		102	703	97	158	121	80	68	40	80	78
24	79		92	316	102	152	201	80	66	70	78	247
25	51		42	284	112	100	160	78	46	70	73	254
26	62	60	40	333	100	90	157	78	71	70	41	391
27	81		107	214	241	122	155	48	71	64	43	295
28	69		112	109	431	120	150	41	68	66	78	204
29	41		96	52		122	125	80	73	61	71	208
30	60		91	122		136	77	77	62	37	68	264
31	68		84	109		166		41		75	66	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	91	34	65.5	0.051	0.06
November	119	45	78.8	.061	.07
December	120	40	79.5	.062	.07
January	703	39	133	.103	.12
February	475	72	178	.138	.14
March	401	90	187	.145	.17
April	2,640	77	481	.373	.42
May	193	40	84.9	.066	.08
June	252	41	80.0	.062	.07
July	231	36	71.2	.055	.06
August	342	41	95.5	.074	.09
September	391	41	115	.089	.10
The year	2,640	34	137	.106	1.45

Chippewa River at Bishops Bridge, near Winter, Wis.

Location.- Water-stage recorder in sec. 23, T. 39 N., R. 6 W., at highway bridge 3 miles below Chippewa Reservoir Dam and 4 miles northwest of Winter.

Drainage area.- 775 square miles.

Records available.- February 1912 to September 1934.

Average discharge.- 21 years (1913-34), 638 second-feet.

Extremes.- Maximum daily discharge during year, 819 second-feet Aug. 3-6 (gage height, 5.30 feet); minimum daily discharge, 98 second-feet Apr. 28, May 16.
1912-34: Maximum discharge, 6,940 second-feet Apr. 22, 1916 (gage height, 9.56 feet); minimum, 14 second-feet Apr. 17-20, 1925 (gage height, 3.25 feet).

Remarks.- Records good. Stage-discharge relation affected by ice Jan. 28-31, Feb. 19-28, Mar. 5-10, 18-20, 22-25, 27. Part of table of monthly discharge corrected for regulation by storage in Chippewa and Moose Lake Reservoirs.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	191	204	579	519	383	358	220	124	139	182	474	188
2	191	204	579	519	383	358	220	127	139	185	692	188
3	191	204	579	519	383	334	290	127	142	468	819	188
4	191	204	579	519	383	334	163	127	142	496	819	188
5	191	204	579	519	383	334	182	124	145	496	819	188
6	191	204	579	519	383	334	188	122	142	502	819	185
7	191	204	579	462	383	334	188	119	145	502	812	185
8	191	204	579	409	425	334	188	119	145	490	812	172
9	191	204	579	409	513	334	182	122	145	496	669	172
10	191	260	579	409	519	334	127	119	145	490	468	172
11	191	334	579	409	383	334	122	111	145	490	468	172
12	191	409	579	409	383	253	127	114	145	490	468	172
13	191	409	548	409	358	204	127	103	145	490	462	172
14	191	334	548	409	358	204	119	103	365	490	462	172
15	191	462	548	409	358	204	119	107	490	490	462	172
16	191	610	548	409	358	214	119	98	490	484	462	172
17	191	610	548	409	358	220	119	127	490	490	462	172
18	191	610	548	409	358	220	119	130	490	490	462	172
19	194	610	548	409	435	220	119	130	490	490	462	172
20	194	610	548	409	430	220	119	136	490	490	462	172
21	194	610	548	409	425	204	119	145	490	490	317	172
22	194	610	548	409	419	220	119	145	490	490	182	148
23	194	598	548	409	414	220	119	145	490	490	188	127
24	194	579	548	409	409	220	116	145	490	484	185	127
25	194	579	548	409	404	220	108	145	484	484	185	127
26	194	579	548	409	393	220	103	142	309	484	182	188
27	194	579	548	409	383	220	100	139	191	484	182	157
28	194	579	548	409	358	220	98	139	185	484	182	142
29	194	579	548	409		220	100	139	185	484	182	142
30	194	579	548	409		220	100	139	185	479	185	142
31	194		536	409		220		139		474	188	

Month	Observed			Gain or loss in storage (Millions of cubic feet)	Corrected for Storage		
	Maximum	Minimum	Mean		Mean	Per square mile	Run-off in inches
October	194	191	192	+356	325	0.419	0.48
November	610	204	432	-180	363	.468	.52
December	579	536	560	-780	269	.347	.40
January	519	409	432	-660	186	.240	.28
February	519	358	397	-770	79	.102	.11
March	358	204	261	-70	235	.303	.35
April	290	98	141	+4,676	1,940	2.50	2.79
May	145	98	127	+1,194	569	.734	.85
June	490	139	289	-314	168	.217	.24
July	502	182	469	-1,032	84	.108	.12
August	819	182	451	-883	121	.156	.18
September	188	127	167	+1,199	630	.813	.91
The year	819	98	327	+2,736	414	.534	7.23

Chippewa River near Bruce, Wis.

Location.- Chain gage in sec. 4, T. 35 N., R. 7 W., 1 mile east of Bruce, just below mouth of Thornapple River.

Drainage area.- 1,600 square miles.

Records available.- December 1913 to September 1934.

Average discharge.- 20 years (1914-34), 1,289 second-feet, not corrected for storage.

Extremes.- Maximum discharge recorded during year, 8,460 second-feet Apr. 6 (gage height, 8.6 feet); minimum, 229 second-feet Oct. 8-12, June 2, 3.
1914-34: Maximum discharge, 14,900 second-feet Apr. 10, 1922 (gage height, 13.7 feet); minimum recorded, 155 second-feet June 10, 1932 (gage height, 0.9 foot).

Remarks.- Records good except those for period of ice effect, Nov. 10 to Apr. 5, which are fair. Part of table of monthly discharge corrected for regulation by storage in Chippewa and Moose Lake Reservoirs.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	255	371	680	606	467	535	500	467	255	311	606	371
2	255	402	680	606	500	570	500	500	229	311	606	434
3	255	402	680	606	500	570	2,560	500	229	311	606	467
4	255	371	680	606	467	606	6,570	500	255	311	951	535
5	255	371	680	606	467	718	7,180	500	255	606	951	467
6	255	371	680	606	467	680	8,300	467	255	606	951	402
7	255	371	643	570	434	718	5,970	467	283	606	951	402
8	229	371	643	500	434	643	4,110	434	283	606	951	402
9	229	283	606	500	434	643	3,480	434	402	606	912	371
10	229	311	606	500	434	643	2,920	402	402	680	756	371
11	229	371	606	500	434	643	2,300	402	371	680	606	434
12	229	434	606	500	434	643	1,860	402	341	643	606	371
13	255	467	643	500	467	606	1,440	402	341	606	606	371
14	255	500	643	500	467	535	1,190	402	341	643	606	371
15	283	500	643	467	500	535	1,030	402	500	606	643	371
16	467	500	643	467	500	535	912	402	643	606	643	402
17	467	570	643	434	467	570	834	371	643	606	643	434
18	402	643	643	434	467	535	795	371	606	606	643	434
19	371	718	643	434	467	535	756	371	606	606	643	402
20	371	718	643	434	467	500	718	402	643	606	643	402
21	341	718	643	434	467	500	680	606	643	606	643	434
22	311	718	643	467	467	570	643	570	606	606	371	434
23	311	718	643	535	467	570	643	500	606	643	371	434
24	311	718	643	535	467	570	606	434	606	643	371	467
25	255	718	643	500	500	500	606	402	606	643	371	1,360
26	283	718	643	500	570	467	570	371	570	643	371	3,890
27	311	718	643	535	535	467	535	341	500	643	341	5,110
28	255	680	570	467	500	500	500	311	402	643	341	4,350
29	311	680	570	341		500	500	283	341	606	311	3,100
30	341	680	606	402		500	467	283	341	606	311	2,120
31	341		606	467		500		255		606	371	

Month	Observed			Gain or loss in storage (Millions of cubic feet)	Corrected for Storage		
	Maximum	Minimum	Mean		Mean	Per square mile	Run-off in inches
October	467	229	296	+356	429	0.268	0.31
November	718	283	537	-180	468	.293	.33
December	680	570	638	-780	347	.217	.25
January	606	341	502	-660	256	.160	.18
February	570	434	473	-770	155	.097	.10
March	718	467	568	-70	542	.339	.39
April	8,300	467	1,989	+4,676	3,789	2.37	2.64
May	606	255	418	+1,194	860	.538	.62
June	643	229	437	-314	316	.198	.22
July	680	311	582	-1,032	197	.123	.14
August	951	311	603	-883	273	.171	.20
September	5,110	371	997	+1,199	1,460	.913	1.02
The year	8,300	229	668	+2,736	755	.472	6.40

Chippewa River at Chippewa Falls, Wis.

Location.- Water-stage recorder in lot 1, sec. 12, T. 28 N., R. 9 W., at Chippewa Falls, 1 mile below mouth of Duncan Creek.

Drainage area.- 5,600 square miles.

Records available.- June 1888 to September 1934.

Average discharge.- 24 years (1907-10, 1913-34), 4,587 second-feet, not corrected for storage.

Extremes.- Maximum discharge, 33,700 second-feet Sept. 27 (gage height, 13.5 feet); minimum, 22 second-feet Apr. 2 (gage height 0.63 foot); minimum daily discharge, 150 second-feet Apr. 1.
1888-1934: Maximum discharge, 78,000 second-feet Mar. 27, 1920 (gage height 17.0 feet), at old site; minimum, that of Apr. 2, 1934; minimum daily discharge, 44 second-feet Sept. 8, 1929.
Maximum stage known, 26.94 feet Sept. 10, 1884.

Remarks.- Records fair except those for period of ice effect Dec. 11-16, 25-28, Jan. 28 to Feb. 2, Feb. 7-10, 16-19, 25-28, Mar. 6-11, 22, and those estimated from power-plant records, which are poor. Flow regulated by Chippewa power plant immediately above station, by many others above, and by the Chippewa, Moose Lake, Flambeau, and Rest Lake Reservoirs. Part of table of monthly discharge corrected for storage in these reservoirs.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	550	1,450	1,600	*430	1,550	*3,300	150	2,480	2,190	950	1,420	1,350
2	990	1,470	1,580	*1,820	1,600	*3,090	1,270	2,380	1,840	1,800	1,130	1,300
3	1,240	1,770	960	*2,100	1,410	*2,000	9,950	2,290	1,020	2,130	1,050	1,420
4	1,110	1,260	2,490	*1,840	460	750	15,500	2,640	1,900	885	1,750	2,420
5	1,480	880	1,850	*1,780	1,410	2,140	26,200	2,820	1,900	1,480	1,750	2,480
6	*995	1,610	1,580	*1,460	1,800	2,160	26,200	1,170	1,690	1,350	2,000	1,980
7	*867	1,610	1,690	*400	1,360	2,000	26,600	3,730	1,500	1,180	1,640	1,610
8	*406	1,350	1,840	*1,590	1,140	1,900	23,600	3,880	1,320	980	1,220	1,320
9	*1,220	1,170	1,400	*2,120	1,410	1,550	23,200	3,990	*1,290	1,420	1,050	1,140
10	*1,260	1,660	980	*2,070	984	1,840	*20,400	3,910	*705	1,520	1,130	2,320
11	*1,040	860	1,500	*1,850	410	654	*17,300	2,330	*1,310	1,440	1,160	1,950
12	*1,020	380	1,550	*2,050	1,370	2,260	14,900	1,380	*1,280	1,420	895	1,580
13	*1,030	810	1,320	*1,190	1,880	2,120	10,900	1,160	1,300	1,340	1,240	1,540
14	*979	760	1,320	*460	1,740	2,270	9,060	1,800	1,320	1,200	1,700	1,790
15	510	920	1,180	*1,510	1,330	2,160	6,100	2,070	1,290	860	1,420	1,920
16	1,990	1,410	1,020	*1,930	1,140	2,360	6,830	2,110	1,100	1,550	1,320	1,610
17	1,520	1,070	290	*2,130	894	*1,840	5,050	1,900	855	1,600	1,480	1,460
18	1,620	870	1,250	*1,710	497	*705	4,880	2,000	1,480	1,660	935	1,300
19	1,660	390	*1,580	*1,360	1,230	1,530	4,650	1,820	1,610	1,540	985	1,720
20	1,240	1,350	*1,270	*1,260	*1,890	1,820	4,670	1,170	1,500	1,400	1,400	2,080
21	*1,170	1,940	*1,440	*501	*1,260	1,410	4,580	1,830	1,300	1,280	1,320	1,970
22	510	2,060	*1,500	*1,690	*1,150	654	1,680	2,140	1,520	965	1,190	1,840
23	1,590	1,950	*1,450	*1,390	*1,780	*1,810	4,600	2,910	1,380	1,500	1,220	2,120
24	1,620	1,710	*980	*1,610	*1,300	*1,610	4,570	2,690	1,080	1,660	1,020	3,210
25	980	1,520	*310	*1,660	497	*418	4,020	2,540	1,820	1,420	925	6,030
26	1,910	880	*1,100	1,620	1,790	*1,490	4,110	2,170	2,060	1,120	885	10,300
27	1,930	2,240	*1,230	1,230	1,550	1,330	4,230	1,240	2,300	1,300	1,210	27,500
28	1,540	2,760	*1,690	1,140	1,600	1,200	3,300	2,240	2,160	1,360	1,480	25,500
29	620	2,190	*2,240	1,500		1,050	1,250	2,390	1,940	960	1,390	18,800
30	1,790	700	*1,780	1,460		980	3,810	1,040	1,410	1,470	1,460	15,200
31	1,610		*405	1,360		1,110		1,950		1,700	1,060	

Month	Observed			Gain or loss in storage (Millions of cubic feet)	Corrected for storage		
	Maximum	Minimum	Mean		Mean	Per square mile	Run-off in inches
October	1,990	406	1,226	-20	1,219	0.218	0.25
November	2,760	380	1,367	-390	1,217	.217	.24
December	2,490	290	1,367	-1,087	961	.172	.20
January	2,130	400	1,491	-820	1,185	.212	.24
February	1,890	410	1,301	-800	971	.173	.18
March	3,300	418	1,662	-70	1,636	.292	.34
April	26,600	150	9,785	+7,846	12,800	2.29	2.56
May	3,990	1,040	2,264	+2,221	3,089	.552	.64
June	2,300	705	1,512	-878	1,173	.209	.23
July	2,180	860	1,371	-2,075	597	.107	.12
August	2,000	885	1,285	-1,981	545	.097	.11
September	27,500	1,140	4,942	+1,535	5,535	.988	1.10
The year	27,500	150	2,453	+3,481	2,563	.458	6.21

*Estimated from power-plant records.

Chippewa River at Durand, Wis.

Location.- Water-stage recorder in SW¼ sec. 21, T. 25 N., R. 13 W., at Durand, 400 feet above toll bridge. Zero of gage is 695.20 feet above mean sea level.

Drainage area.- 9,010 square miles.

Records available.- July 1928 to September 1934.

Extremes.- Maximum discharge during year 47,900 second-feet Apr. 4 (gage height, 12.43 feet); minimum daily discharge, 1,320 second-feet Dec. 27.
1928-34: Maximum discharge, that of Apr. 4, 1934; minimum, 646 second-feet (estimated) Feb. 10, 1930.
Maximum stage known, 18.4 feet Sept. 12, 1884.

Remarks.- Records fair except those for periods of ice effect Nov. 14-20, Dec. 5 to Mar. 15, which are poor. Regulation by operation of power plants and Chippewa, Moose Lake, Flambeau, and Rest Lake Reservoirs. Part of table of monthly discharge corrected for storage in these reservoirs.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,490	2,900	2,570	2,460	2,650	2,560	3,170	4,920	2,570	3,170	2,420	1,930
2	2,210	2,650	2,810	1,670	2,850	2,560	2,650	4,700	3,170	2,570	2,210	1,930
3	2,150	2,350	3,080	1,700	3,160	2,560	12,300	4,700	2,900	2,730	1,930	2,350
4	2,090	2,420	3,080	2,210	2,650	2,190	42,600	4,130	2,210	3,080	1,880	2,900
5	2,030	2,420	3,060	2,560	2,140	2,100	42,600	4,700	2,730	2,210	2,150	2,990
6	2,280	2,210	3,380	2,560	2,280	2,850	44,300	4,470	2,650	2,210	2,350	2,990
7	2,090	2,650	2,960	2,460	2,850	3,270	41,400	3,700	2,650	2,570	2,650	2,810
8	1,980	2,810	2,850	1,900	2,560	3,910	37,900	4,810	2,570	2,090	2,650	2,420
9	1,980	2,570	2,850	1,730	2,460	3,480	30,200	5,160	2,900	1,980	2,150	2,090
10	1,980	2,490	2,650	2,370	2,850	3,270	27,100	5,520	3,080	2,280	1,930	1,980
11	1,980	2,350	2,140	2,650	2,650	4,360	23,200	5,160	2,420	2,490	1,880	2,490
12	1,980	2,210	2,460	2,650	2,370	4,580	19,500	4,130	2,730	2,350	1,800	2,650
13	2,030	2,090	2,850	2,750	2,560	5,770	16,800	3,700	2,280	2,280	1,760	2,280
14	2,150	1,950	1,800	2,280	3,480	6,300	13,800	2,900	2,150	2,280	1,760	2,150
15	2,150	1,900	1,930	1,960	3,480	6,030	11,500	3,380	2,280	2,030	2,030	2,150
16	2,150	1,870	2,030	1,740	3,590	6,440	9,000	3,380	2,280	1,930	2,280	2,280
17	2,990	2,460	1,900	2,070	3,380	6,570	9,670	3,590	2,030	2,210	2,090	2,420
18	3,080	2,650	1,530	2,560	3,060	4,810	8,040	3,380	2,030	2,150	2,090	2,350
19	2,990	2,560	1,450	2,560	2,560	4,360	7,430	3,080	2,030	2,350	1,980	2,350
20	2,990	2,650	1,560	2,280	2,850	4,020	7,430	2,810	2,490	2,350	1,840	2,280
21	2,900	3,170	1,770	2,070	3,160	4,360	7,430	2,490	2,420	2,280	1,880	2,730
22	2,730	3,170	2,460	1,900	2,850	3,910	6,440	2,810	2,280	2,030	1,840	2,570
23	2,090	3,480	2,650	2,370	2,100	3,480	4,920	3,170	2,090	2,090	1,930	2,280
24	2,210	3,590	2,370	2,650	2,460	3,480	5,900	3,800	2,280	2,150	2,030	2,420
25	2,420	3,380	1,660	2,750	2,650	3,170	6,300	3,590	2,030	2,350	1,880	5,280
26	2,810	2,900	1,530	2,650	2,020	2,570	5,900	3,590	3,380	2,210	1,800	11,500
27	2,420	2,420	1,320	2,750	2,460	3,080	6,030	3,380	3,170	2,150	1,720	17,200
28	2,990	3,380	1,910	2,560	2,650	3,170	6,160	2,350	4,470	2,030	1,800	30,200
29	2,570	4,130	2,280	1,580		3,270	5,040	2,990	4,580	1,840	1,980	32,300
30	2,150	3,700	2,850	2,100		3,590	3,480	3,380	4,130	1,880	1,980	24,700
31	2,570		2,650	2,460		3,170		2,280		2,090	2,150	

Month	Observed			Gain or loss in storage* (Millions of cubic feet)	Corrected for storage		
	Maximum	Minimum	Mean		Mean	Per square mile	Run-off in inches
October	3,080	1,980	2,375	-20	2,368	0.263	0.30
November	4,130	1,870	2,716	-390	2,566	.285	.32
December	3,380	1,320	2,335	-1,087	1,929	.214	.25
January	2,750	1,580	2,289	-820	1,983	.220	.25
February	3,590	2,020	2,742	-800	2,412	.268	.28
March	6,570	2,100	3,846	-70	3,820	.424	.49
April	44,300	2,650	15,610	+7,846	18,630	2.07	2.31
May	5,520	2,280	3,747	+2,221	4,572	.507	.58
June	4,580	2,030	2,699	-878	2,360	.262	.29
July	3,170	1,840	2,271	-2,075	1,497	.166	.19
August	2,650	1,720	2,026	-1,981	1,286	.143	.16
September	32,300	1,930	5,966	+1,535	6,559	.728	.81
The year	44,300	1,320	4,033	+3,481	4,143	.460	6.23

*Chippewa and Flambeau Reservoirs.

Flambeau River at Flambeau Reservoir, Wis.

Location.- Chain gage near north line of sec. 3, T. 41 N., R. 2 E., a quarter of a mile below dam of the Flambeau Reservoir.

Drainage area.- 620 square miles.

Records available.- September 1927 to September 1934.

Extremes.- Maximum daily discharge during year, 565 second-feet May 27-31, June 10-18; minimum daily discharge, 3.1 second-feet Apr. 12 (gage height, 2.39 feet).
1927-34: Maximum discharge, 2,140 second-feet Oct. 21, 1928 (gage height, 6.76 feet); minimum daily discharge, that of Apr. 12, 1934.

Remarks.- Records good except those of extremely low discharge Apr. 9-12, Sept. 26-30, which are fair. Part of table of monthly discharge corrected for storage in Flambeau and Rest Lake Reservoirs.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	470	470	448	426	364	286	286	188	540	540	493	516
2	470	470	448	426	364	267	286	188	540	540	493	540
3	470	470	448	426	364	267	178	188	540	516	493	540
4	448	470	384	426	344	267	80	191	540	516	493	540
5	448	470	324	426	344	267	166	194	565	516	493	540
6	448	470	448	426	344	324	102	194	540	516	470	540
7	426	470	448	405	344	324	86	194	540	516	470	540
8	426	470	448	405	324	324	86	191	540	516	470	540
9	426	470	384	405	384	344	4.3	221	540	516	470	540
10	426	470	384	405	324	344	3.9	305	565	516	448	540
11	426	470	448	405	324	305	3.6	344	565	516	448	516
12	426	470	448	405	324	305	3.1	344	565	516	448	493
13	405	470	448	405	305	344	41	364	565	516	448	493
14	405	470	448	405	305	324	41	364	565	516	493	470
15	405	470	448	405	305	324	41	426	565	516	540	470
16	426	448	448	405	305	324	100	493	565	516	540	470
17	426	448	448	384	305	344	191	493	565	493	540	448
18	426	448	448	384	324	384	188	493	565	516	540	448
19	426	448	448	384	305	324	188	493	540	516	540	448
20	426	448	448	384	305	305	185	493	540	493	540	448
21	426	448	448	384	305	286	185	493	540	493	540	448
22	426	448	448	364	305	364	188	493	540	493	540	426
23	426	448	448	384	305	324	188	493	540	493	540	364
24	448	448	448	364	305	344	188	493	540	493	540	344
25	448	448	448	364	305	324	188	493	540	493	540	175
26	426	448	426	364	324	249	188	540	540	493	540	5.1
27	426	448	426	364	305	324	188	565	540	493	540	3.5
28	426	448	426	470	305	324	191	565	540	493	540	3.2
29	448	448	426	448		324	191	565	540	493	540	8.8
30	448	448	426	384		305	188	565	540	493	540	11.2
31	448		426	384		286		565		493	516	

Month	Observed			Gain or loss in storage (Millions of cubic feet)	Corrected for storage		
	Maximum	Minimum	Mean		Mean	Per square mile	Run-off in inches
October	470	405	434	-376	294	0.474	0.55
November	470	448	459	-210	378	.610	.68
December	448	324	434	-307	319	.515	.59
January	470	364	401	-160	341	.550	.63
February	384	305	324	-30	312	.503	.52
March	384	249	315	0	315	.508	.59
April	286	3.1	138	+3,170	1,358	2.19	2.44
May	565	188	393	+1,027	776	1.25	1.44
June	565	540	548	-564	330	.532	.59
July	540	493	508	-1,043	119	.192	.22
August	540	448	509	-1,098	99	.160	.18
September	540	3.2	396	+336	526	.848	.95
The year	565	3.1	406	+745	430	.694	9.38

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Flambeau River near Butternut, Wis.

Location.- Chain gage in lot 10, sec. 28, T. 41 N., R. 1 E., 6 miles southeast of Butternut.

Drainage area.- 660 square miles.

Records available.- July 1914 to September 1934.

Average discharge.- 20 years, 646 second-feet, not corrected for storage.

Extremes.- Maximum daily discharge, 808 second-feet June 26 (gage height, 2.80 feet); minimum daily discharge, 248 second-feet Apr. 15, Sept. 30.
1914-34: Maximum discharge recorded, 5,430 second-feet Apr. 22, 23, 1916 (gage height, 9.0 feet); minimum, 91 second-feet Sept. 18, 19, 1925 (gage height, 0.25 foot).

Remarks.- Records fair. Discharge estimated during period of ice effect, Nov. 12 to Mar. 31, from records of Flambeau River at Flambeau Reservoir. Part of table of monthly discharge corrected for storage in Flambeau and Rest Lake Reservoirs.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	500	518	453	431	369	296	593	536	654	573	482	340
2	482	536	453	431	369	277	613	593	654	573	465	555
3	482	518	453	431	369	277	717	573	654	573	465	613
4	482	518	389	431	349	277	299	536	654	573	465	674
5	465	518	329	431	349	277	482	482	654	573	465	633
6	448	500	453	431	349	334	400	400	654	573	465	613
7	448	482	453	410	349	334	555	384	654	593	465	573
8	415	432	453	410	329	334	573	326	674	593	465	573
9	415	518	389	410	389	354	717	326	674	593	465	573
10	415	465	389	410	329	354	633	384	674	613	465	573
11	415	555	453	410	329	315	573	415	674	613	465	573
12	415	506	453	410	329	315	326	432	674	613	465	555
13	415	506	453	410	310	354	369	565	674	593	465	536
14	415	506	453	410	310	334	354	555	674	518	448	536
15	415	506	453	410	310	334	248	536	674	518	536	573
16	448	484	453	410	310	334	273	674	654	536	536	555
17	482	484	453	389	310	354	448	654	654	518	536	536
18	500	484	453	389	329	394	432	654	674	518	536	536
19	518	484	453	389	310	334	400	633	674	518	536	536
20	500	484	453	389	310	315	400	654	674	518	536	536
21	465	484	453	389	310	296	415	654	717	500	536	573
22	482	484	453	369	310	374	340	654	717	500	536	555
23	500	484	453	389	310	334	354	613	717	500	536	448
24	465	484	453	369	310	354	415	613	717	518	518	555
25	448	484	453	369	310	354	415	613	762	518	518	674
26	448	484	431	369	329	279	415	633	808	500	536	613
27	448	484	431	369	310	354	369	717	762	500	536	593
28	465	484	431	475	310	374	415	717	593	500	555	448
29	465	484	431	453		374	354	674	593	500	555	340
30	465	484	431	389		406	448	674	593	500	555	248
31	465		431	389		386		674		500	555	

Month	Observed			Gain or loss in storage (Millions of cubic feet)	Corrected for storage		
	Maximum	Minimum	Mean		Mean	Per square mile	Run-off in inches
October	518	415	458	-376	318	0.482	0.56
November	555	432	495	-210	414	.627	.70
December	453	329	439	-307	324	.491	.57
January	475	369	406	-160	346	.524	.60
February	389	310	329	-30	317	.480	.50
March	405	277	335	0	335	.508	.59
April	717	248	445	+3,170	1,668	2.53	2.82
May	717	326	566	+1,027	949	1.44	1.66
June	808	593	676	-564	458	.694	.77
July	613	500	543	-1,043	154	.233	.27
August	555	448	505	-1,098	95	.144	.17
September	674	248	541	+336	671	1.02	1.14
The year	808	248	479	+745	503	.762	10.35

Flambeau River at Babbs Island, near Winter, Wis.

Location.- Water-stage recorder on west line of sec. 16, T. 38 N., R. 3 W., 10 miles east of Winter.

Drainage area.- 964 square miles.

Records available.- August 1929 to September 1934.

Extremes.- Maximum discharge recorded during year, 2,550 second-feet Sept. 26 (gage height, 13.2 feet); minimum recorded, 295 second-feet July 29 (gage height, 10.29 feet).

1929-34: Maximum discharge, that of Sept. 26, 1934; minimum, 218 second-feet July 9, 1930 (gage height, 9.73 feet).

Remarks.- Records poor. No records Nov. 10 to Apr. 11. Part of table of monthly discharge corrected for storage in Flambeau Reservoir.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	544	590						567	664	522	460	614
2	400	614						664	567	544	480	544
3	567	664						830	544	590	544	614
4	480	590						772	590	567	522	614
5	460	664						664	590	480	382	772
6	460	501						614	614	544	346	772
7	480	590						522	614	567	328	717
8	501	614						522	717	544	346	664
9	460	664						522	772	480	420	664
10	460							501	614	614	420	590
11	522							480	614	590	382	614
12	544						1,470	522	717	614	382	664
13	501						1,090	664	614	544	346	717
14	480						955	522	717	614	400	614
15	501						890	567	664	439	363	664
16	544						717	664	664	439	522	830
17	664						664	664	544	522	439	664
18	664						772	664	567	501	522	717
19	590						772	664	590	544	382	664
20	567						717	664	664	544	439	772
21	664						664	664	590	567	400	890
22	614						664	717	614	544	460	830
23	544						614	664	664	382	420	590
24	717						614	664	544	544	460	590
25	614						717	664	590	501	480	1,240
26	544						614	567	590	501	420	2,320
27	544						590	614	614	420	400	2,320
28	614						567	614	590	522	480	1,850
29	501						544	664	614	312	501	1,620
30	501						522	590	614	363	501	1,170
31	717							664		480	567	

Month	Observed			Gain or loss in storage (Millions of cubic feet)	Corrected for storage		
	Maximum	Minimum	Mean		Mean	Per square mile	Run-off in inches
October	717	400	547	-376	407	0.422	0.49
November 1-9	664	501	610	-63	529	.549	.18
December							
January							
February							
March							
April 12-30	1,470	522	745	+2,008	1,965	2.04	1.44
May	830	480	624	+1,027	1,007	1.04	1.20
June	772	544	622	-564	404	.419	.47
July	614	312	514	-1,043	125	.130	.15
August	567	328	436	-1,098	26	.027	.03
September	2,320	544	897	+336	1,027	1.07	1.19
The year							

Flambeau River near Ladysmith, Wis.

Location.- In sec. 35, T. 36 N., R. 5 W., at Big Falls power plant of Lake Superior District Power Co., 14 miles above Ladysmith.

Drainage area.- 1,910 square miles.

Records available.- October 1923 to September 1934. Comparable records February 1903 to December 1906 at Ladysmith, and January 1914 to September 1923 about 8 miles below present site.

Average discharge.- 20 years (1914-34), 1,607 second-feet.

Extremes.- Maximum daily discharge during year, 7,080 second-feet Apr. 9; minimum daily, 348 second-feet Nov. 5.
1903-6, 1914-34: Maximum discharge recorded, 19,500 second-feet Apr. 11, 1922; minimum daily, 176 second-feet Aug. 30, 1925.

Remarks.- Records good. Part of table of monthly discharge corrected for storage in Flambeau and Rest Lake Reservoirs. Records of daily discharge, computed from power-plant records, furnished by Lake Superior District Power Co.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	797	1,000	661	624	552	415	406	1,310	937	604	606	1,150
2	697	885	947	586	595	425	612	1,530	945	650	648	864
3	811	751	471	629	681	581	1,780	1,830	547	889	726	641
4	730	698	842	699	478	397	3,620	1,780	796	783	838	929
5	597	348	774	682	577	551	4,110	1,580	828	658	677	1,190
6	727	808	826	859	584	487	3,970	1,390	762	765	514	1,180
7	730	776	601	506	584	544	4,940	1,320	887	796	520	1,140
8	669	749	755	616	543	525	5,970	1,260	986	796	522	1,130
9	712	486	701	662	578	550	7,080	883	1,310	585	642	668
10	678	439	409	653	688	707	6,990	1,020	762	834	630	845
11	665	529	490	657	383	425	5,930	1,000	915	783	645	849
12	718	521	546	620	526	540	4,220	1,060	1,060	851	535	862
13	717	610	662	771	502	512	3,550	778	984	817	502	945
14	625	508	701	518	524	481	3,150	1,180	990	890	588	848
15	654	535	732	609	554	528	2,720	944	941	695	528	1,180
16	794	528	859	625	601	590	2,160	1,070	1,020	565	713	629
17	932	676	622	613	551	622	2,490	1,180	724	606	738	967
18	1,050	941	680	628	402	427	1,820	1,360	908	640	804	1,030
19	995	564	641	629	452	531	1,960	966	869	722	711	941
20	881	821	726	716	459	570	1,600	982	929	728	591	1,000
21	881	687	692	511	474	351	1,750	1,290	879	729	736	1,250
22	926	795	743	660	493	580	1,790	1,220	829	762	643	1,150
23	740	747	883	735	474	555	1,420	1,240	933	548	802	1,050
24	966	711	648	666	471	635	1,600	1,380	703	588	746	1,090
25	970	950	458	708	399	465	1,700	1,050	741	653	847	3,030
26	822	433	562	752	405	502	1,540	938	865	717	661	6,590
27	736	680	519	871	404	500	1,440	645	836	611	582	6,550
28	810	726	678	420	398	472	1,330	963	791	677	780	5,720
29	814	801	635	609		452	1,190	1,120	816	546	674	5,060
30	750	466	816	563		520	1,280	774	840	409	714	4,240
31	981		569	552		598		904		608	923	

Month	Observed			Gain or loss in storage (Millions of cubic feet)	Corrected for storage		
	Maximum	Minimum	Mean		Mean	Per square mile	Run-off in inches
October	1,050	597	793	-376	653	0.342	0.39
November	1,000	348	672	-210	591	.309	.34
December	947	409	673	-307	558	.292	.34
January	871	420	644	-160	584	.306	.35
February	688	383	512	-30	500	.262	.27
March	707	351	517	0	517	.271	.31
April	7,080	406	2,804	+3,170	4,024	2.11	2.35
May	1,830	645	1,160	+1,027	1,543	.808	.93
June	1,310	547	878	564	660	.346	.39
July	890	409	694	-1,043	305	.160	.18
August	923	502	671	-1,098	261	.137	.16
September	6,590	629	1,824	+336	1,954	1.02	1.14
The year	7,080	348	984	+745	1,008	.528	7.15

South Fork of Flambeau River near Phillips, Wis.

Location.- Chain gage in NW¼SW¼ sec. 10, T. 37 N., R. 2 W., half a mile downstream from mouth of Big Elk River and 12 miles west of Phillips.

Drainage area.- 666 square miles.

Records available.- August 1929 to September 1934 (winter records incomplete).

Extremes.- Maximum discharge recorded during year, 7,180 second-feet Apr. 10 (gage height, 13.5 feet); minimum recorded, 55 second-feet Aug. 10, 11 (gage height, 4.38 feet).
1929-34: Maximum discharge, that of Apr. 10, 1934; minimum, 39 second-feet Aug. 31, Sept. 3-5, 1933.

Remarks.- Records poor. No records Nov. 15 to Apr. 7.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	74	177						575	205	126	57	91
2	68	186						622	196	118	59	104
3	67	186						575	196	118	64	104
4	68	186						622	186	118	64	160
5	68	186						575	196	111	64	177
6	74	196						552	186	91	64	177
7	68	196						529	186	91	61	168
8	74	196					2,820	484	196	91	61	168
9	79	196					2,910	484	196	91	57	160
10	85	196					6,880	398	205	98	55	160
11	85	205					5,680	419	215	98	55	168
12	91	205					4,980	378	225	104	57	186
13	91	205					4,000	398	225	104	57	177
14	104	205					2,060	378	215	111	59	186
15	104						1,730	359	215	104	59	186
16	118						1,500	342	215	98	61	186
17	118						1,230	325	205	91	59	186
18	134						729	310	177	85	61	215
19	142						674	310	168	74	61	215
20	151						622	325	160	68	59	236
21	168						484	342	151	68	61	269
22	168						674	342	151	68	64	282
23	168						785	359	134	66	66	295
24	168						729	359	134	61	68	310
25	160						674	325	134	61	68	622
26	168						674	310	142	59	68	2,740
27	168						622	295	134	61	68	3,000
28	177						575	269	134	61	68	3,180
29	177						529	246	134	61	68	3,000
30	186						575	225	126	64	68	2,390
31	186							215		64	85	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	186	67	121	0.182	0.21
November 1-14	205	177	194	.291	.15
December					
January					
February					
March					
April 8-30	6,880	484	1,832	2.75	2.35
May	622	215	395	.593	.68
June	225	126	178	.267	.30
July	126	59	86.6	.130	.15
August	85	55	62.8	.094	.11
September	3,180	91	650	.976	1.09
The year					

Jump River at Sheldon, Wis.

Location.- Chain gage in sec. 26, T. 33 N., R. 5 W., at highway bridge in Sheldon, 11 miles above mouth.

Drainage area.- 510 square miles.

Records available.- July 1915 to September 1934.

Average discharge.- 19 years, 484 second-feet.

Extremes.- Maximum discharge recorded during year, 6,400 second-feet Apr. 8 (gage height, 8.3 feet); minimum recorded, 12 second-feet July 28, 29 (gage height, 2.55 feet).
1915-34: Maximum discharge recorded, 15,600 second-feet Mar. 26, 1920 (gage height, 11.48 feet); minimum, that of July 28, 29, 1934.

Remarks.- Records good except those for period of ice effect, Nov. 7 to Apr. 2, which are fair. Gage read on alternate days from Nov. 26 to Apr. 3; discharge estimated or interpolated between readings.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	36	80	36	26	42	43	222	355	90	29	20	52
2	36	106	36	30	41	52	2,750	455	70	44	18	74
3	31	74	36	33	38	76	5,270	455	44	36	17	124
4	28	63	36	34	36	100	3,800	403	36	36	17	150
5	26	63	36	36	36	103	5,270	379	36	29	20	161
6	26	63	36	36	35	106	5,270	310	36	26	22	150
7	26	52	36	36	34	106	5,700	301	31	29	18	135
8	26	49	36	36	34	106	5,700	244	49	31	18	100
9	28	46	36	36	34	106	4,490	231	56	36	18	56
10	31	42	36	36	33	106	3,970	214	63	31	17	52
11	34	42	36	36	32	106	3,180	188	100	31	15	52
12	36	42	36	36	32	106	2,630	201	90	31	15	52
13	34	42	36	36	32	106	1,900	180	70	31	18	52
14	31	36	36	36	32	106	1,690	201	63	29	18	56
15	34	26	36	36	32	106	1,020	188	56	47	18	63
16	49	26	36	36	32	106	700	180	52	52	18	63
17	56	34	36	36	32	106	632	188	52	41	18	124
18	74	36	36	36	32	106	568	214	52	31	22	288
19	80	36	36	36	33	106	568	180	74	29	22	244
20	90	36	36	36	34	106	539	201	63	26	22	180
21	74	36	36	36	35	106	510	403	52	22	22	142
22	70	36	36	38	36	106	510	403	52	22	22	142
23	70	36	36	41	34	115	482	310	63	18	24	201
24	74	36	36	44	33	124	482	310	44	16	31	539
25	63	36	34	46	33	135	455	222	52	15	31	2,120
26	63	36	32	49	33	146	355	161	52	15	34	3,180
27	63	36	31	52	34	163	332	150	39	15	36	4,490
28	52	36	30	51	34	180	310	135	36	14	36	4,140
29	52	36	29	50		192	310	124	34	12	36	3,040
30	63	36	28	47		205	288	124	31	15	31	2,120
31	63		27	44		214		106		18	34	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	90	26	49.0	0.096	0.11
November	106	26	45.1	.088	.10
December	36	27	34.7	.068	.08
January	52	26	38.6	.076	.09
February	42	32	34.2	.067	.07
March	214	43	118	.231	.27
April	5,700	222	1,997	3.92	4.37
May	455	106	249	.488	.56
June	100	31	54.6	.107	.12
July	52	12	27.6	.054	.06
August	36	15	22.8	.045	.05
September	4,490	52	745	1.46	1.63
The year	5,700	12	282	.553	7.51

Red Cedar River near Colfax, Wis.

Location.- Water-stage recorder in sec. 27, T. 30 N., R. 11 W., at highway bridge 3½ miles below Trout Creek and 4½ miles north of Colfax.

Drainage area.- 1,100 square miles.

Records available.- March 1914 to September 1934.

Average discharge.- 20 years, 743 second-feet.

Extremes.- Maximum discharge during year (estimated), 21,900 second-feet Apr. 3 (gage height, 11.4 feet); minimum, 164 second-feet Aug. 13, 17 (gage height, 0.2 foot). 1914-34: Maximum discharge, that of Apr. 3, 1934; minimum, 148 second-feet July 24, 1931, and Sept. 23, 1933.

Remarks.- Records fair except those estimated Apr. 7-27, July 28 to Aug. 8, and those for periods of ice effect, Nov. 14-28, Dec. 7 to Mar. 15, which are poor. Flow regulated by four storage reservoirs upstream.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	198	414	468	338	322	322	432	458	194	222		222
2	208	411	447	322	302	359	482	456	184	199		217
3	237	413	492	322	328	373	14,500	422	187	198		235
4	223	416	587	322	315	413	12,900	427	195	187		241
5	241	401	494	325	370	413	6,270	423	199	191	180	215
6	245	464	362	335	312	436	3,470	340	196	202		200
7	254	448	338	389	389	488		332	197	198		198
8	244	377	302	348	299	488	1,860	314	199	189		190
9	230	282	305	348	335	488		317	198	197	183	195
10	239	328	308	362	352	381		338	289	228	178	195
11	205	364	397	440	359	431		318	222	212	173	209
12	238	442	409	377	373	345		316	211	202	171	203
13	238	341	426	393	359	703	610	275	194	213	169	207
14	208	458	418	409	409	920		275	183	199	173	207
15	213	510	431	393	500	1,320		254	182	196	172	331
16	370	565	413	308	479	1,590		256	184	195	175	297
17	453	623	431	302	532	1,480		248	175	195	171	384
18	341	623	418	305	532	1,270	240	246	199	187	177	282
19	313	623	409	293	401	1,140		250	201	180	215	274
20	364	623	426	342	366	1,020		250	202	173	273	290
21	344	594	373	345	389	993		238	256	194	230	258
22	376	565	381	468	338	636		238	190	198	201	242
23	374	538	393	468	255	613	250	227	185	190	198	222
24	394	510	436	505	318	527		227	388	190	196	270
25	320	484	413	356	308	484		217	549	190	193	856
26	345	458	381	345	318	470	370	220	351	190	184	2,920
27	340	468	381	352	356	603	370	196	274	190	186	4,090
28	343	458	373	373	322	551	436	222	256		193	2,590
29	320	457	373	312		449	436	197	227	190	189	1,840
30	343	472	338	308		395	458	208	219		209	1,630
31	371		338	302		500		193			223	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	453	198	295	0.268	0.31
November	623	282	471	.428	.48
December	587	302	402	.365	.42
January	505	293	358	.325	.37
February	532	255	366	.333	.35
March	1,590	322	663	.603	.70
April	14,500	240	1,769	1.61	1.80
May	458	193	287	.261	.30
June	549	175	230	.209	.23
July	228	178	196	.178	.21
August	273	169	190	.173	.20
September	4,090	190	657	.597	.67
The year	14,500	169	488	.444	6.04

Red Cedar River at Menomonie, Wis.

Location.- Water-stage recorder in sec. 26, T. 28 N., R. 13 W., at Menomonie, 900 feet below power house of Northern States Power Co. and 1,000 feet below mouth of Wilson Creek.

Drainage area.- 1,810 square miles.

Records available.- June 1907 to September 1908, May 1913 to September 1923, March 1925 to September 1934.

Average discharge.- 19 years (1913-23, 1925-34), 1,172 second-feet.

Extremes.- Maximum discharge (estimated), 40,000 second-feet Apr. 4 (gage height, 16.0 feet, from flood marks); minimum, 53 second-feet July 18 (gage height, 0.85 foot). 1907-8, 1913-23, 1925-34: Maximum discharge, that of Apr. 4, 1934; minimum, 21 second-feet Dec. 9, 1928 (gage height, 0.65 foot).

Remarks.- Records good except those estimated for lack of gage heights, Apr. 3-6, May 6-12, May 29 to July 9, which are fair. Regulation by operation of power plants at Menomonie and at Cedar Falls and by storage in four reservoirs upstream.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	505	617	709	542	513	532	1,090	660	366	705	367	361
2	496	606	760	555	662	550	606	660	366	376	408	361
3	488	587	819	752	703	807	800	1,160	360	376	380	332
4	480	700	862	606	480	898	29,000	1,160	360	479	332	456
5	480	664	986	627	569	1,190	22,900	1,090	286	615	332	479
6	480	597	725	733	606	1,260	10,500	945	377	388	346	347
7	488	756	681	578	606	1,630	5,770	842	376	388	395	339
8	496	750	617	606	532	1,700	2,910	853	376	388	328	312
9	480	754	606	649	532	1,250	3,110	648	375	388	315	275
10	480	560	435	627	606	1,250	3,110	648	405	560	328	278
11	480	541	503	638	560	1,230	1,090	648	377	587	272	334
12	480	550	430	638	587	1,220	1,980	648	445	384	312	332
13	480	627	487	713	587	1,220	1,510	713	422	353	332	318
14	480	560	480	720	541	1,220	832	1,090	422	353	438	318
15	472	463	505	714	541	1,250	606	606	422	353	472	383
16	607	463	455	638	824	1,250	430	430	377	361	488	649
17	832	463	499	560	994	1,170	430	430	377	353	425	460
18	758	463	645	560	606	735	284	430	377	353	331	758
19	678	518	678	699	1,090	1,080	660	430	383	346	305	353
20	638	1,030	578	638	1,090	1,100	472	430	383	318	492	590
21	706	784	729	560	870	1,130	472	513	383	392	378	711
22	660	704	660	725	606	1,120	318	430	383	407	427	641
23	606	720	615	967	713	879	318	430	383	422	416	436
24	743	768	617	866	891	920	896	392	388	422	344	334
25	712	731	525	824	532	719	472	392	388	422	392	1,880
26	638	627	627	735	488	789	1,020	392	383	447	284	2,960
27	617	587	627	733	550	831	1,020	392	689	472	430	5,590
28	544	746	574	874	533	825	318	392	701	447	468	5,510
29	585	750	496	779		831	660	376	707	430	420	3,110
30	567	709	521	743		753	660	364	703	392	454	2,520
31	714		698	710		715		370		361	453	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	832	472	576	0.318	0.37
November	1,030	463	646	.357	.40
December	986	430	618	.341	.39
January	967	542	687	.380	.44
February	1,090	480	658	.364	.38
March	1,700	532	1,034	.571	.66
April	29,000	284	3,141	1.74	1.94
May	1,160	364	612	.338	.39
June	707	286	425	.235	.26
July	705	318	421	.233	.27
August	492	272	383	.212	.24
September	5,590	278	1,074	.593	.66
The year	29,000	272	853	.471	6.40

Buffalo River near Tell, Wis.

Location.- Staff gage in NW¼ sec. 16, T. 22 N., R. 12 W., a quarter of a mile north of Tell School and 1 mile northeast of Tell.

Drainage area.- 398 square miles.

Records available.- October 1932 to September 1934 (winter records incomplete).

Extremes.- Maximum discharge 8,650 second-feet during night of Apr. 3-4 (gage height, 8.48 feet, from flood marks); minimum, 69 second-feet Oct. 5 (gage height, 2.06 feet).
1932-34: Maximum discharge, that of Apr. 3-4, 1934; minimum, 59 second-feet Aug. 16, 1933 (gage height, 1.99 feet).

