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UNITED STATES DEPARTMENT OF THE INTERIOR

SURFACE WATER SUPPLY *of the* UNITED STATES 1932

PART 5

HUDSON BAY AND UPPER MISSISSIPPI RIVER BASINS

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

GEOLOGICAL SURVEY WATER-SUPPLY PAPER 730

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

Water-Supply Paper 730

SURFACE WATER SUPPLY *of the* UNITED STATES

1932

PART 5

HUDSON BAY AND UPPER MISSISSIPPI RIVER BASINS

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District Engineers

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

Water Resources Branch
Geological Survey,
Box 3106, Capitol Station
Oklahoma City, Okla.

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Part V 1933

ILLUSTRATION

SURFACE WATER SUPPLY OF HUDSON BAY AND UPPER MISSISSIPPI RIVER BASINS, 1932

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, 1932.

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, 1895–1933

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		
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 6,590 points in the United States and also at many points in Alaska and the Hawaiian Islands. In July 1932, 2,790 gaging stations were being

maintained by the Geological Survey and the cooperating organizations. 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, 1931, and ending September 30, 1932. At the beginning of January in most parts of the United States much of the precipitation in

the preceding three 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.

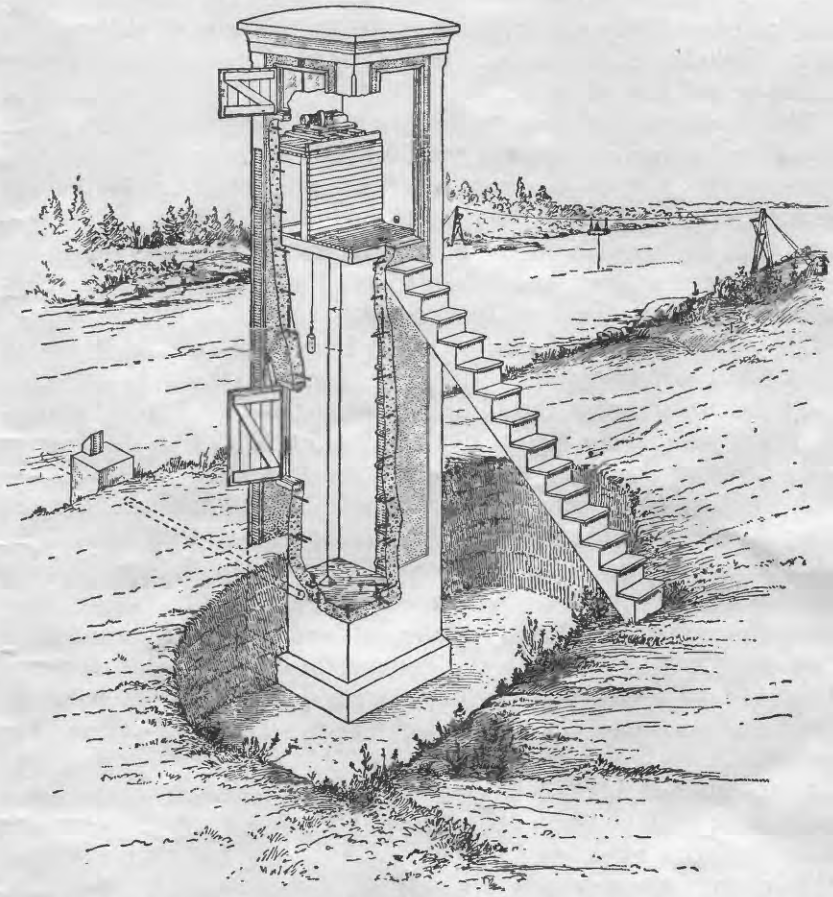

FIGURE 1.—Typical river-measurement station showing concrete well and house for water-stage recorder and staff gages, cable, and car.

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 staff or chain 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 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, in addition to statements regarding location and type of gage, information as to diversions that decrease the flow at the gage, artificial regulation, maximum and minimum recorded discharges, and the accuracy of the records. The maximum discharge given under "Extremes" does not represent the crest discharge unless a water-stage recorder was in operation or a non-recording gage was read at the time of the crest.