Remarks.- Records poor. No records Nov. 15 to Mar. 20.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	103	108					194	185	94	160	185	117
2	88	105					176	185	95	160	185	151
3	83	106					3,210	176	97	160	168	202
4	78	108					8,100	194	98	168	176	185
5	69	116					3,790	194	97	176	168	142
6	78	125					2,430	168	92	160	185	134
7	88	116					1,750	151	87	160	168	114
8	116	116					1,310	151	142	151	210	107
9	106	108					1,040	142	324	142	176	94
10	89	116					543	134	306	160	151	97
11	83	116					543	134	270	236	134	176
12	80	108					417	126	168	194	103	168
13	75	100					360	134	160	168	87	151
14	74	94					288	134	134	142	78	168
15	72						270	134	126	134	73	185
16	224						253	126	117	134	110	160
17	197						253	117	103	134	142	151
18	179						236	117	108	168	114	134
19	161						253	115	107	236	478	126
20	143						236	142	105	288	379	100
21	134					142	219	270	98	270	236	94
22	134					126	219	324	92	253	110	107
23	125					117	219	253	126	210	103	117
24	116					126	194	115	360	202	117	379
25	116					117	194	112	360	194	107	674
26	116					126	219	110	379	185	87	1,440
27	125					126	185	103	398	185	84	900
28	125					126	185	100	437	160	94	838
29	125					134	185	103	499	202	84	674
30	125					142	185	98	360	210	78	521
31	116					142		95		185	126	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	224	69	114	0.286	0.33
November 1-14	125	94	110	.276	.14
December					
January					
February					
March 21-31	142	117	129	.324	.13
April	8,100	176	922	2.32	2.59
May	324	95	150	.377	.43
June	499	87	198	.497	.55
July	288	134	183	.460	.53
August	478	73	151	.379	.44
September	1,430	94	287	.721	.80
The year					

Zumbro River at Zumbro Falls, Minn.

Location.- Water-stage recorder in sec. 36, T. 110 N., R. 14 W., at Zumbro Falls, 700 feet below mouth of Spring Creek. Chain gage to same datum 800 feet downstream prior to Nov. 11, 1933.

Drainage area.- 1,120 square miles.

Records available.- June 1909 to September 1917, April 1929 to September 1934.

Average discharge.- 13 years, 411 second-feet.

Extremes.- Maximum discharge during year, 21,800 second-feet Apr. 4 (gage height, 26.26 feet); minimum, 41 second-feet Aug. 28 (gage height, 6.44 feet).
1909-17, 1929-34: Maximum discharge, that of Apr. 4, 1934; minimum, that of Aug. 28, 1934.
Maximum stage known, about 30.5 feet, present gage, and 29.7 feet, former gage, in April 1888.

Remarks.- Records good. Stage-discharge relation affected by ice Jan. 29 to Feb. 12, Feb. 23 to Mar. 6. Discharge estimated for Jan. 8, 9, 15, 16, 19-22.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	100	87	77	76	255	112	176	156	115	88	141	150
2	82	84	100	74	259	113	190	110	94	92	138	84
3	100	87	99	94	245	130	9,820	98	77	76	110	60
4	100	87	84	101	188	124	18,300	99	77	86	110	70
5	98	87	93	103	196	118	6,250	93	112	71	118	62
6	89	84	99	109	201	127	2,840	102	87	82	140	67
7	91	87	94	100	214	118	1,470	88	84	82	177	108
8	89	87	93	101	203	110	882	92	98	74	174	85
9	84	100	97	102	202	114	712	90	102	68	174	70
10	89	89	93	104	223	114	606	85	99	155	104	62
11	100	84	57	104	154	106	540	80	164	262	88	74
12	98	100	92	108	191	107	444	93	240	249	90	124
13	89	84	94	107	224	109	412	98	134	272	80	88
14	84	96	106	107	217	113	380	88	131	265	86	80
15	87	96	114	105	194	114	322	100	129	138	102	82
16	138	137	107	104	190	112	336	97	99	209	88	84
17	93	107	103	102	167	108	296	109	101	286	82	64
18	89	101	81	96	136	102	276	92	151	326	78	138
19	87	102	102	104	126	100	252	87	262	303	84	90
20	87	87	98	104	130	103	234	92	140	255	66	83
21	82	96	99	150	127	110	244	100	88	290	144	79
22	82	95	107	674	116	108	158	108	99	184	85	139
23	87	95	108	761	162	109	202	87	93	199	74	110
24	87	100	97	480	95	102	187	146	97	234	72	1,380
25	87	102	69	333	97	118	140	102	88	175	104	3,130
26	84	101	80	293	89	97	111	89	84	196	73	4,110
27	84	84	100	302	112	102	108	90	92	162	49	1,760
28	100	95	98	280	112	98	103	90	88	198	42	1,040
29	89	97	97	274		112	106	106	83	152	85	688
30	76	92	100	294		106	110	94	78	100	83	428
31	84		104	293		204		100		158	103	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	138	76	90.8	0.081	0.09
November	137	84	94.3	.084	.09
December	114	57	94.9	.085	.10
January	761	74	198	.177	.20
February	259	89	172	.154	.16
March	204	97	114	.102	.12
April	18,300	103	1,540	1.38	1.54
May	156	80	98.7	.088	.10
June	262	77	113	.101	.11
July	326	68	177	.158	.18
August	177	42	101	.090	.10
September	4,110	60	486	.434	.48
The year	18,300	42	271	.242	3.27

Trempealeau River at Dodge, Wis.

Location.- Chain gage in sec. 11, T. 19 N., R. 10 W., at highway bridge in Dodge, 9 miles above mouth.

Drainage area.- 633 square miles.

Records available.- December 1913 to September 1919, April 1934 to September 1934.

Extremes.- Maximum discharge recorded during period, 2,500 second-feet Sept. 28 (gage height, 6.70 feet); minimum recorded, 132 second-feet Aug. 3 (gage height, -0.26 foot).

1913-19, 1934: Maximum discharge (estimated), 10,000 second-feet Mar. 17, 1919 (gage height, over 9.5 feet); minimum, 105 second-feet (estimated), Feb. 4, 5, 1918.

Remarks.- Records poor.

Discharge, in second-feet, 1934

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1								253	154	420	139	171
2								253	154	351	139	192
3								253	154	290	132	420
4								236	154	290	139	373
5								236	162	271	154	396
6								236	162	641	154	330
7								220	154	330	154	253
8								220	171	373	154	220
9								205	236	290	162	205
10								205	290	310	154	205
11								205	205	290	154	236
12								192	192	253	154	271
13								192	181	236	154	236
14								192	171	220	154	236
15								192	171	192	146	253
16								192	171	205	154	271
17								181	171	192	154	271
18								181	171	181	154	253
19							351	171	181	181	310	236
20							351	181	171	171	850	220
21							330	192	171	171	700	220
22							330	171	171	171	310	220
23							330	171	171	162	236	220
24							310	171	641	162	220	220
25							290	171	420	154	205	498
26							290	162	790	154	192	1,210
27							290	154	1,250	154	181	1,930
28							271	162	1,660	154	171	2,360
29							253	171	1,060	154	171	1,250
30							253	162	583	146	162	1,030
31								162		146	171	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October					
November					
December					
January					
February					
March					
April 19-30	351	253	304	0.480	0.21
May	253	154	195	.308	.36
June	1,650	154	349	.551	.61
July	641	146	239	.378	.44
August	850	132	212	.335	.39
September	2,360	171	480	.758	.85
The year					

Trempealeau River near Trempealeau, Wis.

Location.- Chain gage in sec. 12, T. 18 N., R. 10 W., 1½ miles southwest of West Prairie School, 5 miles northwest of Trempealeau, and 2.2 miles above mouth. Zero of gage is 638.35 feet above mean sea level (adjustment of 1912).

Drainage area.- 692 square miles.

Records available.- October 1931 to June 1934 (discontinued).

Extremes.- Maximum discharge during period, 9,100 second-feet Apr. 5 (gage height, 12.46 feet, by levels to flood marks); minimum recorded, 150 second-feet June 23 (gage height, 2.88 feet).
1931-34: Maximum discharge, that of Apr. 5, 1934; minimum, Sept. 1, 1933, June 23, 1934.

Remarks.- Records fair. Gage-height record furnished by Corps of Engineers, U. S. Army. Stage-discharge relation affected by backwater from Mississippi River Apr. 8-22. No records Nov. 24 to Mar. 25.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	195	218					225	305	172			
2	195	225					375	285	165			
3	160	225					1,270	285	165			
4	195	218					2,680	285	165			
5	195	225					7,500	285	180			
6	195	225					6,400	265	180			
7	195	225					4,640	265	172			
8	195	218					2,970	265	165			
9	210	210					2,140	245	305			
10	210	195					1,390	245	305			
11	210	225					915	235	245			
12	202	218					705	235	218			
13	202	225					605	225	172			
14	202	202					515	225	172			
15	195	210					425	225	165			
16	245	218					375	225	165			
17	325	235					350	218	165			
18	265	245					350	210	158			
19	245	265					350	202	165			
20	235	265					350	195	158			
21	235	285					350	265	165			
22	225	285					375	225	158			
23	218	285					400	195	150			
24	210						375	195	285			
25	218						350	195	575			
26	218					255	350	195	515			
27	218					255	325	195	1,070			
28	210					255	325	188	1,350			
29	225					265	325	180	1,550			
30	210					265	305	180	1,070			
31	225					265		172				

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October 1-23	325	180	216		
November	285	195	232		
December					
January					
February					
March 26-31	265	255	260		
April	7,500	225	1,267		
May	305	172	229		
June	1,550	150	355		
July					
August					
September					
The year					

Black River at Neillsville, Wis.

Location.- Chain gage in sec. 15, T. 24 N., R. 2 W., at highway bridge in Neillsville, 1 mile below O'Neill Creek and 1½ miles above Cunningham Creek.

Drainage area.- 774 square miles.

Records available.- April 1905 to March 1909, December 1913 to September 1934.

Average discharge.- 20 years (1914-34), 545 second-feet.

Extremes.- Maximum discharge recorded during year, 20,800 second-feet Apr. 5 (gage height, 15.3 feet); minimum, 4.0 second-feet Aug. 1-5, 7-11 (gage height, 2.00 feet). 1905-9, 1913-34: Maximum discharge, 37,100 second-feet June 6, 1905 (gage height, 22.4 feet); minimum, 2 second-feet Aug. 29 to Sept. 3, 1933 (gage height, 1.65 feet).

Remarks.- Records good except those for period of ice effect, Nov. 9-28, Dec. 6 to Feb. 24, Mar. 3 to Apr. 1, and those at extremely low stages, which are fair.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.0	28	65	45	60	12	94	123	45	130	4.0	30
2	7.0	37	49	38	72	28	89	113	36	98	4.6	39
3	7.0	39	51	38	72	23	4,050	102	36	84	4.6	213
4	9.0	39	54	38	49	200	11,200	117	30	62	4.0	342
5	9.0	39	49	39	54	308	19,100	130	30	54	4.0	243
6	9.0	39	51	41	54	411	11,400	134	25	49	5.5	200
7	9.0	39	45	51	41	325	6,410	109	27	41	4.0	151
8	11	39	51	41	45	359	2,990	113	27	39	4.0	123
9	9.0	36	31	44	45	359	1,860	109	308	34	4.0	94
10	11	29	36	45	45	292	1,430	93	342	39	4.0	77
11	11	30	20	50	39	243	1,100	84	186	37	4.0	72
12	11	34	37	44	34	213	745	76	117	30	20	65
13	11	31	26	43	28	162	514	76	68	26	14	65
14	11	26	20	37	98	162	470	68	68	23	11	54
15	17	30	20	14	39	125	376	64	54	20	7.8	62
16	39	29	21	21	72	123	325	61	47	20	9.0	80
17	34	26	23	14	104	134	200	61	36	18	7.0	140
18	28	28	23	13	58	140	243	54	38	10	7.8	186
19	37	30	41	25	39	119	228	47	36	11	39	308
20	30	28	39	11	45	130	228	47	34	9.0	140	275
21	37	28	30	16	45	98	200	64	25	10	119	186
22	34	31	30	54	26	82	200	47	17	10	77	140
23	28	26	51	243	28	80	186	47	16	7.8	65	123
24	30	26	41	151	26	58	186	50	20	7.0	45	690
25	23	30	24	119	23	72	162	89	200	7.0	39	1,570
26	26	43	28	109	11	77	162	50	3,300	7.0	28	16,100
27	28	55	30	102	7.8	98	134	50	1,570	6.4	23	10,900
28	28	50	25	113	7.8	93	123	54	562	5.5	23	4,920
29	30	51	25	162		93	130	66	308	5.5	17	2,800
30	30	62	34	162		98	123	54	200	5.5	14	1,710
31	28		44	109		99		45		4.6	28	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	39	7.0	20.7	0.027	0.03
November	62	26	35.3	.046	.05
December	65	20	35.9	.046	.05
January	243	11	65.5	.085	.10
February	104	7.8	46.1	.060	.06
March	411	12	155	.200	.23
April	19,100	89	2,155	2.78	3.10
May	134	45	77.4	.100	.12
June	3,300	16	260	.336	.37
July	130	4.6	29.4	.038	.04
August	140	4.0	25.2	.033	.04
September	16,100	30	1,399	1.81	2.02
The year	19,100	4.0	355	.459	6.21

Black River near Galesville, Wis.

Location.- Chain gage on line between secs. 1 and 2, T. 18 N., R. 7 W., 4½ miles southeast of Galesville on State Trunk Highway 35 and 5 miles below mouth of Fleming Creek. Zero of gage is 657.3 feet above mean sea level.

Drainage area.- 2,120 square miles.

Records available.- December 1931 to September 1934.

Extremes.- Maximum discharge recorded, 17,700 second-feet Sept. 28 (gage height, 11.57 feet); minimum daily discharge (estimated), 245 second-feet Dec. 26.
1931-34: Maximum discharge recorded, that of Sept. 28, 1934; minimum recorded, 180 second-feet Dec. 20, 1932.

Remarks.- Records fair except those for periods of ice effect, Nov. 14-23, Dec. 9 to Mar. 20, which are poor. Discharge interpolated for Sept. 25.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	340	318	420	295	398	335	1,250	890	450	2,220	318	390
2	272	340	390	295	375	295	780	710	420	1,630	340	390
3	272	295	390	260	420	470	3,730	745	390	1,520	340	710
4	318	365	390	315	445	375	4,080	605	365	1,300	295	815
5	340	365	420	315	398	375	10,700	675	340	1,150	318	930
6	318	390	365	335	375	315	15,500	728	340	2,220	340	1,150
7	318	390	365	335	375	335	15,700	780	318	1,630	295	1,060
8	340	365	365	335	278	335	14,000	780	318	1,150	340	1,060
9	340	390	375	315	375	335	10,700	605	605	1,150	365	970
10	295	420	398	315	375	355	3,080	640	480	1,100	318	930
11	365	420	375	315	420	335	3,240	605	420	930	272	890
12	318	390	355	295	398	335	3,080	605	510	850	318	815
13	318	340	355	315	335	315	2,630	605	420	815	340	745
14	318	355	375	375	398	335	1,970	605	450	890	272	745
15	318	335	375	335	420	335	1,850	605	390	745	295	780
16	450	335	375	335	445	315	1,520	570	390	780	295	850
17	420	375	398	315	420	335	1,520	540	420	710	272	780
18	420	355	398	315	375	315	1,520	540	420	640	272	930
19	390	375	335	335	335	375	1,100	570	420	605	340	1,010
20	318	375	335	335	278	420	1,300	540	450	510	480	1,010
21	390	355	355	335	335	480	1,300	540	480	450	365	970
22	390	375	355	600	315	480	1,250	510	480	450	390	1,060
23	378	375	355	760	295	365	1,250	570	450	480	420	1,060
24	365	340	335	600	295	540	1,150	510	890	365	318	1,150
25	318	365	295	600	295	510	1,250	510	675	390	340	1,560
26	295	365	245	680	295	420	1,200	480	890	420	318	1,970
27	318	340	278	470	260	675	1,150	480	4,640	420	272	5,240
28	318	295	288	375	278	745	1,150	420	9,580	365	295	16,900
29	390	250	295	335		605	1,060	420	7,560	365	365	15,000
30	390	390	295	295		450	1,010	420	3,560	318	340	10,500
31	390		278	355		390		510		365	318	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	450	272	346	0.163	0.19
November	420	250	358	.169	.19
December	420	245	352	.166	.19
January	760	260	380	.179	.21
February	445	260	357	.168	.17
March	745	295	406	.192	.22
April	15,700	780	3,701	1.75	1.95
May	890	420	591	.279	.32
June	9,580	318	1,251	.590	.66
July	2,220	318	869	.410	.47
August	480	272	328	.155	.18
September	16,900	390	2,412	1.14	1.27
The year	16,900	245	940	.443	6.02

La Crosse River near West Salem, Wis.

Location.- Chain gage in sec. 32, T. 17 N., R. 6 W., at highway bridge 2 miles west of West Salem and 6 miles below mouth of Dutch Creek.

Drainage area.- 412 square miles.

Records available.- December 1913 to September 1934.

Average discharge.- 20 years, 302 second-feet.

Extremes.- Maximum discharge recorded during year, 2,460 second-feet Apr. 4 (gage height, 9.00 feet); minimum recorded, 98 second-feet Aug. 26; minimum daily discharge (estimated), 98 second-feet Feb. 25.
1913-34: Maximum discharge, 4,780 second-feet Sept. 15, 1928 (gage height, 9.8 feet); maximum gage height recorded, 11.1 feet (caused by ice jam) Mar. 13, 1928; minimum discharge, 56 second-feet Feb. 20, 1927 (gage height, 2.40 feet).

Remarks.- Records fair except those for periods of ice effect, Nov. 15-20, Dec. 11 to Mar. 12, which are poor. Slight diurnal fluctuation is caused by operation of power plants a few miles above station.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	155	216	238	173	147	183	238	194	164	155	164	164
2	216	216	216	216	155	194	475	173	155	194	173	227
3	173	216	216	194	164	205	1,390	173	164	147	155	282
4	205	216	249	183	164	227	2,020	164	173	147	173	376
5	216	216	260	194	164	260	890	183	173	183	117	450
6	205	227	227	194	183	260	525	147	173	352	155	328
7	216	227	216	183	173	216	400	163	173	550	173	238
8	227	216	227	194	164	194	328	183	164	627	147	227
9	260	227	205	194	173	216	293	173	173	352	183	194
10	282	227	164	173	173	227	305	173	238	376	173	194
11	238	216	216	183	117	282	293	183	173	352	173	205
12	238	173	164	194	155	260	249	164	183	293	147	227
13	227	249	183	194	183	205	282	173	194	260	139	227
14	227	214	194	194	163	194	238	194	205	216	173	205
15	194	216	139	183	183	194	216	173	194	227	164	216
16	293	194	131	164	194	194	216	164	173	194	147	260
17	305	139	131	147	205	194	216	183	173	216	139	271
18	293	183	147	164	194	194	216	173	164	205	173	227
19	260	183	147	117	147	183	216	173	183	227	164	227
20	249	260	124	131	147	183	227	173	173	282	155	194
21	238	282	139	124	131	194	216	183	173	238	147	216
22	216	271	124	216	147	183	216	173	194	194	155	216
23	238	227	117	260	139	173	194	155	194	205	155	194
24	216	238	117	352	131	164	216	155	173	173	147	293
25	227	238	110	249	98	164	205	147	249	183	139	400
26	238	227	124	183	147	173	205	164	249	205	110	682
27	249	238	147	194	164	173	194	155	352	271	139	682
28	227	238	131	183	173	164	194	131	328	249	155	500
29	216	227	164	131		173	205	155	227	216	139	352
30	227	216	164	124		155	183	164	194	216	164	305
31	227		131	155		173		139		194	155	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	305	155	232	0.563	0.65
November	282	139	221	.536	.60
December	260	110	170	.413	.48
January	352	117	185	.449	.52
February	205	98	161	.391	.41
March	282	155	199	.483	.56
April	2,020	183	375	.910	1.02
May	194	131	168	.408	.47
June	352	155	197	.478	.53
July	627	147	255	.619	.71
August	183	110	155	.376	.43
September	682	164	293	.711	.79
The year	2,020	98	217	.527	7.17

Little La Crosse River near Leon, Wis.

Location.- Water-stage recorder in sec. 3, T. 16 N., R. 4 W., 2 miles northwest of Leon.

Drainage area.- 77.1 square miles.

Records available.- March to September 1934.

Extremes.- Maximum discharge during period, 1,370 second-feet July 6 (gage height, 9.84 feet); minimum, 17.0 second-feet June 2 (gage height, 1.90 feet).

Remarks.- Records good.

Discharge, in second-feet, 1934

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							40.9	26.5	19.0	20.9	22.2	23.9
2							236	26.1	18.2	20.1	21.8	23.0
3							884	25.7	18.2	19.7	21.8	101
4							123	25.3	19.3	20.5	21.8	90
5							76	25.3	19.7	32.2	24.3	36.4
6							57	24.5	19.7	543	22.6	30.4
7							41.9	23.7	19.7	41.9	22.2	27.8
8							39.1	23.3	21.3	29.4	21.8	26.0
9							38.1	23.7	45.4	27.0	21.8	24.8
10							37.6	22.5	24.5	54	20.9	24.8
11							40.0	22.5	22.9	33.6	22.2	42.5
12							31.6	22.9	22.1	27.8	23.0	29.1
13							29.9	29.0	22.1	26.9	22.2	26.5
14						26.4	29.9	24.9	21.7	25.6	21.3	25.6
15						26.0	29.9	23.3	21.3	23.5	21.8	37.8
16						26.8	29.4	22.9	20.5	23.5	22.2	40.6
17						26.8	29.0	22.5	20.5	24.3	21.3	30.4
18						23.8	30.8	21.7	20.5	23.5	21.3	29.5
19						24.9	33.9	21.3	19.7	131	22.2	29.1
20						26.8	31.2	21.3	19.7	33.6	20.9	28.2
21						25.6	31.2	21.3	18.6	26.9	21.8	31.3
22						24.1	30.8	20.9	18.6	24.3	22.2	31.8
23						23.8	29.9	20.9	20.1	22.6	22.2	29.1
24						24.1	30.8	21.3	56	22.2	22.2	30.4
25						23.8	29.0	21.3	22.9	21.8	20.9	29.6
26						24.5	28.6	20.9	177	132	20.9	63
27						23.8	27.8	20.5	35.8	36.8	20.9	41.1
28						23.0	27.4	20.1	26.5	25.2	20.5	31.3
29						23.4	27.0	20.1	23.3	22.6	20.5	29.5
30						23.0	26.5	20.1	21.7	21.3	20.9	30.0
31						26.4		19.7		21.8	25.2	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October					
November					
December					
January					
February					
March 14-31	26.8	23.0	24.8	0.322	0.21
April	884	26.5	72.6	.942	1.05
May	29.0	19.7	22.8	.296	.34
June	177	18.2	28.6	.371	.41
July	543	19.7	50.3	.652	.75
August	26.2	20.5	21.9	.284	.33
September	101	23.0	35.8	.464	.52
The year					

Coon Creek at Coon Valley, Wis.

Location.- Water-stage recorder in sec. 7, T. 14 N., R. 5 W., in the village of Coon Valley.

Drainage area.- 77.2 square miles.

Records available.- March to September 1934.

Extremes.- Maximum discharge during period, 2,510 second-feet Apr. 2 (gage height, 7.30 feet); minimum, 5.4 second-feet Mar. 30 (gage height, 1.01 feet).

Remarks.- Records good except those above a discharge of 700 second-feet, which are fair.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							45.4	26.0	21.5	23.3	25.0	25.7
2							732	25.4	21.5	22.6	24.2	25.0
3							997	26.0	22.6	21.5	24.2	99
4							71	26.0	24.7	24.7	23.5	47.3
5							58	25.4	24.7	134	25.7	31.2
6							44.8	25.4	22.6	176	24.2	29.5
7							36.5	24.0	22.1	28.8	24.2	27.9
8							34.8	24.0	27.6	26.7	25.0	26.4
9							33.9	24.0	49.2	26.0	25.0	25.7
10							35.7	22.6	24.7	77	25.0	30.4
11							34.8	24.7	23.3	28.8	26.4	39.4
12							31.3	24.7	23.3	27.4	27.1	27.1
13							31.3	33.9	23.3	28.8	24.2	26.4
14							30.4	23.3	23.3	27.4	23.5	27.1
15							30.4	24.7	24.0	24.7	23.5	33.9
16						27.9	28.8	24.0	22.6	26.7	23.5	30.4
17						27.9	28.8	24.7	24.0	25.4	22.8	27.9
18						23.8	30.4	24.0	26.7	24.7	25.0	28.6
19						27.9	29.5	24.0	22.6	140	42.6	27.1
20						27.0	28.1	24.0	22.6	29.5	22.8	25.0
21						26.0	29.5	23.3	21.5	26.7	26.4	27.1
22						23.2	29.5	22.6	22.6	24.7	23.5	28.6
23						23.8	28.1	23.3	48.7	22.6	24.2	26.4
24						24.4	27.4	24.0	55	22.1	23.5	26.4
25						24.4	27.4	24.0	25.4	21.5	22.0	31.2
26						26.0	26.7	23.3	172	425	20.7	61
27						23.8	26.0	22.6	27.4	39.4	21.3	33.9
28						25.1	26.0	22.6	26.0	27.9	20.7	30.4
29						26.0	25.4	23.3	23.3	26.4	21.3	30.4
30						23.2	25.4	22.1	22.6	25.0	22.0	29.5
31						43.3		22.1		25.0	30.4	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October					
November					
December					
January					
February					
March 16-31	43.3	23.2	26.5	0.343	0.20
April	997	25.4	88.1	1.14	1.27
May	33.9	22.1	24.3	.315	.36
June	172	21.5	31.4	.407	.45
July	425	21.5	52.7	.683	.79
August	42.6	20.7	24.6	.319	.37
September	99	25.0	32.9	.426	.48
The year					

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Coon Creek near Stoddard, Wis.

Location.- Water-stage recordsr in sec. 25, T. 14 N., R. 7 W., 3¼ miles east of Stoddard.

Drainage area.- 119 square miles.

Records available.- March to September 1934.

Extremes.- Maximum discharge during period, 2,800 second-feet Apr. 3 (gage height, 9.18 feet); minimum, 25.4 second-feet Sept. 14 (gage height, 2.13 feet).

Remarks.- Records good except those above a discharge of 600 second-feet, which are fair.

Discharge, in second-feet, 1934

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							76	45	36.2	37.7	42.1	44.2
2							530	44.6	36.0	36.5	41.2	41.8
3							1,960	44.1	37.1	36.2	39.7	120
4							200	44.1	39.6	39.5	39.4	106
5							104	44.6	42.5	63	44.2	50
6							100	43.7	37.1	291	39.4	45.3
7							71	42.4	36.5	57	38.9	43.9
8							68	42.4	45.1	45.7	38.0	42.1
9							68	43.7	96	43.4	38.0	40.9
10							65	39.0	42.8	378	38.0	42.1
11							63	39.6	39.5	65	39.2	61
12							57	41	38.3	49.7	40.3	44.2
13							53	55	38.0	48.9	38.0	43.6
14							55	43.4	37.7	47.4	36.6	39.4
15							53	41.6	38.3	43.4	38.0	46.6
16							52	40.7	36.8	45.4	38.0	47.3
17							50	40.1	36.8	46.3	36.9	43.3
18							50	39.8	39.6	43.4	36.9	45.6
19							53	39.5	36.2	162	59	43.6
20							51	38.9	36.8	53	39.4	41.8
21							53	38.9	36.0	44.7	40.0	42.1
22							53	37.1	36.2	41.9	41.5	43.9
23							51	38.0	37.4	40.4	38.9	42.1
24							50	38.6	90	39.5	39.7	41.5
25							51	38.3	41.0	38.9	37.2	54
26							48.3	38.3	182	428	36.3	122
27							46.6	37.4	48.9	124	36.9	58
28						46.0	47.0	38.0	41.6	52	36.9	47.3
29						48.6	45.8	37.4	39.8	46.3	36.9	45.3
30						44.7	45.0	36.5	38.6	43.3	37.4	45.9
31						56		37.1		42.7	44.6	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October					
November					
December					
January					
February					
March					
April	1,960	45.0	142	1.19	1.33
May	55	36.5	40.9	.344	.40
June	182	36.0	47.3	.397	.44
July	428	36.2	83.0	.697	.80
August	59	36.3	39.6	.333	.38
September	122	39.4	52.5	.441	.49
The year					

Root River near Houston, Minn.

Location.- Water-stage recorder in sec. 32, T. 104 N., R. 6 W., 1 mile west of Houston and 2⅛ miles above mouth of South Fork of Root River. Chain gage at same site and datum used prior to Sept. 28, 1933. Zero of gage is 671.86 feet above mean sea level (adjustment of 1929).

Drainage area.- 1,280 square miles.

Records available.- May 1929 to September 1934. May 1909 to September 1917, 1½ miles downstream.

Average discharge.- 13 years, 611 second-feet.

Extremes.- Maximum discharge during year, 19,000 second-feet Apr. 4 (gage height, 12.56 feet); minimum, 65 second-feet Dec. 26 (gage height, 2.30 feet).
1909-17, 1929-34: Maximum discharge, 26,600 second-feet Mar. 31, 1933 (gage height, 14.07 feet); minimum, that of Dec. 26, 1933.

Remarks.- Records fair. Stage-discharge relation affected by ice Nov. 12 to Mar. 12. Discharge interpolated for Oct. 9-14, 16-21, 23-28, 30, 31, Nov. 1-4, 6-11, Jan. 21. Diurnal fluctuation caused by operation of power plant at Rushford.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	200	191	216	186	270	218	330	270	137	192	442	257
2	196	194	230	203	214	230	448	270	150	189	420	359
3	200	196	222	230	168	250	7,660	270	144	182	352	250
4	196	198	230	242	137	330	17,100	270	140	189	352	330
5	200	200	218	246	147	375	9,060	250	150	533	375	310
6	206	202	210	242	144	305	2,940	250	147	2,420	330	270
7	206	204	206	238	140	206	1,670	250	178	1,260	330	234
8	214	206	203	206	134	206	1,090	238	187	582	290	218
9	210	208	200	218	140	559	860	242	766	420	290	218
10	205	210	206	222	161	465	710	234	847	4,260	270	222
11	200	212	90	214	168	420	635	242	522	2,260	270	390
12	196	214	196	218	172	297	560	246	375	990	250	230
13	191	222	222	238	186	270	488	375	310	727	250	214
14	187	203	234	226	192	270	465	310	270	635	238	206
15	182	154	218	214	192	270	442	310	250	526	238	234
16	183	206	222	189	210	270	420	290	230	398	238	238
17	184	250	218	186	218	270	398	270	222	649	230	222
18	185	270	226	206	161	242	375	250	214	680	245	230
19	186	270	226	218	168	242	375	226	206	2,970	409	214
20	187	270	238	250	230	230	352	210	206	988	222	206
21	188	242	226	670	189	250	330	222	206	546	226	210
22	189	226	234	1,090	144	250	330	200	206	398	200	210
23	189	230	200	1,960	128	246	330	189	196	310	210	255
24	188	226	168	970	161	234	310	189	200	242	214	951
25	188	230	90	660	203	222	290	182	192	210	206	555
26	187	230	86	420	196	226	310	189	340	2,440	200	2,690
27	187	222	85	375	196	226	290	158	218	3,750	196	1,310
28	186	222	102	384	203	250	290	182	218	1,130	200	660
29	186	222	116	290		250	290	168	206	760	192	510
30	187	218	150	290		270	270	161	200	588	203	442
31	189		164	290		298		150		488	218	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	214	182	193	0.151	0.17
November	270	154	218	.170	.19
December	238	85	189	.148	.17
January	1,960	186	380	.297	.34
February	270	128	178	.139	.14
March	559	206	279	.218	.25
April	17,100	270	1,647	1.29	1.44
May	375	150	234	.183	.21
June	847	137	261	.204	.23
July	4,260	182	1,029	.804	.93
August	442	192	268	.209	.24
September	2,690	206	428	.334	.37
The year	17,100	85	442	.345	4.68

Upper Iowa River near Decorah, Iowa

Location.- Staff gage in SE¼NE¼ sec. 8, T. 98 N., R. 7 W., at upper power plant of Interstate Power Co., 5 miles northeast of Decorah.

Drainage area.- 576 square miles.

Records available.- July 1933 to September 1934. August 1913 to November 1914 and May 1919 to June 1927 at site 4 miles upstream.

Extremes.- 1933-34: Maximum discharge, 12,250 second-feet July 1, 2, 1933 (gage height, 97.2 feet); minimum, about 10 second-feet at numerous times when power plant was shut down.

Remarks.- Records fair except those for discharges below 40 second-feet, which are poor. Daily-discharge record furnished by Interstate Power Co.

Discharge, in second-feet, 1933

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1										641	252	44
2										10,500	165	66
3										1,880	142	37
4										634	142	55
5										462	122	73
6										304	91	58
7										318	107	51
8										246	94	51
9										188	94	80
10										203	76	15
11										174	78	73
12										188	90	73
13										743	63	73
14										756	91	380
15										279	76	128
16										174	86	104
17										159	73	99
18										159	73	90
19										145	94	82
20										127	63	73
21										1,890	61	74
22										2,360	123	72
23										758	45	68
24										332	75	69
25										233	76	69
26										204	73	74
27										175	58	74
28										175	73	71
29										174	58	73
30										87	51	63
31										175	44	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October					
November					
December					
January					
February					
March					
April					
May					
June					
July	10,500	87	79.5	1.38	1.59
August	252	44	90.6	.157	.18
September	380	15	80.4	.140	.16
The year					

Upper Iowa River near Decorah, Iowa

(Continued)

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	103	49	32	58	91	39	386	63	23	10	57	61
2	88	49	69	39	83	39	1,490	57	23	24	50	33
3	61	40	32	58	91	65	3,530	60	20	10	37	195
4	26	71	43	76	69	25	3,600	60	47	10	50	223
5	27	28	61	54	80	54	2,130	73	27	13	30	136
6	35	55	54	113	76	101	824	23	10	10	50	84
7	16	52	47	25	69	32	625	73	23	70	33	82
8	15	52	32	83	54	61	450	60	50	37	30	86
9	16	49	47	39	54	39	328	50	30	37	50	65
10	12	34	25	32	69	69	290	37	10	414	47	79
11	45	34	32	47	25	17	237	47	37	157	60	85
12	44	34	25	54	61	47	197	80	37	90	27	81
13	37	34	32	69	54	61	197	10	30	50	33	74
14	63	22	32	25	61	50	170	47	23	67	33	80
15	30	10	32	54	39	50	157	70	23	10	442	85
16	90	16	58	39	98	69	157	37	23	205	10	55
17	103	25	25	39	69	91	103	33	10	156	50	10
18	90	46	32	39	32	25	103	37	30	157	63	10
19	63	31	32	39	83	47	103	50	10	210	23	30
20	63	34	47	39	47	83	103	10	43	143	50	37
21	83	52	39	47	47	72	117	43	10	50	30	37
22	34	46	39	3,010	39	58	63	40	10	27	30	37
23	58	61	47	1,760	39	69	97	37	136	37	47	30
24	58	54	32	471	65	80	83	37	74	30	33	538
25	46	43	10	391	10	25	83	37	23	30	50	872
26	46	25	25	171	36	50	67	37	28	1,020	23	2,670
27	46	43	25	215	28	47	80	10	19	420	23	378
28	71	54	25	138	25	50	87	37	32	101	23	387
29	10	54	25	99		69	27	37	10	77	43	374
30	55	28	25	32		28	90	23	17	63	22	197
31	49		43	76		83		23		63	112	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	103	10	51.0	0.089	0.10
November	71	10	40.8	.071	.08
December	69	10	36.3	.063	.07
January	3,010	25	240	.417	.48
February	98	10	56.9	.099	.10
March	101	17	54.7	.095	.11
April	3,600	27	532	.924	1.03
May	80	10	43.2	.075	.09
June	136	10	29.6	.051	.06
July	1,020	10	123	.214	.25
August	442	10	53.6	.093	.11
September	2,670	10	237	.411	.46
The year	3,600	10	124	.215	2.94

Wisconsin River at Whirlpool Rapids, near Rhinelander, Wis.

Location.- Water-stage recorder in sec. 4, T. 35 N., R. 8 E., at head of Whirlpool Rapids, 1 mile below outlet of Crescent Lake and 10 miles southwest of Rhinelander.

Drainage area.- 1,160 square miles.

Records available.- September 1915 to September 1934. December 1905 to September 1915 at a station 3 miles upstream.

Average discharge.- 17 years (1915-26, 1928-34), 1,023 second-feet.

Extremes.- Maximum discharge during year, 3,400 second-feet Apr. 12; minimum, 123 second-feet July 29, 30 (gage height, 0.34 feet); minimum daily discharge recorded, 210 second-feet July 30.

1915-34: Maximum discharge, 5,410 second-feet Apr. 10, 1929 (gage height, 5.70 feet); minimum, that of July 29, 30, 1934; minimum daily discharge recorded, that of July 30, 1934.

Remarks.- Records fair except those for Oct. 1 to Apr. 7, which are poor. Flow is regulated by 14 reservoirs and 3 power plants above station. Owing to unsatisfactory operation of gage, discharge for periods indicated by braced figures was estimated by comparison with records for Wisconsin River at Merrill; discharge also estimated for Mar. 8, 22-25, 28-31, Apr. 8.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			342		515	462		1,370	594	552	253	482
2		418						1,640	582	395	307	411
3								1,790	466	265	256	590
4	259			482		662	1,750	1,840	368	224	268	879
5						762		1,550	377	296	248	1,120
6			319			852		917	468	522	240	1,040
7					512	796		1,190	494	446	245	1,040
8		401				868	2,280	1,490	507	385	262	755
9						941	2,810	1,690	552	250	262	594
10	291			502		831	2,810	1,390	592	330	301	618
11						514	3,100	1,190	366	456	301	394
12						588	3,250	829	616	514	268	377
13			292			926	2,880	806	536	481	250	481
14					605	728	2,810	636	593	487	259	436
15		326				721	2,290	866	738	595	256	604
16						701	2,430	797	859	426	242	790
17				568		688	2,370	952	636	437	265	966
18	345					626	2,370	1,230	376	461	274	1,210
19						607	2,370	1,230	564	524	329	1,160
20			509			762	2,310	884	457	544	230	948
21		299			487	762	2,310	1,140	512	477	265	1,210
22						642	1,770	1,310	512	347	268	1,210
23						635	1,890	1,040	520	305	301	766
24				630		627	1,990	958	386	399	308	741
25	213					620	1,890	1,010	384	308	301	1,290
26			485		462	612	2,090	894	546	347	237	2,110
27						778	2,090	698	552	290	245	2,550
28		342				830	1,690	742	707	304	294	2,620
29				515		830	1,230	860	910	221	319	2,880
30	418					850	1,170	584	659	210	307	2,850
31			482			840		612		252	476	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	418	213	291	0.251	0.29
November	418	299	352	.303	.34
December	509	292	400	.345	.40
January	630	482	544	.469	.54
February	605	462	522	.450	.47
March	941	462	709	.611	.70
April	3,250	1,170	2,148	1.85	2.06
May	1,840	584	1,101	.949	1.09
June	910	366	548	.472	.53
July	595	210	389	.335	.39
August	476	230	279	.241	.28
September	2,880	377	1,104	.952	1.06
The year	3,250	210	697	.601	8.15

Wisconsin River at Merrill, Wis.

Location.- Water-stage recorder on line between secs. 12 and 13, T. 31 N., R. 6 E., 300 feet below new highway bridge at east end of Merrill and half a mile below mouth of Prairie River.

Drainage area.- 2,630 square miles.

Records available.- November 1902 to September 1934.

Average discharge.- 26 years (1907-11, 1912-34), 2,556 second-feet.

Extremes.- Maximum discharge during year, 10,100 second-feet Apr. 9 (gage height, 8.6 feet); minimum, 406 second-feet Aug. 5 (gage height, 3.31 feet).
1902-34: Maximum discharge, 45,000 second-feet July 24, 1912 (gage height, 17.5 feet); minimum, about 90 second-feet Sept. 26, 1908 (gage height, 2.45 feet).

Remarks.- Records good except those for periods of ice effect Nov. 10, 11, Dec. 10-12, Dec. 24-27, Jan. 15-19, Jan. 29-31, Feb. 8-13, Feb. 24-28, and those estimated for Oct. 19-25, which are fair. Flow regulated by 17 reservoirs and 8 power plants above station.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	940	855	975	910	1,200	1,200	1,310	2,060	1,480	885	810	1,190
2	940	875	805	1,010	1,240	1,280	1,130	1,980	1,520	1,360	905	780
3	870	1,490	860	1,050	1,360	1,340	4,800	2,660	1,220	1,060	765	1,340
4	835	1,180	875	1,160	1,310	1,360	6,310	2,320	1,520	1,020	755	1,850
5	665	1,340	850	1,320	1,120	1,720	7,740	2,450	1,380	1,100	475	1,800
6	875	1,240	800	1,500	1,150	1,200	5,630	2,120	1,400	1,130	560	1,940
7	890	1,080	915	1,320	1,170	1,440	5,440	1,640	1,300	1,080	685	1,180
8	855	845	945	840	1,220	1,510	8,460	1,700	1,380	820	580	1,310
9	850	955	905	1,240	1,260	1,480	9,320	2,360	1,440	1,020	575	965
10	910	1,040	945	1,350	1,300	1,490	8,990	2,120	1,090	1,060	485	1,080
11	900	900	820	1,160	1,360	1,190	8,320	1,800	1,540	975	495	1,310
12	700	1,060	716	1,260	1,370	1,040	6,400	1,320	1,420	995	500	1,080
13	1,040	950	545	1,210	1,390	1,100	5,320	1,360	1,210	1,040	565	990
14	1,060	890	1,080	1,300	1,400	1,300	4,470	1,450	1,220	1,140	580	1,010
15	900	845	985	1,360	1,280	1,330	4,320	1,290	1,200	725	645	1,560
16	930	820	750	1,410	1,520	1,450	2,640	1,340	1,100	925	705	1,650
17	865	740	1,240	1,200	1,300	1,370	1,240	1,380	790	1,110	705	1,900
18	885	855	1,300	1,200	1,070	1,240	3,170	1,740	1,120	990	720	1,760
19	1,120	640	1,560	1,340	1,090	1,420	3,750	1,680	905	1,000	590	2,100
20	1,000	735	1,110	1,350	1,120	1,080	3,460	1,350	1,070	965	720	1,840
21	1,050	770	1,140	1,230	1,500	1,180	3,550	2,480	930	935	665	1,840
22	525	915	1,120	1,610	1,430	1,320	3,130	2,340	1,000	775	780	1,360
23	843	975	1,060	1,300	1,340	1,380	2,840	2,690	1,020	885	1,050	1,720
24	710	930	1,120	1,360	1,270	1,240	2,500	1,860	800	1,020	1,280	1,610
25	775	890	1,090	1,410	1,180	1,050	2,940	1,940	980	885	600	2,070
26	885	915	1,010	1,580	1,090	1,020	3,100	1,720	1,410	910	515	7,050
27	745	1,080	1,010	1,500	1,120	960	2,860	1,280	1,220	905	825	6,720
28	780	865	1,110	1,220	1,160	1,200	2,700	1,610	1,220	825	950	8,310
29	880	815	1,270	1,250		1,200	1,840	1,430	1,240	515	970	7,570
30	925	930	1,620	1,200		1,280	2,160	1,360	1,150	320	850	6,020
31	1,420		1,210	1,170		1,220		1,540		870	985	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	1,420	525	889	0.338	0.39
November	1,490	640	947	.360	.40
December	1,620	545	1,024	.389	.45
January	1,610	840	1,268	.482	.56
February	1,520	1,070	1,262	.480	.50
March	1,720	960	1,277	.486	.56
April	9,320	1,130	4,328	1.65	1.84
May	2,690	1,280	1,818	.691	.80
June	1,540	790	1,209	.460	.51
July	1,360	515	960	.365	.42
August	1,280	475	719	.273	.31
September	8,310	780	2,430	.924	1.03
The year	9,320	475	1,505	.572	7.77

Wisconsin River at Knowlton, Wis.

Location.- Water-stage recorder in N½ sec. 29, T. 26 N., R. 7 E., 50 feet below combination railroad and highway bridge at Knowlton and 1½ miles below mouth of Big Eau Pleine River.

Drainage area.- 4,360 square miles.

Records available.- July 1921 to September 1934.

Average discharge.- 13 years, 3,767 second-fset.

Extremes.- Maximum discharge recorded during year, 29,200 second-feet Apr. 6 (gage height, 13.3 feet); minimum, 335 second-feet July 15 (gage height, 1.30 feet); minimum daily discharge, 373 second-feet Aug. 13.
1921-34: Maximum discharge, 49,800 second-feet Apr. 10, 1922 (gage height, 19.5 feet); minimum, 317 second-feet Aug. 8, 1932 (gage height 0.9 foot); minimum daily discharge, that of Aug. 13, 1934.

Remarks.- Records good except those estimated for period of ice effect, Jan. 1 to Mar. 31, and those estimated because of missing gage-height records Nov. 8-10, May 9-12, which are poor. Flow regulated by many storage reservoirs and power plants above station.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,050	913	839	1,170	1,550	1,700	2,180	2,970	1,500	1,730	876	1,360
2	1,090	2,020	1,090	1,300	1,960	1,660	2,030	2,970	1,720	1,160	1,120	1,860
3	1,060	1,600	1,370	1,800	1,660	1,680	2,810	2,650	1,580	1,200	1,360	1,530
4	1,320	1,240	594	1,440	1,090	1,540	17,200	2,650	1,220	701	858	2,890
5	1,160	1,270	904	1,680	1,430		28,000	3,140	1,280	1,250	685	4,190
6	1,020	696	814	1,880	2,100		29,200	3,140	1,290	2,340	494	3,480
7	949	1,160	990	1,250	1,500		22,100	2,490	1,420	2,970	689	3,220
8	1,100	1,560	1,230	1,240	1,550	1,830	17,500	2,810	1,290	2,490	753	1,880
9	657	1,600	1,430	1,610	1,430		17,200	2,200	1,370	1,300	886	1,440
10	814	1,080	1,600	1,360	1,680		14,200	2,080	1,550	1,400	840	1,360
11	977	1,360	890	1,330	1,550		13,000	2,770	1,150	1,400	705	1,550
12	950	913	1,240	1,520	1,620	1,800	10,900	2,240	1,540	1,460	458	1,730
13	980	587	1,000	1,880	2,030	1,960	8,340	1,220	1,660	1,320	373	1,610
14	867	1,150	1,220	1,730	1,640	1,240	7,380	1,020	1,500	1,550	554	1,350
15	818	1,400	1,420	567	1,670	1,550	6,290	1,960	1,360	949	495	1,620
16	802	1,160	1,840	1,150	1,640	2,030	5,320	1,300	1,250	649	567	2,100
17	1,130	1,220	1,430	2,180	2,030	2,570	5,320	960	1,140	1,210	644	3,330
18	1,390	1,160	1,740	1,840	1,460	1,880	4,940	1,260	997	1,220	780	3,650
19	1,030	778	1,520	1,860	1,120	1,580	5,320	1,880	1,040	1,330	958	3,220
20	1,300	687	1,610	1,780	1,660	2,890	5,320	1,370	1,050	1,490	619	2,890
21	1,180	931	1,610	1,640	1,290	2,180	5,510	1,250	1,200	1,440	567	2,970
22	1,250	1,370	1,580	1,140	1,730	1,490	4,940	3,560	1,010	1,020	574	2,490
23	631	1,050	1,800	1,620	1,760	1,760	4,750	3,480	970	562	848	1,360
24	1,030	1,050	2,260	1,850	1,880	1,620	3,830	3,220	709	840	1,290	2,490
25	877	932	1,580	1,540	1,210	1,260	3,140	2,490	649	895	1,220	3,400
26	970	884	1,120	1,760	1,220	1,420	2,970	2,260	2,030	886	778	8,840
27	950	931	1,680	2,030	1,490	2,050	3,830	1,600	5,320	904	510	21,800
28	950	1,030	1,550	1,880	1,400	1,140	3,650	1,220	4,010	886	763	22,400
29	970	1,130	1,580	1,190		1,580	3,740	1,700	2,810	803	867	15,400
30	1,350	1,160	1,620	1,840		1,550	2,420	1,580	2,340	447	931	10,600
31	1,280		1,260	2,030		2,030		1,400		620	970	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	1,390	631	1,028	0.236	0.27
November	2,020	587	1,134	.260	.29
December	2,260	594	1,368	.314	.36
January	2,180	567	1,583	.363	.42
February	2,100	1,090	1,580	.362	.38
March	2,890	1,140	1,773	.407	.47
April	29,200	2,030	8,778	2.01	2.24
May	3,560	960	2,156	.494	.57
June	5,320	649	1,598	.367	.41
July	2,970	447	1,239	.284	.33
August	1,360	373	776	.178	.21
September	22,400	1,350	4,617	1.06	1.18
The year	29,200	373	2,290	.525	7.13

Wisconsin River near Nekoosa, Wis.

Location.- Water-stage recorder in sec. 15, T. 21 N., R. 5 E., 1½ miles below Nekoosa and 4 miles above Tenmile Creek.

Drainage area.- 5,500 square miles.

Records available.- May 1914 to September 1934.

Average discharge.- 20 years, 4,779 second-feet.

Extremes.- Maximum discharge during year, 37,000 second-feet Apr. 6 (gage height, 12.78 feet); minimum daily discharge, 165 second-feet Aug. 12.
1914-34: Maximum discharge recorded, 61,000 second-feet Apr. 12, 1922 (gage height, 16.1 feet); minimum daily discharge, that of Aug. 12, 1934.

Remarks.- Records excellent except those for period of ice effect, Dec. 28 to Feb. 10, Feb. 19 to Mar. 1, Mar. 6-10, 12-16, which are fair. Flow is regulated by many storage reservoirs and power plants above station.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	900	1,900	1,350	1,330	2,060	1,710	1,600	3,900	2,250	2,200	1,200	2,050
2	1,250	1,850	1,900	1,580	1,850	1,800	1,900	3,550	2,350	1,800	1,450	630
3	1,500	1,750	1,300	1,450	1,580	1,850	4,900	3,450	1,400	1,650	1,150	1,450
4	1,450	2,150	1,800	1,580	1,220	1,300	10,500	3,050	1,850	450	1,350	2,050
5	1,500	1,300	1,350	1,580	1,580	1,500	26,200	3,450	2,300	1,650	500	3,750
6	1,400	1,250	1,450	1,450	1,850	2,140	35,800	2,800	2,300	2,450	1,300	4,250
7	1,450	1,350	1,500	1,220	1,990	2,430	31,700	2,800	2,300	3,000	1,350	3,400
8	900	1,550	1,350	1,450	1,710	2,140	24,000	3,300	2,050	2,550	1,450	3,600
9	1,500	2,000	1,450	1,710	1,990	1,850	19,400	3,350	2,150	2,100	1,450	1,330
10	1,400	2,350	1,100	1,710	1,850	1,990	17,500	3,250	1,300	2,700	1,200	3,080
11	1,300	1,400	2,350	1,450	1,200	1,100	15,400	2,850	1,650	2,800	600	1,450
12	1,300	1,300	1,500	1,710	1,700	1,450	13,400	2,900	2,000	2,200	165	1,710
13	1,300	1,650	1,500	1,990	1,750	1,710	9,900	1,950	2,000	1,950	1,150	1,780
14	1,450	1,300	1,450	1,330	2,150	1,780	9,250	2,100	2,200	1,950	1,150	1,780
15	750	1,300	900	1,850	2,100	1,920	4,550	2,500	2,400	750	1,150	2,060
16	1,350	1,400	1,200	1,780	1,950	1,920	5,600	2,400	2,200	1,450	1,050	205
17	1,250	1,350	1,000	1,710	1,800	2,950	5,100	2,300	950	1,750	1,200	3,270
18	1,550	1,300	2,050	1,580	1,100	2,850	5,450	2,250	1,300	1,900	900	4,360
19	1,650	900	1,650	1,850	1,710	2,450	4,950	2,400	1,800	1,350	1,200	4,470
20	1,600	1,250	1,800	1,780	1,580	1,900	4,950	1,300	1,900	1,450	1,200	6,740
21	1,850	1,250	1,950	1,000	1,220	2,550	5,100	1,950	1,900	2,200	1,150	3,900
22	1,200	1,400	1,950	1,110	1,580	2,550	5,750	2,600	1,900	1,000	1,050	3,250
23	1,200	1,550	1,850	1,580	1,710	2,400	3,750	4,250	1,800	1,450	1,150	1,500
24	1,500	1,750	1,100	1,850	1,450	1,900	4,700	4,150	950	1,450	1,200	2,150
25	1,400	1,900	1,850	1,990	1,220	1,500	4,150	4,000	1,350	1,550	1,700	3,250
26	1,350	1,250	2,140	1,850	1,710	1,850	3,550	3,450	2,550	1,500	690	4,950
27	1,400	1,150	1,710	2,140	1,450	1,650	3,500	1,750	4,400	1,400	1,200	13,700
28	1,450	1,500	1,580	1,110	1,710	1,950	3,650	2,200	5,650	1,200	1,250	21,800
29	900	1,800	1,450	2,280		2,050	3,150	2,500	4,300	850	1,250	20,100
30	1,300	1,250	1,710	2,140		2,200	3,250	1,950	4,200	1,400	1,450	13,500
31	1,850		1,110	1,990		1,800		1,450		1,400	2,100	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	1,850	750	1,360	0.247	0.28
November	2,350	900	1,520	.276	.31
December	2,350	900	1,553	.282	.33
January	2,280	1,000	1,649	.300	.35
February	2,150	1,100	1,670	.304	.32
March	2,950	1,100	1,975	.359	.41
April	35,800	1,600	9,753	1.77	1.98
May	4,250	1,300	2,777	.505	.58
June	5,650	950	2,255	.410	.46
July	3,000	450	1,726	.314	.36
August	2,100	165	1,173	.213	.25
September	21,800	205	4,717	.858	.96
The year	35,800	165	2,665	.485	6.59

Wisconsin River at Muscoda, Wis.

Location.- Water-stage recorder in sec. 1, T. 8 N., R. 1 W., at highway bridge half a mile above Eagle Mill Creek and 1 mile north of Muscoda. Zero of gage is 664.3 feet above mean sea level.

Drainage area.- 10,300 square miles.

Records available.- December 1902 to December 1903, December 1913 to September 1934.

Average discharge.- 20 years (1914-1934), 8,546 second-feet.

Extremes.- Maximum discharge during year, 36,800 second-feet Apr. 12 (gage height, 7.50 feet); minimum, 2,320 second-feet Aug. 21; minimum daily discharge, 2,480 second-feet Aug. 27, 28.

1902-3, 1913-34: Maximum discharge, 72,100 second-feet Apr. 16, 1922 (gage height, 10.60 feet); minimum (estimated), 1,600 second-feet Dec. 20, 1921; minimum daily discharge, 2,000 second-feet Feb. 11, 1918.

Maximum stage known, 11.1 feet during August 1868; gage datum unknown.

Remarks.- Records good except those for periods of ice effect, Nov. 15-18, Dec. 24 to Mar. 28, which are fair. Flow regulated by storage reservoirs and power plants upstream.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,300	3,400	3,500	3,700	4,400	3,700	4,300	6,260	3,110	6,420	3,110	2,620
2	3,400	3,020	3,600	3,700	4,200	3,600	5,160	4,500	3,300	4,700	2,940	2,620
3	3,500	3,110	3,700	3,600	4,200	3,400	7,090	4,400	3,200	4,400	2,940	2,780
4	3,400	3,200	3,700	3,500	4,200	3,400	9,700	4,600	3,200	4,100	2,850	3,800
5	3,200	3,600	3,500	3,700	4,300	3,400	8,530	6,100	3,300	4,100	2,760	4,100
6	3,200	3,800	3,700	3,800	3,800	3,500	7,090	7,090	3,400	3,700	2,700	4,100
7	3,300	3,500	3,500	3,700	3,800	3,700	7,980	7,260	3,300	3,900	2,620	4,100
8	3,400	3,700	3,500	4,100	3,400	3,500	8,720	5,930	3,200	3,600	2,850	4,800
9	3,500	3,500	3,600	3,600	2,850	2,850	17,200	4,300	3,400	3,300	2,780	4,700
10	3,700	3,600	3,700	3,600	3,110	3,020	24,600	4,000	3,110	3,900	2,620	6,590
11	3,500	3,500	3,300	3,500	3,020	3,500	32,100	4,000	3,110	5,030	3,020	4,700
12	3,400	3,500	3,500	3,600	3,300	4,300	34,400	3,900	3,020	5,160	3,200	3,900
13	3,400	3,400	3,700	4,000	3,600	4,100	30,000	4,600	3,200	4,200	3,200	4,000
14	3,300	3,500	3,600	4,200	3,400	3,110	25,800	6,260	2,940	4,500	2,700	4,200
15	3,300	3,700	3,550	3,800	3,300	2,850	20,400	6,100	3,110	4,500	2,940	4,700
16	3,600	3,400	3,600	3,600	3,500	2,850	17,700	4,500	3,110	4,300	2,780	4,920
17	3,700	3,700	3,600	3,400	3,200	3,020	11,900	4,000	2,940	3,600	2,700	4,500
18	3,600	3,900	3,600	3,020	3,300	3,500	12,400	3,800	3,600	3,500	2,620	4,800
19	3,400	3,500	3,550	3,600	2,850	3,700	10,300	4,000	3,600	3,600	3,400	4,700
20	3,400	3,400	3,500	3,400	2,850	3,200	9,100	4,400	3,900	3,900	2,620	4,800
21	3,400	3,200	3,450	3,600	3,200	3,500	8,720	4,700	3,400	3,800	2,550	4,800
22	3,500	3,200	3,400	4,000	3,110	3,500	8,530	4,000	3,400	3,200	2,950	6,590
23	3,300	3,110	3,300	4,500	2,850	3,200	8,340	3,800	3,110	3,200	2,780	6,920
24	3,500	3,200	3,250	4,200	2,850	3,800	9,100	3,500	2,850	3,200	2,780	7,440
25	3,500	3,200	3,200	4,100	2,940	3,500	8,160	3,300	2,850	3,110	2,620	5,930
26	3,400	3,400	3,150	3,400	3,200	3,020	8,340	3,600	3,110	3,020	2,550	4,300
27	3,300	3,800	3,000	4,000	3,400	3,500	8,720	4,100	3,110	3,110	2,480	4,600
28	3,200	3,500	3,050	4,200	3,700	4,100	7,800	6,590	3,200	3,110	2,480	4,920
29	3,400	3,600	3,200	2,780		3,800	7,980	6,100	4,000	3,110	2,700	6,260
30	3,020	3,700	3,400	3,600		4,100	7,980	4,000	5,760	3,200	2,780	9,900
31	3,200		3,700	4,400		4,800		3,300		3,110	2,620	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	3,700	3,020	3,394	0.330	0.38
November	3,900	3,020	3,461	.336	.37
December	3,700	3,000	3,471	.337	.39
January	4,500	2,780	3,732	.362	.42
February	4,700	2,850	3,440	.334	.35
March	4,500	2,850	3,501	.340	.39
April	34,400	4,300	12,940	1.26	1.41
May	7,260	3,300	4,742	.460	.53
June	5,760	2,850	3,328	.323	.36
July	6,420	3,020	3,857	.374	.43
August	3,400	2,480	2,795	.271	.31
September	9,900	2,620	4,910	.477	.53
The year	34,400	2,480	4,454	.432	5.87

Tomahawk River at Tomahawk, Wis.

Location.- In sec. 28, T. 35 N., R. 6 E., at Jersey power plant of Wisconsin Public Service Corporation, 1 mile north of Tomahawk.

Drainage area.- 547 square miles.

Records available.- January 1930 to September 1934.

Extremes.- Maximum daily discharge during year, 612 second-feet June 8; no flow several times in April, May, September.
1930-34: Maximum daily discharge, 1,220 second-feet Sept. 13, 1930; no flow several times in 1931, 1934.

Remarks.- Records good. Records of discharge, computed from power plant records, furnished by Wisconsin Public Service Corporation. Flow completely regulated by four reservoirs operated by the Wisconsin Valley Improvement Co. in the interest of power development. Part of table of monthly discharge corrected for storage in all four reservoirs upstream.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	415	352	302	304	304	432	339	371	246	366	336	444
2	415	352	302	304	327	330	317	321	271	314	336	444
3	415	352	302	304	326	330	301	233	329	227	336	495
4	370	352	304	304	299	352	199	218	465	370	336	363
5	382	352	304	304	293	353	214	262	604	364	338	206
6	387	352	304	304	305	353	0	147	540	387	422	0
7	387	352	305	304	306	353	160	103	572	389	490	143
8	387	352	323	304	306	338	0	0	612	346	490	262
9	387	342	323	304	293	346	151	63	463	497	507	255
10	387	319	323	291	287	353	50	69	370	589	523	244
11	387	319	308	287	287	353	55	55	472	537	491	244
12	387	272	304	319	304	342	0	52	569	518	493	244
13	376	302	304	300	304	330	50	126	554	506	493	328
14	362	302	310	326	304	330	61	104	559	491	493	472
15	362	302	324	287	287	334	0	187	576	526	493	426
16	362	302	306	287	287	353	0	231	540	412	493	232
17	362	302	304	294	287	353	0	263	540	319	493	249
18	316	302	304	291	383	341	134	218	564	319	493	174
19	320	302	309	287	399	338	134	204	540	362	511	132
20	342	302	323	287	386	345	0	247	523	355	491	161
21	362	302	308	289	385	399	0	247	354	363	491	167
22	422	302	304	330	388	399	0	239	336	336	491	154
23	406	302	312	297	388	391	168	207	336	336	394	154
24	359	302	323	289	388	389	287	238	382	336	386	154
25	357	302	323	304	388	366	287	247	358	336	468	227
26	357	302	304	304	388	372	225	247	395	332	513	210
27	357	302	304	304	353	366	133	218	348	336	460	184
28	357	302	304	309	356	366	77	239	368	336	444	184
29	340	302	304	328		366	294	233	387	336	461	155
30	315	302	304	311		296	351	188	387	336	456	107
31	336		304	304		339		228		336	444	

Month	Observed			Gain or loss in storage (Millions of cubic feet)	Corrected for storage		
	Maximum	Minimum	Mean		Mean	Per square mile	Run-off in inches
October	422	315	370	-191	299	0.547	0.63
November	352	272	317	-87	283	.517	.58
December	324	302	309	-38	295	.539	.62
January	330	287	302	-88	269	.492	.57
February	399	287	332	-304	206	.377	.39
March	432	296	355	-70	329	.601	.69
April	351	0	133	+2,882	1,245	2.28	2.54
May	371	0	194	+412	348	.636	.73
June	612	246	452	-504	258	.472	.53
July	589	227	384	-576	168	.307	.35
August	523	336	454	-975	90	.165	.19
September	495	0	240	+1,568	845	.154	1.72
The year	612	0	321	+2,027	385	.704	9.54

Rib River at Rib Falls, Wis.

Location.- Chain gage in NW¼ sec. 27, T. 29 N., R. 5 E., at highway bridge in Rib Falls, 6 miles below mouth of Black Creek.

Drainage area.- 309 square miles.

Records available.- May 1925 to September 1934.

Extremes.- Maximum discharge recorded during year, 11,300 second-feet Sept. 26 (gage height, 9.7 feet); minimum recorded, 9.1 second-feet Aug. 14-18.
1925-34: Maximum discharge recorded, 12,500 second-feet Aug. 21, 1926 (gage height, 10.10 feet); minimum (estimated), 3 second-feet Jan. 23, 1930.

Remarks.- Records good except those for period of ice effect, Nov. 11 to Dec. 4, Dec. 7 to Apr. 2, which are fair.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	20	38	18	16	34	32	49	128	30	43	13	22
2	18	35	18	16	34	40	49	134	24	34	13	35
3	18	32	21	16	34	69	6,040	134	20	25	15	181
4	18	30	31	16	34	298	3,730	122	18	23	13	239
5	18	30	43	16	34	427	4,430	116	20	25	15	110
6	20	30	37	16	34	188	3,410	110	20	51	12	69
7	20	27	27	16	34	154	2,450	94	20	31	10	42
8	22	24	21	16	34	122	1,710	78	22	23	10	30
9	24	24	19	16	34	94	1,530	69	239	23	12	24
10	24	24	18	16	34	40	1,150	60	147	25	12	20
11	24	23	17	17	34	38	890	56	83	25	12	22
12	22	21	17	17	37	37	548	49	56	21	10	22
13	22	18	17	17	37	94	450	49	49	17	10	22
14	22	16	17	18	37	81	339	56	35	15	9.1	20
15	52	14	17	18	37	94	298	52	30	15	9.1	42
16	45	13	17	18	38	107	239	49	24	15	9.1	360
17	35	13	17	18	37	137	220	42	22	13	9.1	278
18	35	14	17	18	37	94	202	49	27	12	9.1	167
19	35	14	17	19	37	69	318	52	24	12	12	110
20	32	18	17	19	37	81	258	65	22	12	14	110
21	32	23	17	19	37	94	239	134	21	12	16	74
22	30	24	17	21	37	86	220	548	21	12	13	69
23	27	24	17	23	37	65	239	258	19	12	16	69
24	27	24	17	25	36	51	220	167	19	10	16	258
25	27	21	17	42	35	43	188	128	25	10	18	523
26	32	21	17	51	35	38	167	94	830	10	14	10,600
27	32	21	17	51	34	34	147	69	339	12	13	5,200
28	27	21	17	51	32	34	134	56	150	10	13	1,900
29	32	21	17	51		34	122	49	96	12	13	1,080
30	35	21	17	42		38	122	38	58	12	13	830
31	38		17	34		49		32		12	16	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	52	18	27.9	0.090	0.10
November	38	13	22.6	.073	.08
December	43	17	19.7	.064	.07
January	51	16	24.2	.078	.09
February	38	32	35.4	.115	.12
March	427	32	92.3	.299	.34
April	6,040	49	1,004	3.25	3.63
May	548	32	101	.327	.38
June	830	18	83.7	.271	.30
July	51	10	18.8	.061	.07
August	18	9.1	12.6	.041	.05
September	10,600	20	751	2.43	2.71
The year	10,600	9.1	181	.586	7.94

Yellow River at Sprague, Wis.

Location.- Chain gage in NW¼ sec. 11, T. 19 N., R. 3 E., 1 mile southeast of Sprague and 10 miles above Necedah Dam.

Drainage area.- 436 square miles.

Records available.- September 1926 to September 1934.

Extremes.- Maximum discharge recorded during year, 1,350 second-feet Apr. 6 (gage height, 10.2 feet); minimum (estimated), 6.2 second-feet Feb. 27, Mar. 3.
1926-33: Maximum discharge (estimated), 2,660 second-feet Sept. 17, 1928; minimum, 5.4 second-feet Sept. 9, 1933.

Remarks.- Records poor at low stages; fair at medium stages. Stage-discharge relation affected by ice Nov. 12-23, Dec. 7 to Apr. 3. Discharge interpolated for Oct. 1, 8, 15, 22, 29, Nov. 5, 12, 19, 26, Apr. 7, 8.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.8	11	12	10	35	7.4	24	68	30	224	32	27
2	6.8	11	14	9.2	32	7.1	23	68	28	143	24	27
3	6.8	10	17	10	30	6.2	43	65	26	114	22	32
4	6.5	10	16	10	26	6.8	110	65	26	88	20	37
5	6.5	10	15	9.8	26	8.3	623	62	26	74	24	43
6	6.8	10	13	9.8	22	7.7	1,350	62	24	81	26	123
7	7.1	10	13	9.2	20	7.4	1,280	58	22	78	26	123
8	7.7	10	12	8.6	18	6.8	1,280	58	22	71	28	114
9	8.3	11	11	8.6	20	13	1,220	55	26	65	26	88
10	8.3	12	9.8	9.2	16	81	716	52	24	88	22	74
11	8.3	11	9.8	8.9	17	68	403	62	28	92	22	68
12	7.7	10	9.8	9.5	17	49	278	52	26	88	20	58
13	7.7	10	9.8	10	18	38	237	49	24	81	20	52
14	7.4	9.8	9.8	9.5	16	38	200	52	22	68	18	71
15	8.6	9.8	9.8	8.6	17	30	165	49	24	58	18	68
16	9.8	9.8	9.8	9.8	15	30	143	49	20	52	17	65
17	11	9.8	9.8	7.7	15	23	133	49	18	49	17	237
18	9.8	11	9.8	8.3	13	24	118	55	18	46	17	212
19	9.8	11	9.8	7.7	10	20	114	46	17	43	17	154
20	9.8	11	9.5	7.7	10	20	133	40	17	40	17	114
21	9.5	11	8.9	6.8	12	21	110	46	17	38	17	100
22	9.6	11	9.5	8.0	8.3	30	118	46	14	32	18	81
23	9.8	11	9.8	6.5	11	26	96	46	13	30	24	84
24	9.8	12	10	7.1	9.8	22	88	55	13	30	24	88
25	10	12	9.5	8.0	9.8	24	88	46	26	28	22	88
26	11	11	8.3	9.8	9.5	20	84	46	55	26	22	88
27	11	9.8	13	6.5	6.2	20	81	40	278	26	24	224
28	11	9.8	11	68	8.6	20	78	46	601	24	24	789
29	12	11	11	84		20	74	38	623	24	24	1,100
30	12	10	10	55		33	71	35	403	24	20	924
31	12		11	38		27		33		24	24	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	12	6.5	9.01	0.021	0.02
November	12	9.8	10.6	.024	.03
December	17	8.3	11.1	.025	.03
January	84	6.5	15.5	.036	.04
February	35	6.2	16.7	.038	.04
March	81	6.2	24.3	.056	.06
April	1,350	23	316	.725	.81
May	68	33	51.4	.118	.14
June	623	13	83.7	.192	.21
July	224	24	62.9	.144	.17
August	32	17	22.1	.051	.06
September	1,100	27	178	.408	.46
The year	1,350	6.2	66.3	.152	2.07

Kickapoo River at Gays Mills, Wis.

Location.- Chain gage in sec. 28, T. 10 N., R. 4 W., at highway bridge just below dam and power plant of Interstate Power Co. in Gays Mills, 2 miles below mouth of Tainter Creek.

Drainage area.- 629 square miles.

Records available.- December 1913 to June 1934 (discontinued).

Average discharge.- 19 years (1914-33), 429 second-feet.

Extremes.- Maximum discharge recorded during period, 5,550 second-feet Apr. 5 (gage height, 12.75 feet); minimum recorded, 55 second-feet May 24 (gage height, 0.44 foot).

1913-34: Maximum discharge, 7,350 second-feet Mar. 31, 1933 (gage height, 13.96 feet); minimum, 48 second-feet July 27, 1931 (gage height, 0.51 foot).

Remarks.- Records poor. Stage-discharge relation affected by ice Nov. 15-19, Dec. 10-21, Dec. 24 to Jan. 19, Jan. 29 to Feb. 16, Feb. 20 to Mar. 11. Considerable diurnal fluctuation caused by operation of power plant above station.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	222	236	222	376	236	182	334	182	98			
2	222	236	222	348	236	182	1,690	169	156			
3	222	208	276	264	236	208	3,700	162	150			
4	208	208	292	222	236	222	4,670	162	110			
5	208	222	292	222	236	222	5,000	156	195			
6	222	222	264	222	208	222	2,080	156	110			
7	222	236	250	195	208	222	622	150	110			
8	250	222	250	182	182	195	406	156	130			
9	320	222	236	195	182	182	348	150	169			
10	320	222	195	182	182	195	334	150	250			
11	292	236	162	182	169	195	320	156	208			
12	250	222	156	169	169	250	320	162	130			
13	250	236	169	195	169	250	278	278	117			
14	236	222	162	195	195	250	236	264	117			
15	236	169	169	182	208	250	222	236	117			
16	250	162	169	150	208	250	222	222	117			
17	306	169	169	136	236	278	236	182	169			
18	292	195	182	162	222	278	250	169	130			
19	264	162	182	156	278	250	222	169	117			
20	236	250	182	222	236	264	222	189	130			
21	250	236	162	222	236	236	236	169	138			
22	264	250	222	1,280	195	222	222	143	195			
23	250	250	222	1,640	169	222	208	130	130			
24	250	236	162	1,260	182	208	208	104	75			
25	250	222	169	975	182	208	222	104	182			
26	250	236	156	694	169	208	222	104	143			
27	236	236	195	422	182	208	208	117	502			
28	222	250	195	470	182	222	222	110	306			
29	236	250	195	278		222	208	124	130			
30	236	250	195	250		208	169	156	162			
31	236		222	222		208		98				

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	320	208	249	0.396	0.46
November	250	162	223	.355	.40
December	292	156	204	.324	.37
January	1,840	136	382	.607	.70
February	278	169	205	.326	.34
March	278	182	223	.355	.41
April	5,000	169	795	1.26	1.41
May	278	98	160	.254	.29
June	502	75	160	.254	.28
July					
August					
September					
The year					

Kickapoo River at Steuben, Wis.

Location.- Chain gage in SW¼ sec. 9, T. 8 N., R. 4 W., at highway bridge in Steuben, 1½ miles above Duffy Creek and 15 miles above mouth. Zero of gage is 659.0 feet above mean sea level.

Drainage area.- 699 square miles.

Records available.- May 1933 to September 1934.

Extremes.- Maximum discharge recorded during period May to September 1933, 4,290 second-feet July 3 (gage height, 9.06 feet); minimum discharge recorded, 200 second-feet Aug. 14, 26, 29, Sept. 1, 2.
1934: 5,830 second-feet Apr. 5 (gage height, 10.32 feet); minimum recorded, 167 second-feet Aug. 30 (gage height, 1.12 feet).

Remarks.- Records fair except those for period of ice effect, Nov. 16 to Mar. 11, and those above 1,000 second-feet, which are poor. Diurnal regulation caused by operation of power plant at Gays Mills, 15 miles upstream.

Discharge, in second-feet, 1933

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1									429	258	238	200
2									375	2,180	258	200
3									341	3,670	258	209
4									341	3,550	248	218
5									326	619	248	289
6									312	375	228	312
7									300	326	228	268
8									289	312	228	248
9									289	289	218	218
10									326	278	218	218
11									289	278	218	228
12									278	268	238	447
13									268	268	209	675
14									248	239	200	341
15									258	312	209	278
16									248	268	209	278
17									258	258	209	268
18									248	248	218	258
19									248	228	258	248
20									248	238	228	258
21									238	248	218	248
22									248	393	209	228
23								548	238	466	209	238
24								485	258	326	209	228
25								447	268	278	248	228
26								393	248	258	209	248
27								375	248	248	209	258
28								341	248	238	200	289
29								429	228	228	200	268
30								771	238	228	209	248
31								619		228	209	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October					
November					
December					
January					
February					
March					
April					
May 23-31	771	341	490	0.701	0.23
June	429	228	279	.399	.45
July	3,670	228	569	.814	.94
August	258	200	222	.318	.37
September	675	200	271	.388	.43
The year					

Kickapoo River at Steuben, Wis.

(Continued)

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	248	258	248	268	248	191	341	248	200	228	228	209
2	238	258	238	268	248	191	1,840	248	200	200	209	200
3	248	248	248	278	248	209	2,460	228	200	191	218	278
4	228	238	289	278	248	218	4,920	248	200	191	200	706
5	228	248	268	278	238	248	5,830	228	191	200	200	675
6	238	248	238	278	238	268	4,660	228	209	191	228	447
7	228	248	238	278	238	268	1,630	228	200	505	191	258
8	238	258	228	278	238	278	619	238	200	594	200	228
9	289	248	228	278	228	278	505	228	209	268	209	218
10	341	248	218	278	228	289	429	228	238	943	191	209
11	289	238	209	278	228	289	429	218	248	447	191	258
12	268	248	248	278	228	289	393	228	218	289	191	218
13	268	248	268	268	228	268	375	278	209	258	191	228
14	258	248	278	268	218	258	326	300	200	238	191	228
15	258	228	268	258	218	248	326	268	191	228	218	248
16	268	218	258	258	218	258	312	248	200	228	191	238
17	289	218	248	258	209	268	289	238	200	218	200	238
18	300	238	248	248	209	300	300	228	200	218	191	238
19	278	248	248	248	200	258	289	218	191	326	183	228
20	268	248	248	248	200	248	289	218	191	943	183	238
21	268	248	248	248	191	258	278	218	191	312	218	238
22	268	248	248	248	191	258	278	209	191	268	183	238
23	258	248	248	248	191	248	278	209	191	218	183	238
24	268	248	258	248	191	238	278	209	191	209	183	238
25	258	248	258	248	183	238	268	209	200	209	183	218
26	258	248	258	248	183	238	268	209	248	218	183	218
27	258	248	258	248	183	248	258	209	258	646	175	218
28	258	248	258	248	183	238	258	200	675	981	175	228
29	258	248	258	248		238	258	209	228	300	175	248
30	248	248	258	248		248	238	200	218	258	175	228
31	248		268	248		238		200		238	183	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	341	228	262	0.375	0.43
November	258	218	245	.351	.39
December	289	209	251	.359	.41
January	278	248	261	.373	.43
February	248	183	216	.309	.32
March	300	191	252	.361	.42
April	5,830	238	974	1.39	1.55
May	300	200	228	.326	.38
June	675	191	223	.319	.36
July	981	191	347	.496	.57
August	228	175	194	.278	.32
September	706	200	270	.386	.43
The year	5,830	175	310	.443	6.01

Turkey River at Elkader, Iowa

Location.- Wire gage in sec. 23, T. 93 N., R. 5 W., in tailrace of Interstate Power Co.'s hydroelectric plant in Elkader, Iowa.

Drainage area.- 892 square miles.

Records available.- July 1933 to September 1934.

Extremes.- 1933-34: Maximum discharge, 11,800 second-feet July 2, 1933 (gage height, 14.2 feet); minimum, about 15 second-feet at numerous times when power plant was shut down; minimum daily discharge, 25 second-feet June 14, 29, 30, 1934.

Remarks.- Records fair. Daily-discharge record furnished by Interstate Power Co.

Discharge, in second-feet, 1933

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1										275	119	66
2										7,170	148	60
3										4,220	157	72
4										2,580	112	84
5										1,220	140	77
6										614	128	87
7										470	122	77
8										342	117	63
9										287	122	74
10										272	114	62
11										250	111	70
12										241	111	69
13										231	97	85
14										252	100	84
15										486	90	106
16										244	93	131
17										224	92	85
18										196	88	81
19										184	92	101
20										179	86	77
21										172	84	72
22										241	85	60
23										164	83	72
24										179	89	60
25										176	81	68
26										163	84	92
27										151	74	83
28										135	72	89
29										135	72	89
30										132	66	83
31										120	60	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October					
November					
December					
January					
February					
March					
April					
May					
June					
July	7,170	120	700	0.785	0.90
August	157	60	99.6	.112	.13
September	131	60	79.3	.089	.10
The year					

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Turkey River at Elkader, Iowa

(Continued)

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	77	78	71	107	363	67	356	64	40	33	40	46
2	66	71	65	96	252	73	1,320	95	29	30	33	50
3	60	86	80	75	206	109	1,160	72	50	28	37	280
4	66	73	84	86	128	120	1,740	84	34	49	52	413
5	71	84	80	132	135	132	1,490	84	52	104	835	124
6	56	86	85	121	135	98	1,000	93	52	173	329	100
7	71	69	77	109	123	90	454	49	28	55	122	89
8	64	69	77	80	111	86	317	90	31	33	77	79
9	68	73	69	91	86	63	182	68	182	75	103	71
10	80	69	61	90	90	90	169	73	57	1,550	86	62
11	66	71	36	86	90	80	264	71	52	383	98	105
12	72	83	59	71	92	88	220	68	43	91	98	86
13	60	57	65	86	94	92	206	79	42	77	70	67
14	83	77	61	69	110	115	185	71	25	63	57	73
15	70	40	59	69	102	94	166	84	35	72	540	216
16	108	57	65	61	100	98	169	74	35	64	218	125
17	177	61	65	57	86	111	146	98	230	225	56	77
18	115	61	48	65	100	88	144	79	750	350	70	91
19	115	80	65	57	73	82	142	67	189	264	69	81
20	107	69	65	52	75	92	122	62	101	74	47	79
21	103	78	50	102	90	112	131	33	74	84	88	88
22	124	69	73	2,080	69	110	122	60	48	75	61	86
23	82	75	57	788	67	102	122	62	43	58	63	69
24	82	73	57	654	69	78	104	61	45	51	50	64
25	82	77	36	165	59	78	120	31	30	50	45	58
26	82	75	36	236	61	82	104	39	47	67	47	1,220
27	78	63	46	250	52	82	110	49	35	57	42	1,100
28	73	69	40	266	59	82	90	38	33	57	36	697
29	73	69	36	300		82	93	59	25	50	37	571
30	73	82	40	351		94	85	50	25	28	27	374
31	88		102	298		90		28		42	45	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	177	56	83.6	0.094	0.11
November	86	40	71.5	.080	.09
December	102	36	61.6	.069	.08
January	2,080	52	231	.259	.30
February	363	52	110	.123	.13
March	132	63	92.3	.103	.12
April	1,740	85	368	.041	.05
May	98	28	65.6	.074	.09
June	750	25	81.4	.091	.10
July	1,550	28	142	.159	.18
August	835	27	115	.129	.15
September	1,220	46	221	.248	.29
The year	2,080	25	137	.164	1.69

Turkey River at Garber, Iowa

Location.- Chain gage in sec. 36, T. 92 N., R. 4 W., at highway bridge at Garber, 2,000 feet below mouth of Elk Creek.

Drainage area.- 1,530 square miles.

Records available.- August 1913 to November 1916, May 1919 to September 1927, November 1932 to September 1934.

Extremes.- Maximum discharge recorded during year, 6,230 second-feet Jan. 22 (gage height, 11.09 feet); minimum discharge recorded, 46 second-feet June 29 (gage height, 3.20 feet); minimum daily discharge, 55 second-feet June 29.
1913-16, 1919-27, 1932-34: Maximum discharge recorded, about 26,600 second-feet Feb. 23, 1922 (gage height, 28.06 feet); minimum, that of June 29, 1934.

Remarks.- Records fair. Discharge estimated because of ice Dec. 8 to Jan. 19, Feb. 5 to Mar. 4. Diurnal fluctuation caused by operation of hydroelectric plant at Elkader.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	116	109	104	180	376	115	354	129	67	68	66	101
2	121	116	116	160	422	130	2,660	112	59	61	74	84
3	114	121	138	120	422	210	2,120	120	70	60	70	118
4	111	121	124	160	354	300	2,390	116	68	62	75	1,420
5	116	116	121	220	240	376	1,760	123	80	222	376	293
6	121	121	111	210	230	256	1,500	105	91	712	615	274
7	128	128	111	180	220	239	679	101	80	127	206	156
8	138	124	115	130	210	180	472	101	68	91	108	123
9	137	131	105	150	140	163	399	123	313	99	239	114
10	124	126	100	145	145	185	354	105	134	5,200	293	106
11	137	124	90	130	150	160	333	108	101	820	222	447
12	135	124	95	130	155	256	256	91	89	258	148	169
13	118	131	100	125	160	206	239	105	69	274	131	123
14	104	131	100	120	170	171	239	110	80	156	105	99
15	112	128	100	115	170	206	239	97	74	134	1,340	2,570
16	243	131	100	115	160	169	239	91	66	125	584	293
17	350	112	95	110	150	171	191	105	80	206	222	206
18	164	109	90	110	150	191	185	94	80	333	129	206
19	167	110	90	110	145	191	158	97	399	499	127	177
20	160	124	95	111	140	160	191	94	140	206	116	156
21	224	116	100	128	135	166	166	84	118	134	92	183
22	221	107	100	5,670	130	163	158	89	114	106	153	171
23	164	107	100	3,400	120	177	158	83	91	94	108	150
24	175	119	95	1,760	115	177	163	78	150	81	91	127
25	151	111	90	980	105	150	129	81	77	84	92	114
26	138	111	90	555	100	156	158	67	77	91	89	239
27	126	116	95	499	90	143	140	61	65	97	87	1,260
28	124	112	90	472	100	140	138	80	73	101	73	780
29	116	104	90	354		166	129	75	55	81	78	584
30	119	108	100	555		177	177	70	62	81	75	422
31	119		160	555		171		73		67	78	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	350	104	148	0.097	0.11
November	131	104	118	.077	.09
December	138	90	104	.068	.08
January	5,670	110	573	.374	.43
February	422	90	186	.122	.13
March	376	115	188	.123	.14
April	2,660	129	549	.359	.40
May	129	61	95.7	.062	.07
June	399	55	103	.067	.07
July	5,200	60	346	.226	.26
August	1,340	66	202	.132	.15
September	2,570	84	376	.246	.27
The year	5,670	55	249	.163	2.20

Maquoketa River near Manchester, Iowa

Location.- Water-stage recorder in sec. 9, T. 88 N., R. 5 W., 2 miles southeast of Manchester. Zero of gage is 895.06 feet above mean sea level.

Drainage area.- 306 square miles.

Records available.- April 1933 to September 1934.

Extremes.- 1933-34: Maximum discharge, 2,850 second-feet May 20, 1933 (gage height, 8.38 feet); minimum, 3 second-feet at numerous times during May and June, 1934; minimum daily discharge, 6 second-feet June 8, 29, 1934.

Remarks.- Records fair. Large diurnal fluctuation caused by operation of power plant 2 miles above station. Discharge estimated because of ice Dec. 26 to Jan. 8, Jan. 29 to Feb. 5. Gage-height record furnished by Iowa Electric Co.

Discharge, in second-feet, 1933

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1								86	224	136	57	30
2								107	201	462	67	31
3								88	176	338	64	33
4								94	127	198	57	30
5								92	127	134	53	27
6								99	111	116	62	34
7								109	125	107	50	28
8								150	109	105	52	28
9								147	111	111	53	31
10								118	99	86	53	30
11								103	101	82	48	37
12								552	92	78	44	31
13								572	86	64	45	48
14								276	86	58	37	48
15								235	80	67	34	44
16								326	75	62	34	42
17								243	75	57	47	42
18								447	75	57	36	31
19								1,210	65	53	21	37
20								2,520	62	53	21	34
21								1,150	67	52	31	36
22								552	55	67	37	33
23								444	75	80	40	34
24								338	84	53	48	40
25							88	279	84	52	34	42
26							76	262	69	50	33	103
27							80	246	65	48	39	50
28							88	230	64	47	37	50
29							80	243	65	47	31	45
30							103	268	67	48	18	44
31								254		36	44	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October					
November					
December					
January					
February					
March					
April 25-30	103	76	85.8	0.280	0.06
May	2,520	86	382	1.25	1.44
June	224	55	96.7	.316	.35
July	462	36	96.9	.317	.37
August	67	18	42.8	.140	.16
September	103	27	39.1	.128	.14
The year					

Maquoketa River near Manchester, Iowa

(Continued)

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	40	36	41			46	42	27	10	38	30	29
2	40	41	36			47	47	26	10	25	23	44
3	36	34	53		44	52	54	27	13	16	30	59
4	34	40	52			44	56	26	11	21	27	54
5	33	41	40	44		54	58	25	12	147	56	38
6	37	38	33		54	67	39	26	12	89	52	48
7	39	42	55		53	48	44	27	9	54	47	25
8	44	37	40		62	48	46	30	6	39	26	32
9	45	34	33	40	64	49	46	32	7	23	51	49
10	43	34	34	37	61	49	41	26	12	114	48	25
11	40	44	54	34	45	37	36	24	10	60	43	30
12	40	37	57	36	49	47	36	28	11	106	55	40
13	36	44	40	66	56	46	33	26	10	144	25	29
14	40	33	40	52	42	54	32	26	12	229	26	29
15	44	39	37	54	42	35	34	27	15	88	52	71
16	37	50	36	49	41	34	35	26	13	92	65	87
17	39	42	31	54	41	56	33	26	21	144	44	43
18	28	38	36	53	42	45	33	24	18	117	44	71
19	37	31	32	47	51	36	30	20	15	76	40	32
20	40	41	33	51	48	37	27	20	16	68	30	40
21	44	39	40	52	41	34	31	23	15	52	25	69
22	50	31	31	480	46	34	30	21	12	56	24	46
23	39	43	36	420	59	34	24	21	11	39	25	54
24	42	37	32	188	62	32	29	20	11	45	19	46
25	37	39	60	126	59	35	28	17	11	35	21	53
26	34	37		118	46	34	30	17	12	28	38	44
27	37	40		100	46	34	27	13	10	32	29	45
28	44	36	44	74	45	29	25	13	8	27	27	44
29	45	34				33	26	14	6	40	22	38
30	43	33		44		46	27	14	11	30	22	36
31	40					38		12		26	22	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	50	28	39.6	0.129	0.15
November	50	31	38.1	.125	.14
December	60	31	41.2	.135	.16
January	480	34	84.4	.276	.32
February	64	41	49.1	.160	.17
March	67	29	41.7	.136	.16
April	58	24	36.0	.118	.13
May	32	12	22.7	.074	.09
June	21	5	11.7	.038	.04
July	229	16	67.7	.221	.26
August	65	19	35.1	.115	.13
September	87	25	45.0	.147	.16
The year	480	6	42.7	.140	1.91

Maquoketa River near Delhi, Iowa

Location.- Water-stage recorder in sec. 29, T. 88 N., R. 4 W., in tailrace of Interstate Power Co.'s hydroelectric plant, 1½ miles south of Delhi. Zero of gage is 774.325 feet above mean sea level.

Drainage area.- 348 square miles.

Records available.- July 1933 to September 1934.

Extremes.- 1933-34: Maximum discharge, 1,570 second-feet July 2, 1933 (gage height, 84.6 feet); minimum, about 8 second-feet at numerous times when plant was shut down.

Remarks.- Records fair. Daily-discharge record furnished by Interstate Power Co.

Discharge, in second-feet, 1933

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1										252	81	27
2										739	85	51
3										567	145	18
4										190	206	49
5										102	8	46
6										163	17	47
7										172	69	46
8										80	32	66
9										37	47	42
10										85	56	8
11										85	54	45
12										90	27	43
13										85	117	40
14										85	42	47
15										90	39	75
16										32	37	215
17										76	42	8
18										76	47	38
19										61	61	30
20										49	8	71
21										54	47	25
22										69	47	30
23										44	47	56
24										88	47	8
25										64	47	33
26										66	47	109
27										73	28	91
28										76	47	45
29										83	35	42
30										35	37	35
31										100	37	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October					
November					
December					
January					
February					
March					
April					
May					
June					
July	739	32	125	0.359	0.41
August	206	8	55.0	.158	.18
September	215	8	49.5	.142	.16
The year					

Maquoketa River near Delhi, Iowa

(Continued)

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	164	78	70	8	49	52	8	36	8	8	33	8
2	33	49	79	56	52	52	44	36	8	25	43	31
3	31	43	15	54	49	49	50	36	12	23	85	145
4	40	47	54	54	28	34	55	36	28	89	28	153
5	40	8	48	56	54	52	124	36	74	262	8	64
6	45	49	51	52	52	52	47	8	8	228	8	74
7	117	34	43	8	60	47	8	47	30	42	36	39
8	54	43	65	51	54	47	103	8	30	8	44	8
9	155	49	56	52	54	47	39	8	8	37	100	8
10	270	49	128	49	56	47	39	32	8	100	42	28
11	81	49	54	52	8	8	34	60	16	146	94	30
12	118	54	54	62	49	48	39	38	30	158	8	31
13	51	54	50	61	54	52	40	8	8	188	60	37
14	8	44	64	8	56	47	39	25	28	169	38	78
15	8	49	53	46	52	47	8	30	30	206	34	61
16	40	47	46	41	58	45	35	35	8	184	26	8
17	33	41	8	48	60	45	40	25	8	105	35	32
18	8	41	48	48	8	28	42	17	31	51	49	90
19	26	17	52	46	52	46	40	30	21	78	8	59
20	27	17	47	49	49	8	43	8	12	68	59	56
21	45	41	52	73	54	8	36	8	23	74	68	89
22	8	41	50	464	49	207	8	36	24	8	8	70
23	40	41	57	495	52	8	34	35	23	43	43	37
24	29	41	8	339	54	8	41	35	8	84	28	42
25	8	49	21	120	8	8	45	35	24	65	31	39
26	8	8	70	60	52	35	38	37	48	39	8	42
27	102	60	41	134	41	21	38	8	8	69	34	86
28	40	52	49	35	49	35	43	30	8	39	31	42
29	8	49	49	56		48	8	30	25	8	33	59
30	41	59	63	58		49	38	8	8	8	30	8
31	8		86	52		39		28		8	8	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	270	8	54.4	0.156	0.18
November	78	8	43.4	.125	.14
December	128	8	52.6	.151	.17
January	495	8	89.9	.258	.30
February	60	8	46.9	.135	.14
March	207	8	42.5	.122	.14
April	124	8	40.2	.116	.13
May	60	8	27.4	.079	.09
June	74	8	20.2	.058	.06
July	262	8	84.4	.242	.28
August	100	8	37.4	.107	.12
September	153	8	51.8	.149	.17
The year	495	8	49.4	.142	1.92

Maquoketa River below North Fork of Maquoketa River, near Maquoketa, Iowa

Location.- Water-stage recorder in SW¼NE¼ sec. 17, T. 84 N., R. 3 E., at Bridgeport Bridge, 1,200 feet above mouth of Mill Creek and 3 miles northeast of Maquoketa.

Drainage area.- 1,550 square miles (revised).

Records available.- September 1913 to September 1934.

Average discharge.- 21 years, 917 second-feet.

Extremes.- Maximum discharge during year, 7,520 second-feet July 6 (gage height, 13.60 feet); minimum, 100 second-feet June 2 (gage height, 1.14 feet); minimum daily discharge, 130 second-feet June 30.

1913-34: Maximum discharge, 21,800 second-feet Mar. 14, 1929; maximum gage height, 22.0 feet Mar. 27, 1916; minimum discharge, 39 second-feet Sept. 15, 1931 (gage height, 0.81 foot); minimum daily discharge, 112 second-feet Aug. 22, 1931.