The table of daily discharge gives, in general, the discharge in second-feet corresponding to the daily gage height, which may be a once daily reading or the mean of twice daily readings of a non-recording gage, or the mean daily gage height obtained from a water-stage recorder graph.

At stations on streams subject to sudden or rapid diurnal fluctuation, the discharge obtained from the rating table and the mean daily gage height may not be the true mean discharge for the day. If such stations are equipped with water-stage recorders, the mean daily discharge may be obtained by averaging discharge at regular intervals during the day or by using the discharge integrator, an instrument for obtaining 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. On this average flow are based computations recorded in the remaining columns, which are defined on page 2.

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 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.

The tables of monthly discharge give 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.

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.

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 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., 603 State Public Works Building.
Trenton, N.J., 228 Federal Building.
Harrisburg, Pa., 492 Education Building.
Charlottesville, Va., Brooks Museum, 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., 630 Power 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., 632 State Office Building.
Iowa City, Iowa, 402 Hydraulic Laboratory, University of Iowa.
Topeka, Kans., State House.
Rolla, Mo., Rolla Building, Missouri School of Mines and Metallurgy.
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, 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., 510 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 6,590 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
10th A, pt. 2	Descriptive information only	
11th A, pt. 2	Monthly discharge and descriptive information	1884 to September 1890.
12th A, pt. 2	do	1884 to June 30, 1891.
13th A, pt. 3	Mean discharge in second-feet	1884 to Dec. 31, 1892.
14th A, pt. 2	Monthly discharge (long-time records, 1871 to 1893)	1888 to Dec. 31, 1893
B 131	Descriptions, measurements, gage heights, and ratings	1893-9[illegible].
16th A, pt. 2	Descriptive information only	1895.
B 140	Descriptions, measurements, gage heights, ratings, and monthly discharge (also many data covering earlier years).	
W 11	Gage heights (also gage heights for earlier years)	1896.
18th 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.
19th A, pt. 4	Description, 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.

The records at most of the stations discussed in these reports extends 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 1932. 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, 1889–1932

[For basins included, see p. 5]

Year	1	2	3	4	5	6	7	8	9	10	11	12-A	12-B	12-C
1899 [a]	35	[b] 35, 36	36	36	36	[c] 36, 37	37	37	[d] 37, 38	38, [e] 39	38, [f] 39	38	38	38
1900 [g]	47, [h] 48	48	48, [i] 49	49	49	49, [j] 50	50	50	50	51	51	51	51	51
1901	65, 75	65, 75	65, 75	65, 75	[k] 65, 66, 75	66, 75	[k] 65, 66, 75	66, 75	66, 75	66, 75	66, 75	66, 75	66, 75	66, 75
1902	82	[b] 82, 83	83	[l] 82, 83	[k] 83, 85	84	[k] 83, 84	84	85	85	85	85	85	85
1903	97	[b] 97, 98	98	97	[k] 98, 99, [m] 100	99	[k] 98, 99	99	100	100	100	100	100	100
1904	[n] 124, [o] 125, [p] 126	[p] 126, 127	128	129	[k] 128, 130	130, [q] 131	[k] 128, 131	132	133	133, [r] 134	134	135	135	135
1905	[n] 165, [o] 166, [p] 167	[p] 167, 168	169	170	171	172	[k] 169, 173	174	175, [s] 177	176, [r] 177	177	178	178	[t] 177, 178
1906	[n] 201, [o] 202, [p] 203	[p] 203, 204	205	206	207	208	[k] 205, 209	210	211, [s] 213	212, [r] 213	213	214	214	214
1907–8	241	242	243	244	245	246	247	248	249	250, [r] 251	251	252	252	252
1909	261	262	263	264	265	266	267	268	269	270, [r] 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