Remarks.- Records fair. Diurnal fluctuations at low water due to operation of power plant above station.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	250	237	250				299	198	164	1,130	254	278
2	224	220	247				282	182	141	478	224	306
3	285	186	317				299	189	150	272	257	1,420
4	274	233	306				1,230	198	152	204	211	2,290
5	250	254	303				762	198	201	5,880	613	768
6	254	254	268	*200	*210		380	211	158	6,920	201	592
7	250	257	247				372	208	170	2,360	268	489
8	274	240	233			*200	354	198	201	1,140	285	433
9	282	257	224				306	192	208	743	292	376
10	299	224	257				328	224	198	1,760	418	321
11	350	264	211				296	158	170	2,360	387	306
12	350	278	227		339		268	170	158	1,300	530	292
13	321	257	198		292		257	217	138	893	430	250
14	324	282	208		264		244	214	147	986	303	285
15	328	179	244	*210	274	299	240	208	170	902	324	406
16	292	313	264		274	292	237	179	170	678	324	453
17	250	292	271		250	313	*235	182	173	656	368	426
18	240	220	261			342	*229	179	244	722	324	335
19	233	292	250			306	*225	182	224	880	292	271
20	254	324	233			296	*220	173	164	634	282	339
21	250	299	250	317		278	*215	192	217	433	254	473
22	250	261	250	1,070		257	*211	387	189	430	233	395
23	268	*260	254	1,140	*190	244	*206	250	161	328	271	357
24	278	*265	274	970		278	*202	192	173	335	247	357
25	247	*270		858		306	198	192	161	299	217	342
26	230	*270		613		257	198	201	167	306	237	335
27	233	*260	*200	489		244	208	195	128	339	217	282
28	220	*250				224	211	173	133	303	204	292
29	247	244		*220		227	208	179	138	285	217	328
30	271	264				237	208	164	130	282	204	292
31	227					282		161		264	220	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	350	220	268	0.173	0.20
November	324	179	257	.166	.19
December	317		240	.155	.18
January	1,140		336	.217	.25
February			218	.141	.15
March			241	.155	.18
April	1,230	198	305	.197	.22
May	387	158	198	.128	.15
June	244	130	170	.110	.12
July	6,920	204	1,110	.716	.82
August	613	201	294	.190	.22
September	2,290	250	470	.303	.34
The year	6,920		344	.222	3.02

*Estimated.

WAPSIPINICON RIVER BASIN

Wapsipinicon River at Independence, Iowa

Location.- Staff gage in sec. 4, T. 88 N., R. 9 W., at Interstate Power Co.'s hydroelectric plant in Independence.

Drainage area.- 1,060 square miles.

Records available.- July 1933 to September 1934.

Extremes.- 1933-34: Maximum discharge, 1,080 second-feet July 3, 1933; maximum gage height, 86.5 feet Apr. 11, 1934; minimum discharge, about 7 second-feet at numerous times when power plant was shut down.

Remarks.- Records fair. Daily-discharge record furnished by Interstate Power Co.

Discharge, in second-feet, 1933

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1										183	71	20
2										566	84	33
3										893	69	7
4										742	58	33
5										643	97	20
6										507	7	20
7										546	97	20
8										581	46	20
9										294	46	33
10										315	46	7
11										226	58	20
12										213	97	20
13										149	7	58
14										149	46	46
15										161	33	20
16										58	33	84
17										132	33	7
18										126	33	46
19										110	33	58
20										69	7	46
21										106	46	20
22										136	20	20
23										149	46	20
24										97	33	7
25										97	33	58
26										84	46	110
27										71	7	46
28										71	46	46
29										84	33	46
30										7	20	46
31										97	20	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October					
November					
December					
January					
February					
March					
April					
May					
June					
July	893	7	247	0.233	0.27
August	97	7	43.6	.041	.05
September	110	7	34.6	.033	.04
The year					

Wapsipinicon River at Independence, Iowa

(Continued)

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7	58	58	7	123	46	8	64	8	8	8	36
2	46	58	68	7	123	46	140	64	15	8	8	8
3	33	58	46	20	136	71	159	64	8	8	8	50
4	46	58	71	71	86	36	338	78	15	8	8	68
5	33	7	71	33	152	84	449	92	15	78	8	56
6	33	58	58	58	46	91	449	8	15	64	8	64
7	46	58	58	7	84	58	572	50	8	8	8	50
8	7	46	58	78	71	46	673	78	15	8	64	36
9	46	58	58	29	71	58	781	64	29	8	8	8
10	46	46	7	33	71	84	845	64	8	29	50	64
11	46	58	46	46	58	7	684	64	15	8	50	64
12	46	7	46	58	71	84	391	64	8	8	8	50
13	33	65	46	71	71	110	373	8	15	8	50	36
14	46	61	46	7	71	65	199	78	8	134	8	37
15	7	35	33	71	71	84	213	64	8	36	8	176
16	97	20	46	33	71	78	173	50	15	214	64	8
17	58	7	7	33	71	133	186	50	8	43	8	106
18	71	58	33	33	110	36	120	50	15	50	64	162
19	71	7	33	46	58	71	134	50	8	78	8	36
20	71	58	46	52	58	71	127	8	8	78	8	78
21	110	58	33	7	7	78	172	43	43	78	43	162
22	7	58	46	434	7	78	8	43	8	8	8	92
23	71	58	58	676	84	78	162	36	22	64	43	8
24	71	58	7	486	58	78	106	36	8	43	8	50
25	71	65	46	470	46	7	64	36	8	43	8	64
26	46	7	33	255	20	78	106	22	8	43	8	78
27	58	75	20	311	20	84	99	8	8	8	8	78
28	58	58	20	286	52	71	162	22	8	43	36	292
29	7	58	20	149		47	8	22	8	8	8	468
30	58	46	58	217		74	78	8	8	22	8	386
31	71		109	149		88		15		8	36	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	110	7	48.9	0.046	0.05
November	75	7	47.4	.045	.05
December	109	7	44.7	.042	.05
January	676	7	136	.128	.15
February	152	7	70.2	.066	.07
March	133	7	68.4	.064	.07
April	845	8	266	.251	.28
May	92	8	45.3	.043	.05
June	43	8	12.4	.012	.01
July	214	8	40.4	.038	.04
August	64	8	21.5	.020	.02
September	468	8	95.7	.090	.10
The year	845	7	74.5	.070	.94

Rock River at Watertown, Wis.

Location.- Water-stage recorder in sec. 4, T. 8 N., R. 15 E., on left bank of river 700 feet below Milwaukee Street highway bridge, Watertown, and 1-1/8 miles below mouth of Silver Creek.

Records available.- June 1931 to September 1934.

Drainage area.- 971 square miles (previously published erroneously as 791).

Extremes.- Maximum discharge during year, 1,010 second-feet Apr. 4 (gage height, 3.08 feet); minimum daily discharge, 2 second-feet Aug. 5, 9, 10.
1931-34: Maximum discharge, 3,250 second-feet May 20, 1933 (gage height, 3.81 feet); minimum, 1 second-foot several times during 1931 and 1932.

Remarks.- Records good except those for low stages and those for periods of ice effect, which are poor. The operation of power plant and feed mill a quarter of a mile upstream causes considerable diurnal fluctuation.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	91	100	94	137	59	*29	291	199	105	47	23	3
2	113	122	103	127	106	50	456	178	105	47	28	3
3	115	96	116	93	48	101	688	176	100	47	26	3
4	122	115	137	116	74	68	967	206	117	44	23	3
5	93	90	95	130	75	111	886	155	114	36	2	5
6	103	97	131	114	52	92	841	190	100	7	8	4
7	112	77	132	138	*53	*82	787	160	120	19	3	3
8	60	79	119	129	*51	*79	720	174	134	6	3	3
9	132	46	105	139	*49	*77	680	664	134	45	2	3
10	81	87	*89	109	*46	*60	696	344	105	67	2	4
11	62	114	*79	115	31	*67	712	266	69	53	25	4
12	70	120	*72	147	115	*79	696	206	117	68	3	5
13	53	105	*67	178	74	*79	720	324	57	58	31	5
14	67	55	*60	175	94	87	720	286	57	37	3	6
15	42	*49	55	161	118	163	712	254	60	9	3	13
16	71	*47	73	*161	107	156	640	268	49	45	11	5
17	51	55	94	*158	*102	179	585	168	18	36	3	22
18	64	116	79	*151	*100	225	534	195	38	35	3	22
19	56	116	102	*141	*97	225	487	158	32	35	3	24
20	43	93	59	107	*79	321	421	151	32	35	3	24
21	50	102	123	112	*55	301	416	151	33	32	3	22
22	66	86	77	109	*47	190	376	137	114	12	3	24
23	50	88	114	90	*35	135	363	108	65	35	3	3
24	83	90	103	138	*23	199	341	125	29	34	14	21
25	85	91	*55	113	*12	173	384	131	49	29	12	3
26	87	40	*51	119	*18	117	364	134	49	41	3	3
27	89	114	*49	113	*18	122	344	120	49	37	3	3
28	92	123	*55	115	*22	155	282	117	35	28	3	17
29	94	102	*65	*111		115	276	114	49	6	3	20
30	96	111	*89	*102		168	183	125	49	31	3	3
31	98		216	*74		151		137		24	3	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	132	39	80.4	0.083	0.10
November	123	33	90.6	.093	.10
December	216	49	92.2	.095	.11
January	178	74	127	.131	.15
February	118	12	62.9	.065	.07
March	321	29	134	.138	.16
April	967	183	553	.570	.64
May	664	108	197	.203	.23
June	134	18	72.8	.075	.08
July	68	6	35.0	.036	.04
August	31	2	8.4	.0087	.01
September	24	3	9.4	.0097	.01
The year	967	2	122	.126	1.70

*Estimated.

Rock River at Afton, Wis.

Location.- Water-stage recorder on line between secs. 22 and 27, T. 2 N., R. 12 E., at highway bridge in Afton, three-quarters of a mile above mouth of Bass Creek. Datum lowered 1.00 foot Oct. 1, 1933. Zero of gage is 742.18 feet above mean sea level.

Drainage area.- 3,190 square miles.

Records available.- February 1914 to September 1934.

Average discharge.- 20 years, 1,858 second-feet.

Extremes.- Maximum discharge during year, 2,890 second-feet Apr. 11 (gage height, 5.36 feet); minimum, 36 second-feet Aug. 26 (gage height, 0.09 foot); minimum daily discharge, 42 second-feet Aug. 25, 26

1914-33: Maximum discharge recorded, 13,000 second-feet Mar. 23, 24, 1929; maximum gage height recorded, 11.81 feet, present datum, Mar. 23, 1929; minimum discharge, that of Aug. 26, 1934; minimum daily discharge, that of Aug. 25, 26, 1934.

Remarks.- Records fair except those for periods of ice effect, Nov. 16, 17, Dec. 11-16, Dec. 25 to Jan. 5, Jan. 29 to Feb. 5, Feb. 8-11, Feb. 19 to Mar. 2, Mar. 9-11, which are poor. Regulation by operation of power plants above.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	417	719	571	251	640	215	813	937	324	66	439	201
2	200	692	655	215	661	328	950	770	209	196	172	263
3	728	693	497	472	640	663	1,060	786	391	214	150	275
4	456	709	299	518	598	417	1,460	723	309	76	108	366
5	612	696	587	598	661	275	1,740	1,050	389	184	155	521
6	616	702	683	750	750	598	1,860	699	357	308	455	423
7	588	730	705	683	728	619	2,350	923	367	501	276	370
8	490	639	661	661	661	705	2,440	875	306	228	219	487
9	318	661	558	750	619	476	2,440	752	411	271	120	222
10	671	722	619	661	619	472	2,530	606	394	481	81	453
11	691	693	518	661	499	235	2,710	812	288	320	91	339
12	489	505	640	750	499	307	2,620	673	345	356	67	225
13	672	289	454	979	640	616	2,530	832	338	300	373	175
14	499	583	538	1,160	750	605	2,530	664	221	196	257	147
15	387	649	558	770	381	649	2,180	813	419	118	269	410
16	355	558	558	869	352	651	2,020	607	261	302	111	206
17	617	282	661	1,070	417	670	2,020	757	80	436	124	281
18	503	625	661	1,040	399	679	1,980	633	472	324	76	316
19	449	414	640	971	184	602	1,860	761	490	186	56	388
20	280	316	661	798	598	688	1,860	717	282	311	399	413
21	732	620	661	894	381	709	1,780	702	471	311	297	510
22	583	658	619	777	598	853	1,520	720	368	285	187	489
23	286	572	640	782	196	850	1,420	539	258	255	204	317
24	748	650	576	788	193	688	1,420	754	135	469	77	292
25	728	653	100	988	215	767	1,460	685	255	124	42	495
26	752	594	108	728	84	741	1,420	638	438	262	42	445
27	766	234	619	705	132	871	1,380	607	153	115	230	513
28	599	615	640	960	328	742	1,180	635	277	77	117	547
29	444	655	399	705		641	911	489	300	45	137	489
30	299	638	538	750		945	668	139	120	178	168	379
31	654		598	728		830		566		155	183	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	766	200	536	0.168	0.19
November	730	234	592	.186	.21
December	705	100	556	.174	.20
January	1,160	215	756	.237	.27
February	750	84	479	.150	.16
March	945	215	618	.194	.22
April	2,710	668	1,770	.555	.62
May	1,050	139	705	.221	.25
June	490	80	314	.098	.11
July	501	45	247	.077	.09
August	453	42	183	.057	.07
September	547	147	365	.114	.13
The year	2,710	42	593	.186	2.52

Rock River at Como, Ill.

Location.- Water-stage recorder in NW¼ sec. 30, T. 21 N., R. 7 E., fourth principal meridian, 1 mile above Como, 3 miles below Rock Falls, and 3½ miles above mouth of Elkhorn Creek.

Drainage area.- 8,700 square miles.

Records available.- December 1933 to September 1934; November 1914 to September 1934 records collected at Lyndon, 16½ miles downstream (drainage area, 9,010 square miles).

Extremes.- Maximum discharge during period, 5,640 second-feet Apr. 6 (gage height, 4.15 feet); minimum discharge, 275 second-feet Aug. 20 (gage height, 1.15 feet); minimum daily discharge, 440 second-feet Aug. 20.
1914-34: Maximum discharge recorded, 39,500 second-feet Mar. 28, 1916, at Lyndon; minimum, that of Aug. 20, 1934.

Remarks.- Records excellent except those for periods of ice effect, Dec. 25 to Jan. 3, Jan. 8, 9, Jan. 29 to Feb. 3, Feb. 8-12, Feb. 19 to Mar. 2, which are good. About 100 second-feet diverted above gage to Illinois & Mississippi Canal. Some diurnal fluctuations from power plants upstream.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1				1,900	2,500	1,250	2,340	1,880	886	1,180	896	640
2				2,060	2,400	1,950	2,040	1,580	1,050	1,020	734	739
3				2,000	2,300	1,740	2,340	1,920	1,120	644	664	619
4				1,900	2,240	2,160	3,160	1,760	926	751	850	842
5				2,240	2,380	1,970	3,880	1,780	862	2,100	638	1,220
6				2,550	2,220	2,170	4,750	1,700	820	886	824	1,510
7				2,480	2,120	1,710	5,000	1,890	1,080	890	674	1,520
8				2,420	1,550	2,170	4,750	1,530	874	684	863	1,640
9				2,300	1,600	2,410	4,250	1,370	800	1,560	974	1,760
10				2,080	1,350	1,720	4,120	1,890	888	2,960	1,230	1,440
11				2,580	1,700	2,240	3,880	1,550	909	3,120	1,250	1,360
12				1,880	2,000	2,120	3,880	1,540	744	2,220	852	862
13				2,740	2,040	2,100	3,880	1,520	992	2,810	719	1,450
14				3,260	2,010	1,860	3,880	1,400	883	3,190	887	1,170
15				3,400	1,660	1,840	3,640	1,600	908	3,180	1,030	1,080
16				3,840	2,150	2,000	3,520	1,450	921	2,460	598	1,160
17				3,660	1,620	2,040	3,520	1,440	821	1,860	937	1,110
18				3,640	1,960	2,270	3,060	1,430	1,160	1,280	2,030	1,220
19				3,880	1,250	1,920	3,040	1,540	934	1,490	1,610	1,290
20				3,880	1,300	2,290	3,020	1,610	1,040	1,560	440	1,260
21				3,160	1,300	2,100	3,010	1,500	1,440	1,140	658	1,700
22			1,860	3,280	1,410	3,030	2,750	1,560	1,760	1,450	816	1,920
23			2,180	3,620	1,610	2,500	2,680	1,360	1,900	1,030	981	1,190
24			1,680	2,750	1,400	1,900	2,870	1,560	1,810	1,540	898	1,360
25			1,470	2,820	1,100	2,400	2,440	1,300	2,920	1,600	794	1,610
26			1,200	2,970	1,080	1,900	2,510	1,380	1,600	1,460	700	1,530
27			720	3,400	1,100	1,820	2,330	1,260	1,200	1,120	818	1,530
28			1,050	2,490	1,300	1,900	2,240	1,140	1,520	834	636	1,620
29			1,300	1,900		2,080	2,300	1,280	1,760	682	662	1,520
30			2,000	1,240		2,020	2,000	1,280	1,640	886	721	1,460
31			1,950	1,500		1,460		1,100		684	692	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October					
November					
December					
January	3,880	1,240	2,701		
February	2,500	1,080	1,738		
March	3,030	1,250	2,034		
April	5,000	2,000	3,236		
May	1,920	1,100	1,519		
June	2,920	744	1,206		
July	3,190	644	1,568		
August	2,030	440	873		
September	1,920	619	1,311		
The year					

Rock River at Lyndon, Ill.

Location.- Chain gage in NE¼ sec. 21, T. 20 N., R. 5 E., fourth principal meridian, at highway bridge in Lyndon, 14 miles above Rock Creek. Zero of gage is 584.37 feet above mean sea level (1929 general adjustment).

Drainage area.- 9,010 square miles.

Records available.- November 1914 to September 1934, when station was replaced by new station at Como, 18½ miles upstream.

Average discharge.- 20 years, 5,647 second-feet.

Extremes.- Maximum discharge recorded during year, 5,280 second-feet Apr. 7 (gage height, 6.51 feet); minimum recorded, 465 second-feet Aug. 21 (gage height, 3.08 feet).

1914-34: Maximum discharge recorded, 39,500 second-feet Mar. 26, 1916; maximum gage height (backwater from ice), 19.6 feet Feb. 16, 1918; minimum discharge recorded, that of Aug. 21, 1934.

Remarks.- Records good. Discharge estimated for Oct. 20 and for periods of ice effect, Nov. 17, Dec. 11-15, Dec. 26 to Jan. 22, Jan. 30 to Mar. 12. Some diurnal fluctuation at low stages owing to power plants upstream. About 100 second-feet diverted above gage to Illinois & Mississippi Canal

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,080	1,820	1,820	2,050	2,350	1,350	2,080	1,820	965	1,280	920	675
2	1,950	1,950	1,950	2,100	2,400	1,950	1,950	1,570	755	1,280	835	638
3	1,690	2,220	2,080	2,150	2,500	1,550	2,220	1,820	1,280	755	600	795
4	2,220	2,080	1,950	1,800	2,200	2,050	2,790	1,820	1,010	638	878	878
5	1,950	1,950	1,690	2,150	2,350	2,050	3,690	1,450	678	2,790	795	965
6	1,820	1,950	1,690	2,600	2,050	1,600	4,660	1,820	835	1,450	755	1,330
7	1,570	1,820	1,950	2,600	2,050	1,800	5,280	1,820	920	715	795	1,280
8	1,950	2,220	2,080	2,600	1,600	2,100	5,280	1,390	1,060	965	638	1,390
9	2,080	2,080	2,080	2,250	1,850	2,350	4,660	1,330	835	1,010	1,010	1,690
10	1,950	2,080	1,820	2,050	1,350	1,550	4,260	1,510	835	2,500	1,010	1,510
11	1,820	1,950	1,550	2,350	1,800	2,100	4,070	1,820	965	3,880	1,330	1,220
12	1,110	1,950	1,050	1,950	2,050	2,250	5,860	1,450	755	2,500	920	965
13	2,220	1,690	1,350	2,950	2,000	2,220	4,070	1,390	920	2,500	835	965
14	1,820	1,690	1,850	3,000	1,950	1,950	4,070	1,690	1,110	2,790	715	1,330
15	1,950	1,950	1,800	3,100	1,750	1,950	3,690	1,160	878	3,310	1,110	1,010
16	1,690	1,510	2,080	3,600	2,200	1,820	3,500	1,690	965	2,500	635	1,160
17	1,390	900	1,950	3,500	1,450	1,950	3,500	1,280	920	1,950	835	1,280
18	1,690	2,080	2,080	3,800	1,950	2,080	3,120	1,510	1,280	1,450	1,060	1,330
19	1,950	1,950	1,950	4,100	1,200	1,950	2,950	1,160	965	1,950	2,360	1,160
20	1,280	1,820	2,080	4,000	1,250	2,220	2,950	1,690	1,110	1,690	498	1,160
21	2,080	1,950	1,950	3,400	1,350	1,950	2,790	1,510	1,220	1,160	498	1,450
22	1,330	1,950	2,080	3,550	1,550	2,790	2,500	1,510	1,690	1,280	755	1,820
23	1,820	2,080	1,950	3,690	1,550	2,640	2,790	1,570	1,570	1,280	920	1,220
24	2,220	2,220	1,690	2,950	1,550	1,820	2,640	1,330	1,950	1,280	1,010	1,390
25	1,820	1,690	1,510	2,500	1,150	2,360	2,500	1,390	1,690	1,570	795	1,450
26	1,950	1,690	1,200	2,950	1,050	2,080	2,500	1,160	3,690	1,510	755	1,450
27	2,080	2,080	640	3,120	1,200	1,450	2,500	1,390	1,570	1,110	755	1,390
28	2,360	1,690	930	2,640	1,200	1,950	1,950	1,330	1,330	1,060	675	1,450
29	2,220	1,690	1,350	1,160		1,820	2,220	1,110	1,570	1,110	638	1,390
30	1,820	1,690	1,850	1,300		2,220	2,220	1,220	1,020	755	715	1,390
31	1,690		2,000	1,450		1,510		1,450		755	715	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	2,360	1,110	1,857		
November	2,220	900	1,880		
December	2,080	640	1,742		
January	4,100	1,160	2,691		
February	2,500	1,050	1,739		
March	2,790	1,350	1,988		
April	5,280	1,950	3,243		
May	1,820	1,110	1,489		
June	3,690	755	1,245		
July	3,880	638	1,638		
August	2,360	498	870		
September	1,820	638	1,238		
The year	5,280	498	1,801		

Crawfish River at Milford, Wis.

Location.- Chain gage in sec. 4, T. 7 N., R. 14 E., at highway bridge on County Trunk Highway A in Milford, 1 mile below Rock Creek and 8 miles above mouth.

Drainage area.- 764 square miles.

Records available.- June 1931 to September 1934.

Extremes.- Maximum discharge recorded during year, 1,140 second-feet Apr. 6 (gage height, 4.06 feet); minimum, 9.4 second-feet Oct. 14 (gage height, 1.28 feet).
1931-34: Maximum discharge recorded, 2,580 second-feet Apr. 3, 1933; minimum, 6.0 second-feet Sept. 19, 20, 1932, Oct. 8, 1933.

Remarks.- Records good except those for period of ice effect, Nov. 14-18, Dec. 11-14, 18-22, Dec. 25 to Jan. 8, Jan. 17-20, 25, Jan. 28 to Mar. 11, Mar. 18, 19, 26-29, and those for period Mar. 12 to May 15, which are fair.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	91	52	77	31	79	36	143	79	27	33	17	19
2	64	126	79	40	79	48	312	91	39	27	20	30
3	42	158	79	42	77	57	605	108	36	33	21	29
4	88	140	46	45	68	68	860	150	33	22	25	61
5	54	132	150	51	64	85	1,020	122	30	25	27	50
6	56	59	85	57	57	85	1,140	99	33	31	22	50
7	72	77	94	61	54	88	1,080	88	21	39	42	42
8	57	42	105	57	42	91	913	68	18	32	38	35
9	72	59	85	57	36	94	706	31	17	31	32	21
10	46	42	82	54	38	108	757	176	24	38	40	18
11	56	48	57	50	42	108	757	248	32	52	36	14
12	68	46	46	59	50	94	757	77	57	48	31	29
13	48	46	45	122	50	77	706	266	31	41	31	16
14	10	42	51	180	54	70	482	248	26	30	22	11
15	35	36	56	201	57	72	409	214	25	48	30	36
16	27	31	59	201	79	75	360	102	41	33	34	36
17	68	29	64	180	108	99	298	140	29	34	19	24
18	59	35	57	162	75	102	180	165	77	27	24	22
19	13	41	51	154	57	122	269	136	39	21	51	18
20	19	46	54	143	42	140	271	102	18	35	23	15
21	57	66	40	184	36	231	205	118	56	26	18	31
22	102	70	50	201	31	271	197	136	31	30	25	41
23	82	75	64	184	31	266	231	102	32	24	16	30
24	112	79	64	180	31	169	244	91	46	18	24	18
25	52	17	45	154	31	126	169	57	27	21	20	12
26	20	132	32	140	31	143	169	41	44	25	26	14
27	88	52	26	132	31	108	176	40	35	22	23	26
28	22	61	22	108	33	94	91	26	34	23	34	17
29	64	56	22	94		79	112	42	39	21	18	40
30	70	77	22	88		61	42	40	36	31	18	38
31	56		22	85		94		33		23	21	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	112	10	57.1	0.075	0.09
November	158	17	65.7	.086	.10
December	150	22	59.1	.077	.09
January	201	31	113	.148	.17
February	108	31	52.2	.068	.07
March	271	36	108	.141	.16
April	1,140	42	456	.597	.67
May	266	26	111	.145	.17
June	77	17	34.4	.045	.05
July	52	18	30.5	.040	.05
August	51	16	26.7	.035	.04
September	61	11	28.1	.037	.04
The year	1,140	10	94.9	.124	1.70

Yahara River near McFarland, Wis.

Location.- Chain gage in SW¼ sec. 3, T. 6 N., R. 10 E., at bridge on Federal Highway 51, about 400 feet downstream from outlet of Lake Waubesa and 1 mile southwest of McFarland. Zero of gage is 840.2 feet above mean sea level.

Drainage area.- 337 square miles.

Records available.- September 1930 to September 1934.

Extremes.- Maximum discharge recorded during year, 223 second-feet Apr. 11, 12 (gage height, 3.94 feet); minimum recorded, 13 second-feet June 17.
1930-34: Maximum discharge recorded, 655 second-feet May 21, 1933; minimum recorded, 13 second-feet June 13, 1931, and June 17, 1934.

Remarks.- Records fair. Stage-discharge relation affected by ice Nov. 15-20, 26-29, Dec. 10-30, Mar. 9, 10, and by growth of grass in the channel the greater part of the summer.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	78	59	61	55	50	50	120	138	98	18	75	35
2	69	64	59	56	47	53	138	138	80	19	80	34
3	69	63	66	61	47	56	158	138	67	19	71	56
4	69	63	66	66	45	59	179	128	64	18	67	63
5	69	55	66	71	45	63	190	128	56	17	75	55
6	67	58	64	69	45	58	190	128	56	20	92	52
7	66	61	64	67	46	56	190	124	49	20	98	49
8	66	58	61	67	49	56	201	116	43	18	100	47
9	58	59	61	64	47	67	201	100	46	19	104	45
10	58	56	53	64	47	58	201	100	38	20	106	43
11	59	49	14	64	47	53	223	98	37	24	110	40
12	61	49	23	63	47	47	223	86	29	25	106	36
13	59	61	23	80	49	53	212	98	26	27	104	38
14	52	53	45	82	50	50	212	102	21	27	100	37
15	52	50	55	77	50	53	212	96	18	27	96	53
16	58	17	53	86	50	49	212	84	15	26	98	49
17	56	28	50	73	50	69	201	80	13	30	98	46
18	52	39	49	67	61	88	201	77	20	32	100	46
19	52	37	47	64	53	77	201	77	19	42	94	43
20	53	42	40	58	55	77	201	73	16	47	75	42
21	67	55	43	58	53	77	201	71	17	50	71	55
22	77	56	42	63	52	77	190	75	17	52	73	55
23	75	56	46	58	59	75	179	77	16	58	69	52
24	69	56	45	53	55	67	179	80	16	63	66	50
25	55	50	77	59	53	75	179	66	16	66	59	50
26	52	36	59	59	53	84	168	73	19	73	56	46
27	59	30	61	59	52	98	168	77	18	77	50	46
28	55	59	59	59	53	69	158	86	19	75	43	39
29	53	56	63	55		80	148	94	20	78	40	39
30	58	56	59	55		96	138	88	18	80	39	39
31	59		61	58		98		86		78	37	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	78	52	61.4	0.182	0.21
November	64	17	51.0	.151	.17
December	77	14	52.7	.156	.18
January	86	53	64.2	.191	.22
February	61	45	50.4	.150	.16
March	98	47	67.4	.200	.23
April	223	120	186	.552	.62
May	138	86	96.2	.285	.33
June	98	13	32.9	.098	.11
July	80	17	40.2	.119	.14
August	110	37	79.1	.235	.27
September	63	34	46.0	.136	.15
The year	223	13	69.0	.205	2.79

Pecatonica River at Freeport, Ill.

Location.- Chain gage in NW¼ sec. 32, T. 27 N., R. 8 E., at Hancock Avenue Bridge in Freeport, 2 miles above mouth of Yellow Creek. Zero of gage is 739.52 feet above mean sea level.

Drainage area.- 1,330 square miles.

Records available.- September 1914 to September 1934.

Average discharge.- 20 years, 937 second-feet.

Extremes.- Maximum discharge recorded during year, 2,660 second-feet Jan. 14 (gage height, 12.0 feet, estimated); minimum recorded, 98 second-feet July 3 (gage height, 2.84 feet).

1914-34: Maximum discharge recorded, 18,400 second-feet Mar. 16, 1929 (gage height, 19.76 feet); minimum recorded, that of July 3, 1934.

Remarks.- Records good. Discharge estimated for periods of ice effect, Dec. 13, 14, 27-30, Jan. 29 to Mar. 2, and for periods of missing gage-height records, Jan. 11-14, July 14.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	350	384	282	524	367	219	367	282	204	159	189	182
2	316	350	350	678	316	234	816	219	182	174	189	250
3	367	367	367	816	316	384	1,990	219	189	136	182	234
4	316	350	367	638	367	524	2,220	250	189	174	174	542
5	250	367	350	488	384	488	1,920	266	174	219	166	896
6	333	299	401	435	266	616	744	250	250	638	189	816
7	316	333	384	401	282	638	524	219	189	926	234	488
8	299	350	350	401	316	638	470	250	182	658	234	333
9	316	350	299	401	299	506	435	250	182	435	219	219
10	333	333	299	384	250	488	384	234	174	700	250	234
11	350	299	204	384	299	384	435	219	250	1,920	189	234
12	350	350	219	618	266	299	401	219	174	2,180	122	219
13	350	333	250	1,360	286	367	384	204	182	1,660	204	189
14	333	350	282	2,420	316	384	367	234	189	678	250	204
15	316	219	316	2,580	333	401	350	266	152	435	316	234
16	333	250	350	2,380	250	350	316	266	174	384	580	367
17	350	282	367	1,880	316	350	316	266	166	299	744	488
18	299	316	299	1,080	266	506	316	234	299	316	350	418
19	266	350	350	700	333	987	299	189	367	350	204	350
20	350	367	367	580	286	792	299	204	435	418	204	266
21	367	367	282	524	299	435	234	204	470	580	174	418
22	401	367	367	618	250	367	316	266	435	618	204	401
23	542	367	299	926	250	350	333	204	266	367	219	452
24	488	316	350	1,290	316	266	316	234	234	250	174	470
25	435	333	384	987	250	316	219	250	367	219	159	401
26	384	350	333	744	299	250	299	219	561	234	219	316
27	316	333	316	618	234	316	299	219	618	299	204	299
28	350	282	299	485	219	333	282	234	350	401	189	299
29	350	350	299	435		266	266	234	189	282	152	219
30	367	350	316	435		350	282	189	182	234	166	299
31	384		350	350		282		204		234	189	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	542	250	351	0.264	0.30
November	384	219	334	.251	.28
December	401	204	324	.244	.28
January	2,580	350	857	.644	.74
February	384	219	293	.220	.23
March	987	219	422	.317	.37
April	2,220	219	540	.406	.45
May	282	189	232	.174	.20
June	618	152	266	.200	.22
July	2,180	136	535	.402	.46
August	744	122	233	.175	.20
September	896	182	358	.269	.30
The year	2,580	122	396	.298	4.03

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Sugar River near Brodhead, Wis.

Location.- Chain gage in sec. 26, T. 2 N., R. 9 E., at highway bridge 2 miles above mouth of Jordan Creek and 2 miles southwest of Brodhead.

Drainage area.- 529 square miles.

Records available.- February 1914 to September 1934.

Average discharge.- 20 years, 358 second-feet.

Extremes.- Maximum discharge recorded during year, 943 second-feet Apr. 4 (gage height, 3.2 feet); minimum recorded, 45 second-feet Aug. 26 (gage height, 0.28 foot).
1914-34: Maximum discharge, about 13,000 second-feet Sept. 13, 1915 (gage height, 11.4 feet from flood marks); minimum, that of Aug. 26, 1934.

Remarks.- Records fair except those for period of ice effect, Nov. 13-19, Dec. 9 to Jan. 21, Jan. 25 to Mar. 7, Mar. 9-11, which are poor. Flow regulated by operation of power plant in Brodhead.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	148	210	127	172	184	109	222	160	61	58	138	93
2	160	248	197	275	197	148	362	160	118	76	118	93
3	138	222	210	303	197	134	783	160	109	67	127	93
4	172	210	222	275	160	172	943	184	116	56	101	118
5	160	148	235	248	160	210	706	118	172	93	76	109
6	148	172	197	222	160	210	524	127	138	148	93	148
7	148	197	172	210	172	210	362	172	109	222	148	138
8	127	197	197	210	172	222	347	109	101	86	118	93
9	172	148	172	210	148	184	332	197	76	197	76	64
10	172	138	127	197	109	127	262	184	101	262	148	127
11	148	118	127	184	101	93	303	184	69	347	76	148
12	138	160	184	248	118	138	303	101	93	425	59	101
13	138	134	148	490	138	160	289	160	51	318	109	109
14	148	184	172	490	138	172	210	184	93	222	118	101
15	109	172	184	524	118	148	235	184	72	127	93	118
16	197	148	172	524	138	148	275	184	101	127	118	109
17	148	148	148	457	127	248	210	184	93	138	160	127
18	160	148	148	332	76	210	222	109	118	138	109	148
19	138	160	148	275	86	262	222	118	138	160	109	160
20	148	184	138	210	148	248	222	101	262	172	67	172
21	235	134	148	184	109	262	210	75	210	160	118	235
22	148	184	138	289	60	184	160	118	148	197	109	138
23	303	172	138	524	210	172	172	138	93	148	118	235
24	235	172	138	425	118	172	197	138	101	127	109	222
25	197	160	138	118	93	138	184	118	172	127	118	197
26	235	172	172	184	127	210	172	138	109	138	74	160
27	235	172	160	172	172	160	172	86	138	127	101	160
28	160	172	160	160	101	160	197	101	86	148	93	160
29	148	172	148	148		172	184	101	72	101	79	160
30	184	148	160	160		197	197	93	79	138	79	86
31	222		172	148		172		148		109	93	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	303	109	172	0.325	0.37
November	248	118	173	.327	.36
December	235	127	164	.310	.36
January	524	118	276	.522	.60
February	210	60	137	.259	.27
March	262	93	181	.342	.39
April	943	160	306	.578	.64
May	197	75	140	.265	.31
June	262	51	113	.214	.24
July	425	56	160	.302	.35
August	160	59	105	.198	.23
September	235	64	137	.259	.29
The year	943	51	172	.325	4.41

Iowa River at Marshalltown, Iowa

Location.- Water-stage recorder in sec. 24, T. 84 N., R. 18 W., in Marshalltown. Chain gage 500 feet upstream in sec. 23, at same datum but above different control, was used prior to May 8, 1934. Two temporary staff gages in vicinity were used May 9 to Sept. 26, 1934.

Drainage area.- 1,500 square miles.

Records available.- May 1915 to September 1927, February 1933 to September 1934. February to August 1903 at old dam site 1 mile above present station.

Average discharge.- 13 years (1915-27, 1933-34), 657 second-feet.

Extremes.- Maximum discharge recorded during year, 1,160 second-feet Jan. 24; maximum recorded gage height, 5.88 feet July 17; minimum discharge recorded, 12 second-feet June 17, 21, 22.
1915-27, 1933-34: Maximum discharge recorded, 42,000 second-feet June 4, 1918 (gage height, 17.74 feet); minimum, about 2 second-feet Nov. 24, 1917.

Remarks.- Records fair Oct. 1 to July 25, good thereafter. Discharge estimated for Dec. 11 to Jan. 22, Feb. 25 to Mar. 2, Sept. 2, 3, 9, 16.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	101	65	58		58	80	94	64	16	22	33	40
2	99	62	62		59	90	96	65	17	21	30	55
3	96	59	69	42	62	113	99	61	16	22	29	71
4	92	57	66		58	113	103	51	15	30	27	86
5	86	65	64		57	109	111	62	15	37	26	105
6	83	69	58		66	129	113	65	15	119	26	81
7	82	71	57		75	101	117	71	14	36	27	64
8	85	66	59	48	96	99	101	37	13	35	25	53
9	82	64	62		117	101	348	75	13	36	24	48
10	77	61	65		109	105	107	59	13	37	25	42
11	74	58			109	103	105	58	13	38	50	42
12	62	59			105	107	99	50	13	40	42	36
13	65	62	45	51	107	103	85	65	13	92	33	18
14	68	58			109	101	83	82	13	94	28	22
15	71	42			117	105	88	78	13	92	99	14
16	80	53			107	96	88	75	13	750	123	23
17	85	58			99	105	86	77	12	1,000	72	32
18	82	65	50		99	109	63	78	13	460	47	44
19	77	59			80	107	82	65	13	310	40	58
20	74	57		49	85	121	86	35	13	310	34	38
21	71	59			90	107	85	34	12	295	27	40
22	75	62			86	82	86	32	12	165	28	36
23	77	58	46	61	83	75	88	28	22	86	21	36
24	76	57		1,160	82	66	88	28	23	75	23	34
25	71	58		431		86	85	25	23	65	22	54
26	68	62		403	73	85	82	23	18	53	24	126
27	71	58		207		83	86	22	23	50	23	415
28	74	57	43	66		88	75	22	23	45	21	456
29	77	54		64		90	65	20	23	40	23	336
30	74	56		62		94	66	20	22	35	28	278
31	68			59		98		19		34	34	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	101	62	78.2	0.052	0.06
November	71	53	59.6	.040	.04
December	69		51.1	.034	.04
January	1,160		115	.077	.09
February	117	56	85.6	.057	.06
March	129	66	98.4	.066	.08
April	348	65	99.3	.066	.07
May	82	19	49.9	.033	.04
June	23	12	16.0	.011	.01
July	1,000	21	146	.097	.11
August	123	21	35.9	.024	.03
September	458	14	92.8	.062	.07
The year	1,160	12	77.3	.052	.70

Iowa River at Iowa City, Iowa

Location.- Water-stage recorder in sec. 15, T. 79 N., R. 6 W., 200 feet below Burlington Street highway bridge in Iowa City and 25 feet below the hydraulic laboratory of the State University of Iowa. Zero of gage is at elevation 39.00 feet, Iowa City datum, and 627.27 feet, mean sea level datum.

Drainage area.- 3,230 square miles (revised).

Records available.- June 1903 to July 1906, October 1913 to September 1934.

Average discharge.- 23 years, 1,490 second-feet.

Extremes.- Maximum discharge during year, 2,140 second-feet July 17 (gage height, 43.60 feet); minimum discharge, 29 second-feet June 20; minimum daily discharge, 30 second-feet June 20, 22. Gage heights published in Water-Supply Papers 730 and 745 refer to elevation above Iowa City datum.

1903-6, 1913-34: Maximum discharge, 36,200 second-feet June 7, 1918 (gage height, 19.45 feet, former gage; previously published reference to present gage in error); minimum daily discharge, 10 second-feet Dec. 26, 1916; practically no flow Sept. 3, 1925, caused by regulation.

Remarks.- Records fair. Considerable fluctuation at low stages, owing to operation of power plant above station.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	143	179	93	86	293	198	*190	118	65	72	169	*100
2	118	179	129	88	362	185	*185	149	75	65	144	*129
3	160	104	151	92	421	268	*245	183	60	80	139	*84
4	154	156	155	90	444	169	293	159	62	64	139	*262
5	120	142	182	89	464	272	271	128	62	196	148	*182
6	184	94	127	*130	448	312	306	133	122	144	104	156
7	106	135	132	*100	456	373	520	168	58	49	132	198
8	196	123	164	*100	400	424	396	109	61	53	79	153
9	119	147	123	*110	372	327	365	99	93	92	136	131
10	120	122	178	*130	323	272	385	123	63	75	88	125
11	172	96	102	*95	340	194	430	132	62	173	164	72
12	123	110	91	*165	325	285	417	115	60	273	83	144
13	158	97	90	96	247	343	383	125	58	568	57	102
14	119	104	91	116	282	359	398	91	60	640	244	152
15	118	125	112	104	329	330	319	114	60	362	421	84
16	120	90	90	112	340	336	253	116	58	710	199	101
17	108	90	139	106	302	306	351	90	31	1,680	113	145
18	145	96	122	121	339	258	290	131	46	1,840	120	90
19	135	112	96	104	374	305	327	103	56	1,700	97	158
20	164	131	89	89	229	292	261	121	30	1,280	96	135
21	237	143	127	100	278	298	243	99	40	1,030	85	108
22	277	134	95	111	321	254	195	105	30	710	108	155
23	247	126	136	100	274	190	178	113	*32	485	78	*115
24	147	193	91	352	275	272	199	96	*70	428	99	*87
25	127	124	95	1,380	235	255	179	106	*35	362	102	*85
26	158	141	95	1,320	147	204	163	84	*55	327	82	*100
27	152	142	94	1,320	171	245	245	61	*35	289	51	107
28	152	142	94	1,160	185	289	166	86	*50	262	90	61
29	220	128	93	682		211	172	80	*35	175	58	67
30	130	147	92	226		204	113	62	*55	136	57	*142
31	153		88	307		*200		65		180	60	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	277	118	154	0.048	0.06
November	179	94	128	.040	.04
December	182	88	115	.036	.04
January	1,380	86	296	.092	.11
February	456	147	321	.099	.10
March	424	169	272	.084	.10
April	520	113	282	.087	.10
May	183	61	112	.035	.04
June	122	30	56.0	.017	.02
July	1,840	36	468	.145	.17
August	421	51	121	.037	.04
September	262	61	124	.038	.04
The year	1,840	30	204	.063	.86

Iowa River at Wapello, Iowa

Location.- Water-stage recorder in sec. 27, T. 74 N., R. 3 W., at highway bridge at east edge of Wapello, 15.4 miles (corrected) above mouth of river. Prior to Apr. 17, 1934, a chain gage at same site and datum was used.

Drainage area.- 12,480 square miles.

Records available.- February 1915 to September 1934.

Average discharge.- 19 years (1915-34), 5,890 second-feet.

Extremes.- Maximum discharge recorded during year, 7,230 second-feet Apr. 11 (gage height, 3.27 feet); minimum, 529 second-feet July 5 (gage height, -1.38 feet). 1915-34: Maximum discharge, 67,500 second-feet Mar. 19, 1929 (gage height, 16.22 feet); minimum, about 400 second-feet Dec. 15-17, 1916.

Remarks.- Records fair Oct. 1 to Apr. 16, good thereafter. Discharge estimated because of ice Dec. 11 to Jan. 22, Jan. 25-27, Jan. 29 to Feb. 13, Feb. 15-17, and Feb. 19 to Mar. 12. Records partly computed and several discharge measurements made by engineers of Mississippi River Power Co.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	925	925	880	750	1,900	1,100	1,210	1,120	604	568	962	702
2	925	880	925	800	1,800	1,300	1,210	1,090	597	558	936	765
3	880	880	925	800	2,000	1,700	1,210	1,060	597	539	870	825
4	925	970	970	800	2,300	1,800	1,260	1,070	632	531	825	1,040
5	840	970	1,070	800	2,400	1,700	1,260	1,050	621	539	870	1,460
6	800	925	1,070	800	2,400	1,600	1,260	1,000	632	562	1,010	1,480
7	760	925	1,070	800	2,300	1,500	1,210	948	628	2,680	1,490	1,190
8	840	925	1,070	800	2,100	1,200	1,480	942	632	3,260	1,220	1,080
9	840	925	1,020	800	2,000	1,100	3,170	929	610	2,530	955	1,080
10	925	970	1,070	800	1,900	900	5,600	890	604	1,740	870	1,030
11	800	970	800	800	1,900	1,000	7,230	884	621	1,300	965	942
12	800	840	600	800	1,850	1,100	5,820	922	591	1,200	978	916
13	800	880	600	800	1,800	1,210	4,400	922	579	1,170	986	877
14	800	925	600	800	1,810	1,210	4,040	910	594	3,510	870	884
15	800	880	650	850	1,700	1,420	3,510	916	579	3,770	870	929
16	800	760	700	850	1,600	1,420	3,000	877	585	4,310	1,620	916
17	840	760	720	800	1,500	1,420	2,920	851	588	5,180	1,740	942
18	840	800	720	800	1,550	1,420	2,600	825	576	4,040	1,290	978
19	840	800	660	800	1,400	1,310	2,460	798	576	3,770	1,060	982
20	925	760	680	800	1,100	1,310	2,160	792	600	3,680	942	936
21	970	880	720	850	1,000	1,210	1,940	765	688	3,420	896	962
22	970	970	820	1,000	900	1,210	1,800	792	655	3,170	870	978
23	1,120	1,020	950	1,070	850	1,120	1,670	786	616	2,760	838	1,050
24	1,020	1,020	1,000	970	820	1,120	1,530	770	639	2,230	838	1,010
25	1,020	1,020	700	1,000	800	1,210	1,540	760	614	1,740	814	910
26	1,020	970	650	1,500	820	1,120	1,430	745	610	1,600	786	896
27	1,120	970	600	3,000	850	1,120	1,390	736	576	1,590	765	890
28	1,020	970	600	3,280	900	1,030	1,330	716	560	1,390	725	884
29	970	970	600	2,600		1,030	1,340	675	552	1,190	702	890
30	925	925	650	2,300		1,210	1,160	656	565	1,100	720	832
31	925		700	2,000		1,030		632		1,020	706	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	1,120	760	903	0.072	0.08
November	1,020	760	913	.073	.08
December	1,070	600	800	.064	.07
January	3,280	750	1,150	.092	.11
February	2,400	800	1,580	.127	.13
March	1,800	900	1,260	.101	.12
April	7,230	1,160	2,400	.192	.21
May	1,120	632	865	.069	.08
June	688	552	604	.048	.05
July	5,180	531	2,150	.172	.20
August	1,740	702	968	.078	.09
September	1,480	702	975	.078	.09
The year	7,230	531	1,210	.097	1.31

Ralston Creek at Iowa City, Iowa

Location.- Water-stage recorder in NE¼ sec. 11, T. 79 N., R. 6 W., at highway bridge on Rochester Road, just outside city limits of Iowa City.

Drainage area.- 3.01 square miles.

Records available.- October 1932 to September 1934.

Extremes.- Maximum discharge during year, 249 second-feet July 12 (gage height, 4.0 feet, from high-water mark); no flow at numerous times.
1932-34: Maximum discharge, that of July 12, 1934; no flow at numerous times.
Maximum discharge since 1924, 851 second-feet Aug. 6, 1932 (gage height, 8.18 feet).

Remarks.- Records fair except those for July and August, which are poor. Discharge estimated for July 12-17, Aug. 5, 11, 14-16.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0.02	0.01	0.05	0	0	0.20			0	0	0
2	0	.02	.02	.03	0	.91	.14			0	0	.06
3	0	.02	.28	.03	0	.11	.11			0	0	.79
4	0	.02	.07	.17	0	.28	.07			0	0	.04
5	0	.02	.02	.28	.01	.28	.05			0	.14	0
6	0	.02	.02	.36	.17	.04	.03			0	0	0
7	0	.02	.02	.32	.03	.03	.02			0	0	0
8	0	.02	.01	.07	0	.03	.02			0	0	0
9	.01	.02	.01	.65	0	0	.02			0	0	0
10	.01	.01	.02	1.03	0	0	.02			0	0	0
11	.01	.02	.01	.70	0	0	.02			0	.04	0
12	0	.03	0	.50	0	.02	.01			23.4	0	0
13	0	.02	0	.50	.02	.09	.01			.01	0	0
14	0	.02	0	.09	.02	.05	.02			.24	3.04	0
15	.01	.01	.02	.09	.03	.05	.02			3.30	1.62	0
16	.01	.01	.02	.07	.02	.05	.01			9.49	.08	0
17	.01	.02	.03	.05	.02	.50	.01			.21	0	0
18	.02	.02	.02	.04	.03	.11	.01			0	0	0
19	.01	.04	0	.02	.01	.05	.01			0	0	0
20	.01	.07	.48	.02	0	.05	.01			0	0	0
21	.01	.11	.23	.07	0	.07	.01			0	0	0
22	.01	.09	.07	.41	0	.04	.01			0	0	0
23	.01	.07	.05	.36	0	.03	.01			0	0	0
24	.01	.07	.04	.41	0	.02	.01			0	0	0
25	.02	.02	0	.20	0	.02	.01			0	0	0
26	.03	.02	0	.07	0	.05	.02			0	0	0
27	.03	.02	0	.11	0	.04	.03			0	0	0
28	.02	.02	0	.20	0	.02	.01			0	0	0
29	.02	.02	0	.01		.04	.01			0	0	0
30	.02	.02	0	0		.04	.01			0	0	0
31	.02		.06	0		.04				0	0	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	0.03	0	0.010	0.003	0.003
November	.11	.01	.030	.010	.01
December	.48	0	.049	.016	.02
January	1.03	0	.223	.072	.08
February	.17	0	.013	.004	.004
March	.91	0	.099	.033	.04
April	.20	.01	.031	.010	.01
May	0	0	0	0	0
June	0	0	0	0	0
July	23.4	0	1.18	.39	.45
August	3.04	0	.159	.053	.06
September	.79	0	.030	.001	.001
The year	23.4	0	.155	.052	.68

Note.- No flow during May and June.

Cedar River at Mitchell, Iowa

Location.- Staff gage in sec. 8, T. 98 N., R. 17 W., at hydroelectric plant of Interstate Power Co. in Mitchell.

Drainage area.- 845 square miles.

Records available.- July 1933 to September 1934.

Extremes.- 1933-34: Maximum discharge, 3,760 second-feet Apr. 4, 1934 (gage height, 89.7 feet); minimum, about 5 second-feet almost daily during low-water periods, when power plant was shut down.

Remarks.- Records fair. Daily-discharge record furnished by Interstate Power Co.

Discharge, in second-feet, 1933

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1										155	74	53
2										663	74	110
3										427	65	53
4										203	61	80
5										167	105	71
6										84	20	75
7										102	56	71
8										183	56	63
9										18	74	110
10										67	74	5
11										88	80	67
12										102	113	71
13										88	5	93
14										80	75	67
15										145	127	75
16										5	67	143
17										84	84	5
18										53	74	75
19										86	125	75
20										27	5	71
21										71	40	75
22										117	58	67
23										38	58	116
24										84	58	9
25										75	58	58
26										75	110	62
27										71	5	77
28										73	49	53
29										118	58	45
30										16	58	88
31										65	45	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October					
November					
December					
January					
February					
March					
April					
May					
June					
July	663	5	117	0.138	0.16
August	127	5	64.9	.077	.09
September	143	5	69.4	.082	.09
The year					

Cedar River at Mitchell, Iowa

(Continued)

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5	98	72	88	82	59	234	72	40	5	31	67
2	27	79	122	76	76	72	213	72	64	31	40	5
3	40	69	53	80	119	135	2,850	75	5	45	69	58
4	65	138	90	65	40	36	3,660	88	66	131	74	45
5	84	22	76	94	94	103	1,830	119	40	58	5	62
6	71	77	94	110	81	76	877	23	58	53	49	58
7	119	73	140	40	96	84	731	58	40	94	67	40
8	5	93	92	72	63	45	605	71	80	5	58	53
9	71	55	155	76	67	36	372	71	410	58	40	81
10	49	55	27	84	123	74	302	102	290	59	58	14
11	77	140	59	66	23	5	255	36	206	84	91	27
12	45	45	59	78	81	81	194	86	75	67	5	44
13	58	55	71	123	81	85	128	14	106	97	27	49
14	107	85	109	27	85	93	171	58	49	125	49	37
15	40	58	45	81	81	70	89	62	66	31	67	71
16	137	53	130	63	81	78	86	58	101	76	23	5
17	71	76	23	80	123	128	105	67	5	97	53	80
18	110	138	90	67	36	23	120	58	62	106	80	84
19	49	27	58	67	58	75	84	94	53	80	5	90
20	58	85	89	114	86	70	93	5	53	75	62	23
21	134	76	68	18	79	83	148	49	45	105	53	44
22	22	102	73	383	63	70	36	49	45	18	49	24
23	82	71	115	241	67	79	89	45	101	45	40	7
24	67	80	31	279	107	123	84	49	5	45	40	80
25	83	131	53	365	5	49	96	53	31	53	80	151
26	67	49	53	165	81	65	71	78	36	49	5	247
27	67	76	76	250	58	57	78	5	45	49	31	228
28	138	66	63	27	67	75	150	40	31	27	40	143
29	31	127	50	103		70	5	31	49	105	23	149
30	75	58	118	86		65	72	40	78	9	52	76
31	64		23	87		110		40		31	23	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	138	5	68.3	0.081	0.09
November	140	22	78.6	.093	.10
December	155	23	76.7	.091	.11
January	383	18	115	.136	.16
February	123	5	75.1	.089	.09
March	135	5	73.4	.087	.10
April	3,660	5	461	.545	.61
May	119	5	57.0	.067	.08
June	410	5	77.8	.092	.10
July	131	5	61.7	.073	.08
August	91	5	44.8	.053	.06
September	247	5	71.4	.084	.09
The year	3,660	5	105	.124	1.67

Cedar River at Janesville, Iowa

Location.- Chain gage in sec. 35, T. 91 N., R. 14 W., at highway bridge in Janesville, 3 miles above junction with Shell Rock River. Zero of gage is 870 feet above mean sea level.

Drainage area.- 1,660 square miles.

Records available.- April 1905 to September 1906, May 1915 to September 1927, November 1932 to September 1934.

Average discharge.- 13 years (1915-27, 1933-34), 635 second-feet.

Extremes.- Maximum discharge recorded during year, 10,700 second-feet Apr. 6 (gage height, 9.84 feet); minimum discharge recorded, 48 second-feet May 31, June 2 (gage height, 1.08 feet).

1905-6, 1915-27, 1932-34: Maximum discharge recorded, 27,700 second-feet Apr. 1, 1933 (gage height, 15.43 feet); minimum discharge recorded, 28 second-feet Oct. 21, 1922.

Remarks.- Records fair. Discharge estimated for periods of ice effect, Nov. 13-16, 30, Dec. 8 to Mar. 20, and for Aug. 22, 23. Diurnal fluctuation during low water periods caused by operation of power plant at Waverly, 9 miles above station.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	122	81	92				152	210	52	73	59	81
2	81	70	87				147	168	52	70	57	77
3	98	136	122	90	95	110	177	139	61	73	64	73
4	122	118	87				900	210	68	101	70	75
5	132	143	104				4,140	210	70	136	68	75
6	125	104	73				10,100	108	70	128	61	84
7	118	114	75				4,520	108	73	73	57	81
8	139	104		110	90	125	1,480	147	66	73	52	78
9	111	114	65				1,220	206	101	68	52	75
10	122	118					1,140	186	92	70	95	81
11	104	128					980	139	92	59	156	75
12	98	104					900	160	111	66	118	90
13	111		75	85	95	165	750	132	122	90	122	78
14	143						605	160	143	95	108	75
15	143	80					405	156	177	87	87	78
16	125						468	143	147	98	95	78
17	164	139					375	143	108	95	90	81
18	230	118		80	125	95	303	274	118	90	104	73
19	136	111					268	160	101	118	81	73
20	98	98					285	152	114	92	87	78
21	125	132	70			114	268	132	118	73	78	101
22	98	118				114	196	114	95	75	87	95
23	98	87		440	95	114	173	92	95	84	95	78
24	104	118				128	252	78	78	78	104	108
25	111	201				122	230	81	75	95	81	139
26	66	191			70	143	252	81	75	92	84	160
27	64	177				139	210	59	111	95	68	375
28	59	181	60	165		136	225	57	118	73	75	339
29	70	164				120	111	66	75	70	81	303
30	87	128				122	132	66	78	66	78	263
31	90					122		48		70	78	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	230	59	113	0.068	0.08
November	201	70	121	.073	.08
December			752	.045	.05
January			162	.098	.11
February			96.8	.058	.06
March			124	.075	.09
April	10,100	111	1,050	.632	.70
May	274	48	134	.081	.09
June	177	52	95.2	.057	.06
July	136	59	84.7	.051	.06
August	156	52	83.6	.050	.06
September	375	73	117	.070	.08
The year	10,100	48	187	.112	1.52

IOWA RIVER BASIN

Cedar River at Cedar Rapids, Iowa

Location.- Water-stage recorder in sec. 28, T. 83 N., R. 7 W., in central part of Cedar Rapids, 1,000 feet above Eighth Avenue Bridge and half a mile below dam.

Drainage area.- 6,640 square miles.

Records available.- February 1903 to September 1934.

Average discharge.- 31 years (1903-34), 3,020 second-feet.

Extremes.- Maximum discharge during year, 8,620 second-feet Apr. 9 (gage height, 5.55 feet); minimum, 204 second-feet July 4 (gage height, 2.28 feet); minimum daily discharge, 236 second-feet July 1.

1903-34: Maximum discharge, 72,000 second-feet Mar. 19, 1929 (gage height, 20.1 feet); minimum, 190 second-feet Sept. 9, 1921; minimum daily discharge, that of July 1, 1934.

Flood of June 1851 reached a stage of about 20 feet.

Remarks.- Records good except those for period Oct. 9 to Nov. 9 and those estimated for periods of ice effect, which are fair. Diurnal fluctuation caused by operation of power plant half a mile above station.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	657	480	591	570	940	550	580	679	327	236	327	318
2	530	690	624	520	1,040	550	591	646	336	278	363	327
3	540	580	570	520	1,010	646	762	646	363	260	417	550
4	570	580	580	520	1,080	613	786	602	345	308	372	435
5	540	580	613	490	888	888	1,010	668	327	916	354	354
6	602	480	550	490	862	810	1,870	635	300	1,970	372	444
7	550	480	580	*490	*820	*750	5,040	613	300	1,480	354	462
8	560	480	560	*490	*760	*670	6,950	613	292	690	381	345
9	480	580	550	*480	*600	*570	8,440	613	300	679	390	318
10	480	646	624	480	*609	*500	5,220	591	309	690	336	399
11	480	738	714	490	624	570	3,570	591	372	602	354	426
12	480	480	435	520	750	836	3,060	591	345	657	390	417
13	480	480	309	510	580	914	2,520	624	336	690	520	426
14	480	580	284	560	798	738	2,220	591	327	738	490	381
15	480	580	444	510	679	726	2,150	570	318	624	580	510
16	480	390	490	510	714	679	1,760	550	408	738	435	435
17	480	363	530	500	786	774	1,610	540	453	786	426	530
18	690	490	500	462	875	602	1,390	510	738	1,020	453	500
19	690	702	490	444	750	714	1,200	480	345	1,460	480	500
20	940	738	510	465	738	635	1,080	462	336	1,520	381	520
21	810	738	480	444	690	714	1,110	471	390	1,250	363	490
22	690	646	490	968	550	570	968	500	345	954	381	453
23	580	646	560	1,330	*500	602	996	500	345	762	336	453
24	690	635	570	1,590	*450	657	875	490	354	714	327	444
25	480	646	*430	1,660	*440	635	862	462	345	679	300	408
26	560	646	*350	1,860	*430	613	914	417	345	560	292	462
27	480	580	*340	1,800	*430	613	750	354	336	550	309	381
28	480	520	*340	1,740	*450	591	679	336	300	520	363	602
29	480	510	*350	1,140		602	750	327	292	480	284	810
30	480	602	*410	*1,050		580	679	327	260	435	284	888
31	480		580	*1,000		657		327		345	284	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	940	480	562	0.085	0.10
November	738	363	576	.087	.10
December	624		489	.074	.08
January	1,860		795	.119	.14
February	1,080		709	.107	.11
March	774		664	.100	.11
April	8,440	580	2,010	.303	.34
May	679	327	527	.079	.09
June	738	260	350	.053	.06
July	1,970	236	761	.115	.13
August	580	284	377	.057	.07
September	888	318	466	.070	.08
The year	8,440	236	689	.104	1.41

*Estimated because of ice.

Shell Rock River at Greene, Iowa

Location.- Staff gage in sec. 1, T. 93 N., R. 17 W., at Interstate Power Co.'s hydroelectric plant in Greene.

Drainage area.- 1,375 square miles.

Records available.- July 1933 to September 1934.

Extremes.- 1933-34: Maximum discharge, 4,750 second-feet Apr. 4, 1934 (gage height, 94.2 feet); minimum, about 14 second-feet at numerous times when power plant was shut down.

Remarks.- Records fair. Gage-height record furnished by Interstate Power Co.

Discharge, in second-feet, 1933

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1										187	57	54
2										524	79	73
3										867	66	68
4										585	91	64
5										315	48	64
6										212	64	64
7										186	64	57
8										157	86	64
9										129	57	66
10										122	64	54
11										100	64	54
12										122	64	54
13										100	64	107
14										93	57	57
15										107	63	64
16										71	70	86
17										86	78	71
18										93	64	57
19										86	57	79
20										78	57	64
21										71	64	57
22										93	64	71
23										79	57	57
24										86	64	64
25										107	57	68
26										78	57	75
27										86	71	78
28										86	57	64
29										86	57	57
30										57	57	78
31										71	54	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October					
November					
December					
January					
February					
March					
April					
May					
June					
July	867	57	165	0.120	0.14
August	79	48	63.6	.046	.05
September	107	54	66.3	.048	.05
The year					

Shell Rock River at Greene, Iowa

(Continued)

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	57	64	64	35	57	36	75	64	36	14	14	46
2	43	57	80	43	57	57	87	57	43	25	25	25
3	57	50	61	35	72	78	1,010	64	14	25	25	57
4	57	64	71	35	34	36	4,330	64	32	57	36	36
5	43	43	71	100	64	78	3,240	93	28	25	14	46
6	57	64	53	57	64	57	2,220	43	28	68	14	30
7	106	64	57	64	64	64	1,540	57	28	46	25	36
8	14	50	54	68	49	81	1,150	64	31	25	25	46
9	50	57	57	57	49	50	1,000	64	64	14	25	14
10	50	43	36	57	61	86	875	57	36	44	36	36
11	50	64	43	50	26	36	795	57	246	36	57	46
12	50	64	46	43	64	71	617	94	152	57	14	25
13	43	28	50	64	57	86	507	21	122	51	36	36
14	57	43	57	28	49	50	423	50	122	57	25	39
15	50	28	43	53	55	93	283	61	89	27	52	46
16	93	71	50	57	64	78	300	36	78	46	36	25
17	143	50	39	50	100	100	238	57	46	46	46	36
18	115	50	43	43	42	28	249	36	57	46	46	57
19	78	43	21	57	64	71	206	57	36	36	14	36
20	37	43	50	57	72	86	152	28	57	57	25	25
21	64	64	43	36	57	71	152	36	36	46	25	36
22	57	57	46	294	57	71	147	28	36	14	25	46
23	64	64	53	496	57	86	129	36	57	25	25	25
24	57	64	28	399	72	64	107	36	25	41	25	36
25	43	64	35	186	26	28	107	36	25	25	46	111
26	73	50	40	143	57	64	107	50	36	25	14	237
27	97	50	35	175	34	49	61	14	36	44	25	342
28	57	57	43	73	49	71	162	28	25	14	25	212
29	64	64	35	119		57	36	28	36	57	25	132
30	54	50	37	72		78	93	28	36	14	36	89
31	64		35	72		64		28		14	36	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	143	14	62.7	0.046	0.05
November	71	28	54.1	.039	.04
December	80	21	47.6	.035	.04
January	496	28	101	.073	.08
February	100	26	56.2	.041	.04
March	100	28	65.3	.048	.06
April	4,330	36	680	.494	.55
May	94	14	47.5	.035	.04
June	246	14	55.8	.041	.05
July	68	14	36.2	.026	.03
August	57	14	28.9	.021	.02
September	342	14	67.0	.049	.05
The year	4,330	14	108	.079	1.05

Shell Rock River near Clarksville, Iowa

Location.- Chain gage in T. 92 N., R. 16 W., at highway bridge 1¼ miles northwest of Clarksville and 25 miles above junction with Cedar River.

Drainage area.- 1,660 square miles.

Records available.- May 1915 to September 1927, November 1932 to September 1934 (discontinued).

Average discharge.- 13 years, 558 second-feet.

Extremes.- Maximum discharge recorded during year, 3,260 second-feet Apr. 4 (gage height, 5.38 feet); minimum discharge recorded, 10 second-feet Aug. 2 (gage height, 0.05 foot).
1915-27, 1932-34: Maximum discharge recorded, 19,800 second-feet Mar. 31, 1933 (gage height, 16.7 feet); minimum discharge recorded, that of Aug. 2, 1934.

Remarks.- Records fair. Discharge estimated because of ice for Nov. 15-17, Dec. 10 to Mar. 14. Diurnal fluctuation during low water due to operation of power plant at Greene, 10 miles upstream.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	57	59	64	43	80	52	92	62	22	24	11	27
2	53	56	74	50	80	60	155	61	31	15	10	33
3	52	56	100	44	86	80	380	58	38	19	13	33
4	51	54	74	48	90	90	3,160	57	21	35	14	43
5	53	81	81	80	46	60	2,960	54	27	39	20	29
6	51	59	61	120	80	95	2,400	71	26	27	17	37
7	48	61	64	70	80	65	2,050	39	29	36	11	27
8	118	57	70	78	70	90	1,630	57	29	35	13	24
9	30	59	48	82	60	90	1,390	54	35	24	26	32
10	51	53	48	73	65	62	1,160	51	46	17	24	19
11	53	59	52	65	73	62	990	44	107	32	27	21
12	48	59	55	60	42	65	825	59	186	37	37	31
13	51	67	60	57	78	60	670	81	103	57	16	26
14	51	56	64	78	65	62	585	31	95	29	24	20
15	59	56	60	42	60	65	405	45	65	34	19	44
16	84	56	60	65	70	81	430	50	59	37	27	31
17	90	65	48	68	80	75	380	37	59	37	27	21
18	151	81	51	58	120	107	304	44	37	37	26	26
19	98	82	45	53	55	49	312	37	46	36	31	41
20	43	64	50	60	80	62	133	47	35	30	17	27
21	54	47	52	105	85	62	155	33	30	27	17	33
22	59	64	54	190	67	57	322	31	35	34	15	26
23	74	64	60	600	68	59	115	27	35	17	16	31
24	53	59	40	500	75	49	119	31	41	19	15	23
25	51	51	45	250	80	75	107	33	26	28	16	33
26	54	70	48	180	50	33	99	35	23	19	23	166
27	48	54	44	195	50	49	92	41	26	19	14	405
28	63	56	50	140	50	39	99	22	26	31	13	226
29	61	56	44	95		54	59	27	20	20	13	143
30	64	70	45	100		88	61	27	24	21	17	99
31	61		42	115		160		29		12	31	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	151	30	62.3	0.038	0.04
November	82	51	61.0	.037	.04
December	100	40	56.5	.034	.04
January	600	42	121	.073	.08
February	120	42	70.9	.043	.04
March	160	33	69.6	.042	.05
April	3,160	59	718	.432	.48
May	81	22	44.4	.027	.03
June	186	20	46.1	.028	.03
July	57	12	28.5	.017	.02
August	37	10	19.4	.012	.01
September	405	19	59.2	.035	.04
The year	3,160	10	112	.067	.90

Lime Creek at Mason City, Iowa

Location.- Wire-weight gage in sec. 3, T. 97 N., R. 20 W., at Fourteenth Street highway bridge in Mason City.

Drainage area.- 535 square miles.

Records available.- December 1932 to September 1934.

Extremes.- Maximum discharge during year, 1,470 second-feet Apr. 3 (gage height, 10.5 feet, from high-water mark); minimum discharge recorded, 2.5 second-feet Dec. 29-31, Aug. 5.
1932-34: Maximum discharge, about 9,400 second-feet Mar. 30, 1933 (gage height, 22.15 feet, from gage reading at flood crest); practically no flow Aug. 30 to Sept. 1, 1933.

Remarks.- Records fair. Discharge interpolated for Dec. 24. Slight diurnal fluctuation caused by American beet Sugar Co.'s plant several miles upstream.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7	16	11	3.5	5.5	10	37	25	6	5.5	5.5	4
2	7	18	22	3	8	11	63	25	6.5	3	5	4.5
3	6.5	10	20	4	8	14	70	25	11	5.5	3	5
4	6.5	19	19	3.5	7	19	845	26	10	6	6	3.5
5	6.5	26	18	8	8	17	765	25	11	7	2.5	9
6	8	13	10	8	8	8	725	22	10	7	4	3.5
7	6.5	13	19	6.5	6.5	11	568	19	9	10	3.5	6.5
8	9	9	6.5	4	7	11	430	29	11	9	4.5	8
9	8	6.5	6.0	5	8	10	367	25	10	9	5	6.5
10	8.5	7	8	5.5	5.5	19	253	26	10	8	6	8
11	8.5	19	7	3.5	6	15	202	20	131	7	5.5	8
12	9	18	4	4	6.5	18	144	17	94	9	4	7
13	8.5	7	3.5	4.5	6.5	27	118	15	54	13	5	7
14	9	8.5	3.5	3.5	8.5	12	92	19	43	8	5	8.5
15	9	9	4.5	7	26	12	82	19	27	6	5	10
16	37	6.5	3	5.5	7	13	68	17	25	19	5.5	5
17	14	7	4.5	6.5	14	20	68	12	23	19	5.5	8.5
18	12	10	3.5	5	18	18	64	17	20	12	5	9.0
19	13	6	5	5.5	13	32	53	10	15	7	6	10
20	12	11	3.5	6.5	12	23	48	11	20	6.5	6	8.5
21	25	14	4.5	8	12	32	48	7	18	6	5.5	8.5
22	11	11	6.5	144	11	19	36	13	15	4.5	6.5	8.5
23	11	14	7	82	10	17	36	15	19	3	6	11
24	20	11	6	61	9	17	42	12	18	3	6	11
25	11	20	5.5	39	6.5	17	37	7	6.5	5	5	36
26	13	8.5	4.5	29	5.5	19	34	8	8.5	5.5	4.5	56
27	14	18	3	26	6	25	30	8	6.5	4	3.5	40
28	11	14	5	18	11	26	27	5.5	6.5	3.5	4	30
29	10	19	2.5	12		25	25	6	6	4	4	30
30	12	13	2.5	7		11	25	6.5	6	5	4.5	20
31	13		2.5	10		14		6.5		6	4.5	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	37	6.5	11.5	0.021	0.02
November	26	6.5	12.7	.024	.03
December	22	2.5	7.45	.014	.02
January	144	3.0	17.4	.033	.04
February	26	5.5	9.29	.017	.02
March	32	8	17.6	.033	.04
April	845	25	180	.336	.37
May	29	5.5	16.1	.030	.03
June	131	6	21.9	.041	.04
July	19	3	7.29	.014	.02
August	6.5	2.5	4.89	.009	.01
September	56	3.5	13.0	.024	.03
The year	845	2.5	26.4	.049	.67

Clear Lake at Clear Lake, Iowa

Location.- Staff gage in sec. 14, T. 96 N., R. 22 W., at State fish hatchery at Clear Lake.

Records available.- May 1933 to September 1934.

Extremes.- Maximum stage recorded during period, 5.02 feet May 20, 22, 23, 1933; minimum recorded, 1.70 feet Aug. 28, 29, 1934.

Remarks.- No records for periods in which no gage heights are given. No discharge from lake after June 20, 1933.

Discharge measurement of Clear Lake outlet, May 18, 1933: 6.06 second-feet.

Gage height, in feet, 1933

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1									4.93	4.54	4.18	
2									4.93	4.66	4.14	3.88
3									4.96	4.64	4.14	3.84
4									4.99	4.62	4.13	3.82
5									4.98	4.59	4.10	3.94
6									4.94	4.57	4.10	3.90
7									4.93	4.55	4.09	3.89
8									4.92	4.52	4.08	3.89
9									4.87	4.50	4.08	3.85
10									4.86	4.50	4.07	3.83
11									4.83	4.48	4.06	3.82
12									4.79	4.48	4.05	3.80
13									4.74	4.47	4.03	3.80
14									4.72	4.46	4.00	3.80
15									4.72	4.42	3.99	3.80
16									4.69	4.40	4.02	3.80
17									4.66	4.38	4.01	3.81
18									4.64	4.35	3.98	3.79
19									4.61	4.35	3.96	3.82
20								5.02	4.58	4.32	3.92	3.80
21								5.00	4.57	4.30	3.91	3.78
22								5.02	4.55	4.30	3.88	3.74
23								5.02	4.52	4.38		3.72
24								5.00	4.52	4.36	3.88	3.71
25								4.98	4.54	4.35		3.73
26								4.95	4.52	4.33		3.74
27								4.94	4.50	4.32		3.74
28								4.94	4.49	4.30		3.71
29								4.98	4.46	4.28		3.71
30								4.93	4.46	4.26		3.70
31								4.92		4.23		

Gage height, in feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.67	3.66	3.50						2.62	2.24	1.98	1.76
2	3.64	3.64							2.59	2.22	1.94	1.76
3	3.63	3.61							2.63	2.19	1.90	1.78
4	3.63	3.62							2.60	2.22	1.88	1.80
5	3.60	3.62	3.51							2.28	1.86	1.80
6	3.58	3.62	3.48						2.50	2.30	1.86	1.80
7	3.56	3.60	3.46						2.52	2.26	1.86	1.80
8	3.54	3.59	3.44						2.60	2.26	1.86	1.80
9	3.53	3.57	3.42						2.68	2.26	1.88	1.78
10	3.52	3.56	3.41						2.60	2.26	1.92	1.78
11	3.53	3.55	3.40						2.66	2.24	1.90	1.78
12	3.50	3.55	3.40						2.58	2.26	1.90	1.76
13	3.50	3.54	3.39					2.97	2.54	2.28	1.90	1.76
14	3.50	3.54	3.38					2.97	2.50	2.28	1.92	1.76
15	3.50		3.37					2.94	2.50	2.28	1.94	1.76
16	3.64		3.37					2.97	2.49	2.28	1.94	1.74
17	3.60		3.37					2.93	2.47	2.28	1.94	1.74
18	3.60		3.37					2.90	2.47	2.28	1.92	1.74
19	3.60	3.55	3.38					2.89	2.46	2.28	1.90	1.74
20	3.58	3.54	3.39					2.86	2.46	2.28	1.86	1.74
21	3.58	3.54	3.39					2.94	2.44	2.28	1.84	1.74
22	3.55	3.53	3.39						2.42	2.26	1.82	1.74
23	3.52	3.53	3.40					2.80	2.42	2.24	1.82	1.76
24	3.50	3.54	3.40					2.76	2.38	2.20	1.80	1.78
25	3.50	3.54	3.40					2.74	2.38	2.16	1.78	1.84
26	3.50	3.53	3.39					2.72	2.34	2.12	1.76	1.88
27		3.53	3.38					2.72	2.32	2.10	1.72	1.90
28		3.53	3.38			3.22		2.70	2.30	2.06	1.70	1.90
29	3.66	3.52	3.36			3.22		2.68	2.26	2.02	1.70	1.90
30	3.66	3.51	3.36			3.24		2.66	2.25	2.00	1.72	1.88
31	3.66					3.30		2.66		2.00	1.74	

Skunk River near Ames, Iowa

Location.- Water-stage recorder in sec. 23, T. 84 N., R. 24 W., 2½ miles north of Ames, 3½ miles below Keigley Branch, and 5 miles above mouth of Squaw Creek.

Drainage area.- 320 square miles.

Records available.- July 1920 to August 1927, March 1933 to September 1934.

Extremes.- Maximum discharge during year, 1,300 second-feet Jan. 22 (gage height, 5.39 feet); no flow at times during June, July, and August.
1920-27, 1933-34: Maximum discharge, about, 3,540 second-feet Sept. 17, 1921 (gage height, 9.2 feet); no flow at times during June, July, and August 1934.

Remarks.- Records poor prior to July 20, good thereafter.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.0	*2	4.2	*0.5	*25	*11	15.0	*4	0.4	*0	0.05	0.28
2	1.5	*2	3.7	*.5	*30	*14	17.4	*4	.3	*0	.03	.22
3	1.0	*2	12.8	*.5	*30	17.4	24	*4	.6	*4	.01	2.0
4	.9	*2	12.8	*.5	*25	13.8	33	3.8	.8	*10	.02	1.5
5	.9	*2	7.5	*.5	*19	15.0	43	3.8	.5	*20	.03	.97
6	.8	*2	4.2	.3	*17	7.5	49	3.4	.3	*35	.11	.42
7	.8	*2	5.1	*.5	*16	9.0	42	3.4	.3	*40	.11	.28
8	1.0	*2	2.3	*.5	*15	7.0	38	3.4	.5	*20	.09	.20
9	1.0	*2	3.4	*.5	*15	6.5	34	3.1	.8	*18	.04	.17
10	*1	*2	3.1	*.5	15.0	10.2	31	3.4	.8	*15	.01	.17
11	*1	*3	*2	*.5	15.8	9.6	26	3.1	.2	*11	0	.14
12	*1	*3	*1	*.5	15.8	10.8	22	3.4	*.1	*8	.02	.14
13	*1	*3	*1	*.5	15.8	15.0	17.4	4.1	*.1	*5	.02	.16
14	*1	*3	*1	*.5	17.4	11.4	13.8	3.4	*.1	*3	.02	.13
15	*2	2.9	*1	*.5	15.8	13.2	12.0	3.1	*.1	*2	.07	.23
16	*6	*2	*1	*.5	18.2	13.2	10.8	2.8	*.1	*2	.25	.32
17	*8	*2	*1	*.5	14.4	13.2	13.2	1.8	*.1	1.6	.16	.22
18	*8	*3	*1	*1	15.8	5.2	12.0	1.5	*.1	*2	.11	.23
19	*8	*4	*2	*2	15.0	6.1	12.0	1.4	*.1	*2	.05	.18
20	*8	*5	*2	3.4	14.4	8.0	*9	1.2	*0	2.4	.01	.17
21	7.5	*5	3.1	3.7	15.8	7.5	7.5	1.0	*0	3.0	*0	.26
22	*7	*5	3.7	186	14.4	7.5	*7	1.0	*0	2.1	*0	.28
23	*7	*4	4.7	420	10.8	7.5	*6	.8	*0	1.6	*0	.22
24	6.8	4.2	*2	268	8.5	6.5	*6	.9	*0	.97	*0	.22
25	*6	4.2	*1	191	*8	7.5	*5	.7	*0	.59	*0	1.59
26	*5	3.1	*.5	250	*8	8.5	*5	.6	*0	.44	*0	58
27	*5	3.7	*.5	183	*8	6.5	*5	.5	.01	.38	*0	216
28	*4	4.2	*.5	134	*9	8.0	4.4	.8	*0	.25	*0	97
29	*3	4.2	*.5	*70		8.5	*4	.9	*0	.16	*0	65
30	*3	4.2	1.4	*20		8.5	*4	.9	*0	.08	*1	*60
31	*2		*2	*20		8.5		.5		.05	*.5	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	8	0.8	3.59	0.011	0.01
November	5	2	3.09	.010	.01
December	12.8	.5	2.97	.009	.01
January	420	.3	56.8	.178	.21
February	30	8	16.0	.050	.05
March	17.4	5.2	9.75	.030	.04
April	49	4	17.6	.055	.06
May	4.1	.5	2.28	.007	.01
June	.8	0	.210	.001	.001
July	40	0	6.79	.021	.02
August	.25	0	.087	.0003	.0003
September	216	.13	16.9	.053	.06
The year	420	0	11.3	.035	.48

*Estimated.

Skunk River at Coppock, Iowa.

Location.- Chain gage in sec. 1, T. 73 N., R. 8 W., at highway bridge an eighth of a mile above Chicago, Burlington & Quincy Railroad bridge at Coppock and a quarter of a mile above junction with Crooked Creek.

Drainage area.- 2,890 square miles.

Records available.- October 1913 to September 1934.

Average discharge.- 20 years (1914-34), 1,370 second-feet.

Extremes.- Maximum discharge recorded during year, 1,640 second-feet Jan. 26 (gage height, 6.17 feet); minimum recorded, 18 second-feet Aug. 28 (gage height, 1.86 feet).

1913-34: Maximum discharge recorded, 25,200 second-feet June 15, 1930 (gage height, 22.13 feet); minimum, that of Aug. 28, 1934.

A stage of about 22 feet occurred on or about May 31, 1903.

Remarks.- Records fair except those estimated, which are poor. Discharge estimated because of ice Nov. 15-17, Dec. 10 to Jan. 25, Jan. 30 to Mar. 12. Records partly computed, and several discharge measurements made by engineers of Mississippi River Power Co.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	104	110	83	50	380	40	138	82	46	376	35	31
2	90	101	83	50	340	100	149	80	45	225	34	22
3	83	101	160	50	340	180	160	78	44	94	30	28
4	83	99	120	50	330	240	256	75	43	60	30	106
5	75	97	110	50	320	260	225	73	42	52	29	60
6	75	101	99	45	280	200	197	72	38	49	30	40
7	67	101	92	40	260	160	184	70	36	41	29	43
8	83	92	92	40	240	110	172	67	36	35	26	41
9	82	90	83	40	230	80	172	76	43	33	24	41
10	76	87	60	40	220	60	172	73	48	32	23	58
11	67	90	40	40	210	100	172	73	44	30	24	45
12	64	87	20	40	200	180	172	76	36	289	23	38
13	61	80	20	40	200	184	160	94	33	978	23	32
14	60	76	20	40	200	184	149	83	32	496	21	32
15	55	40	20	40	200	211	138	78	34	658	21	32
16	67	45	20	40	200	197	138	75	31	1,040	21	29
17	75	60	25	40	180	184	128	72	33	1,270	21	25
18	88	83	30	40	160	184	128	70	30	708	21	30
19	83	78	40	40	100	197	112	64	30	340	20	53
20	160	70	45	40	80	172	110	64	29	197	19	53
21	225	60	55	50	60	184	106	64	27	358	19	64
22	184	82	60	60	60	184	104	62	48	184	19	50
23	138	87	60	80	50	172	103	61	73	149	19	41
24	138	90	50	100	50	172	97	58	35	101	20	36
25	120	94	40	120	40	160	92	61	43	83	19	35
26	128	82	30	1,640	40	149	101	54	44	70	19	40
27	149	83	20	1,040	30	138	88	53	36	53	19	32
28	128	83	20	540	30	138	92	50	33	52	18	28
29	120	63	20	395		138	88	49	126	46	19	32
30	110	75	30	300		138	85	48	108	42	19	36
31	101		45	400		128		46		40	19	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	225	55	112	0.039	0.04
November	110	70	84.2	.029	.03
December	160	20	54.6	.019	.02
January	1,640	40	180	.062	.07
February	380	30	180	.062	.06
March	260	40	159	.055	.06
April	256	85	140	.048	.05
May	94	46	67.8	.023	.03
June	126	27	442	.015	.02
July	1,270	30	284	.091	.10
August	35	18	23.0	.008	.01
September	106	22	41.1	.014	.02
The year	1,640	18	111	.038	.51

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Skunk River at Augusta, Iowa

Location.- Chain gage in sec. 26, T. 69 N., R. 4 W., at highway bridge a third of a mile from Augusta post office and 12.2 miles above mouth. Zero of gage is 528.55 feet above mean sea level, Memphis datum.

Drainage area.- 4,290 square miles.

Records available.- September to November 1913, May 1915 to September 1934.

Average discharge.- 19 years (1915-34), 2,110 second-feet.

Extremes.- Maximum discharge recorded during year, 1,960 second-feet Apr. 5 (gage height, 3.8 feet); minimum recorded, 7 second-feet Aug. 27 to Sept. 1 (gage height, 1.0 foot).

1913, 1915-34: Maximum discharge recorded, 44,500 second-feet June 17, 1930 (gage height, 22.55 feet); minimum, that of Aug. 27 to Sept. 1, 1934.

Remarks.- Records fair except those for estimated periods and for discharges below 50 second-feet, which are poor. Discharge estimated because of ice Nov. 17-19, Dec. 11 to Mar. 11. Slight diurnal fluctuation during low water due to operation of power plant upstream. Records partly computed, and results of several discharge measurements furnished by engineers of Mississippi River Power Co.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	321	142	82	40	300	50	142	82	42	179	50	7
2	269	110	70	50	340	60	159	70	60	82	60	95
3	179	110	110	60	350	80	159	82	82	348	42	179
4	159	142	110	80	300	120	348	95	42	244	42	42
5	110	95	124	70	240	300	1,960	95	50	95	42	22
6	82	95	159	70	240	400	1,260	70	82	95	28	199
7	110	82	110	70	230	300	980	110	106	82	28	95
8	95	95	142	60	200	200	440	82	508	70	28	95
9	95	82	95	40	190	160	440	82	348	70	22	60
10	95	82	95	40	180	60	294	95	110	50	28	60
11	95	82	40	50	190	100	244	95	95	50	28	70
12	95	95	25	50	200	348	348	95	70	70	28	70
13	95	82	20	50	200	294	294	95	70	60	28	82
14	82	82	20	40	220	294	269	124	60	744	34	82
15	82	70	20	50	210	199	244	110	60	1,040	28	508
16	82	34	20	40	200	244	222	110	70	440	42	269
17	95	40	25	50	200	269	199	95	50	980	34	124
18	70	45	30	50	180	244	199	110	124	1,570	22	50
19	82	55	35	30	90	244	199	95	1,040	1,260	28	50
20	142	70	40	40	60	244	159	82	294	744	22	42
21	82	95	45	60	60	179	124	82	124	348	22	95
22	244	82	55	80	60	244	110	95	95	294	22	199
23	321	82	60	65	50	199	82	82	378	348	18	110
24	222	95	50	60	50	199	110	82	378	269	18	95
25	199	70	40	60	50	199	110	95	222	179	10	70
26	159	82	25	100	40	159	110	82	95	199	10	70
27	124	82	20	1,000	40	142	159	82	110	82	7	124
28	199	70	20	700	40	179	179	95	95	70	7	60
29	179	70	20	400		179	95	95	70	70	7	60
30	199	82	20	350		110	95	95	70	82	7	42
31	222		30	320		124		110		28	7	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	321	70	148	0.034	0.04
November	142	34	83.3	.019	.02
December	159	20	56.7	.013	.02
January	1,000	30	136	.032	.04
February	350	40	168	.039	.04
March	400	50	198	.046	.05
April	1,960	82	324	.076	.08
May	124	70	92.6	.022	.03
June	1,040	42	167	.039	.04
July	1,570	28	330	.077	.09
August	60	7	25.8	.006	.01
September	508	7	104	.024	.03
The year	1,960	7	152	.035	.49

Des Moines River near Jackson, Minn.

Location.- Chain gage in sec. 28, T. 103 N., R. 35 W., 8 miles northwest of Jackson. Zero of gage is 1,304.85 feet above mean sea level (adjustment of 1929).

Records available.- August 1930 to September 1934. May 1909 to December 1913 comparable records at a site 8 miles downstream.

Extremes.- Maximum discharge recorded during year, 224 second-feet Apr. 3 (gage height, 2.68 feet); no flow for several days in May, June, August, and September.
1909-13, 1930-34: Maximum discharge, 1,690 second-feet June 29, 1909 (gage height, 10.00 feet at former site); no flow at times in 1931, 1934.

Remarks.- Records fair except those for period of ice effect, Nov. 8-16, Mar. 14-24, which are poor. Discharge estimated for Nov. 11-15, July 28-30, Sept. 29, 30. No records Nov. 17 to Mar. 13.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10	4.9					17	4.6	0	68	0.1	0
2	11	4.1					13	8.7	0	59	.1	0
3	10	4.1					224	4.6	0	57	0	0
4	8.0	4.9					154	6.0	0	57	0	0
5	7.2	4.1					196	6.9	0	54	0	0
6	5.7	4.9					139	6.0	0	59	0	0
7	4.1	4.1					117	5.1	0	58	0	0
8	3.7	4.1					104	5.1	23	46	0	0
9	3.7	4.1					84	6.0	110	40	0	0
10	3.2	4.1					79	6.9	139	36	0	0
11	2.8	3.9					68	6.9	124	35	0	0
12	3.2	3.7					59	3.1	82	31	.1	0
13	3.7	3.4					54	2.1	20	36	.1	0
14	3.7	3.2				18	52	1.9	170	29	.1	0
15	4.1	3.0				12	44	1.4	196	26	3.6	0
16	5.7	2.8				19	38	1.4	187	24	1.9	0
17	5.7					15	33	1.2	154	25	1.4	0
18	6.4					10	29	.9	154	20	.8	0
19	5.7					19	26	.5	146	15	.5	0
20	6.4					25	23	.4	146	12	.3	0
21	6.4					29	20	.4	146	9.6	.2	0
22	6.4					24	17	.1	146	7.8	.1	0
23	5.7					22	19	.1	146	5.1	.1	0
24	5.7					20	25	.1	139	4.6	0	0
25	4.9					23	12	0	124	4.1	0	0
26	4.9					26	9.6	0	110	3.1	0	0
27	4.1					25	9.6	0	110	2.1	0	.1
28	3.7					23	11	0	90	1.6	0	.6
29	3.7					20	8.7	0	77	1.1	0	.5
30	3.7					19	9.2	0	71	.6	0	.5
31	4.9					16		0		.1	0	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	11	2.8	5.42		
November. 1-16	4.9	2.8	3.96		
December.					
January					
February					
March 14-31	29	10	20.3		
April	224	8.7	56.5		
May	8.7	0	2.59		
June	196	0	93.7		
July	68	.1	26.7		
August	3.6	0	.30		
September	.6	0	.06		
The year					

Des Moines River near Boone, Iowa

Location.- Staff gage in sec. 24, T. 84 N., R. 27 W., at dam of Boone Water Department, 2 miles northwest of Boone and 2 miles above Bluff Creek.

Drainage area.- 5,490 square miles.

Records available.- October 1933 to September 1934 at present site, April 1920 to September 1924 at site 1.3 miles upstream, October 1924 to September 1927 at site a quarter of a mile upstream.

Extremes.- Maximum discharge recorded during year, 6,770 second-feet Apr. 6 (gage height, 2.90 feet); minimum (estimated), 40 second-feet Dec. 27-30.
1920-27, 1933-34: Maximum discharge recorded, 16,900 second-feet July 11, 1920 (gage height, 13.39 feet, old gage); minimum, 39 second-feet July 23, 1926.
Highest stage since 1907, 17.85 feet, present gage datum, and 24.4 feet, old chain-gage datum at site a quarter of a mile upstream, occurred Apr. 2, 1933 (discharge not determined). A stage of 20.54 feet, old chain gage datum, occurred June 6, 1918 (discharge, about 32,000 second-feet).

Remarks.- Records fair except those below 200 second-feet, which are poor. Some diurnal fluctuation during low stages caused by operation of city power plant at Fort Dodge.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1				64	232	97	144	210	57	264	112	153
2				90	221	119	190	200	57	200	112	112
3	*175			70	210	171	264	221	64	200	90	104
4				76	171	171	1,640	181	57	312	90	90
5			*150	76	171	181	4,740	253	57	300	97	119
6		*115		83	161	161	6,290	264	64	363	83	104
7				90	161	83	3,950	181	64	431	76	97
8				104	153	90	2,880	171	64	474	76	83
9	*195			104	119	127	2,560	161	83	459	83	83
10				64	136	83	2,400	144	615	403	83	76
11			*70	76	127	136	2,250	97	2,710	567	83	76
12				90	119	144	1,960	127	2,880	417	97	70
13				76	119	181	1,510	97	2,250	363	83	64
14				90	153	181	1,220	161	1,820	363	83	70
15	*170		57	64	161	161	1,010	181	1,490	417	97	*66
16			104	76	181	127	791	127	1,110	459	153	*67
17		*100	127	90	119	144	701	144	887	337	127	*70
18			97	90	119	104	701	127	701	599	97	*74
19			119	64	136	112	535	112	535	987	90	*75
20	*115		97	70	136	144	505	83	535	1,010	83	*76
21			83	90	161	136	474	90	474	849	90	*76
22			112	221	104	112	445	90	417	615	83	*74
23			136	253	119	161	417	70	363	489	83	70
24			97	1,010	104	127	389	83	376	363	70	57
25	119	*130	57	737	57	104	389	76	324	350	76	70
26			*45	520	*58	127	363	76	312	253	83	*112
27		114	*40	535	*59	97	324	76	276	242	76	153
28	*130		*40	276	*70	97	312	70	242	200	70	200
29		*120	*40	376		127	312	70	232	190	83	112
30			*40	403		144	253	76	200	181	83	*98
31			*41	431		153		51		127	97	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October			155	0.028	0.03
November			113	.021	.02
December		40	95.2	.017	.02
January	1,010	64	208	.038	.04
February	232	57	137	.025	.03
March	181	83	132	.024	.03
April	6,290	144	1,331	.242	.27
May	264	51	131	.024	.03
June	2,880	57	644	.117	.13
July	1,010	127	412	.075	.09
August	153	70	90.0	.016	.02
September	200	57	91.7	.017	.02
The year	6,290	40	294	.054	.73

*Estimated.

Des Moines River at Des Moines, Iowa

Location.- Water-stage recorder in sec. 2, T. 78 N., R. 24 W., at Walnut Street Bridge, in Des Moines, a quarter of a mile below dam of Des Moines Electric Co. and a third of a mile above mouth of Raccoon River. Zero of gage is 773.74 feet above mean sea level.

Drainage area.- 6,180 square miles.

Records available.- October 1902 to August 1903, October 1914 to September 1927, October 1932 to September 1934. May 1905 to July 1906 at Interurban Bridge, near Highland Park, 5 miles upstream.

Average discharge.- 14 years (1915-27, 1932-34), 1,920 second-feet.

Extremes.- Maximum discharge during year, 5,370 second-feet Apr. 7 (gage height, 4.40 feet); minimum, 56 second-feet June 7; minimum gage height, 0.00 foot Sept. 25.
1914-27, 1932-34: Maximum discharge, about 41,500 second-feet June 7, 1918 (gage height, 16.5 feet); minimum daily discharge, 35 second-feet Dec. 31, 1923, and Jan. 1, 1924; zero flow has occurred at times since construction of dam above gage.
Maximum stage known, about 23 feet in May 1903 (caused by backwater from Raccoon River; discharge not determined).