[a] Rating tables and index to Water-Supply Papers 35–39 contained in Water-Supply Paper 39. Tables for monthly discharge for 1899 in Twenty-first Annual Report, Part 4.
[b] James River only.
[c] Gallatin River.
[d] Green and Gunnison Rivers and Colorado River above Gunnison River.
[e] Mohave River only.
[f] Kings and Kern Rivers and south Pacific slope basins.
[g] 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. Tables of monthly discharge for 1900 in Twenty-second Annual Report, Part 4.
[h] Wissahickon and Schuylkill Rivers to James River.
[i] Scioto River.
[j] Loup and Platte Rivers near Columbus, Nebr., and all tributaries below junction with Platte River.
[k] Tributaries of Mississippi River from east.
[l] Lake Ontario and tributaries to St. Lawrence River proper.
[m] Hudson Bay only.
[n] New England rivers only.
[o] Hudson River to Delaware River, inclusive.
[p] Susquehanna River to Yadkin River, inclusive.
[q] Platte and Kansas Rivers.
[r] The Great Basin in California, except Truckee and Carson River Basins.
[s] Below junction with Gila River.
[t] Rogue, Umpqua, and Siletz Rivers only.

COOPERATION

The work in the several States was done under cooperative agreements as follows: In Illinois with the Illinois Department of Purchases and Construction, Henry H. Kuhn, director, and with the Illinois Department of Registration and Education, M. F. Walsh, director; in Indiana with the Department of Conservation, Denzil Doggett, assistant State engineer; in Minnesota with the Minnesota Department of Drainage and Waters, E. V. Willard, director, with the city of Minneapolis and with the city of St. Paul; in Missouri with the Missouri Bureau of Geology and Mines, 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 of Wisconsin, A. V. Guillou, chief engineer.

Acknowledgments are also due the Corps of Engineers, United States Army, for financial assistance in collecting records published herein. Several stations in Minnesota, Montana, and North Dakota were maintained from funds appropriated by the Department of State of the United States.

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 also rendered by the following municipalities and corporations: In Illinois by the Central Illinois Public Service Co. and the North Counties Hydroelectric Co.; in Iowa by the city of Ottumwa; in Minnesota by the Ford Motor Co.; in Wisconsin by the Northern States Power Co. and Wisconsin Power & Light Co.

DIVISION OF WORK

The data for the stations in the several States were collected and prepared for publication as follows: In Illinois by J. H. Morgan, district engineer, assisted by L. C. Crawford, C. L. Muntz, and Mrs. M. F. Bressler; in Indiana by H. E. Grosbach, district engineer, assisted by W. D. Mitchell, W. P. Cross, R. L. Spencer, R. C. Van Drew, and Mrs. C. Perrin; in Iowa data for Des Moines River at Eldon collected under direction of J. H. Morgan and prepared for publication by R. G. Kasel; in Minnesota and North Dakota, for all the stations on the Mississippi River and for that on the Whetstone River

near Big Stone, S.Dak., by C. L. Batchelder, district engineer, assisted by A. H. Frazier, O. B. Johnson, K. B. Nelson, G. L. Oakland, and C. E. Putz; in Missouri by H. C. Beckman, district engineer, assisted by H. C. Bolon, R. D. Schmickle, C. J. Eyberg, and C. H. Jennings; in Montana by W. A. Lamb, district engineer, assisted by A. H. Tuttle, C. S. Heidel, Edward Post, E. H. Bekkedahl, H. C. Smith, and Mrs. G. Thompson; in Wisconsin and St. Croix River near Rush City, Minn., by S. B. Soulé, district engineer, assisted by C. C. Yonker and R. H. Brigham.

The records were reviewed and manuscript assembled by H. P. Eisenhuth.

172423—33——2

GAGING-STATION RECORDS

HUDSON BAY 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 1932.
EXTREMES.—Maximum stage during year, 5.86 feet May 23; minimum, 1.20 feet Sept. 17.
1929–32: Maximum stage, 5.86 feet May 23, 1932; minimum, 0.02 foot Dec. 16, 29, 30, 1929, Jan. 1, 1930.
REMARKS.—Records excellent. No diversions.