Remarks.- Records fair except those below 200 second-feet, which are poor. Discharge estimated for periods Dec. 25 to Jan. 4, Feb. 26 to Mar. 1. Gage-height record furnished by U. S. Weather Bureau.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	276	155	142	90	336	120	178	292	70	238	200	104
2	258	136	160	95	336	150	181	278	66	261	166	110
3	258	136	167	90	332	193	187	261	64	265	150	200
4	241	142	184	100	319	236	224	236	63	257	145	140
5	212	153	195	115	291	278	1,030	248	61	357	132	119
6	198	158	231	118	261	232	3,830	207	59	405	142	110
7	190	153	241	118	247	232	5,140	224	56	394	160	98
8	180	151	215	118	225	172	4,360	218	63	405	128	96
9	167	142	174	118	228	184	3,330	200	80	469	106	96
10	153	144	180	118	187	137	2,940	181	73	494	100	96
11	151	140	92	120	200	123	2,660	158	83	416	89	92
12	149	140	80	120	221	204	2,480	147	1,730	439	94	92
13	140	136	88	118	193	221	2,140	147	2,850	439	96	91
14	136	136	92	106	210	221	1,760	184	2,220	410	92	84
15	162	116	94	97	248	232	1,370	172	1,830	410	92	64
16	247	102	96	94	292	240	1,160	178	1,430	336	108	80
17	231	120	91	94	265	248	1,000	196	1,150	427	106	79
18	212	130	88	94	307	221	885	166	979	445	114	87
19	193	120	89	91	163	200	777	166	795	399	114	91
20	172	124	96	89	190	193	679	158	655	777	110	91
21	198	122	97	89	228	190	607	147	600	926	108	91
22	195	134	106	140	210	190	585	137	548	906	106	86
23	194	153	111	358	178	181	508	135	508	731	106	79
24	182	162	86	654	145	166	469	132	469	570	104	69
25	170	174	60	508	100	181	445	123	405	475	92	76
26	170	164	60	950	75	169	405	116	383	383	89	126
27	162	172	60	950	75	155	389	110	342	347	80	399
28	151	162	60	706	85	155	352	98	297	297	80	257
29	151	151	60	276		155	326	91	288	253	79	283
30	195	140	60	279		155	321	82	311	240	80	248
31	201		70	323		169		74		207	102	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	276	136	190	0.031	0.04
November	174	102	142	.023	.03
December	241	60	117	.019	.02
January	950	89	237	.038	.04
February	336	75	220	.036	.04
March	278	120	190	.031	.04
April	5,140	178	1,357	.220	.25
May	292	74	170	.028	.03
June	2,850	56	618	.100	.11
July	926	207	433	.070	.08
August	200	79	112	.018	.02
September	399	69	125	.020	.02
The year	5,140	56	324	.052	.72

Des Moines River near Tracy, Iowa

Location.- Chain gage in sec. 19, T. 75 N., R. 17 W., at highway bridge in Bellefontaine, near Tracy, 3 miles above mouth of Cedar Creek and 6 miles below mouth of English Creek. Zero of gage is 671.78 feet above mean sea level.

Drainage area.- 12,400 square miles.

Records available.- March 1920 to September 1927, March 1933 to September 1934.

Extremes.- Maximum discharge recorded during year, 4,950 second-feet Apr. 9 (gage height, 5.53 feet); minimum discharge recorded, 125 second-feet June 7, 8 (gage height, 1.98 feet).
1920-27, 1933-34: Maximum discharge recorded, 38,600 second-feet Apr. 7, 1933 (gage height, 16.5 feet); minimum, that of June 7, 8, 1934.
Maximum stage since 1851, about 25 feet May 31, 1903 (discharge, about 100,000 second-feet).

Remarks.- Records good except those for period December to March, which are fair. Discharge estimated for periods of ice effect, Dec. 12-19, Dec. 25 to Feb. 15, Feb. 19 to Mar. 3.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	740	330	395				363	609	164	484	288	186
2	650	388	372			350	378	559	208	425	300	246
3	562	330	402	230	670		408	493	164	467	326	240
4	402	330	402			651	408	476	164	493	326	288
5	402	372	402			651	559	512	150	393	294	1,340
6	380	402	402			651	861	512	130	313	262	682
7	344	402	402			661	2,320	493	125	661	251	326
8	386	402	480	255	435	588	4,380	476	125	993	199	300
9	330	402	416			580	4,760	476	144	861	224	240
10	330	402	402			425	4,020	467	168	774	204	230
11	316	402	330			393	3,530	442	378	751	199	213
12	295	402				363	3,070	442	751	762	199	512
13	323	402		250	450	363	2,930	417	861	861	164	661
14	323	402				363	2,780	363	2,150	925	164	762
15	344	402				393	2,480	370	2,780	797	190	797
			245									
16	480	295			599	393	1,900	378	2,480	774	204	797
17	1,360	388			609	512	1,570	313	2,150	797	195	450
18	832	330		220	609	393	1,420	281	1,570	705	168	341
19	650	330				393	1,420	300	1,420	694	164	307
20	562	330	262			378	1,270	262	1,270	651	164	268
					305							
21	480	330	262			378	1,130	257	1,130	630	164	224
22	402	365	330			378	1,060	246	1,060	925	186	262
23	402	365	330	525		363	925	246	861	993	182	224
24	395	344	330			378	861	313	682	993	182	208
25	365	295				378	661	246	640	786	182	208
					210							
26	402	295				378	630	204	661	588	173	208
27	402	344	170			378	630	190	569	503	157	356
28	402	402		1,350		378	559	199	550	450	147	578
29	380	402				378	531	177	512	385	133	1,900
30	330	402				307	512	164	503	333	130	1,650
31	330					307		164		313	130	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	1,360	295	461	0.037	0.04
November	402	295	366	.030	.03
December	480		293	.024	.03
January			500	.040	.05
February			434	.035	.04
March		307	426	.034	.04
April	4,760	363	1,610	.130	.14
May	609	164	356	.029	.03
June	2,780	125	817	.066	.07
July	993	313	661	.053	.06
August	326	130	202	.016	.02
September	1,900	208	500	.040	.04
The year	4,760	125	550	.044	.59

Des Moines River at Eldon, Iowa

Location.- Chain gage in sec. 27, T. 71 N., R. 12 W., at highway bridge in Eldon, Wapello County, about 1 mile above Soap Creek.

Drainage area.- 13,300 square miles.

Records available.- October 1930 to September 1934; comparable records at Ottumwa, March 1917 to September 1927, January 1929 to September 1930.

Extremes.- Maximum discharge recorded during year, 5,020 second-feet Apr. 10 (gage height, 5.16 feet); minimum, 44 second-feet June 11.
1917-27, 1929-34: Maximum discharge recorded, 58,700 second-feet June 11, 1917 (gage height, at Ottumwa, 16.5 feet); minimum, that of June 11, 1934.
Maximum discharge since 1850 and probably in the last century occurred on May 31, 1903, and is estimated as 100,000 second-feet.

Remarks.- Records fair except those affected by moss growth May 1 to June 12, and those estimated because of ice, Dec. 12-14, Dec. 17 to Feb. 11, Feb. 19 to Mar. 7, Mar. 10, which are poor. Diurnal fluctuation at low stages due to operation of power plant at Ottumwa.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	640	262	352	140	550	290	371	688	277	384	237	206
2	522	417	215	150	490	410	475	606	114	384	223	1,230
3	995	365	316	175	550	540	310	688	397	352	252	371
4	242	390	228	190	1,000	580	2,470	597	371	333	257	631
5	688	219	352	200	1,230	570	1,790	571	100	475	262	345
6	133	358	417	200	1,230	1,000	1,110	530	288	390	210	1,110
7	70	267	288	200	1,230	500	995	491	146	232	288	785
8	358	390	310	150	1,000	785	2,760	491	55	461	146	377
9	345	288	333	180	300	640	4,500	417	322	1,230	352	316
10	322	371	432	205	500	520	4,840	554	80	888	103	219
11	310	257	189	230	550	377	3,840	538	46	888	174	247
12	333	397	130	240	623	580	3,520	293	61	735	159	206
13	232	305	100	240	735	538	3,210	735	995	735	163	940
14	288	193	125	240	735	305	3,060	597	835	888	103	1,920
15	310	365	232	240	995	377	2,760	631	2,470	888	149	940
16	371	242	242	240	835	514	2,470	365	2,760	785	339	1,110
17	371	247	125	240	514	597	2,190	530	2,470	835	73	940
18	1,600	242	120	240	554	403	1,920	305	2,050	835	174	835
19	1,050	352	115	240	420	530	1,660	328	1,660	688	117	328
20	835	277	130	240	350	417	1,470	293	1,530	631	78	267
21	499	189	175	250	300	507	1,290	425	1,350	606	136	322
22	483	198	220	260	280	483	1,350	305	1,470	597	85	103
23	468	339	230	275	280	439	1,170	305	1,230	785	210	170
24	432	345	175	290	275	352	1,110	322	888	1,050	156	257
25	390	223	130	300	260	339	940	377	888	888	85	219
26	640	365	105	450	250	377	995	403	688	785	87	95
27	252	174	95	1,500	250	299	835	232	688	640	98	133
28	403	371	85	1,500	245	316	688	475	571	546	75	73
29	384	210	75	1,200		345	688	215	554	439	95	688
30	384	328	105	950		365	735	371	606	365	98	1,790
31	365		130	750		371		333		282	193	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	1,600	70	475	0.036	0.04
November	417	174	298	.022	.02
December			202	.015	.02
January			384	.029	.03
February			590	.044	.05
March			473	.036	.04
April	4,840	310	1,851	.139	.16
May	735	215	452	.034	.04
June	2,760	46	865	.065	.07
July	1,230	232	646	.049	.06
August	362	73	167	.013	.01
September	1,920	73	572	.043	.05
The year	4,840	46	578	.043	.59

Des Moines River at Keosauqua, Iowa

Location.- Water-stage recorder in sec. 36, T. 69 N., R. 10 W., at county bridge in Keosauqua, a quarter of a mile above old dam site and Government locks. Prior to Dec. 22, 1933, a chain gage at same site and datum was used.

Drainage area.- 13,900 square miles.

Records available.- May 1903 to July 1906, April 1910 to September 1934.

Average discharge.- 21 years (1913-34), 4,810 second-feet.

Extremes.- Maximum discharge during year, 8,740 second-feet Apr. 4 (gage height, 3.70 feet); minimum, 72 second-feet Aug. 30 (gage height, -0.43 foot).
1903-6, 1910-34: Maximum discharge, about 97,000 second-feet June 1, 1903 (gage height, 27.85 feet); minimum, that of Aug. 30, 1934.
Flood of June 1, 1851, reached a stage of about 24 feet (discharge, about 80,000 second-feet).

Remarks.- Records fair. Discharge estimated because of ice Dec. 11 to Jan. 26, Jan. 29 to Feb. 12, Feb. 18 to Mar. 5, Mar. 8-12, 18, and interpolated for Nov. 24, Sept. 22. Records partly computed, and several discharge measurements made by engineers of Mississippi River Power Co.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	869	480	375	150	600	300	438	649	282	459	406	233
2	727	282	428	170	500	450	470	610	249	375	328	225
3	597	375	282	200	500	570	515	623	225	319	310	1,100
4	869	538	375	210	600	700	8,740	623	282	328	282	438
5	375	538	480	220	1,300	850	6,150	649	301	319	274	636
6	538	375	375	220	1,300	990	1,550	649	151	396	266	570
7	282	480	375	220	1,300	1,020	1,040	623	428	356	241	1,160
8	105	375	282	210	1,100	500	1,280	550	233	249	282	784
9	375	480	328	200	800	480	3,160	438	144	438	144	480
10	375	241	282	210	600	480	4,360	459	301	669	257	396
11	328	375	200	240	620	480	3,880	492	158	929	165	336
12	328	480	180	250	650	520	3,280	480	80	841	233	319
13	375	375	170	250	727	610	2,800	428	80	755	166	301
14	130	375	160	250	841	503	2,610	675	626	727	216	1,680
15	428	216	160	250	784	448	2,390	688	1,130	655	144	1,260
16	241	130	150	250	899	459	2,170	597	2,190	899	130	929
17	375	130	150	250	649	492	1,800	436	2,590	714	282	914
18	428	375	150	250	500	510	1,550	527	2,170	727	120	899
19	1,620	200	150	250	430	538	1,320	480	1,660	727	158	755
20	944	375	200	250	370	492	1,150	470	1,420	701	158	406
21	669	375	400	260	330	527	1,040	375	1,320	701	110	480
22	597	165	350	270	300	538	914	503	1,610	623	165	330
23	538	282	250	290	300	480	884	480	1,610	503	137	179
24	538	282	180	300	290	503	784	396	1,150	714	249	241
25	428	282	150	320	280	438	727	356	944	884	179	301
26	428	282	110	500	270	428	841	338	826	899	144	282
27	538	428	100	1,250	260	438	869	347	649	755	241	172
28	375	375	90	1,660	250	428	826	241	610	701	193	291
29	536	428	80	1,300		406	777	338	515	585	80	151
30	428	282	120	1,050		417	714	266	503	438	72	1,100
31	538		140	800		375		257		448	80	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	1,620	105	520	0.037	0.04
November	538	130	346	.025	.03
December	480	80	253	.017	.02
January	1,660	150	403	.029	.03
February	1,300	250	627	.045	.05
March	1,020	300	528	.038	.04
April	8,740	438	1,970	.142	.16
May	688	241	485	.035	.04
June	2,590	80	821	.059	.07
July	929	249	620	.045	.05
August	406	72	201	.014	.02
September	1,680	151	578	.042	.05
The year	8,740	72	607	.044	.60

Tuttle Lake near Ceylon, Minn.

Location.- Staff gage in SW¼ sec. 31, T. 101 N., R. 31 W., 1-5/8 miles above dam at outlet of Tuttle Lake and 7 miles southeast of Ceylon. Zero of gage is 2.0 feet below crest of dam at outlet.

Records available.- July 1930 to September 1934.

Extremes.- Maximum gage height during year, 2.32 feet Apr. 11 and 13; minimum, 0.68 foot Sept. 23.
1930-34: Maximum gage height, 3.99 feet Apr. 4, 6, 8, 1933; minimum, 0.00 foot several times in September 1931.

Remarks.- Daily gage readings subject to fluctuation owing to wind. No measurements of discharge made during year. No records on days for which no gage-heights are given.

Gage height, in feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.12	1.86				1.85	1.88	1.82	1.28	1.13	0.94	0.78
2	2.08	1.88				1.85	1.86	1.78	1.18	1.09	.90	.76
3	2.08	1.90				1.85	2.16	1.80	1.20	1.15	.88	.76
4	2.08	1.90				1.85	2.18	1.82	1.20	1.17	.86	.76
5	2.08	1.88				1.85	2.22	1.82	1.16	1.17	.92	.78
6	2.08	1.86					2.24	1.82	1.26	1.23	.88	.84
7	2.08	1.84					2.24	1.80	1.18	1.21	.79	.78
8	2.00	1.82					2.24	1.72	1.58	1.15	.79	.76
9	2.00	1.80					2.28	1.66	1.52	1.15	.83	.76
10	2.00	1.82					2.26	1.68	1.52	1.15	.82	.76
11	2.00	1.84				1.83	2.32	1.70	1.56	1.15	.80	.74
12	2.00	1.94				1.83	2.30	1.68	1.52	1.15	.82	.74
13	2.00	1.92				1.79	2.32	1.62	1.48	1.17	.80	.74
14	2.00	1.90				1.81	2.28	1.68	1.48	1.15	.84	.76
15	1.98	1.90				1.81	2.10	1.62	1.46	1.37	.94	.78
16	1.98					1.79	2.15	1.42	1.43	1.18	.92	.74
17	1.96					1.85	2.13		1.41	1.22	.90	.78
18	1.96					1.79	2.13		1.33	1.24	.82	.76
19	1.96					1.77	2.09	1.50	1.39	1.20	.80	.74
20	1.92					1.79	2.25	1.52	1.37	1.20	.88	.74
21	1.92					1.83	1.95	1.50	1.37	1.14	.86	.72
22	1.92					1.83	2.13	1.52	1.35	1.16	.84	.70
23	1.90					1.81	2.13	1.44	1.29	1.14	.82	.68
24	1.90					1.81	2.11	1.46	1.27	1.10	.82	.72
25	1.90					1.79	2.11	1.42	1.21	1.08	.80	.74
26	1.88					1.87	2.11	1.40	1.23	1.06	.78	.76
27	1.88					1.75	1.99	1.38	1.23	1.04	.78	.76
28	1.86					1.77	1.87	1.36	1.21	1.04	.76	.78
29	1.86					1.89	1.91	1.34	1.19	1.00	.78	.78
30	1.84					1.87	1.83	1.36	1.19	.98	.76	.80
31	1.84					1.85		1.30		.96	.74	

Tuttle Lake near Dolliver, Iowa

Location.- Staff gage in SE¼ sec. 11, T. 100 N., R. 32 W., just above dam at outlet and 2 miles northeast of Dolliver. Zero of gage is at elevation of crest of dam.

Records available.- May 1933 to September 1934.

Extremes.- Maximum stage recorded during period of record, 1.33 feet May 20, 1933; minimum recorded, -1.30 feet Sept. 23, 1934.

Remarks.- Gage readings discontinued during winter. Daily gage readings subject to fluctuation owing to wind. Because of flash boards and fish screens on crest of dam there is no fixed relation between lake stage and discharge over dam.

Discharge measurements of Tuttle Lake outlet, 1933

Date	Gage height (feet)		Discharge (second-feet)
	Above dam	Below dam	
May 16	1.36	1.72	31.5
May 18	1.24	2.09	55.9

Day	1933						1934					
	May	June	July	Aug.	Sept.	Oct.	Apr.	May	June	July	Aug.	Sept.
1		1.04	0.50	0.23	0.02	0.21	-0.08	0.14	-0.61	-0.72	-0.98	-1.16
2		1.00	.60	.29	.21	.09	-.08	.10	-.66	-.75	-.87	-1.11
3		1.02	.58	.28	.31	.10	+.16	.08	-.72	-.80	-.95	-1.05
4		.99	.54	.21	.31	.15	.29	.04	-.73	-.88	-.99	-1.11
5		1.00	.51	.18	.24	.03	.26	.00	-.73	-.70	-1.09	-1.06
6		.98	.49	.22	.32	.13	.28	.00	-.71	-.75	-1.03	-1.11
7		.98	.51	.29	.26	.29	.26	.00	-.73	-.80	-1.06	-1.12
8		.95	.55	.21	.26	.22	.23	-.08	-.43	-.89		-1.18
9		.82	.49	.20	.37	.07	.35	-.17	-.32	-.89	-1.06	-1.25
10		.86	.43	.21	.40	.00	.39	-.17	-.38	-.76	-1.08	-1.22
11		.95	.42	.20	.37	.13	.50	-.21	-.33	-.78	-1.10	-1.12
12		.90	.41	.28	.32	.13	.57	-.25	-.35	-.69	-1.08	-1.12
13		.82	.40	.19	.29	.00	.57	-.25	-.40	-.76	-1.07	-1.21
14		.78	.50	.16	.29	.00	.30	-.33	-.39	-.72	-1.08	-1.11
15		.72	.43	.12	.26		.29	-.42	-.42	-.76	-.95	-1.06
16		.66	.38	.27	.30	.16	.30	-.42	-.45	-.76	-.98	-1.22
17		.59	.29	.36	.30	.10	.30	-.42	-.42	-.70	-1.00	-1.26
18	1.20	.58	.26	.23	.27	.06	.32	-.42	-.44	-.66	-1.00	-1.16
19	1.30	.58	.23	.13	.43	.07	.34	-.50	-.51	-.68	-.93	-1.27
20	1.33	.55	.19	.12	.35	.00	.36		-.47	-.70	-.96	-1.10
21	1.20	.60	.24	.09	.27	.00	.40		-.51	-.71	-.96	-1.18
22	1.14	.60	.29	.14	.34		.39		-.53	-.73	-1.09	-1.28
23	1.12	.50	.51	.12	.26		.48	-.46		-.78	-1.06	-1.30
24	1.10	.56	.42	.19	.24		.42	-.44	-.62	-.78	-1.05	-1.27
25	1.18	.56	.38	.22	.20		.31	-.44	-.71	-.74	-1.11	-1.11
26	1.24	.49	.35	.20	.24		.32	-.50	-.61	-.70	-1.10	-1.06
27	1.19	.44	.30	.15	.19		.28	-.55	-.69	-.81	-1.10	-1.12
28	1.15	.40	.23	.12	.22		.27	-.58	-.68	-.85	-1.12	-1.10
29	1.12	.42	.22	.06	.09		.26	-.53	-.70	-.79	-1.25	-.98
30	1.15	.42	.20	.04	.35		.24	-.58	-.72	-.90	-1.26	-1.05
31	1.12		.17	.01				-.64		-.96	-1.26	

Note.- Gage height on Mar. 15, 1934, was -0.18 foot.

Raccoon River at Van Meter, Iowa

Location.- Water-stage recorder in SW¼ sec. 22, T. 78 N., R. 27 W., at highway bridge a third of a mile from railroad station at Van Meter, 1 mile below junction of North and South Raccoon Rivers, and 30 miles above junction of Raccoon and Des Moines Rivers. A chain gage at same site and datum was used prior to Aug. 9, 1934. Zero of gage is 841.12 feet above mean sea level.

Drainage area.- 3,410 square miles.

Records available.- April 1915 to November 1927, October 1932 to September 1934.

Average discharge.- 13 years (1915-27, 1933-34), 1,110 second-feet.

Extremes.- Maximum discharge recorded during year, 2,020 second-feet Apr. 7 (gage height, 5.0 feet); minimum, 19 second-feet Aug. 29 (gage height, 1.38 feet). 1915-27, 1932-34: Maximum discharge recorded, 40,000 second-feet Sept. 20, 1926 (gage height, 18.96 feet); minimum, that of Aug. 29, 1934.

Remarks.- Records poor for period Oct. 1 to June 10 and good thereafter. Some diurnal fluctuation during low water caused by operation of power plant at Adel, 10 miles upstream from station.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			138			*105	160	219	61	164	63	75
2			165				160	219	63	95	60	143
3	*160		194	*70	*205		160	210	63	92	56	235
4			194			259	219	216	56	82	58	106
5			138			340	328	185	47	200	50	86
6			138			336	900	182	48	266	48	97
7			136			332	2,020	128	48	118	36	95
8	*120	*100	138	*82	*150	162	1,780	182	50	213	32	82
9			113			162	1,390	128	1,700	276	29	75
10			113			222	1,110	102	529	353	29	67
11	†82					222	900	152	540	252	29	48
12						222	821	152	375	416	29	63
13	*100			*80	*145	162	693	180	1,000	397	28	48
14						191	623	126	737	455	26	47
15						191	513	102	513	362	26	50
16		113				191	460	102	402	274	28	47
17		69	*65			191	460	102	388	219	29	44
18	*140	69			*160	191	460	126	270	200	30	44
19		90				191	340	99	440	242	31	42
20		113		*70		191	281	77	256	216	30	39
21		113				191	276	77	162	239	28	40
22		113			*130	191	274	77	180	228	25	42
23	*125	113				162	270	77	157	235	26	44
24		113		1,110		162	266	80	185	165	29	45
25		138		1,110		162	141	75	133	95	28	60
26		113		579	*60	162	228	60	126	48	26	988
27		113		681		162	259	60	130	141	25	873
28	*115	90	*45	407		162	191	60	104	82	22	350
29		90		245		162	191	60	86	80	21	194
30		90		180		162	219	61	82	73	29	123
31				205		162		61		71	31	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October			126	0.037	0.04
November			101	.030	.03
December			87.5	.026	.03
January	1,110		201	.059	.07
February			145	.043	.04
March	340		191	.056	.06
April	2,020	141	537	.157	.18
May	219	60	121	.035	.04
June	1,700	47	298	.087	.10
July	455	48	204	.060	.07
August	63	21	33.5	.010	.01
September	988	39	143	.042	.05
The year	2,020	21	182	.053	.72

*Estimated.
†Discharge measurement.

Fox River at Wayland, Mo.

Location.- Chain gage in NW¼ sec. 31, T. 65 N., R. 6 W., at bridge on State Highway 4, three-quarters of a mile west of Wayland.

Drainage area.- 400 square miles.

Records available.- October 1929 to September 1934, February 1922 to September 1929 at site 2 miles upstream.

Extremes.- Maximum discharge recorded during year, 1,780 second-feet Apr. 5 (gage height, 10.92 feet); no flow July 22-31, Aug. 1-11, 14-17, 19-30; minimum gage height, 1.75 feet Aug. 10.
1930-34: Maximum discharge recorded, 25,000 second-feet June 29, 1933 (gage height, 21.53 feet); no flow on many days during September 1930, July and August 1934.

Remarks.- Records fair except those for days of rapidly changing stage and those estimated, which are poor. Stage-discharge relation affected by ice Dec. 24 to Jan. 3, Jan. 29 to Feb. 2, Feb. 23-27, Mar. 1-3.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	25	9	6	*6	*6	*2	10	5	1.4	4.8	0	28
2	21	8	7	*6	*6	*2	10	4.8	.8	3.7	0	36
3	19	7	9	*8	9	*8	10	4.7	1.0	3.1	0	39
4	15	6	9	9	9	22	994	4.7	.7	2.6	0	37
5	12	6	8	11	9	63	1,470	4.3	.5	2.6	0	*40
6	10	6	8	10	9	55	745	4.3	.7	2.3	0	42
7	10	7	8	10	8	39	425	3.9	148	2.3	0	34
8	9	*6	8	10	8	34	385	3.4	29	1.9	0	11
9	9	6	8	10	9	29	275	2.9	36	1.3	0	7
10	8	6	8	11	9	23	160	2.9	28	.4	0	6
11	8	5	8	10	9	18	83	2.6	16	.1	0	4.3
12	8	5	e	10	9	17	44	5	6	.2	1.4	3.9
13	7	4.8	8	10	9	16	17	6	3.4	.6	.3	4.5
14	7	5	8	9	10	15	13	5	2.9	.7	0	5
15	7	4.7	8	10	10	14	13	4.7	2.6	.5	0	329
16	7	5	8	9	10	14	12	4.3	2.5	.4	0	35
17	6	4.7	8	9	10	13	11	3.7	20	.3	0	13
18	6	4.7	8	9	10	13	10	5	148	.3	.1	12
19	6	4.5	10	*10	10	12	9	4.3	104	.2	0	24
20	7	*4.4	10	10	10	12	8	*3.4	*98	.1	0	27
21	7	4.3	15	10	9	11	9	2.5	93	.1	0	365
22	8	4.3	14	9	10	11	8	8	68	0	0	54
23	7	*4.1	12	9	*8	10	7	22	110	0	0	31
24	6	3.9	*11	9	*6	10	6	10	195	0	0	10
25	6	5	*8	9	*6	10	5	6	148	0	0	*10
26	6	5	*6	10	*2	10	5	5	98	0	0	9
27	6	6	*6	10	*2	10	6	3.9	*57	0	0	22
28	6	6	*6	10	†2	9	5	2.8	16	0	0	33
29	6	6	*6	*8		9	6	2.5	9	0	0	242
30	6	6	*6	*6		9	6	1.8	4.8	0	0	33
31	8		*6	*6		9		1.5		0	.2	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	25	6	9.0	0.022	0.03	553
November	9	3.9	5.51	.014	.02	328
December	15	6	8.4	.021	.02	514
January	11	6	9.1	.023	.03	561
February	10	2	8.0	.020	.02	444
March	83	2	17.7	.044	.05	1,090
April	1,470	5	159	.398	.44	9,460
May	22	1.5	4.87	.012	.01	299
June	195	.5	48.3	.121	.14	2,870
July	4.8	0	.92	.0023	.003	57
August	1.4	0	.06	.00015	.0002	4.0
September	365	3.9	51.6	.129	.14	3,070
The year	1,470	0	26.6	.0665	.90	19,250

*Estimated.
†Discharge measurement.

North Fabius River at Monticello, Mo.

Location.- Chain gage in SE¼ sec. 6, T. 61 N., R. 7 W., at bridge on State Highway 96, 1 mile south of Monticello. Zero of gage is about 541.8 feet above mean sea level.

Drainage area.- 452 square miles.

Records available.- February 1922 to September 1934.

Average discharge.- 11 years (1923-34), 308 second-feet.

Extremes.- Maximum discharge recorded during year, 1,270 second-feet Sept. 29 (gage height, 8.80 feet); no flow May 29 to June 8, June 12 to Sept. 1.
1922-34: Maximum discharge, 17,400 second-feet June 30, 1933 (gage height, 30.8 feet, from flood marks); no flow May 29 to June 8, June 12 to Sept. 1, 1934.

Remarks.- Records fair except those estimated for periods of ice effect, Dec. 24-31, Jan. 1-4, 8-21, Jan. 27 to Feb. 26, Feb. 28 to Mar. 3, Mar. 10, and those estimated for Oct. 1, May 10-13, which are poor.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	35	2.1	1.5	0.9	2.9	0.9	18	4.1	0			0
2	18	2.1	4.1	.9	2.9	.9	14	2.9	0			.3
3	11	2.1	5	.9	2.9	2.9	13	2.5	0			132
4	10	1.9	4.1	2.9	2.9	10	227	1.7	0			132
5	8	1.9	3.7	10	2.9	108	757	6	0			61
6	6	2.1	3.3	9	2.9	72	324	2.9	0			52
7	5	2.5	2.7	8	2.9	46	166	2.1	0			31
8	8	2.5	1.9	7	2.9	36	108	.7	0			14
9	6	2.5	1.9	2.9	2.9	26	62	.3	1.9			7
10	4.1	2.5	1.5	2.9	2.9	12	102	.3	.1			6
11	3.3	2.5	1.1	2.9	2.9	12	48	.2	.1			3.3
12	7	2.5	.9	2.9	7	15	30	.1	0			3.3
13	4.1	1.9	.9	2.9	7	12	24	3.0	0			4.1
14	3.7	1.9	1.1	2.9	7	10	17	4.5	0			4.1
15	6	1.7	.9	2.9	7	10	16	2.9	0			713
16	4.1	1.7	.7	2.9	7	8	14	1.7	0			174
17	4.1	1.7	1.1	2.9	7	9	14	1.9	0			124
18	4.5	1.7	.7	2.9	7	8	10	2.3	0			78
19	4.1	1.7	1.5	2.9	7	10	8	1.7	0			42
20	6	1.7	1.1	7	2.9	9	8	2.1	0			25
21	5	1.7	.9	7	2.9	8	7	1.7	0			691
22	7	1.7	.9	10	2.9	8	4.5	1.7	0			429
23	4.5	1.7	.7	10	.9	8	6	.7	0			124
24	2.7	1.5	.9	10	.9	9	4.1	.1	0			61
25	1.9	1.5	.9	10	.9	8	3.3	3.7	0			35
26	2.1	1.7	.9	7	.9	7	4.1	.9	0			22
27	1.7	1.7	.9	7	*.9	8	3.7	.3	0			25
28	1.5	1.1	.9	2.9	.9	8	4.1	.1	0			227
29	2.3	1.3	.9	2.9		8	3.3	0	0			1,270
30	2.3	1.1	.9	2.9		7	3.3	0	0			366
31	2.1		.9	2.9		8		0				

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	35	1.5	6.16	0.014	0.02	379
November	2.5	1.1	1.87	.0041	.005	111
December	5	.7	1.59	.0035	.004	98
January	10	.9	4.87	.011	.01	300
February	7	.9	3.64	.0081	.008	202
March	108	.9	16.3	.036	.04	1,000
April	757	3.3	67.4	.149	.17	4,010
May	6	0	1.71	.0038	.004	105
June	1.9	0	.07	.00015	.0002	4.2
July	0	0	0	0	0	0
August	0	0	0	0	0	0
September	1,270	0	162	.358	.40	9,630
The year	1,270	0	21.9	.0485	.66	15,840

*Discharge measurement.
Note.- No flow during July and August.

North Fabius River at Taylor, Mo.

Location.- Water-stage recorder in NE¼SE¼ sec. 2, T. 59 N., R. 6 W., at bridge on State Highway 61 at Taylor. Zero of gage is about 470.0 feet above mean sea level. Chain gage at same location and datum used prior to Sept. 18, 1934.

Drainage area.- 930 square miles.

Records available.- April 1930 to September 1934.

Extremes.- Maximum discharge during year, 2,380 second-feet Sept. 29 (gage height, 6.18 feet); minimum, 0.1 second-foot July 23-25 (gage height, 1.72 feet).
1930-34: Maximum discharge, 30,300 second-feet June 30, 1933 (gage height, 22.85 feet from floodmarks); minimum, that of July 23-25, 1934.
Maximum stage known, 23.5 feet Nov. 19, 1928.

Remarks.- Records good except those for days of rapidly changing stage, which are fair.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	72	13	18	22	15	15	30	14	4.3	0.7	0.5	1.3
2	56	12	28	22	14	21	49	15	3.5	.7	.3	2.1
3	53	15	49	22	14	31	77	14	3.5	.3	.3	2.1
4	49	13	38	24	14	36	217	13	3.5	.3	.3	1.7
5	38	13	28	26	15	63	1,260	16	3.5	.2	.5	2.7
6	30	15	25	36	15	143	960	15	2.7	.3	.5	133
7	28	19	21	31	15	107	678	13	1.7	.3	.7	119
8	21	23	19	29	14	126	400	12	.9	.3	.3	70
9	19	19	21	26	12	107	237	10	4.3	.2	.3	48
10	19	16	18	26	12	65	182	10	5	.2	.3	36
11	18	15	15	24	14	42	154	9	4.3	.3	3.1	31
12	16	15	15	29	15	36	107	8	5	.3	1.9	26
13	16	15	18	26	14	33	70	8	5	.7	1.1	133
14	15	15	18	24	12	31	61	9	5	.3	.7	42
15	15	13	16	22	14	29	45	23	4.3	.3	.7	136
16	13	12	15	22	15	26	39	19	4.3	.2	3.9	495
17	12	10	17	20	15	31	36	21	5	.2	1.1	310
18	15	12	17	19	14	33	36	25	22	.3	1.1	261
19	16	12	20	20	14	31	33	20	16	.2	.7	198
20	15	10	24	20	15	33	29	19	6	.2	.3	126
21	16	10	26	20	15	36	24	15	4.7	.2	.3	110
22	15	10	29	19	15	33	22	12	4.7	.2	.3	825
23	13	13	26	20	14	31	19	11	3.9	.1	.2	445
24	13	15	26	22	14	26	17	10	3.1	.1	.2	301
25	15	13	24	22	12	24	15	8	2.3	.1	.2	229
26	16	15	22	22	12	26	14	8	1.9	.3	.5	143
27	15	16	22	24	12	29	17	8	1.5	.2	.5	89
28	13	15	22	22	15	31	15	8	1.5	.3	.3	107
29	13	15	22	20		32	15	7	1.1	.3	.2	1,810
30	13	16	20	15		28	15	6	1.1	.3	.3	1,200
31	14		22	15		30		5		.5	.5	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	72	12	22.3	0.024	0.03	1,370
November	23	10	14.2	.015	.02	843
December	49	15	22.6	.024	.03	1,390
January	36	15	22.9	.025	.03	1,410
February	15	12	14.0	.015	.02	776
March	143	15	44.0	.047	.05	2,710
April	1,260	14	162	.174	.19	9,650
May	25	5	12.6	.014	.02	776
June	22	.9	4.52	.0049	.005	269
July	.7	.1	.29	.00031	.0004	18
August	3.9	.2	.71	.00076	.0009	44
September	1,810	1.3	248	.267	.30	14,740
The year	1,810	.1	47.0	.0505	.70	34,000

Middle Fabius River near Baring, Mo.

Location.- Water-stage recorder in NW¼NW¼ sec. 26, T. 64 N., R. 12 W., at bridge on State Highway 15, 6 miles north of Baring. Zero of gage is about 679.1 feet above mean sea level. Chain gage at same location and datum used prior to Sept. 17.

Drainage area.- 156 square miles.

Records available.- April 1930 to September 1934 (fragmentary).

Extremes.- Maximum discharge recorded during year, 800 second-feet Apr. 4 (gage height, 8.60 feet); no flow July 23-26, Aug. 8 to Sept. 1.
1930-34: Maximum discharge, 7,730 second-feet June 29, 1933 (gage height, 24.23 feet, from flood marks); no flow on many days during 1930, 1931, 1934.

Remarks.- Records very poor and fragmentary Oct. 1 to Sept. 11; continuous thereafter. Discharge estimated during periods of ice effect Dec. 28, Jan. 30, 31, Feb. 14-26, Mar. 2.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1											0.1	0
2				4.0	4.0	4				0.1		
3	1.6	1.6					11			.1	.1	
4		1.8		6			680	1.7	0.8			8
5	1.1		2.9	6		62	224	1.5		.1		
6			2.9			34	68			.1		1.4
7					6		31	1.9	.8		.1	
8					4.5	14			.8		0	
9	.8			4.5			14		1.1			
10		1.8					13				0	
11	.9		2.9	4.9			10		.8	.1	0	
12				4.5		8				.1		.2
13						8	6		.8		0	.2
14		1.3	2.9		2		6	11		.1		139
15			4.5	4.5					.8			46
16	.9		3.5	4.5	2	4.0	4.4			.1	0	32
17		1.6			2	4.5	4.4				0	8
18	.8	1.6	3.2					2.2	.3			2.8
19			3.2			7		2.2				1.8
20			11		1.0		3.7				0	3.2
21			19		1.0	6		.7	.4			34
22			14						.6		0	115
23		2.6		4.5	.5		1.9	3.2		0		28
24		2.9		7		4.9		2.0			0	10
25				7								4.2
26	1.6			7	.5	4.9	3.0			0		84
27	1.8	2.6				4.9	2.3			.1		131
28	1.8		2		*.5			.9	.1			99
29		2.9							.1	.1		361
30	2.6			2			2.3				0	45
31				2				.5		.1	0	

*Discharge measurement.

North Fork of South Fabius River at Edina, Mo.

Location.- Chain gage in SE¼NE¼ sec. 13, T. 62 N., R. 12 W., at bridge on State Highway 15 at Edina. Zero of gage is 719.1 feet above mean sea level.

Drainage area.- 72 square miles.

Records available.- April 1930 to September 1934 (fragmentary).

Extremes.- Maximum discharge recorded during year, 341 second-feet Apr. 5 (gage height, 7.85 feet); no flow on many days.
1930-34: Maximum discharge, 13,300 second-feet June 29, 1933; no flow on many days.

Remarks.- Records fair but fragmentary, as gage was not read on many days. River frozen solid Jan. 3. Discharge computed only for days on which gage was read.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1									0.1			0
2												
3	0	0.1		0	0.3							
4			0.1				26	0.4			0	
5	0						341	.3				
6							72					
7	0								.1			7
8					.4	6						
9							8		.8			
10	0				.3	2.0						
11		0									0	
12				.1				.1				1.2
13							2.3					2.0
14	0		.1		.3		1.6					1.0
15					.2	.7						93
16									0		.2	
17					.2	.5						
18		0		.3			1.2	1.5	0		.2	10
19								.4				
20		0		.4		.9						
21	.1						.8					
22												53
23					.3	.5			0			
24											0	
25								.1			0	
26						.5						
27		.1	0	.3			.5					156
28	0				.4		.5					156
29				.3					0			341
30												
31	0					.6					0	

Note.- No flow during July.

Salt River near Shelbina, Mo.

Location.- Water-stage recorder in SW¼NE¼ sec. 17, T. 57 N., R. 10 W., at bridge on State Highway 15, 3 miles north of Shelbina. Zero of gage is 663.3 feet above mean sea level. Chain gage at same location and datum used prior to Mar. 1, 1934.

Drainage area.- 481 square miles.

Records available.- April 1930 to September 1934 (fragmentary).

Extremes.- Maximum discharge during year, 2,800 second-feet Sept. 30 (gage height, 10.48 feet); no flow June 25 to Aug. 15.
1930-34: Maximum discharge recorded, 16,000 second-feet July 1, 1933 (gage height, 22.62 feet); no flow June 25 to Aug. 15, 1934.
Maximum stage known, 23.5 feet in June, 1928 (discharge, 18,000 second-feet).

Remarks.- Gage-height records fragmentary Oct. 1 to Feb. 28, and discharges not computed. Records continuous but poor Mar. 1 to Sept. 30.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						6	1.6	6	2.0		0	8
2						10	3.2	4.0	1.8		0	11
3	*1.6					15	3.2	2.8	2.4		9	357
4						18	168	6	2.0		0	349
5						19	1,250	15	2.0		0	217
6						16	1,120	47	1.8		0	106
7						29	332	24	1.8		0	60
8						26	120	11	1.6		0	51
9						20	73	7	2.0		0	38
10						14	56	4.4	5		0	29
11						14	52	4.0	13		0	23
12						10	45	3.2	17		0	319
13						7	45	6	17		0	1,240
14						4.4	33	383	10		0	1,600
15						3.6	25	201	6		0	1,980
16						2.4	23	94	3.2		146	1,930
17						2.4	19	39	8		144	1,630
18						3.2	16	23	10		102	435
19						3.2	12	13	5		50	201
20						4.0	11	10	2.8		39	114
21						3.2	9	6	1.6		44	722
22						2.0	7	4.8	1.4		31	1,850
23						1.2	6	4.4	.8		24	1,680
24						.8	6	10	.2		22	540
25						.8	6	10	0		24	175
26						1.0	6	5	0		18	108
27						1.6	6	2.8	0		13	673
28						1.4	10	2.0	0		11	1,120
29						1.2	13	2.0	0		9	1,700
30						1.0	9	2.0	0		8	2,600
31						.6		2.4			8	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October						
November						
December						
January						
February						
March	29	0.6	7.81	0.016	0.02	480
April	1,250	1.6	116	.241	.27	6,910
May	383	2.0	30.8	.064	.07	1,890
June	17	0	3.95	.0082	.009	235
July	0	0	0	0	0	0
August	146	0	22.4	.047	.05	1,370
September	2,600	8	729	1.52	1.70	43,370

*Discharge measurement.

Note.- No flow during July.

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Salt River near Hunnewell, Mo.

Location.- Chain gage in SW¼NW¼ sec. 10, T. 56 N., R. 9 W., half a mile below Black Creek and 2 miles west of Hunnewell. Zero of gage is about 615.6 feet above mean sea level.

Drainage area.- 626 square miles.

Records available.- April 1930 to September 1934.

Extremes.- Maximum discharge recorded during year, 2,920 second-feet Sept. 15 (gage height, 10.00 feet); no flow on many days during October, May to September.
1930-34: Maximum discharge recorded, 15,400 second-feet July 1, 1933 (gage height, 21.30 feet); no flow on many days during October 1933, May to September 1934.
Maximum stage known, about 21.8 feet, date unknown.

Remarks.- Records fair.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.9	1.4	4.8	4.5	3.1	5	9	6	0		0	0
2	.6	1.4	4.8	4.5	3.1	7	9	6	0		0	0
3	.9	1.7	8	4.5	3.1	8	10	5	0		0	0
4	1.2	3.3	12	6	2.3	8	21	4.2	0		0	424
5	1.5	2.5	8	8	2.3	9	1,420	6	0		0	314
6	1.2	2.5	4.8	8	2.3	18	1,660	14	0		0	260
7	.9	2.5	4.8	4.5	2.3	18	742	52	0		0	75
8	.3	2.5	4.2	4.5	1.9	16	208	32	0		0	29
9	.3	1.7	3.8	4.5	1.9	27	140	16	0		0	18
10	.3	1.7	4.2	4.5	1.9	19	110	9	0		0	11
11	.3	1.7	3.3	6	1.9	18	59	8	0		0	4.5
12	.3	2.5	3.3	6	1.9	14	56	4.8	0		0	424
13	.3	2.5	2.5	6	1.4	16	34	6	0		0	828
14	0	2.5	2.5	6	1.0	14	30	7	0		0	1,850
15	.3	2.5	2.5	6	1.0	11	25	370	0		0	2,920
16	.3	4.8	2.5	6	1.0	8	16	234	.6		208	2,200
17	0	3.8	3.3	6	1.0	8	16	78	.6		82	2,500
18	0	3.8	2.5	6	2.9	10	12	28	12		221	748
19	0	3.8	3.3	4.5	2.9	9	11	16	3.5		71	260
20	0	3.8	6	4.6	2.9	8	8	8	3.1		22	208
21	0	3.8	4.8	4.5	2.9	8	8	5	1.9		14	162
22	0	3.8	2.5	4.5	2.9	7	8	3.5	0		11	1,900
23	0	4.8	2.3	4.5	2.9	7	8	2.7	0		6	2,400
24	0	4.8	4.5	4.5	2.9	21	8	2.7	0		1.2	1,000
25	0	3.8	4.5	4.5	3.8	16	6	.6	0		0	247
26	0	3.8	4.5	4.5	3.8	14	8	3.1	0		0	132
27	.3	3.8	4.5	4.5	4.2	14	8	4.0	0		0	78
28	.6	3.8	4.5	4.5	6	16	6	2.7	0		0	260
29	.9	4.8	4.5	4.5		8	6	1.2	1.2		0	1,950
30	.9	4.8	6	4.0		7	6	0	33		0	2,560
31	1.5		7	3.1		6		0			0	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	1.5	0	0.45	0.00072	0.0008	27
November	4.8	1.4	3.16	.0050	.006	188
December	12	2.3	4.54	.0073	.008	279
January	8	3.1	5.10	.0081	.009	314
February	6	1.0	2.55	.0041	.004	142
March	27	5	12.1	.019	.02	744
April	1,660	6	156	.249	.28	9,270
May	370	0	30.2	.048	.06	1,860
June	33	0	1.86	.0030	.003	111
July	0	0	0	0	0	0
August	221	0	20.5	.033	.04	1,260
September	2,920	0	792	1.27	1.42	47,130
The year	2,920	0	84.7	.135	1.85	61,320

Note.- No flow during July.

Salt River near New London, Mo.

Location.- Chain gage in NE¼NW¼ sec. 36, T. 56 N., R. 5 W., at bridge on State Highway 61, 2 miles north of New London. Zero of gage is about 476.9 feet above mean sea level.

Drainage area.- 2,480 square miles.

Records available.- February 1922 to September 1934.

Average discharge.- 12 years, 1,560 second-feet.

Extremes.- Maximum discharge recorded during year, 15,800 second-feet Sept. 30 (gage height, 15.40 feet); no flow Aug. 3-14.
1922-34: Maximum discharge, 58,700 second-feet June 21, 1928 (gage height, 28.8 feet, from flood marks); no flow Aug. 3-14, 1934.

Remarks.- Records fair except those for periods of ice effect, Dec. 25 to Jan. 2, Jan. 27 to Feb. 2, Feb. 26 to Mar. 6, and those estimated for Feb. 3-25, which are poor.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	38	38	24	6	6	136	15	12	22	0.1	38
2	13	35	45	24	6	13	159	15	12	22	.1	247
3	10	48	55	35		24	114	13	9	24	0	1,750
4	10	55	55	45		24	80	12	9	22	0	1,220
5	6	52	52	45		38	114	103	9	15	0	690
6	13	45	38	41		38	89	38	7	15	0	780
7	13	38	103	41		69	2,980	230	15	15	0	513
8	15	35	80	41		114	1,910	159	15	15	0	308
9	15	30	67	38		172	940	166	15	15	0	166
10	15	27	59	38		98	513	141	14	13	0	119
11	17	24	48	41		84	264	114	4,380	13	0	89
12	17	22	41	45		67	179	84	1,670	13	0	67
13	15	22	45	45		71	136	63	660	13	0	6,070
14	13	17	38	45	10	52	108	59	239	12	0	6,200
15	17	15	41	45		55	89	48	141	12	.1	4,280
16	17	10	38	41		48	75	35	84	4.9	55	6,440
17	17	20	38	41		41	67	264	63	2.6	13,200	5,590
18	17	27	38	38		45	59	200	67	2.6	9,190	3,420
19	17	27	32	35		38	48	124	136	2.6	1,990	1,440
20	16	30	41	35		45	41	80	75	2.6	875	1,220
21	20	27	38	32		38	41	52	136	.3	458	760
22	20	35	38	32		38	35	41	136	.3	975	1,080
23	20	36	67	32		41	30	35	84	.3	405	5,030
24	20	35	67	32		38	22	35	67	.3	330	3,880
25	17	32	55	24		38	22	27	45	.2	141	1,830
26	67	35	38	20	13	38	27	27	45	.2	93	810
27	67	32	24	13	13	41	20	27	38	.2	75	405
28	52	32	24	6	6	52	17	22	35	.2	59	264
29	41	35	24	6		67	17	15	24	.2	52	12,600
30	41	38	24	6		63	22	15	22	.1	52	14,800
31	41		24	6		63		15		.1	41	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	67	6	22.3	0.0090	0.01	1,370
November	55	10	31.8	.013	.01	1,890
December	103	24	45.6	.018	.02	2,810
January	45	6	32.0	.013	.01	1,970
February	13	6	9.8	.0040	.004	543
March	172	6	53.5	.022	.03	3,290
April	2,980	17	278	.112	.12	16,570
May	264	12	73.4	.030	.03	4,510
June	4,380	7	275	.111	.12	16,390
July	24	.1	8.35	.0034	.004	513
August	13,200	0	896	.361	.42	55,120
September	14,800	38	2,737	1.10	1.23	162,800
The year	14,800	0	370	.149	2.01	267,800

Crooked Creek near Shelbina, Mo.