Gage height, in feet, 1932

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1	------	3.72	4.60	2.66	1.76	16	4.60	5.18	3.18	2.02	1.23
2	------	3.84	4.46	2.58	1.70	17	4.68	5.24	3.18	2.06	1.20
3	------	4.10	4.34	2.50	1.72	18	4.60	5.16	3.00	2.10	------
4	------	4.32	4.32	2.46	1.64	19	4.62	5.00	3.10	2.12	------
5	------	4.40	4.30	2.40	1.58	20	4.70	4.78	3.16	2.06	------
6	------	4.38	4.14	2.38	1.56	21	5.00	4.76	3.08	2.06	------
7	------	4.38	3.98	2.32	1.54	22	5.60	4.80	3.00	2.18	------
8	------	4.16	3.86	2.28	1.52	23	5.86	5.00	2.96	2.16	------
9	------	4.18	3.70	2.24	1.48	24	5.20	5.20	2.92	2.14	------
10	------	4.22	3.60	2.22	1.45	25	4.84	5.08	2.96	2.10	------
11	------	4.30	3.52	2.24	1.42	26	4.66	4.98	2.88	2.06	------
12	------	4.40	3.40	2.26	1.39	27	4.42	4.78	2.84	2.00	------
13	------	4.64	3.34	2.16	1.34	28	3.92	4.73	2.80	1.98	------
14	------	4.82	3.32	2.10	1.30	29	3.78	4.68	2.78	1.96	------
15	4.62	5.08	3.26	2.06	1.25	30	3.76	4.60	2.80	1.90	------
						31	3.74	------	2.74	1.84	------

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 1932.
EXTREMES.—Maximum stage during year, 3.97 feet June 18; minimum, 0.05 foot Oct. 18.
1929–32: Maximum stage, 4.10 feet May 26, 1929; minimum, 0.04 foot Oct. 24, 25, 1929.
REMARKS.—Records excellent. No diversions. Stage increased by inflow of Swiftcurrent Creek during part of year.

Gage height, in feet, 1931–32

Day	Oct.	May	June	July	Aug.	Sept.	Day	Oct.	May	June	July	Aug.	Sept.
1	0.38	------	2.13	2.86	1.72	1.26	16	0.07	3.13	3.41	1.83	1.41	0.48
2	.37	------	2.23	2.78	1.66	1.24	17	.07	2.98	3.82	1.83	1.42	.45
3	.36	------	2.33	2.72	1.63	1.23	18	.06	2.83	3.92	1.82	1.41	.40
4	.33	------	2.42	2.66	1.61	1.21	19	.07	2.77	3.86	1.82	------	.37
5	.32	------	2.49	2.60	1.60	1.20	20	.07	2.76	3.60	1.80	------	.34
6	.29	------	2.50	2.54	1.60	1.20	21	.08	2.91	3.45	1.79	1.43	.30
7	.28	1.69	2.48	2.43	1.60	1.19	22	.07	3.35	3.33	1.79	1.44	.26
8	.25	1.76	2.42	2.31	1.60	1.16	23	.12	3.70	3.35	1.78	1.48	.24
9	.22	1.83	2.39	2.20	1.59	1.04	24	.23	3.73	3.41	1.77	1.46	.19
10	.18	1.97	2.41	2.10	1.59	.96	25	.28	3.50	3.43	1.76	1.42	.17
11	.15	2.16	2.45	1.99	1.58	.86	26	.32	3.20	3.36	1.75	1.38	.15
12	.12	2.37	2.47	1.90	1.54	.76	27	.30	2.88	3.21	1.74	1.35	.12
13	.10	2.73	2.54	1.86	1.49	.67	28	.26	2.62	3.09	1.73	1.32	.10
14	.08	2.93	2.69	1.85	1.45	.60	29	.23	2.39	2.97	1.72	1.31	.10
15	.08	3.14	2.96	1.84	1.42	.54	30	.18	2.23	2.89	1.72	1.30	.09
							31	------	2.10	------	1.74	1.28	------

ST. MARY RIVER NEAR BABB, MONT.