Location.- Chain gage in NW¼SW¼ sec. 33, T. 56 N., R. 10 W., at bridge on State Highway 15, 6 miles south of Shelbina. Zero of gage is 669.6 feet above mean sea level.

Drainage area.- 70 square miles.

Records available.- April 1930 to September 1934.

Extremes.- Maximum discharge recorded during year, 545 second-feet Sept. 15 (gage height, 5.48 feet); no flow on many days.
1930-34: Maximum discharge recorded, 2,160 second-feet May 26, 1933 (gage height, 11.88 feet); no flow on many days.
Maximum known stage, about 13 feet, date unknown.

Remarks.- Records poor and fragmentary as gage was not read on many days.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0			0							0.1
2			0			0			0			
3		0				0		0			0	
4	0			0			1.4	0				26
5		0				1.6	117	41				13
6			0			1.0			0			
7					0		10			0		2.4
8					0	.3						
9				0		1.8	1.0	1.2				
10	0				0	.3	1.0					
11		0						.1	0	0	0	
12		0						.2				
13				0								
14					0			.2	0	0		76
15	0		0	0		.1		.2	0			545
16	0				0				0		136	
17			0		0							
18		0		0					0		19	12
19	0	0		0	0	.1	.1		0			
20	0			0	0	.1	.1					
21					0					0		
22					0			0				27
23				0		.1						
24		0		0	0			0				
25				0			0		0		.7	3.4
26	0	0		0		.1		0	0			
27					0	.3						
28							0			0		76
29												
30		0	0	0		.4			10			
31								0			.1	

Davis Creek near Mexico, Mo.

Location.- Chain gage in NE¼SE¼ sec. 21, T. 51 N., R. 9 W., at bridge on State Highway 22, 2 miles northwest of Mexico. Zero of gage is about 728.8 feet above mean sea level.

Drainage area.- 59 square miles.

Records available.- April 1930 to September 1934.

Extremes.- Maximum discharge recorded during year, 1,230 second-feet Aug. 16 (gage height, 10.63 feet); no flow on many days.
1930-34: Maximum discharge recorded, 2,820 second-feet May 19, 1931 (gage height, 14.40 feet); no flow on many days each year.
Maximum stage known, about 17 feet, date unknown.

Remarks.- Records poor and fragmentary as gage was not read for many days. Stage-discharge relation affected by ice Jan. 29, Feb. 2.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			0.1			0.2					0	
2			.1	0.1	0	.6		0.1				
3	0.1	0.1				2.4		.1				
4	0		.3	.2			0.6		0			0
5				.2		4.6	41	.1				
6	0	.1			.1	2.0	11					
7	0		.1		.1	1.2	3.9					
8					.1	.6						0
9	0		.1	.1	.1	.5	.6	.1	0			
10				.1			.4	.1				0
11							.4		51		0	
12	0				.1	.2						338
13	0	0									0	86
14	0	0				.2	.2	0	.3			161
15		0		.1	.1							
16	0					.1	.2	0			1,040	
17		0					.2	0			722	1.1
18		0		.1				0	.1		7	3.0
19	0		8	.1	.1	.1						
20	4.9	0	1.3		.1		.1				1.0	
21	1.2	0					.1	0	.6		1.0	
22		0		.1		.5		0	.4			10
23					.1		.1				3.2	
24	.8	.1				.3						
25		0		.1			.1				.6	.8
26	1.7						.3	0				
27	2.0	0			.3							.6
28		0	0				.2	0	0		.2	.8
29		0		0					0		.2	1,160
30	.4		0			18			0		.1	
31								0				

Note.- No flow during July.

Cuivre River near Troy, Mo.

Location.- Chain gage in SE¼ sec. 14, T. 49 N., R. 1 W., at bridge on State Highway 61, 2 miles north of Troy. Zero of gage is 450.4 feet above mean sea level.

Drainage area.- 903 square miles.

Records available.- February 1922 to September 1934.

Average discharge.- 12 years, 733 second-feet.

Extremes.- Maximum discharge recorded during year, 13,900 second-feet Sept. 29 (gage height, 20.20 feet); minimum, 0.1 second-foot at times during July and August; minimum gage height, 1.84 feet Aug. 9-11.

1922-34: Maximum discharge, about 52,600 second-feet May 18, 1929 (gage height, 25.75 feet at former location, from flood marks); minimum, that of July and August, 1934.

Remarks.- Records good except those for days of rapidly changing stage, which are poor.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	470	49	10	19	16	13	439	49	3.1	1.6	0.2	10
2	190	44	7	14	13	33	266	40	3.1	1.0	.2	17
3	128	29	12	17	16	859	240	37	1.9	.8	.1	178
4	59	26	10	24	18	859	215	29	3.1	.5	.2	76
5	40	44	11	47	16	567	439	33	1.9	.8	.2	47
6	23	33	12	120	18	306	377	23	2.5	.9	.1	28
7	18	23	9	165	16	202	334	20	3.7	.8	.2	19
8	16	20	10	130	13	90	225	29	1.9	.6	.1	12
9	13	18	7	100	11	135	202	23	2.5	.4	.1	10
10	11	13	10	76	13	110	152	33	37	.5	.1	9
11	8	17	9	52	13	105	128	26	502	.6	.1	6
12	6	12	7	56	11	85	98	19	439	.3	.4	7
13	4.8	10	9	47	13	71	92	19	178	.2	.2	320
14	3.7	9	8	38	13	66	78	17	95	.3	.1	2,160
15	3.1	7	12	35	12	61	92	19	64	.4	.1	1,070
16	6	8	9	31	11	56	83	17	37	.3	6,810	1,110
17	6	9	12	24	13	52	88	14	20	.2	5,620	266
18	3.7	7	9	28	64	71	92	10	320	.2	2,160	125
19	10	6	125	24	68	76	83	12	202	.1	439	71
20	320	7	165	28	98	125	73	10	52	.4	215	47
21	706	6	155	29	83	502	64	9	35	.2	150	42
22	5,600	9	125	29	64	439	54	8	24	.1	408	35
23	1,070	7	95	26	59	240	49	6	22	.2	253	24
24	348	9	80	23	54	90	40	4.0	10	.4	140	54
25	178	7	61	26	49	140	29	3.4	9	.2	100	35
26	118	10	56	29	33	502	44	2.8	6	.2	76	22
27	88	9	35	20	13	2,070	68	4.0	4.0	.5	42	17
28	73	7	28	23	11	1,490	64	3.4	2.2	.2	35	24
29	64	6	24	26		2,790	54	2.8	1.6	.2	19	13,300
30	59	6	19	10		1,440	52	4.0	2.2	.2	14	2,660
31	54		17	18		743		2.2		.2	12	

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	8,600	3.1	410	0.454	0.52	25,180
November	49	6	15.6	.017	.02	926
December	165	7	37.4	.041	.05	2,300
January	165	10	43.0	.048	.06	2,650
February	98	11	29.7	.033	.03	1,650
March	2,790	13	464	.514	.59	28,540
April	439	29	144	.159	.18	8,560
May	49	2.2	17.1	.019	.02	1,050
June	502	1.6	69.6	.077	.09	4,140
July	1.6	.1	.44	.00049	.0006	27
August	6,810	.1	533	.590	.68	32,760
September	13,300	6	727	.805	.90	43,280
The year	13,300	.1	209	.231	3.14	151,100

Des Plaines River at Lemont, Ill.

Location.- Chain gage in NW¼ sec. 20, T. 37 N., R. 11 E., at Stephens Street Bridge, a quarter of a mile north of Lemont and 8 miles above confluence with Chicago Sanitary Canal. Zero of gage is 584.10 feet above mean sea level.

Drainage area.- 705 square miles.

Records available.- November 1914 to September 1934.

Average discharge.- 19 years (1915-34), 410 second-feet, not including overflow into Chicago Sanitary Canal.

Extremes.- Maximum discharge recorded during year, 239 second-feet Oct. 22 (gage height, 3.02 feet); no flow July 29 to Aug. 15.
1915-34: Maximum discharge recorded, 5,520 second-feet Mar. 18, 1919; no flow on various dates.

Remarks.- Records poor. Discharge estimated for periods of ice effect, Dec. 27 to Jan. 3, Feb. 5-12, 25-28. During high water part of flow spills into Chicago Sanitary Canal 7 miles above gage but no over flow during this year.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	47	47	38	29	8.1	9.5	24	14	1.2	2.4	0	0.9
2	38	38	38	34	7.1	16	38	21	1.6	1.6	0	2.4
3	42	47	38	40	6.1	24	47	24	1.2	2.0	0	8.1
4	38	66	27	47	9.5	30	57	19	.9	2.0	0	16
5	30	47	30	47	9	30	62	24	1.2	2.4	0	27
6	24	24	30	57	9	34	57	19	2.0	1.6	0	27
7	14	14	24	62	8	38	47	19	2.4	2.0	0	42
8	11	19	19	52	7	34	57	16	2.0	3.7	0	38
9	12	24	16	47	6	30	52	11	2.4	4.4	0	34
10	12	30	19	42	5	30	62	9.5	2.4	6.1	0	38
11	14	21	16	38	8	34	75	11	2.0	4.4	0	21
12	11	30	16	38	13	30	85	9.5	1.2	4.4	0	5.2
13	11	38	16	42	21	27	94	12	.9	3.7	0	1.6
14	12	47	14	38	19	24	80	11	1.2	3.0	0	1.2
15	16	62	14	42	19	24	66	9.5	2.4	2.4	0	1.6
16	14	75	19	38	19	19	47	5.2	2.0	3.0	.1	2.0
17	19	57	16	34	21	16	34	2.0	2.4	4.4	.9	1.2
18	19	52	14	34	16	19	30	2.0	1.2	3.0	.2	1.6
19	19	38	16	30	12	21	30	1.2	1.6	3.7	.5	1.2
20	34	30	38	30	11	30	27	1.2	1.2	2.0	.7	3.0
21	75	30	38	30	14	42	24	.7	1.2	1.6	.5	4.4
22	218	24	30	30	16	38	19	.7	2.4	.9	.3	5.2
23	186	16	24	62	14	24	11	.5	5.2	.7	.3	6.1
24	126	19	24	66	12	19	9.5	.7	12	.3	.5	3.7
25	94	16	19	47	10	14	8.1	.5	19	.7	.7	3.0
26	75	24	19	38	8	12	6.1	.3	12	.2	.5	2.0
27	66	34	18	30	7	19	4.4	.5	11	.3	.3	2.0
28	66	42	17	16	5	16	3.7	.3	8.1	.2	.7	3.0
29	75	30	17	8.1		16	6.1	.3	5.2	0	.9	6.1
30	62	42	21	9.5		19	11	.5	4.4	0	1.2	8.1
31	52		25	8.1		21		.9		0	1.2	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	218	11	49.4	0.070	0.08
November	75	14	36.1	.051	.06
December	38	14	22.9	.032	.04
January	66	8.1	37.6	.053	.06
February	21	5	11.4	.016	.02
March	42	9.5	24.5	.035	.04
April	94	3.7	39.1	.055	.06
May	24	.3	7.97	.011	.01
June	19	.9	3.80	.0054	.006
July	6.1	0	2.16	.0031	.003
August	1.2	0	.31	.00044	.0005
September	42	.9	10.6	.015	.02
The year	218	0	20.5	.029	.40

Illinois River at Morris, Ill.

Location.- Wire-weight gage in NE¼ sec. 9, T. 33 N., R. 7 E., on remaining span of old highway bridge in Morris, 10 miles below mouth of Kankakee River. Chain gage was used at same site and datum prior to Sept. 20, 1934. Zero of gage is 478.50 feet above mean sea level (corrected to general adjustment of 1929).

Records available.- October 1919 to September 1934. January 1903 to December 1904 at station near Monooka.

Average discharge.- 15 years, 13,330 second-feet.

Extremes.- Maximum discharge recorded during year, 15,400 second-feet Apr. 3, 4 (gage height, 8.7 feet); minimum recorded, 6,150 second-feet Oct. 18 (gage height, 5.1 feet).

1919-34: Maximum discharge recorded, 62,300 second-feet Apr. 2, 1933 (gage height, 19.1 feet); minimum recorded, 5,120 second-feet Aug. 21, 1929 (gage height, 3.9 feet).

A stage of 26.2 feet occurred in 1831.

Remarks.- Records good. Discharge estimated for Jan. 31 because of ice effect and for Sept. 16-19 because of missing gage-height record. Discharge includes flow diverted from Lake Michigan by Chicago Sanitary Canal. Gage-height record furnished by U. S. Weather Bureau.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12,900	11,100	11,800	9,280	13,400	11,100	13,200	9,780	9,280	9,280	9,030	9,030
2	12,600	11,600	11,100	8,780	13,200	10,500	14,300	10,000	9,280	9,280	9,280	9,530
3	13,200	12,100	10,500	10,500	10,000	9,030	15,400	10,500	9,280	9,280	9,280	10,800
4	13,400	10,300	10,300	10,300	9,280	9,530	15,400	10,000	10,300	9,280	9,280	10,800
5	12,600	10,000	10,300	9,780	8,260	10,000	15,100	10,000	9,780	9,280	9,280	9,780
6	12,400	10,500	11,100	10,500	9,280	10,000	15,100	10,000	10,000	9,530	9,280	12,100
7	12,100	10,500	10,800	9,280	9,530	9,530	14,600	9,530	10,000	9,280	9,530	10,800
8	10,500	10,800	11,800	8,040	9,280	9,530	14,000	10,800	9,530	9,280	9,530	11,600
9	6,610	10,800	11,600	9,780	9,030	9,780	13,700	10,800	10,300	9,280	9,030	11,300
10	7,560	10,800	11,300	10,300	12,900	9,780	13,200	10,500	10,000	9,280	10,000	11,100
11	8,280	10,800	11,100	10,300	11,800	9,780	12,100	9,780	10,000	9,280	9,280	10,800
12	8,530	10,800	10,300	10,300	10,000	9,780	12,600	9,780	10,000	8,280	9,280	11,300
13	12,100	10,800	11,300	13,700	9,280	9,280	12,100	10,500	9,530	9,280	9,280	10,300
14	8,280	11,800	11,300	11,600	10,000	9,280	12,600	10,500	11,800	9,530	9,280	11,100
15	8,280	10,000	10,800	9,780	8,780	9,780	11,800	9,780	9,530	9,280	9,260	10,600
16	9,530	11,100	11,600	9,780	8,780	10,800	10,800	9,780	11,600	9,280	9,780	
17	11,800	10,800	10,800	9,280	9,280	10,500	9,030	9,780	10,000	9,280	10,800	11,000
18	6,150	10,000	10,500	10,500	8,530	9,530	11,800	9,780	10,000	9,280	9,780	
19	11,300	10,500	10,500	8,280	7,800	8,530	10,800	9,780	10,000	9,280	10,000	
20	11,300	10,500	11,600	10,300	10,500	7,560	10,800	9,780	9,530	9,530	10,500	11,300
21	11,300	11,600	10,500	9,030	10,300	11,600	11,100	9,780	9,780	9,280	10,300	10,000
22	13,200	10,300	10,500	8,280	9,280	9,530	10,800	10,000	9,780	9,030	9,530	11,600
23	15,100	10,800	11,600	9,530	8,780	10,500	10,500	9,530	9,530	8,530	10,500	11,300
24	14,600	11,100	11,100	9,780	8,780	11,300	10,500	10,000	9,530	8,780	9,780	10,500
25	15,100	10,500	10,500	9,280	8,040	10,500	11,100	11,100	9,280	8,780	10,000	10,000
26	14,800	10,800	10,500	11,100	7,560	10,300	10,300	10,000	10,000	8,530	9,530	10,300
27	13,200	10,800	12,900	10,800	12,400	10,800	9,780	9,530	9,030	9,030	9,280	10,000
28	13,400	11,100	12,900	10,000	10,500	8,280	10,500	9,530	9,530	9,530	9,530	10,800
29	12,900	10,500	12,400	9,780		10,500	10,500	9,530	9,530	9,280	9,780	9,780
30	11,600	11,800	12,900	9,780		9,530	10,500	10,000	9,280	9,280	9,780	10,000
31	11,100		11,300	11,200		12,100		9,530		9,280	9,780	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	15,100	6,150	11,470		
November	12,100	10,000	10,830		
December	12,900	10,300	11,210		
January	13,700	8,040	9,972		
February	13,400	7,560	9,806		
March	12,100	7,560	9,953		
April	15,400	9,030	12,130		
May	11,100	9,530	9,990		
June	11,800	9,030	9,834		
July	9,530	8,280	9,183		
August	10,800	9,030	9,631		
September	12,100	9,030	10,690		
The year	15,400	6,150	10,390		

Illinois River at Peoria, Ill.

Location.- Staff gage in NW¼ sec. 2, T. 8 N., R. 8 E., at foot of Grant Street, Peoria, 4½ miles above mouth of Kickapoo Creek. Zero of gage is 428.39 feet above mean sea level (corrected to general adjustment of 1929).

Records available.- March 1910 to September 1934. March 1903 to July 1906 at station 3½ miles downstream.

Average discharge.- 24 years, 16,560 second-feet.

Extremes.- Maximum discharge recorded during year, 14,600 second-feet Apr. 15 (gage height, 11.87 feet); minimum recorded, 8,480 second-feet Oct. 19, Mar. 12.
1910-34: Maximum discharge, 58,300 second-feet Oct. 8-10, 1926 (gage height, 25.0 feet); minimum probably less than 7,250 second-feet during estimated period Dec. 14, 1910, to Jan. 10, 1911.
Maximum stage known, 26.6 feet in 1844.

Remarks.- Records good. Discharge estimated for Nov. 17, 25, Jan. 29 to Feb. 4, Feb. 10-13, Feb. 25 to Mar. 5, July 14, 15, because of uncertain slope. Gage-height record furnished by Corps of Engineers, U. S. Army. Discharge determined on basis of slope as obtained by use of an auxiliary staff gage on highway bridge at Pekin, 9.3 miles downstream.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11,900	13,700	11,300	10,500	10,500	11,100	10,500	11,300	9,660	10,400	9,460	9,770
2	11,800	13,400	11,100	10,700	10,300	11,100	10,700	11,600	9,610	10,200	9,340	9,280
3	12,400	13,600	10,300	10,900	10,200	11,000	10,600	11,500	9,610	9,930	9,340	9,600
4	12,500	13,600	10,900	10,600	10,300	11,300	12,800	11,900	9,930	9,800	9,410	9,790
5	13,100	13,600	11,500	10,600	10,400	10,300	12,500	11,600	9,680	9,980	9,660	10,200
6	13,500	12,700	11,700	11,500	10,900	10,400	13,600	11,300	9,930	9,410	8,980	10,600
7	13,400	12,700	10,300	11,700	10,600	10,100	13,600	11,000	9,800	9,980	9,660	10,800
8	13,000	12,200	11,500	11,600	10,600	9,950	13,800	10,600	9,610	9,560	9,660	10,600
9	12,700	12,100	11,000	11,200	10,600	10,500	13,700	10,200	9,810	9,660	9,900	10,900
10	12,100	12,000	10,900	11,100	10,700	10,600	14,100	11,100	10,200	9,530	9,530	10,900
11	11,200	11,700	11,700	10,600	10,400	9,950	14,400	11,400	9,360	9,530	9,660	11,500
12	11,300	12,900	11,100	11,000	10,100	8,480	14,000	10,700	10,100	9,740	9,360	11,500
13	10,900	12,400	11,300	10,200	10,300	9,660	13,800	10,100	9,860	9,410	9,660	11,500
14	10,700	12,400	10,900	11,200	10,200	10,300	13,700	11,000	9,610	9,700	9,570	11,700
15	10,600	12,200	10,200	11,100	10,400	8,890	14,600	11,200	10,200	10,000	9,500	11,700
16	9,500	12,100	10,800	10,600	10,400	9,880	13,500	10,500	9,980	9,820	9,460	11,900
17	10,500	11,000	11,200	10,900	10,300	9,490	12,800	9,920	9,610	9,680	9,460	11,900
18	10,900	12,100	11,000	10,600	10,100	10,300	13,200	10,500	9,810	9,880	9,660	12,100
19	8,480	11,100	11,500	11,300	10,000	9,580	13,200	10,400	9,530	9,660	9,780	11,200
20	10,300	11,300	10,900	10,600	9,870	9,770	13,100	10,200	9,780	9,950	9,980	10,900
21	8,770	11,100	11,400	10,600	9,890	9,790	13,300	10,000	9,900	10,100	9,560	11,600
22	9,670	10,600	11,200	10,100	9,540	11,700	12,600	10,800	9,530	10,200	10,400	11,600
23	10,700	11,800	11,100	10,700	9,450	9,880	12,100	10,100	9,930	10,200	10,100	11,500
24	11,100	11,700	11,500	9,940	9,580	9,340	13,200	10,500	10,000	9,730	10,300	11,200
25	13,000	11,000	11,300	11,300	8,970	9,710	12,400	10,500	9,980	9,860	10,100	11,200
26	12,000	11,500	11,200	10,600	8,650	10,200	12,000	10,300	10,100	9,430	9,980	10,600
27	13,700	10,600	9,750	10,700	9,240	10,200	12,100	9,940	10,100	9,730	9,810	11,100
28	14,100	11,400	11,000	11,100	10,700	10,000	11,700	9,890	9,980	9,160	10,400	10,700
29	14,000	10,200	11,200	11,100		9,590	11,500	9,730	9,890	9,280	9,860	11,300
30	13,900	11,200	11,300	10,900		10,200	11,500	9,890	10,100	9,500	9,810	11,100
31	14,000		10,300	10,500		9,850		9,670		9,180	9,660	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	14,100	8,480	11,800		
November	13,700	10,200	12,000		
December	11,700	9,750	11,040		
January	11,700	9,940	10,840		
February	10,900	8,650	10,110		
March	11,700	8,480	10,120		
April	14,600	10,500	12,820		
May	11,900	9,670	10,620		
June	10,200	9,530	9,861		
July	10,400	9,160	9,748		
August	10,400	9,340	9,710		
September	12,100	9,280	11,010		
The year	14,600	8,480	10,810		

Illinois River at Beardstown, Ill.

Location.- Staff gage in NE¼ sec. 15, T. 18 N., R. 12 W., at highway bridge on State Street, Beardstown, 9½ miles below mouth of Sangamon River. Zero of gage is 419.89 feet above mean sea level (corrected to general adjustment of 1929).

Records available.- October 1920 to September 1934.

Average discharge.- 14 years, 23,980 second-feet.

Extremes.- Maximum discharge recorded during year, 15,800 second-feet Apr. 8-16 (gage height, 9.4 feet); minimum (estimated), 9,500 second-feet Feb. 26, 27, during period of ice effect.

1920-34: Maximum discharge recorded, 105,000 second-feet Oct. 9, 1926; maximum gage height, 26.25 feet Oct. 12, 1926; minimum discharge, that of Feb. 26, 27, 1934; minimum gage height recorded, 7.5 second-feet Dec. 31, 1930, Jan. 1, 1931.

Maximum discharge known, about 115,000 second-feet Apr. 4, 1904.

Remarks.- Records good. Discharge estimated for periods of ice effect, Dec. 26-30, Jan. 30 to Feb. 1, Feb. 23-28. Gage-height record furnished by the U. S. Weather Bureau.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	13,700	15,100	12,400	12,400	11,100	11,100	12,800	13,100	10,800	10,800	10,500	12,400
2	13,700	15,100	12,400	12,800	11,400	11,800	13,100	13,100	10,800	10,800	10,500	13,400
3	13,700	15,100	12,400	13,100	11,800	12,800	13,700	13,100	10,800	10,800	10,500	13,100
4	13,700	15,100	12,400	12,800	12,100	13,100	14,100	12,800	10,800	10,800	10,500	13,700
5	14,100	14,700	12,400	12,800	11,800	13,700	14,700	12,800	10,800	10,800	10,500	13,700
6	14,100	14,700	12,400	12,400	11,800	13,700	15,100	12,800	10,800	10,500	10,500	14,100
7	13,700	14,400	12,400	12,400	11,800	13,400	15,400	12,800	10,800	10,500	10,500	14,400
8	13,700	14,400	12,400	12,400	11,800	13,100	15,800	12,800	10,800	10,500	10,500	14,400
9	13,700	14,100	12,400	12,400	11,100	13,100	15,800	12,400	10,800	10,500	10,500	14,100
10	14,100	14,100	12,400	12,400	10,500	12,400	15,800	12,100	11,100	10,500	10,500	13,700
11	13,700	14,100	12,400	12,400	10,100	12,400	15,800	11,800	11,100	10,500	10,500	13,700
12	13,700	13,700	12,400	12,100	11,100	12,400	15,800	11,800	11,100	10,500	11,100	13,700
13	13,400	13,400	12,100	12,100	11,100	12,100	15,500	11,800	11,100	10,500	11,100	13,400
14	13,100	13,400	12,100	12,100	11,400	12,100	15,800	11,800	10,800	10,500	11,400	13,400
15	12,800	13,400	12,100	12,100	11,400	11,800	15,800	11,800	10,800	11,100	11,100	13,700
16	12,400	13,400	12,100	12,100	11,400	11,800	15,800	11,800	10,800	12,400	11,800	13,400
17	12,100	13,400	12,100	12,100	11,400	11,400	15,400	11,800	10,800	13,100	11,800	13,400
18	12,100	13,100	12,100	12,100	11,400	11,800	15,400	11,400	10,800	13,400	11,800	13,400
19	11,800	13,100	12,100	12,100	11,100	11,800	15,100	11,400	11,100	13,700	11,800	13,400
20	11,800	13,100	12,100	12,100	11,100	11,800	14,700	11,400	11,100	13,700	11,800	13,400
21	11,800	13,100	12,100	12,100	11,100	11,800	14,700	11,400	10,800	13,400	11,800	13,100
22	12,400	12,800	12,400	12,100	10,800	11,800	14,700	11,100	10,800	13,100	11,800	13,100
23	12,400	12,800	12,400	12,100	10,500	11,800	14,400	11,100	11,100	12,800	11,800	13,100
24	12,800	12,800	12,400	12,100	10,100	11,800	14,400	11,100	11,100	12,800	12,100	13,100
25	13,400	12,800	12,100	12,100	9,820	11,800	14,100	11,100	11,100	12,100	12,100	13,100
26	13,700	12,400	11,800	12,100	9,500	11,800	14,100	11,100	10,800	11,800	11,800	13,100
27	14,400	12,400	11,400	12,100	9,500	11,800	14,100	11,100	10,800	11,400	11,800	13,100
28	14,700	12,400	11,400	12,100	10,100	12,100	14,100	11,100	10,800	11,100	11,800	13,100
29	14,700	12,400	11,400	11,400		12,400	13,700	11,100	10,800	11,100	11,800	14,100
30	14,700	12,400	11,400	11,100		12,400	13,400	11,100	10,800	10,800	11,800	13,700
31	15,100		11,800	11,100		12,400		10,800		10,800	11,400	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	15,100	11,800	13,390		
November	15,100	12,400	13,570		
December	12,400	11,400	12,140		
January	13,100	11,100	12,180		
February	12,100	9,500	11,000		
March	13,700	11,100	12,240		
April	15,800	12,800	14,780		
May	13,100	10,800	11,830		
June	11,100	10,800	10,890		
July	13,700	10,500	11,520		
August	12,100	10,500	11,260		
September	14,400	12,400	13,480		
The year	15,800	9,500	12,360		

Kankakee River at Davis, Ind.

Location.- Chain gage in sec. 13, T. 34 N., R. 3 W., at highway bridge on U. S. Route 30 about 4 miles east of Hanna, Knox County.

Drainage area.- 510 square miles.

Records available.- April 1931 to September 1934 in reports of U. S. Geological Survey, July 1925 to September 1927 in reports of the Indiana Department of Conservation.

Extremes.- Maximum discharge recorded during year, 840 second-feet Apr. 5 (gage height, 7.04 feet); minimum recorded, 168 second-feet Aug. 5, 6, 13, 14.
1931-34: Maximum discharge recorded, 1,290 second-feet May 12, 1933 (gage height, 9.43 feet); minimum, that of Aug. 5, 6, 13, 14, 1934.

Remarks.- Records good except those estimated for periods of ice effect, Dec. 27-30, Jan. 29 to Feb. 3, Feb. 10, 11, which are fair. Discharge also estimated for period Sept. 23-30.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	427	377	377	361	340	282	512	345	252	209	181	237
2	478	377	377	345	340	297	708	345	252	209	181	237
3	393	377	377	345	340	329	690	329	252	209	181	252
4	361	361	377	345	345	329	800	329	252	209	181	267
5	345	361	361	345	329	345	840	329	252	209	168	282
6	345	361	361	361	329	329	780	329	377	209	168	297
7	393	361	361	361	329	313	690	313	313	209	181	313
8	444	361	361	345	329	313	618	313	267	209	181	329
9	410	361	361	345	329	313	564	313	267	209	181	329
10	377	361	345	345	320	313	512	313	252	223	181	313
11	361	361	345	345	315	297	512	297	252	237	181	329
12	345	361	345	345	313	313	512	297	237	237	181	345
13	345	361	345	345	313	297	478	297	237	237	168	345
14	345	361	345	345	313	297	478	313	237	237	168	345
15	329	361	345	361	313	297	461	297	237	223	313	345
16	345	345	345	345	313	297	461	297	223	223	762	393
17	361	345	345	345	297	313	444	297	237	223	618	345
18	345	361	345	329	313	329	427	282	252	209	461	361
19	345	361	345	329	297	313	410	282	252	195	444	410
20	345	377	345	329	297	313	393	282	252	195	393	461
21	345	377	361	329	297	345	393	282	252	195	361	444
22	600	393	345	329	297	361	393	267	252	195	297	444
23	600	393	345	377	282	345	393	282	237	195	267	
24	529	377	345	377	313	345	377	282	237	181	267	
25	461	377	329	377	297	329	377	282	223	181	267	
26	444	377	345	361	282	329	361	282	223	181	252	375
27	427	377	350	361	282	329	377	267	223	181	252	
28	410	361	360	345	282	329	361	267	223	181	252	
29	393	361	380	350		329	361	267	223	181	252	
30	393	361	390	350		345	345	252	209	181	237	
31	377		361	340		461		252		181	237	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	600	329	401	0.786	0.91
November	393	345	367	.720	.80
December	390	329	355	.696	.80
January	377	329	349	.684	.79
February	345	282	312	.612	.64
March	461	282	325	.637	.73
April	840	345	501	.982	1.10
May	345	252	296	.580	.67
June	377	209	248	.486	.54
July	237	181	205	.402	.46
August	762	168	271	.531	.61
September	461	237	347	.680	.76
The year	840	168	331	.649	8.81

Kankakee River at Shelby, Ind.

Location.- Chain gage in sec. 33, T. 32 N., R. 8 W., at highway bridge 1 mile south of Shelby, Lake County.

Drainage area.- 1,760 square miles.

Records available.- April 1930 to September 1934 in reports of U. S. Geological Survey, November 1922 to September 1927 in reports of the Indiana Department of Conservation.

Extremes.- Maximum discharge recorded during year, 2,350 second-feet Apr. 7, 8 (gage height, 5.98 feet); minimum recorded, 378 second-feet Aug. 4, 5 (gage height, 0.80 foot).
1930-34: Maximum discharge recorded, 4,480 second-feet May 13, 1933 (gage height, 9.39 feet); minimum recorded, that of Aug. 4, 5, 1934.

Remarks.- Records good except those for period of ice effect, Dec. 27 to Jan. 3, Jan. 29 to Mar. 5, and for periods of backwater from drift at other times during the year, which are fair.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	980	1,020	860	1,200	800	850	1,280	970	623	477	380	598
2	1,060	980	860	1,200	800	.900	1,640	970	598	477	385	623
3	1,140	980	900	1,050	825	1,058	1,820	970	623	477	385	649
4	1,100	940	900	900	825	1,100	2,000	930	598	455	378	790
5	1,020	940	900	900	850	1,050	2,200	930	598	455	378	825
6	860	940	860	900	850	1,000	2,300	895	598	477	380	930
7	940	940	860	900	825	940	2,350	895	598	477	390	930
8	940	940	860	900	800	860	2,350	860	649	477	390	930
9	1,020	900	825	900	800	757	2,250	860	649	477	395	1,010
10	1,020	900	825	900	750	757	2,060	825	623	455	414	970
11	980	900	900	900	800	757	1,880	825	623	477	414	930
12	940	860	825	900	800	757	1,740	825	598	477	395	895
13	900	860	790	900	800	790	1,660	790	573	477	414	930
14	850	900	790	900	800	757	1,560	825	548	524	395	1,010
15	825	860	790	900	800	725	1,520	790	548	500	500	1,090
16	825	860	825	860	800	725	1,480	790	524	477	1,010	1,300
17	825	860	790	860	800	725	1,430	760	524	455	1,300	1,340
18	825	940	790	860	775	725	1,380	760	573	455	1,300	1,250
19	825	940	790	860	750	757	1,340	760	573	434	1,090	1,170
20	825	860	790	825	690	757	1,340	730	548	434	970	1,050
21	825	940	825	825	725	790	1,250	702	548	434	825	970
22	1,060	900	825	825	750	860	1,210	702	524	434	790	930
23	1,320	940	825	900	775	900	1,170	702	548	414	702	895
24	1,460	940	825	860	800	900	1,130	702	548	414	675	860
25	1,460	940	825	980	800	860	1,130	702	548	414	675	860
26	1,360	940	825	1,020	800	860	1,090	702	524	414	623	825
27	1,280	860	825	980	800	825	1,090	675	500	395	623	895
28	1,180	900	825	980	800	825	1,050	675	524	395	623	970
29	1,100	900	825	850		860	1,010	649	524	390	598	970
30	1,100	860	850	825		860	1,010	649	500	390	573	1,010
31	1,020		950	800		1,020		649		390	573	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	1,460	825	1,028	0.584	0.67
November	1,020	860	915	.520	.58
December	950	790	837	.476	.55
January	1,200	800	915	.520	.60
February	850	690	792	.450	.47
March	1,100	725	848	.482	.56
April	2,350	1,010	1,557	.885	.99
May	970	649	789	.448	.52
June	649	500	569	.323	.36
July	524	390	448	.255	.29
August	1,306	378	611	.347	.40
September	1,340	598	947	.538	.60
The year	2,350	378	854	.485	6.59

Kankakee River at Momence, Ill.

Location.- Chain gage in NE¼ sec. 24, T. 31 N., R. 13 E., at highway bridge in Momence, 1½ miles above Tower Creek. Zero of gage is 610.32 feet above mean sea level.

Drainage area.- 2,340 square miles.

Records available.- February 1905 to July 1906, December 1914 to September 1934.

Average discharge.- 19 years (1915-34), 1,760 second-feet.

Extremes.- Maximum discharge recorded during year, 2,570 second-feet Apr. 6-10; maximum gage height recorded, 3.30 feet Apr. 7; minimum discharge recorded, 378 second-feet July 31, Aug. 1, 2, 5 (gage height, 1.56 feet).
1905-6, 1915-34: Maximum discharge (estimated), 12,600 second-feet Jan. 22, 1916; minimum recorded, 306 second-feet Sept. 1, 16, 17, 1919 (gage height, 1.37 feet).

Remarks.- Records good except those estimated for periods of ice effect, Nov. 16, Dec. 13, 14, Dec. 27 to Jan. 1, Jan. 30 to Mar. 4, which are poor. Discharge also estimated for Nov. 12, May 13, June 17.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,130	1,130	1,020	1,070	850	905	1,510	1,070	708	545	378	512
2	1,130	1,130	960	1,440	905	960	2,040	1,070	660	537	385	850
3	1,190	1,130	1,020	1,250	960	1,020	2,120	1,070	660	528	393	870
4	1,130	1,130	1,020	1,190	960	1,190	2,300	1,070	660	512	385	870
5	1,070	1,070	1,020	1,130	905	1,510	2,390	1,070	708	512	378	925
6	1,020	1,070	1,020	1,070	905	1,250	2,570	1,020	708	504	393	980
7	1,020	1,070	1,020	1,020	905	1,070	2,570	1,020	660	504	400	1,040
8	1,020	1,020	1,020	1,070	905	1,020	2,570	1,020	755	504	408	1,040
9	1,070	1,020	960	1,070	905	960	2,570	1,020	755	504	408	1,090
10	1,070	1,020	960	1,020	905	905	2,570	905	708	520	416	1,090
11	1,020	1,020	960	1,020	960	850	2,390	960	660	512	424	1,040
12	1,020	1,020	960	1,020	960	850	2,300	905	660	520	424	925
13	960	1,020	960	1,020	905	850	2,040	905	615	520	408	870
14	960	1,020	960	1,020	960	905	1,960	905	615	553	400	925
15	905	905	960	1,020	960	905	1,800	905	615	553	708	925
16	960	905	960	1,020	960	850	1,730	850	615	520	1,380	1,090
17	960	905	960	1,020	960	905	1,660	850	660	487	1,380	1,270
18	905	905	960	1,020	905	905	1,580	850	660	479	1,310	1,210
19	905	1,190	960	1,020	905	905	1,580	802	660	463	1,190	1,150
20	905	1,130	1,020	1,020	960	905	1,440	802	615	471	1,070	1,040
21	905	1,020	1,070	1,020	960	960	1,380	802	615	455	960	980
22	1,730	1,070	1,020	1,020	960	1,070	1,380	755	570	455	850	925
23	1,580	1,020	1,020	1,070	960	1,070	1,250	802	570	455	802	870
24	1,510	1,020	1,020	1,070	960	1,070	1,310	802	615	440	708	870
25	1,510	1,020	1,020	1,130	850	1,070	1,250	755	615	416	708	822
26	1,510	1,020	960	1,130	850	1,070	1,250	755	615	416	660	870
27	1,380	1,020	905	1,190	850	1,020	1,250	755	562	408	615	925
28	1,380	1,020	905	1,190	850	960	1,190	755	562	400	615	980
29	1,250	1,020	905	1,070		1,020	1,130	708	562	393	537	1,040
30	1,190	1,020	905	905		1,130	1,130	708	553	393	528	1,040
31	1,190		960	850		1,440		708		378	520	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	1,730	905	1,145	0.490	0.56
November	1,190	905	1,035	.442	.49
December	1,070	905	980	.419	.48
January	1,440	850	1,070	.457	.53
February	960	850	921	.394	.41
March	1,510	850	1,016	.434	.50
April	2,570	1,130	1,807	.772	.86
May	1,070	708	883	.377	.43
June	755	553	640	.274	.31
July	553	378	479	.205	.24
August	1,380	378	650	.278	.32
September	1,270	512	968	.414	.46
The year	2,570	378	965	.412	5.59

Iroquois River near Chebanse, Ill.

Location.- Chain gage in SW¼ sec. 10, T. 29 N., R. 13 W., at highway bridge 3 miles below Beaver Creek, 4½ miles east of Chebanse, and 6 miles above confluence with Kankakee River. Zero of gage is 598.27 feet above mean sea level.

Drainage area.- 2,120 square miles.

Records available.- April 1923 to September 1934.

Average discharge.- 11 years, 1,589 second-feet.

Extremes.- Maximum discharge recorded during year, 3,960 second-feet Oct. 3 (gage height, 5.90 feet); minimum recorded, 11 second-feet Aug. 6-8 (gage height, 0.59 foot).

1923-34: Maximum discharge recorded, 27,000 second-feet May 13, 1933 (gage height, about 18.1 feet); minimum recorded, that of Aug. 6-8, 1934.

Maximum discharge known, about 34,000 second-feet in spring of 1913 (gage height, about 19.6 feet).

Remarks.- Records good. Discharge estimated because of ice effect for Nov. 15, 16, Dec. 12, 13, 28-31, Jan. 29 to Mar. 3.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,480	670	174	410	460	223	3,600	250	102	61	19	89
2	3,600	615	170	435	385	219	3,720	237	102	52	18	112
3	3,960	535	190	410	315	240	3,480	245	102	44	19	126
4	3,260	485	211	385	306	315	2,820	241	98	49	16	435
5	2,220	460	211	385	302	410	2,620	245	95	39	13	1,020
6	1,220	410	261	365	297	460	2,220	245	102	34	11	1,360
7	900	385	284	385	292	410	1,950	245	102	34	11	1,360
8	725	360	302	435	306	385	1,680	225	154	42	11	1,290
9	588	338	274	460	315	306	1,440	196	143	34	13	1,290
10	510	310	270	510	360	288	1,220	177	122	42	22	1,290
11	435	284	236	588	315	284	1,080	184	108	34	25	1,220
12	360	253	211	510	248	253	1,080	169	98	37	29	1,080
13	338	227	202	510	266	236	960	165	105	42	34	960
14	288	223	202	485	279	227	840	158	98	37	39	780
15	253	215	202	510	248	227	725	158	82	42	49	560
16	219	206	194	510	261	236	670	161	76	42	79	535
17	236	211	194	698	244	236	670	165	79	37	204	698
18	288	202	202	615	240	236	615	158	108	42	435	900
19	338	202	202	510	248	244	560	150	122	39	615	1,150
20	306	202	266	485	253	266	510	140	115	37	698	960
21	315	202	360	485	223	360	485	136	98	27	535	780
22	780	206	615	510	244	535	460	136	73	22	410	615
23	2,220	223	725	588	270	698	410	129	76	19	338	485
24	2,620	219	780	840	297	780	360	122	79	18	196	385
25	2,320	227	780	1,080	310	780	360	115	76	19	154	338
26	2,040	211	780	1,150	270	535	315	118	67	16	132	279
27	1,520	202	615	1,080	244	485	315	122	64	18	112	258
28	1,080	186	410	1,080	227	560	315	115	61	16	92	262
29	960	198	360	900		900	310	115	64	16	82	315
30	780	186	360	670		1,150	270	108	67	16	85	410
31	725		360	485		2,930		102		16	76	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	3,960	219	1,254	0.592	0.68
November	670	186	295	.139	.16
December	780	170	342	.161	.19
January	1,150	385	596	.281	.32
February	460	223	287	.135	.14
March	2,930	219	497	.234	.27
April	3,720	270	1,202	.567	.63
May	250	102	169	.077	.09
June	154	61	94.6	.045	.05
July	61	16	33.0	.016	.02
August	698	11	148	.070	.08
September	1,360	89	711	.335	.37
The year	3,960	11	469	.221	3.00

Fox River at Algonquin, Ill.

Location.- Water-stage recorder in NW¼ sec. 34, T. 43 N., R. 8 E., 20 feet above Chicago Street Bridge in Algonquin and 400 feet above Crystal Lake outlet. Prior to Oct. 20, 1933 staff gage at same site and datum was used. Zero of gage is 729.31 feet above mean sea level.

Drainage area.- 1,340 square miles.

Records available.- October 1915 to September 1934.

Average discharge.- 19 years, 794 second-feet.

Extremes.- Maximum discharge during year, 1,090 second-feet Nov. 5 (gage height, 1.92 feet); minimum, 1 second-foot Aug. 23 (gage height, 0.50 foot).
1915-34: Maximum discharge recorded, 7,120 second-feet Mar. 31, 1916 (gage height, 5.3 feet); minimum, that of Aug. 23, 1934.

Remarks.- Records excellent except those below 30 second-feet, which are poor. Discharge occasionally regulated at dam 16 miles above gage.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	206	263	114	255	270	173	255	119	213	73	36	17
2	213	270	82	270	270	185	286	154	241	51	26	43
3	206	309	92	270	263	199	317	173	220	64	39	55
4	241	525	92	278	263	213	447	166	206	55	26	55
5	241	1,040	324	294	263	227	437	206	173	73	39	51
6	227	1,000	393	286	263	199	393	185	192	78	32	59
7	234	895	341	341	263	241	255	213	185	73	43	51
8	213	757	402	349	255	278	148	160	114	64	32	36
9	213	712	367	341	248	255	125	71	103	59	36	29
10	185	598	358	324	234	234	213	88	103	68	51	29
11	185	579	241	301	227	241	309	131	73	78	39	32
12	185	428	317	332	220	220	367	125	92	73	29	43
13	199	456	349	376	234	220	358	119	82	73	36	47
14	137	456	349	384	234	286	358	131	68	59	29	43
15	148	248	332	393	241	188	367	166	92	73	47	55
16	137	332	332	341	255	234	324	97	103	64	51	59
17	148	358	349	349	248	279	286	82	73	64	39	51
18	160	358	341	393	248	341	129	97	78	55	26	51
19	125	358	341	410	234	263	119	82	51	55	32	43
20	160	384	358	419	213	241	131	78	37	64	32	42
21	213	384	324	428	213	349	125	68	78	55	20	73
22	241	402	309	393	220	447	154	119	73	51	26	82
23	234	376	324	419	220	349	134	114	64	43	17	78
24	263	341	324	349	213	317	185	166	87	43	39	59
25	255	182	213	437	206	332	179	160	82	47	24	55
26	220	341	241	376	199	358	160	166	82	51	26	64
27	234	270	248	341	192	410	227	192	97	39	29	55
28	220	332	248	419	179	286	136	213	78	47	29	51
29	227	286	241	278		317	101	263	87	21	20	82
30	241	160	227	286		341	91	286	73	43	12	97
31	255		227	278		286		248		32	12	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	263	125	205	0.153	0.18
November	1,040	160	447	.334	.37
December	402	82	284	.212	.24
January	437	255	345	.257	.30
February	270	179	235	.175	.18
March	447	173	274	.204	.24
April	447	91	237	.177	.20
May	286	68	150	.112	.13
June	241	37	110	.082	.09
July	78	21	57.7	.043	.05
August	51	12	31.4	.023	.03
September	97	17	52.9	.039	.04
The year	1,040	12	202	.151	2.05

Fox River at Dayton, Ill.

Location.- Float gages above and below dam in SE¼ sec. 29, T. 34 N., R. 4 E., at plant of North Counties Hydroelectric Co. in Dayton, 6 miles above mouth of river.

Drainage area.- 2,570 square miles.

Records available.- April 1925 to September 1934. November 1914 to February 1925 records collected at Wedron, 4 miles upstream (drainage area 2,500 square miles).

Average discharge.- 18 years (1915-24, 1925-34), 1,490 second-feet; records for site at Wedron corrected for difference in drainage area.

Extremes.- Maximum daily discharge during year, 1,260 second-feet Nov. 7; minimum, 1 second-foot Aug. 29, when wheels were shut down.
1925-34: Maximum daily discharge, 14,300 second-feet Apr. 1, 1929; minimum, that of Aug. 29, 1934.

Remarks.- Records fair. Daily discharge computed from electrical output of power plant and flow over dam. Records collected by North Counties Hydroelectric Co., under general supervision of U. S. Geological Survey, in connection with a Federal Power Commission project.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	349	486	444	400	471	320	515	196	240	243	145	145
2	283	388	333	400	456	359	494	198	330	165	145	282
3	268	414	331	413	431	312	504	241	302	165	152	198
4	319	457	344	487	442	412	665	245	241	165	145	221
5	363	366	320	489	390	401	723	199	300	182	145	182
6	303	614	331	489	376	309	590	198	300	182	145	221
7	321	1,260	244	487	442	466	603	221	300	199	152	348
8	303	1,130	347	559	304	402	555	223	280	182	145	320
9	267	996	471	376	222	345	452	360	265	151	145	282
10	329	880	444	509	251	305	396	281	199	182	145	222
11	373	789	245	415	321	386	402	299	199	182	165	165
12	345	699	242	471	347	386	325	266	182	222	151	165
13	318	629	471	509	377	472	414	242	165	182	165	151
14	348	559	413	491	413	492	399	199	199	222	145	182
15	303	480	639	511	414	345	559	184	242	199	221	181
16	244	227	404	404	331	344	400	165	199	182	182	281
17	266	487	512	392	302	376	524	165	165	165	182	199
18	332	477	332	486	376	334	546	264	152	165	164	182
19	330	512	440	551	182	333	494	242	183	165	165	165
20	319	460	642	444	267	468	369	182	199	182	164	199
21	375	460	460	576	400	494	356	182	182	165	165	198
22	639	514	441	576	413	390	323	182	266	151	145	221
23	536	509	473	580	322	395	225	182	222	182	151	199
24	491	512	477	534	244	539	184	165	222	165	199	165
25	458	443	186	509	244	514	188	165	182	145	165	182
26	403	475	183	514	267	376	383	199	265	152	165	164
27	414	350	224	473	201	510	250	222	818	145	145	198
28	455	378	318	489	244	512	198	182	536	152	152	265
29	414	529	360	186		546	242	182	349	145	1	242
30	333	491	360	222		524	266	240	332	152	151	222
31	399		429	374		416		300		151	145	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	639	244	361	0.140	0.16
November	1,260	227	566	.220	.25
December	642	183	383	.149	.17
January	580	186	462	.180	.21
February	471	182	338	.132	.14
March	546	305	412	.160	.18
April	723	184	418	.163	.18
May	300	165	217	.084	.10
June	818	152	267	.104	.12
July	243	145	174	.068	.08
August	221	1	153	.060	.07
September	348	145	210	.082	.09
The year	1,260	1	330	.128	1.75

Vermilion River at Lowell, Ill.

Location.- Chain gage in SE¼ sec. 8, T. 32 N., R. 2 E., at highway bridge a quarter of a mile northwest of Lowell, LaSalle County, and 10 miles above mouth. Zero of gage is 500.90 feet above mean sea level.

Drainage area.- 1,230 square miles.

Records available.- May 1931 to September 1934.

Extremes.- Maximum discharge recorded during year, 3,370 second-feet Oct. 23 (gage height, 5.06 feet); minimum recorded, 5.9 second-feet Aug. 2-4 (gage height, 1.13 feet).

1931-34: Maximum discharge recorded, 22,200 second-feet (gage height, 10.76 feet); minimum recorded, that of Aug. 2-4, 1934.

Highest stage known, about 16 feet during an ice jam.

Remarks.- Records fair except those estimated for periods of ice effect, Dec. 12-14, 27-30, Jan. 30 to Feb. 4, Feb. 8-14, Feb. 20 to Mar. 1, which are poor.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,200	420	97	138	119	123	1,100	123	31	16	6.5	7.4
2	1,250	401	92	149	123	172	1,250	117	29	13	5.9	19
3	800	356	94	149	130	196	1,150	117	225	11	6.2	24
4	575	304	97	143	132	205	1,100	119	74	9.7	6.2	19
5	427	262	101	140	138	220	1,060	121	22	8.9	8.3	70
6	323	245	99	130	140	250	925	123	18	8.3	8.0	132
7	250	230	94	121	135	180	725	121	14	8.0	13	110
8	192	210	90	114	128	160	688	123	12	8.0	13	123
9	164	192	88	121	114	143	650	125	15	8.0	11	192
10	146	176	92	99	99	101	540	117	16	12	8.6	164
11	132	160	70	106	97	103	505	110	16	13	29	140
12	114	149	66	99	97	114	472	101	13	24	48	121
13	103	138	68	112	97	97	414	101	13	81	21	103
14	92	135	74	130	97	101	375	101	13	66	13	94
15	83	132	81	103	101	97	349	108	13	168	12	88
16	83	110	86	97	110	88	304	108	11	138	11	83
17	81	119	83	90	110	90	245	110	9.3	86	19	66
18	94	121	90	119	125	97	235	106	11	58	19	50
19	90	121	86	106	114	97	215	101	9.7	66	15	40
20	81	125	81	110	108	92	205	94	8.9	66	26	38
21	117	123	106	103	106	92	200	86	8.9	40	14	33
22	1,910	119	103	108	106	188	188	79	22	24	19	31
23	3,050	114	108	119	103	342	184	77	58	19	21	27
24	2,170	110	112	157	101	316	180	68	48	15	19	26
25	1,670	108	121	230	99	262	157	58	33	13	16	21
26	1,150	101	130	292	99	230	149	56	26	14	13	22
27	880	99	110	274	97	215	138	53	20	11	11	33
28	800	99	110	196	94	172	140	50	16	8.6	9.7	31
29	688	99	114	112		146	140	45	13	8.0	8.6	50
30	540	97	121	106		146	130	42	12	6.8	8.0	58
31	440		130	112		408		35		6.5	7.7	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	3,050	81	635	0.516	0.59
November	420	97	172	.140	.16
December	130	66	96.6	.078	.09
January	292	90	135	.110	.13
February	140	94	111	.090	.09
March	408	88	169	.137	.16
April	1,250	130	470	.382	.43
May	125	35	93.4	.076	.09
June	225	8.9	27.7	023	.03
July	168	6.5	33.3	.027	.03
August	48	5.9	14.4	.012	.01
September	192	7.4	67.2	.055	.06
The year	3,050	5.9	169	.137	1.87

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Mackinaw River near Green Valley, Ill.

Location.- Chain gage in sec. 15, T. 23 N., R. 5 W., at highway bridge on State Route 24, 3 miles north of Green Valley.

Drainage area.- 1,100 square miles.

Records available.- March 1921 to September 1934.

Average discharge.- 13 years, 728 second-feet.

Extremes.- Maximum discharge recorded during year, 3,370 second-feet Oct. 22 (gage height, 6.99 feet); minimum recorded, 18 second-feet July 8-11 (gage height, 0.41 foot).

1921-34: Maximum discharge recorded, 21,800 second-feet May 19, 1927 (gage height, 14.2 feet); minimum recorded, that of July 8-11, 1934.

Remarks.- Records good except those estimated for periods of ice effect, Dec. 25-30, Jan. 30 to Feb. 2, Feb. 7-11, Feb. 25 to Mar. 1, which are fair.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,580	299	119	78	92	53	508	119	45	29	47	38
2	1,580	276	119	82	92	67	530	119	43	27	50	580
3	680	265	119	79	93	254	430	111	43	25	244	680
4	410	254	127	83	96	244	411	111	69	23	112	378
5	310	233	119	90	104	265	394	111	70	23	118	194
6	243	223	119	88	85	223	364	111	52	23	168	213
7	225	213	111	88	83	185	336	111	40	22	194	487
8	209	213	111	88	83	159	299	104	37	18	100	276
9	185	204	104	88	79	127	276	96	119	18	83	194
10	169	194	104	85	81	104	276	92	41	18	69	152
11	153	185	104	82	83	92	288	88	73	18	58	124
12	145	176	96	81	86	104	276	83	82	22	78	106
13	137	168	95	85	86	104	244	83	52	20	65	94
14	122	159	95	85	89	104	213	83	49	2,140	47	83
15	114	159	96	83	88	96	204	82	47	487	63	83
16	106	151	95	79	89	93	194	81	45	378	506	100
17	99	151	96	76	83	93	185	81	41	378	160	78
18	99	143	96	72	83	95	176	77	41	244	112	72
19	94	143	96	82	64	96	168	73	43	394	83	68
20	106	143	96	79	77	104	159	69	61	223	78	63
21	145	143	96	77	85	127	151	65	70	138	112	60
22	2,990	143	96	79	79	194	151	63	64	112	94	58
23	2,820	135	96	90	67	254	151	61	57	100	78	55
24	1,510	135	96	127	59	204	143	56	50	83	65	53
25	1,010	135	77	143	54	176	143	54	61	78	56	51
26	730	127	67	159	49	168	135	52	59	67	52	50
27	580	127	64	159	48	168	135	52	43	60	48	53
28	508	127	63	143	49	151	135	49	35	56	44	64
29	430	119	64	111		151	127	47	32	53	40	124
30	378	119	65	82		168	119	47	31	51	38	106
31	323		72	93		265		45		48	38	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	2,990	94	619	0.563	0.65
November	299	119	175	.159	.18
December	127	63	95.9	.087	.10
January	159	72	94.1	.086	.10
February	104	48	78.8	.072	.07
March	265	53	151	.137	.16
April	530	119	244	.222	.25
May	119	45	79.9	.073	.08
June	119	31	53.2	.048	.05
July	2,140	18	173	.157	.18
August	508	38	100	.091	.10
September	680	38	158	.144	.16
The year	2,990	18	169	.154	2.08

Money Creek above Lake Bloomington, Ill.

Location.- Water-stage recorder in SE¼SW¼ sec. 18, T. 25 N., R. 3 E., 200 feet north of line between secs. 18 and 19, McLean County, and about 1 mile above Lake Bloomington.

Drainage area.- 45 square miles.

Records available.- June 1933 to September 1934.

Extremes.- Maximum discharge during year ending Sept. 30, 1934, 96 second-feet Oct. 22 (gage height, 2.00 feet); no flow at various times during July and August.
1933-34: Maximum discharge, that of Oct. 22, 1933; no flow at various times each summer.
Maximum stage known, about 9 or 10 feet.

Remarks.- Records good before June 15, 1934, and excellent thereafter. No records Sept. 13-20, 22, 23, Sept. 25 to Oct. 16, Dec. 26-31, 1933, Jan. 1-14, June 9-14, 1934.

Discharge, in second-feet, 1933

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1										3.6	0	0
2										3.6	0	0
3										3.2	.15	0
4										2.3	.57	0
5										1.8	.19	0
6										1.8	.08	0
7										1.8	.04	0
8										2.1	0	0
9										2.6	0	0
10										2.1	0	0
11										1.6	.01	0
12										1.1	.05	0
13										.89	.02	
14										.78	0	
15										.57	0	
16										.50	0	
17									8.7	.36	0	
18									7.6	.26	0	
19									6.7	.22	*	
20									5.9	.16	.02	
21									5.7	.14	0	0
22									5.4	.09	0	
23									4.9	.07	0	
24									4.5	.05	0	0
25									4.2	.01	0	
26									4.0	0	0	
27									3.8	0	0	
28									3.6	0	0	
29									4.5	0	0	
30									4.9	0	0	
31										0	0	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October					
November					
December					
January					
February					
March					
April					
May					
June 17-30	8.7	3.6	5.31	0.118	0.06
July	3.6	0	1.02	.023	.03
August	.57	0	.0366	.00081	.0009
September					
The year					

*Discharge less than 0.01 second-foot.

Money Creek above Lake Bloomington, Ill.

(Continued)

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		2.8	2.4		1.4	0.67	37	2.4	0.19	0.14	0	*
2		2.6	2.4		1.4	2.6	34	2.3	.14	.05	0	.64
3		3.0	2.6		1.8	5.2	29	2.3	.11	*	0	5.7
4		3.0	3.2		2.1	5.4	25	2.3	.11	*	0	1.5
5		2.6	3.2		2.1	6.2	22	2.3	.08	*	*	.49
6		2.4	3.4		2.1	6.8	18	2.4	†.07	0	*	4.0
7		2.3	3.0		1.9	4.0	15	2.1	†.02	0	*	4.7
8		2.3	2.6		2.8	3.2	14	1.6	*	0	*	1.9
9		2.1	2.4		1.0	2.2	12	1.4		0	*	1.2
10		1.8	2.3		.67	1.5	12	1.2		0	*	1.4
11		1.8	2.4		.57	1.2	11	1.2		0	*	1.0
12		2.3	1.6		.78	1.1	9.0	1.4		*	*	.45
13		2.6	1.5		1.0	1.5	8.0	1.5		*	*	.41
14		2.3	1.5		1.2	1.4	7.6	1.9		.96	*	.16
15		2.1	2.1	1.2	1.4	1.2	6.7	1.9	†.9	.84	.54	.16
16		2.1	2.3	1.4	1.6	1.1	6.5	1.5	.28	.24	.16	.06
17	0.20	2.4	2.4	1.1	1.1	1.2	5.9	1.2	3.8	.18	.05	.03
18	1.0	2.6	2.4	1.1	1.2	1.6	5.2	1.1	44	.30	.02	.01
19	.46	2.8	2.4	1.1	1.0	1.8	4.7	.89	19.7	.15	.13	.01
20	.46	2.8	2.6	1.1	.67	1.8	4.2	.78	7.5	.06	.18	*
21	3.5	3.2	2.8	1.2	.50	4.9	4.2	.67	3.6	.01	.22	*
22	70	3.2	2.3	2.3	.57	5.7	4.2	.57	3.0	*	.17	*
23	35	3.0	2.4	4.7	.89	2.8	4.0	.50	3.3	*	.11	*
24	18	3.0	2.1	7.3	1.4	2.8	3.6	.67	4.1	0	.07	*
25	12	2.8	1.8	5.7	.89	2.4	3.2	.67	4.1	0	.04	*
26	8.0	2.4		3.8	.57	2.1	3.4	.67	3.6	0	.03	*
27	6.7	2.3		4.2	.57	2.3	3.8	.50	1.7	0	.01	*
28	5.4	1.9		3.6	.50	2.3	3.2	.42	.83	0	*	1.7
29	4.2	2.3		2.1		2.3	2.8	.36	.39	0	*	1.4
30	3.6	2.4		1.2		7.6	2.6	.26	.18	0	*	2.6
31	3.0			1.2		56		.22		0	*	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October 17-31	70	0.20	11.4	0.253	0.14
November	3.2	1.8	2.51	.056	.06
December 1-25	3.4	1.5	2.40	.053	.05
January 15-31	7.3	1.1	2.61	.058	.04
February	2.8	.50	1.20	.027	.03
March	56	.67	4.61	.102	.12
April	37	2.6	10.7	.238	.27
May	2.4	.22	1.26	.028	.03
June					
July	.96	0	.095	.0021	.002
August	.54	0	.056	.0012	.001
September	5.7	*	.984	.022	.02
The year					

*Discharge less than 0.01 second-feet.
†Estimated.

Money Creek at Lake Bloomington, Ill.

Location.- Water-stage recorder in pumping plant above dam in SE¼ sec. 1, T. 25 N., R. 2 E., 2.8 miles above mouth, McLean County. Zero of gage is 700.00 feet above mean sea level.
Drainage area.- 61 square miles.

Records available.- October 1930 to September 1934.

Remarks.- Flow regulated by storage in Lake Bloomington (area of lake at level of crest of spillway, 531 acres). Discharge corrected for storage but not for evaporation and seepage. Pumpage record furnished by City of Bloomington and does not include three small diversions. Rainfall record (mean of three gages within basin) furnished by State Water Survey.

Monthly discharge and rainfall, 1933-34

Month	Discharge from spillway (million gallons)	Pumpage (million gallons)	Gain or loss in storage (million gallons)	*Corrected for storage				Rainfall (inches)
				Run-off (million gallons)	Discharge per square mile		Run-off (inches)	
					Million gallons per day	Second-feet		
October	0	86.46	+133.7	220.16	0.116	0.179	0.21	4.15
November	0	83.83	-74.1	9.73	.00532	.0082	.009	.38
December	0	88.05	-67.7	20.35	.0108	.017	.02	.79
January	0	90.09	-34.5	55.59	.0294	.045	.05	.97
February	0	81.92	-55.2	26.72	.0156	.024	.03	.38
March	0	92.49	+88.1	180.59	.0955	.148	.17	1.83
April	0	88.81	+155.0	243.81	.133	.208	.23	1.00
May	0	99.71	-135.7	-35.99	-.0190	-.029	-.03	.49
June	0	111.59	-52.2	59.39	.0325	.050	.06	3.72
July	0	107.89	-150.9	-43.01	-.0227	-.035	-.04	2.66
August	0	102.02	-71.4	30.62	.0162	.025	.03	4.35
September	0	95.83	+14.6	110.43	.0603	.093	.10	5.82
The year	0	1,128.69	-250.3	876.39	.0395	.061	.84	26.54

*Figures with minus sign indicate the amount by which the evaporation and seepage from reservoir exceeded the inflow.

Spoon River at Seville, Ill.

Location - Chain gage in SW¼ sec. 24, T. 6 N., R. 1 E., at Toledo, Peoria & Western Railroad bridge in Seville. Zero of gage is 467.78 feet above mean sea level.

Drainage area.- 1,600 square miles.

Records available.- July 1914 to September 1934.

Average discharge.- 20 years, 1,004 second-feet.

Extremes.- Maximum discharge recorded during year, 4,710 second-feet July 15 (gage height, 11.80 feet); minimum recorded, 14 second-feet June 16, 17, July 9-11. 1914-34: Maximum discharge recorded, 28,900 second-feet Aug. 22, 1924 (gage height, 30.5 feet); minimum recorded, 3.8 second-feet July 31, Aug. 27-29, 1914 (gage height, 1.35 feet).

Remarks.- Records good except those estimated for periods of ice effect, Dec. 27-30, Jan. 29 to Feb. 14, Feb. 20-28, which are fair.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	158	76	71	76	59	79	104	48	18	20	35	26
2	96	71	70	78	58	346	115	44	16	45	31	105
3	88	68	65	78	57	626	129	42	16	92	29	2,100
4	78	70	186	94	55	1,320	165	40	402	94	27	2,660
5	66	71	161	115	54	1,010	386	39	23	39	26	2,340
6	58	66	138	124	53	762	373	39	43	26	466	2,220
7	51	64	120	124	53	466	241	36	28	21	373	2,040
8	68	62	122	115	54	282	202	33	25	16	280	1,160
9	68	62	107	127	55	210	178	28	61	14	137	543
10	66	55	88	118	57	189	158	36	36	14	78	402
11	74	53	74	100	58	136	148	33	26	15	55	280
12	66	51	68	102	62	282	126	31	23	75	134	202
13	59	55	72	98	60	165	121	31	20	860	178	165
14	55	53	76	109	57	136	88	29	19	1,010	306	132
15	51	52	65	115	62	131	83	29	18	4,560	165	433
16	54	53	68	96	66	110	79	28	14	2,850	626	543
17	51	60	66	120	72	91	76	29	14	2,780	502	466
18	48	57	66	158	70	140	75	28	178	2,100	433	716
19	51	59	72	156	58	131	78	25	178	626	190	346
20	57	57	186	136	55	143	78	23	190	502	117	292
21	79	65	158	98	59	162	67	24	113	860	81	254
22	156	60	154	98	68	129	56	24	130	375	57	306
23	98	81	156	94	57	106	56	23	88	228	44	543
24	85	76	134	111	48	84	56	22	373	153	34	402
25	158	81	120	102	44	80	56	21	241	113	37	319
26	118	81	96	94	42	84	67	21	148	78	31	280
27	100	78	83	98	43	80	67	21	101	61	29	332
28	65	78	72	107	47	76	58	20	44	51	26	306
29	78	71	72	78		80	56	19	29	46	24	346
30	78	72	72	62		88	51	19	24	40	23	332
31	78		72	60		84		18		39	24	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	158	48	78.9	0.049	0.06
November	81	51	65.3	.041	.05
December	186	65	102	.064	.07
January	158	60	105	.066	.08
February	72	42	56.5	.035	.04
March	1,320	76	252	.158	.18
April	386	51	120	.075	.08
May	48	18	29.1	.018	.02
June	402	14	88.0	.055	.06
July	4,560	14	574	.359	.41
August	626	23	148	.093	.11
September	2,660	26	686	.429	.48
The year	4,560	14	193	.121	1.64

Sangamon River at Monticello, Ill.

Location.- Chain gage in SW¼ sec. 12, T. 18 N., R. 5 E., at Illinois Central Railroad bridge half a mile west of Monticello.

Drainage area.- 550 square miles.

Records available.- February 1908 to December 1912, June 1914 to September 1934.

Average discharge.- 20 years (1914-34), 407 second-feet.

Extremes.- Maximum discharge recorded during year, 704 second-feet Apr. 1 (gage height, 8.26 feet); minimum recorded, 2.2 second-feet Aug. 1 (gage height, 1.76 feet).
1908-12, 1914-34: Maximum discharge recorded, 15,400 second-feet Oct. 4, 1926 (gage height, 18.4 feet); minimum recorded, 1 second-foot July 31 to Aug. 3, 1914, and several days in August, September 1930.

Remarks.- Records good. Discharge estimated because of ice effect Dec. 26-30, Jan. 29 to Feb. 1, Feb. 8-10, Feb. 19 to Mar. 1 and because of missing gage-height record Feb. 11.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	156	71	33	42	68	28	682	65	21	7.8	2.2	3.0
2	119	68	32	42	65	45	562	65	20	6.4	2.6	44
3	146	68	31	45	71	80	432	62	19	6.1	2.9	254
4	105	65	33	48	74	92	374	62	18	5.7	2.6	136
5	65	65	32	48	71	98	328	60	17	5.4	3.1	119
6	50	62	32	48	62	92	306	60	15	4.7	3.0	105
7	38	56	32	50	62	80	284	57	15	4.6	4.7	80
8	42	53	31	59	56	77	232	54	14	4.2	8.6	62
9	40	50	31	65	53	56	221	52	14	3.9	6.3	50
10	34	48	32	68	50	48	210	50	13	3.6	5.0	47
11	32	45	31	74	48	45	199	45	13	7.8	5.2	42
12	28	45	30	74	50	48	177	45	13	6.6	210	31
13	25	42	30	80	50	59	156	45	14	5.9	65	26
14	20	42	29	77	53	62	146	45	13	77	26	19
15	20	40	28	71	53	65	127	42	13	22	24	177
16	53	40	28	65	50	65	136	42	12	11	92	65
17	65	38	28	56	50	59	119	42	12	8.0	74	53
18	45	38	28	48	48	59	112	40	17	6.6	27	45
19	45	38	27	56	42	62	112	38	19	8.0	17	32
20	48	35	48	62	38	71	98	35	26	7.6	25	22
21	62	42	68	65	34	127	92	32	22	6.6	18	19
22	278	40	71	65	32	177	92	35	23	5.7	18	17
23	362	38	98	92	38	199	92	33	19	4.7	16	13
24	562	38	80	98	42	188	86	31	50	3.6	13	12
25	338	38	71	146	38	136	80	29	62	3.2	11	11
26	243	35	56	146	35	119	77	29	36	3.0	7.0	11
27	156	35	45	136	31	254	74	27	15	2.8	5.9	11
28	119	35	40	119	28	314	71	27	12	2.6	5.4	13
29	98	34	38	98		374	68	25	11	2.5	4.7	199
30	92	34	38	86		505	65	24	9.9	2.4	4.4	188
31	80		40	71		638		22		2.3	3.2	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	562	20	115	0.209	0.24
November	71	34	45.9	.083	.09
December	98	27	41.0	.075	.09
January	146	42	74.2	.135	.16
February	74	28	49.7	.090	.09
March	638	28	139	.253	.29
April	682	65	194	.353	.39
May	65	22	42.6	.077	.09
June	62	9.9	19.3	.035	.04
July	77	2.3	8.14	.015	.02
August	210	2.2	23.0	.042	.05
September	254	3.0	63.5	.115	.13
The year	682	2.2	68.0	.124	1.68

Sangamon River at Riverton, Ill.

Location.- Chain gage in NE¼ sec. 16, T. 16 N., R. 4 W., at bridge on Route 10 in Riverton, 4½ miles below mouth of South Fork. Gage 1,450 feet downstream at Wabash Railway bridge, to datum 5.61 feet lower, used prior to Aug. 10, 1934. Zero of gage is 508.76 feet above mean sea level.

Drainage area.- 2,560 square miles.

Records available.- February 1908 to December 1912, August 1914 to September 1934.

Average discharge.- 20 years (1914-34), 1,740 second-feet.

Extremes.- Maximum discharge recorded during year, 2,540 second-feet Sept. 30 (gage height, 9.98 feet); minimum recorded, 27 second-feet July 11 (gage height, about 1.92 feet, present datum).
1908-12, 1914-34: Maximum discharge recorded, 30,200 second-feet Oct. 4, 1926 (gage height, 32.0 feet, former location); minimum recorded, 3.0 second-feet Oct. 3-15, 1914 (gage height, 6.9 feet, former location).

Remarks.- Records good except those for periods of ice effect, Dec. 28-31, Jan. 29 to Feb. 2, Feb. 26 to Mar. 1, and for periods of missing gage-height record, Aug. 10-13, Sept. 2-4, which are fair. Some regulation of low-water flow and seasonal storage by municipal reservoir at Decatur.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	421	292	102	116	179	90	2,240	259	58	98	44	95
2	561	244	104	116	188	125	2,160	249	59	66	80	70
3	513	234	111	116	206	398	2,020	239	61	58	102	200
4	398	224	109	116	206	758	1,800	239	66	54	95	600
5	312	215	95	120	188	733	1,550	229	64	49	136	873
6	272	216	98	123	179	658	1,370	219	62	42	190	904
7	234	170	98	134	170	609	1,190	229	59	38	171	873
8	206	143	84	134	152	585	1,050	209	65	35	110	842
9	179	134	85	143	125	513	954	219	79	33	74	726
10	152	134	82	134	118	421	889	199	107	30	60	581
11	143	123	84	120	143	312	793	171	180	28	50	465
12	121	120	79	134	134	292	730	162	323	35	200	386
13	109	109	74	134	125	272	668	162	280	49	1,000	315
14	104	102	80	143	143	253	608	182	239	66	552	294
15	104	98	85	152	143	253	579	183	190	699	494	386
16	98	97	90	161	143	253	579	144	153	1,090	904	784
17	100	102	88	161	134	253	551	153	153	761	1,200	873
18	116	109	79	152	125	292	496	144	219	730	1,440	784
19	125	104	84	152	121	312	469	127	323	608	1,550	610
20	143	102	88	152	112	333	417	118	280	638	1,300	465
21	253	105	98	152	111	333	392	110	280	469	935	361
22	784	100	95	152	93	490	368	105	209	301	726	273
23	1,260	109	92	161	80	557	345	95	209	209	581	242
24	925	116	97	188	72	561	323	85	144	144	465	212
25	811	114	102	215	65	490	301	95	110	105	294	184
26	758	105	93	224	59	537	323	88	118	82	184	166
27	685	92	84	206	59	758	301	82	77	66	148	411
28	609	85	79	197	65	1,260	323	76	64	58	222	697
29	490	90	77	179		1,620	301	71	62	49	242	1,930
30	376	98	90	215		2,020	270	68	72	44	140	2,540
31	333		107	170		2,240		64		39	110	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	1,260	98	377	0.147	0.17
November	292	85	136	.053	.06
December	111	74	90.7	.035	.04
January	224	116	154	.060	.07
February	206	59	130	.051	.05
March	2,240	90	599	.234	.27
April	2,240	270	812	.317	.35
May	259	64	182	.059	.07
June	323	58	146	.057	.06
July	1,090	28	218	.085	.10
August	1,550	44	445	.174	.20
September	2,540	70	605	.236	.26
The year	2,540	28	323	.126	1.70

La Moine River at Ripley, Ill.

Location.- Chain gage in NE¼ sec. 33, T. 1 N., R. 2 W., at highway bridge a quarter of a mile east of Ripley. Zero of gage is 431.1 feet above mean sea level (general adjustment of 1929).

Drainage area.- 1,310 square miles.

Records available.- March 1921 to September 1934.

Average discharge.- 13 years, 739 second-feet.

Extremes.- Maximum discharge recorded during year, 1,280 second-feet June 18 (gage height, 8.78 feet); minimum recorded, 9.0 second-feet Aug. 8, 25, 26 (gage height, 2.52 feet).

1921-34: Maximum discharge recorded, 12,500 second-feet July 25, 1924 (gage height, 25.0 feet); minimum recorded, 8.9 second-feet Sept. 11, 12, 1930. Maximum known stage, 26.0 feet, date unknown.

Remarks.- Records good except those during periods of ice effect, Dec. 25-31, Jan. 29 to Feb. 1, Feb. 8-14, Feb. 20 to Mar. 1, which are fair.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	70	23	29	24	27	18	115	30	14	20	10	18
2	62	23	46	27	29	434	135	30	13	18	10	257
3	47	22	70	32	26	472	204	29	13	15	16	524
4	39	22	62	34	25	378	276	29	13	14	19	1,040
5	30	24	54	37	25	316	472	28	13	13	14	1,010
6	28	25	50	39	24	276	604	28	12	12	11	890
7	27	30	47	41	26	257	336	27	12	12	9.8	690
8	24	32	44	39	20	196	187	26	23	12	9.0	356
9	23	30	39	36	18	115	142	26	98	11	10	230
10	22	29	36	32	18	82	109	24	122	11	11	109
11	22	26	34	32	19	73	98	23	212	10	16	54
12	22	25	30	39	20	73	82	23	103	11	92	37
13	21	24	26	39	22	68	68	22	60	14	68	30
14	20	24	24	37	25	82	64	22	34	19	22	28
15	20	22	24	32	30	82	55	21	31	34	18	30
16	21	22	25	30	32	73	49	20	30	39	17	30
17	22	20	29	32	32	73	47	20	28	37	15	30
18	21	20	32	36	34	68	43	20	800	26	13	122
19	20	20	39	38	32	68	40	20	296	56	12	82
20	22	20	74	39	30	82	38	19	56	257	12	52
21	25	21	86	38	27	156	35	18	155	171	11	37
22	45	23	94	37	26	204	33	18	128	51	10	37
23	34	23	98	39	23	149	32	17	92	26	10	257
24	27	22	74	40	20	115	32	17	60	21	9.5	171
25	27	22	54	42	20	98	30	16	51	21	9.0	122
26	30	23	44	41	18	92	29	15	42	19	9.0	82
27	32	24	33	43	18	87	30	15	37	15	11	164
28	27	25	26	36	18	98	30	15	29	13	12	87
29	25	26	22	30		115	31	14	24	12	12	950
30	24	27	20	26		136	31	14	21	11	10	424
31	24		21	25		128		14		10	10	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	70	20	29.1	0.022	0.03
November	32	20	24.0	.018	.02
December	98	20	44.7	.034	.04
January	43	24	35.2	.027	.03
February	34	18	24.4	.019	.02
March	472	18	150	.115	.13
April	604	29	116	.089	.10
May	30	14	21.3	.016	.02
June	800	12	87.4	.067	.07
July	257	10	32.6	.025	.03
August	92	9.0	16.7	.013	.01
September	1,040	18	272	.208	.23
The year	1,040	9.0	70.9	.054	.73

Kaskaskia River at Vandalia, Ill.

Location.- Chain gage in SE¼ sec. 16, T. 6 N., R. 1 E., at Gallatin Street Bridge, Vandalia, 3⅛ miles above Hickory Creek. Zero of gage is 453.30 feet above mean sea level.

Drainage area.- 1,980 square miles.

Records available.- February 1908 to December 1912, August 1914 to September 1934.

Average discharge.- 20 years (1914-34), 1,392 second-feet.

Extremes.- Maximum discharge recorded during year, 4,250 second-feet Aug. 19 (gage height, 14.76 feet); minimum (estimated), 16 second-feet Feb. 27, during period of ice effect.

1908-12, 1914-34: Maximum discharge, 20,000 second-feet Oct. 4, 1926; maximum stage, 25.0 feet, present datum, June 5, 1917; minimum recorded, 3.5 second-feet Aug. 22, 1911.

Remarks.- Records good above and fair below 100 second-feet except those estimated for periods of ice effect, Dec. 25 to Jan. 1, Jan. 29 to Feb. 1, Feb. 26 to Mar. 1, which are poor.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	247	247	62	94	199	76	1,980	305	84	79	129	206
2	279	231	60	94	207	144	1,900	284	88	67	659	189
3	333	207	76	88	215	231	1,780	263	79	63	920	198
4	371	191	70	88	247	711	1,660	263	88	60	584	713
5	333	191	63	107	247	932	1,520	263	75	56	284	1,070
6	297	175	61	128	247	994	1,420	263	84	52	180	1,010
7	263	159	59	151	231	789	1,220	305	79	49	225	980
8	247	144	57	167	215	639	1,130	347	71	46	129	960
9	175	136	56	215	183	511	1,010	305	88	41	97	1,010
10	183	128	57	247	151	471	890	263	150	38	71	980
11	151	121	56	215	159	411	800	234	536	46	63	890
12	128	114	54	231	167	371	740	206	284	42	63	740
13	114	107	52	231	151	333	686	189	150	39	1,780	659
14	107	100	50	247	151	315	632	180	118	97	1,320	560
15	94	94	50	263	159	315	584	164	136	244	440	536
16	94	88	50	263	159	279	713	157	172	326	686	608
17	128	88	57	247	159	279	1,010	150	142	488	3,260	770
18	159	82	63	231	151	279	950	150	112	659	4,150	830
19	167	82	136	215	151	297	608	142	88	284	4,250	860
20	121	76	199	207	59	351	512	136	84	172	4,050	770
21	107	82	183	199	128	351	464	129	75	129	3,220	686
22	144	82	199	207	136	411	440	124	129	107	1,860	560
23	451	76	175	231	128	451	392	118	124	326	1,420	512
24	471	71	151	315	107	451	392	112	107	326	1,220	416
25	297	70	121	351	23	451	368	107	107	234	1,040	347
26	279	68	100	315	18	491	368	102	92	157	800	326
27	279	66	88	333	16	1,760	368	97	84	164	560	284
28	315	64	76	333	30	3,850	347	92	79	1,100	440	440
29	333	62	71	279		2,990	326	92	79	440	347	920
30	315	64	82	231		2,580	326	88	71	157	284	1,900
31	279		88	207		2,140		84		102	234	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	471	94	234	0.118	0.14
November	247	62	116	.059	.07
December	199	50	87.8	.044	.05
January	351	88	217	.110	.13
February	247	16	150	.076	.08
March	3,850	76	796	.402	.46
April	1,980	326	851	.430	.48
May	347	84	184	.093	.11
June	536	71	122	.062	.07
July	1,100	38	200	.101	.12
August	4,250	63	1,121	.566	.65
September	1,900	189	698	.353	.39
The year	4,250	16	400	.202	2.75

Centralia Reservoir Creek near Centralia, Ill.

Location.- Water-stage recorder in NW¼NE¼ sec. 5, T. 1 N., R. 2 E., at bridge over outlet of Centralia Reservoir, 1 mile above confluence with Crooked Creek and 7½ miles northeast of Centralia, Marion County.

Drainage area.- 7 square miles.

Records available.- March 1932 to September 1934.

Remarks.- Flow regulated by storage in reservoir (area of reservoir at level of crest of spillway, 261 acres). Discharge corrected for storage but not for evaporation and seepage. Pumpage record furnished by City of Centralia. Rainfall record (mean of three gages within basin) furnished by State Water Survey.

Monthly discharge and rainfall, 1933-34

Month	Discharge from spillway (million gallons)	Pumpage (million gallons)	Gain or loss in storage (million gallons)	*Corrected for storage				Rainfall (inches)
				Run-off (million gallons)	Discharge per square mile		Run-off (inches)	
					Million gallons per day	Second feet		
October	0	39.0	-42.8	-3.8	-0.018	-0.028	-0.03	3.79
November	0	38.9	-54.2	-15.3	-.073	-.113	-.13	.82
December	0	40.2	-49.9	-9.7	-.045	-.070	-.08	1.49
January	0	40.1	-25.7	+14.4	+.066	+.102	+.12	1.96
February	0	39.2	-38.0	+1.2	+.0061	+.0094	+.01	1.15
March	0	45.2	-20.6	+24.6	+.113	+.175	+.20	3.53
April	0	37.9	+12.2	+50.1	+.239	+.370	+.41	3.35
May	0	42.2	+2.5	+44.7	+.206	+.319	+.37	2.93
June	0	43.3	-66.0	-22.7	-.108	-.167	-.19	3.65
July	0	44.9	-64.3	-19.4	-.089	-.138	-.16	2.53
August	0	43.6	-66.5	-22.9	-.106	-.164	-.19	3.23
September	0	40.4	+22.2	+62.6	+.298	+.461	+.51	6.66
The year	0	494.9	-391.1	+103.8	+.041	+.063	+.84	35.09

*Figures with minus sign indicate the amount by which the evaporation and seepage from the reservoir exceeded the inflow.

Big Muddy River at Plumfield, Ill.

Location.- Chain gage in southwest corner of sec. 20, T. 7 S., R. 2 E., at highway bridge on Route 149 at Plumfield, 2.6 miles below mouth of Middle Fork.

Drainage area.- 753 square miles.

Records available.- August 1914 to September 1934. June 1908 to December 1912 at Chicago, Burlington & Quincy Railroad bridge 2.4 miles upstream.

Average discharge.- 20 years (1914-34), 728 second-feet.

Extremes.- Maximum discharge recorded during year, 947 second-feet Mar. 30 (gage height, 11.35 feet); minimum recorded, 2.2 second-feet Nov. 26-28.
1914-34: Maximum discharge recorded, 16,300 second-feet Feb. 1, 1916 (gage height, 30.2 feet); no flow Aug. 18-28, 1914.

Remarks.- Records fair.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.3	*9.0	2.8	*8.1	7.5	5.2	612	256	7.1	*16	102	4.2
2	5.4	7.5	2.6	6.5	7.7	9.3	265	133	7.1	13	387	4.7
3	4.1	6.1	2.5	6.1	7.5	17	120	84	6.9	10	676	5.9
4	3.6	5.2	2.5	7.9	7.5	27	84	57	6.7	9.0	741	8.1
5	3.3	4.7	2.5	27	7.5	98	64	45	6.3	8.1	494	9.2
6	3.3	4.4	2.8	54	6.5	175	114	*46	5.9	8.4	199	8.7
7	3.4	4.9	3.0	91	6.3	161	310	47	5.9	10	67	7.9
8	4.1	4.1	2.9	79	5.9	112	600	37	6.7	8.5	37	7.5
9	*5.0	4.0	3.0	64	5.9	76	755	33	7.5	7.3	27	7.5
10	4.6	4.0	3.0	54	5.5	56	637	29	*8.0	6.5	23	7.1
11	4.2	3.7	3.0	48	5.4	44	337	27	23	20	19	12
12	4.0	3.4	2.8	38	5.2	32	161	23	11	72	16	33
13	3.4	3.2	2.8	32	5.0	28	96	*22	8.1	328	14	154
14	3.0	2.5	3.2	28	4.9	24	67	109	7.1	494	12	540
15	3.0	2.4	3.3	23	4.7	22	50	702	5.9	*600	11	769
16	5.2	2.6	4.7	19	4.7	20	41	797	5.2	540	14	797
17	5.9	2.8	13	16	4.6	18	37	637	4.9	417	13	756
18	12	2.9	58	13	4.4	19	35	472	4.7	175	10	637
19	16	3.4	175	12	4.9	25	96	274	4.1	67	8.3	407
20	10	3.4	265	11	4.9	25	108	114	5.6	37	7.1	147
21	9.8	2.8	*185	10	5.0	23	67	52	10	26	6.7	62
22	16	2.8	*125	9.3	5.2	22	47	39	9.8	19	5.7	183
23	18	2.6	*80	9.0	4.9	25	35	27	9.0	13	6.3	357
24	17	2.6	*55	9.0	4.9	28	27	20	27	11	6.1	472
25	13	2.5	*36	9.0	4.7	76	22	18	120	9.0	5.7	283
26	9.8	2.4	*24	8.6	4.6	147	39	14	108	7.5	5.7	84
27	7.5	2.4	*16	8.6	4.4	377	259	12	60	6.5	5.4	45
28	5.9	2.4	*11	9.0	4.6	669	612	10	37	5.7	5.2	33
29	7.1	2.5	7.3	8.8		870	*750	9.6	24	5.4	4.9	154
30	9.3	2.5	7.5	8.3		931	650	9.2	18	4.9	4.7	637
31	*11		7.9	7.9		900		8.3		4.5	4.2	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	18	3.0	7.55	0.010	0.01
November	9.0	2.4	3.65	.0048	.005
December	265	2.5	35.9	.048	.06
January	91	6.1	23.7	.031	.04
February	7.7	4.4	5.52	.0073	.008
March	931	5.2	164	.218	.25
April	755	22	236	.313	.35
May	797	8.3	134	.178	.21
June	120	4.1	19.0	.025	.03
July	540	4.5	95.5	.127	.15
August	741	4.2	94.8	.126	.15
September	797	4.2	221	.293	.33
The year	931	2.4	87.0	.116	1.59

*Estimated.

Big Muddy River at Murphysboro, Ill.

Location.- Water-stage recorder in SE¼ sec. 8, T. 9 S., R. 2 W., at Illinois Central Railroad bridge across mouth of Lewis Creek at Murphysboro, Jackson County. Zero of gage is 335.5 feet above mean sea level (general adjustment of 1929).

Drainage area.- 2,170 square miles.

Records available.- December 1916 to September 1934.

Extremes.- Maximum discharge during year, 2,400 second-feet Mar. 29 (gage height, 7.45 feet); minimum, 13 second-feet Oct. 14, 15.
1917-34: Maximum discharge not determined; minimum, 1.0 second-foot Aug. 1, 1921.
Maximum stage known, 39.6 feet (former datum) Feb. 2, 1916 (discharge, about 28,000 second-feet).

Remarks.- Records good. Stage-discharge relation affected by backwater from Mississippi River whenever height on U. S. Weather Bureau gage at Chester, Ill., exceeds about 15 feet. Discharge for all stages above 2.8 feet and when backwater is present during lower stages computed on basis of slope as obtained by use of auxiliary chain gage on Route 13 bridge, 7,700 feet upstream.

Discharge, in second-feet, 1933-34

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	119	46	19	35	24	24	1,710	1,560	21	54	445	21
2	65	39	19	33	24	35	1,430	1,120	19	50	1,210	22
3	41	34	19	30	25	80	999	629	18	43	1,160	24
4	30	31	19	39	26	213	522	337	18	33	1,120	25
5	25	30	21	59	25	360	316	225	17	27	1,210	24
6	21	28	23	80	24	332	658	170	17	28	1,040	26
7	19	26	22	98	24	395	854	130	16	30	803	27
8	17	24	22	127	24	481	1,490	107	15	32	372	26
9	16	26	21	178	23	415	1,850	101	15	37	196	25
10	16	28	20	220	21	309	1,690	103	16	29	114	48
11	15	28	20	213	21	232	1,520	92	17	24	79	230
12	15	25	20	188	20	171	1,120	84	17	34	66	218
13	14	23	19	165	21	135	685	73	18	35	58	355
14	13	21	19	141	21	114	386	235	18	105	51	592
15	13	19	18	119	21	94	264	802	17	350	50	1,750
16	18	18	20	100	21	84	203	1,630	17	474	56	2,080
17	19	16	31	86	20	73	164	1,860	17	503	54	2,010
18	18	16	53	75	20	105	135	1,840	17	527	46	1,850
19	37	16	75	67	21	110	112	1,300	16	431	43	1,650
20	72	15	132	59	21	146	103	881	16	256	40	1,320
21	58	15	304	51	20	165	127	474	16	140	38	842
22	92	16	327	45	21	152	161	276	16	90	36	450
23	90	16	232	45	21	135	146	167	16	61	34	296
24	78	16	165	40	22	114	116	116	15	42	32	280
25	73	15	112	39	25	102	94	88	24	32	30	431
26	62	15	86	37	26	236	109	64	256	30	28	474
27	59	16	70	34	25	1,030	359	50	203	26	26	350
28	54	17	56	32	24	1,550	660	39	140	21	26	206
29	56	17	45	30		2,330	1,670	32	103	18	25	754
30	56	18	40	27		2,070	1,730	26	70	16	24	1,450
31	53		37	25		1,920		23		17	22	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	119	13	43.0	0.020	0.02
November	46	15	22.3	.010	.01
December	327	18	67.0	.031	.04
January	220	25	81.2	.037	.04
February	26	20	22.5	.010	.01
March	2,330	24	442	.204	.24
April	1,850	94	713	.329	.37
May	1,860	23	472	.218	.25
June	256	15	46.0	.018	.02
July	527	16	116	.053	.06
August	1,210	22	275	.127	.15
September	2,080	21	595	.274	.31
The year	2,330	13	241	.111	1.52

Discharge measurements of streams in the Hudson Bay and upper Mississippi River basins at points other than regular gaging stations are listed in the following table:

Miscellaneous discharge measurements in upper Mississippi River basin during the year ending Sept. 30, 1934

Date	Stream	Tributary to-	Locality	Gage height	Discharge
				Feet	Sec.-ft.
Apr. 9	Mississippi River	Gulf of Mexico	Hastings, Minn.	13.83	5,440
Sept.22	do	do	500 feet above mouth of Chippewa River near Reads, Minn.	.....	3,030
Apr. 10	do	do	Reads, Minn.	6.84	42,600
Apr. 17	do	do	do	4.84	26,900
Apr. 24	do	do	do	2.73	19,600
May 2	do	do	do	1.11	14,700
May 16	do	do	do	-.18	11,500
June 6	do	do	do	-1.45	7,820
Aug. 1	do	do	do	-3.43	4,770
Aug. 31	do	do	do	-3.75	4,410
Sept.22	do	do	do	-3.31	5,740
Apr. 12	do	do	Lansing, Iowa	10.09	64,400
Apr. 18	do	do	do	8.78	45,000
Apr. 25	do	do	do	5.48	28,700
May 4	do	do	do	3.25	18,700
May 19	do	do	do	1.88	14,100
June 7	do	do	do	.56	10,600
Aug. 2	do	do	do	-.60	7,870
June 28	do	do	Keokuk, Iowa	484.63	20,300
June 29	do	do	do	484.15	18,600
June 12	Minnesota River	Mississippi River	Carver, Minn.	4.87	257
July 25	do	do	do	4.50	118
Aug. 14	do	do	do	4.50	110
Oct. 10	do	do	Mendota, Minn.	1.12	153
Dec. 11	do	do	do	1.14	192
Jan. 4	do	do	do	1.30	180
Feb. 9	do	do	do	1.25	223
Mar. 21	do	do	do	1.48	235
Apr. 23	do	do	do	2.24	447
June 4	do	do	do	1.12	218
June 12	do	do	do	1.44	335
July 26	do	do	do	1.04	182
Aug. 13	do	do	do	.84	170
Sept.10	do	do	do	1.34	70.2
Sept.14	do	do	do	1.22	189
Nov. 14	Bad Axe River	do	Bridge 2 miles above mouth, near Victory, Wis.	2.85	62.1
Apr. 15	Wapsipinicon River.	do	Near McCausland, Iowa	.....	549
Aug. 19	Raccoon River	Des Moines River	Sec. 18, T. 83 N., R. 30 W., near Jefferson, Iowa.	.....	50.4
May 21	do	do	Above Des Moines water works, Des Moines, Iowa.	.....	74.2
May 21	do	do	Below Des Moines water works, Des Moines, Iowa.	.....	56.9
Aug. 19	Middle Raccoon River.	Raccoon River	Sec. 15, T. 84 N., R. 35 W., near Carroll, Iowa.	.....	0
Oct. 4	South Fork of Salt River.	Salt River	On line between SW¼ SW¼ sec. 1 and NW¼ NW¼ sec. 12, T. 51 N., R. 9 W., 3 miles north of Mexico, Mo.	1.14	2.88

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