LOCATION.—Water-stage recorder in SE¼ sec. 27, T. 36 N., R. 14 W., 600 feet below headworks of St. Mary Canal on the Blackfeet Indian Reservation and 1 mile east of Babb.

DRAINAGE AREA.—278 square miles (includes area of Swiftcurrent Creek above point of diversion into St. Mary Lake).

RECORDS AVAILABLE.—April 1902 to September 1925; May 1929 to September 1932, summer records only.

EXTREMES.—Maximum discharge during year, 2,400 second-feet June 18 (gage height, 5.71 feet); minimum discharge, 108 second-feet Sept. 30 (gage height, 1.70 feet).

1902–25; 1929–32: Maximum discharge, 7,980 second-feet June 5, 1908 (estimated gage height, 9.4 feet); minimum, 30 second-feet Apr. 3–7, 1904.

REMARKS.—Records good. Discharge interpolated May 3–6, Sept. 8. Storage in Sherburne Lake Reservoir on Swiftcurrent Creek. Intake for St. Mary Canal at left end of dam. Records show only water passing over crest of dam; diversion by canal not included.

Discharge, in second-feet, 1932

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	------	336	960	1,500	500	206	16	118	1,820	2,080	636	242	217
2	------	324	1,060	1,470	462	204	17	130	1,710	2,320	636	258	212
3	------	373	1,180	1,400	424	193	18	196	1,640	2,400	625	262	193
4	------	422	1,500	1,370	415	179	19	305	1,540	2,320	619	262	177
5	------	471	1,750	1,330	402	166	20	372	1,500	2,160	592	272	166
6	------	520	1,780	1,260	411	168	21	429	1,610	2,010	570	286	158
7	------	570	1,710	1,140	411	168	22	476	1,940	1,940	564	294	147
8	301	636	1,370	1,030	406	215	23	500	2,240	2,010	564	372	140
9	305	764	1,300	925	398	262	24	495	2,240	2,010	553	368	130
10	301	890	1,260	829	389	377	25	486	2,080	2,010	542	313	128
11	305	1,060	1,300	725	377	393	26	490	1,820	1,940	532	282	125
12	262	1,300	1,330	654	332	340	27	443	1,610	1,820	532	265	121
13	245	1,470	1,400	625	297	305	28	406	1,440	1,710	537	265	118
14	172	1,710	1,500	648	248	262	29	381	1,260	1,610	516	248	116
15	134	1,820	1,710	631	236	236	30	352	1,060	1,540	511	242	112
							31	------	890	------	521	239	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 8-30	500	118	331	15,100
May	2,240	324	1,260	77,500
June	2,400	960	1,700	101,000
July	1,500	511	793	48,800
August	500	236	328	20,200
September	393	112	198	11,800
The period				274,000

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 southwest of Kimball, Alberta, and 5 miles north of international boundary. Staff gage at same site used June 4–23. Chain gage 3 miles downstream was used Nov. 19 to Apr. 7.

DRAINAGE AREA.—497 square miles.

RECORDS AVAILABLE.—January 1913 to September 1932; September 1902 to December 1912 at point half a mile north of international boundary. Comparable records 1905–12 obtained by the Irrigation Branch, Department of the Interior, Canada, half a mile below present station.

EXTREMES.—Maximum discharge during year, 3,040 second-feet June 18 (gage height, 5.28 feet); minimum, 69 second-feet Jan. 18; ice present.

1902–32: Maximum discharge (estimated), 18,000 second-feet June 5, 1908; minimum, 27.8 second-feet Dec. 18, 1930.

REMARKS.—Records good. Stage-discharge relation affected by ice Nov. 19 to Apr. 7. St. Mary Canal diverts water near Babb, Mont., to North Fork of Milk River. Regulation on Swiftcurrent Creek. 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, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	454	a 170	203	a 164	a 80	697	347	459	1,310	1,770	600	311
2	438	a 160	a 206	159	79	a 662	a 404	438	1,500	1,670	566	300
3	429	a 150	209	a 164	a 78	626	460	433	1,590	1,630	529	282
4	424	a 144	a 191	170	76	a 630	a 430	600	1,710	1,580	507	276
5	410	138	173	a 162	a 85	633	401	806	2,250	1,500	507	266
6	392	138	a 174	153	98	a 546	a 350	738	a2,400	1,390	507	263
7	378	224	176	a 138	a 105	460	299	782	2,250	1,280	507	260
8	370	227	a 169	122	115	a 425	327	948	a1,950	1,180	501	266
9	356	224	162	a 118	a 118	390	323	1,130	1,660	1,060	490	378
10	335	221	a 168	115	122	a 396	327	1,250	a1,720	987	485	388
11	323	219	173	a 92	a 122	401	331	1,420	1,780	904	485	507
12	304	238	a 184	70	122	a 390	339	1,610	a1,820	831	438	501
13	300	238	196	a 76	103	374	300	1,790	1,850	798	406	524
14	290	227	a 218	83	101	a 360	272	2,000	a2,040	814	370	490
15	282	211	222	a 78	a 103	341	249	2,170	2,220	798	347	459
16	276	214	a 220	74	105	a 358	216	2,120	a2,470	798	347	448
17	263	206	218	a 72	a 115	368	219	2,000	a2,740	798	356	438
18	260	219	a 213	69	125	a 374	263	1,960	3,040	782	360	433
19	255	215	209	a 77	a 112	368	370	1,870	a2,910	782	356	403
20	249	215	a 200	85	98	a 368	443	1,870	2,780	747	370	392
21	219	222	193	a 88	a 93	368	501	2,040	a2,640	695	415	374
22	140	226	a 187	92	87	368	580	2,580	2,500	687	438	356
23	134	226	181	a 90	a 150	a 363	600	2,840	a2,500	687	454	343
24	150	a 222	a 181	87	218	368	638	2,800	2,500	662	490	335
25	170	218	181	a 87	a 500	a 367	638	2,560	2,420	646	429	327
26	181	a 218	a 178	90	810	363	629	2,220	2,380	629	392	319
27	183	218	176	a 90	a 810	a 360	559	1,890	2,220	621	370	307
28	164	a 222	a 177	87	810	358	535	1,730	2,050	621	365	300
29	146	218	178	a 87	a 726	a 355	501	1,480	1,930	613	352	296
30	206	a 209	a 174	85	------	352	485	1,340	1,830	600	343	286
31	190	------	170	a 82	------	a 351	------	1,230	------	613	343	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	454	134	280	17,200
November	238	138	207	12,300
December	222	162	189	11,600
January	170	69	103	6,330
February	810	76	216	12,400
March	697	341	424	26,100
April	638	216	411	24,500
May	2,840	433	1,580	97,200
June	3,040	1,310	2,170	129,000
July	1,770	600	941	57,900
August	600	343	433	26,600
September	524	266	361	21,500
The year	3,040	69	610	443,000

a 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 seasons, 1918–32.

REMARKS.—Records good. Discharge estimated Apr. 14, 15. 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, 1931–32

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.	Oct.
1	5.6	105	0	533	656	684	727	638	0
2	5.4	106	0	533	617	686	724	640	0
3	5.6	102	0	536	622	683	722	638	0
4	5.6	97	0	538	294	680	722	635	0
5	5.4	97	0	538	12.7	681	719	635	0
6	5.2	51	0	536	12.1	684	722	633	0
7	5.6	10	0	542	124	683	722	633	0
8	5.6	0	5.6	550	463	681	722	564	0
9	5.2	0	7.8	554	551	676	722	427	0
10	5.4	0	4.6	557	587	673	722	289	0
11	5.4	0	4.0	563	587	676	729	91	0
12	8.0	0	48.5	564	588	670	729	0	0
13	11.5	0	115	568	590	670	727	0	0
14	11.2	0	184	590	592	672	717	0	0
15	12.4	0	248	614	598	672	714	0	0
16	12.4	0	449	625	588	678	715	0	0
17	12.1	0	510	604	582	681	719	0	0
18	12.1	0	524	533	584	686	720	0	63
19	12.7	0	528	603	579	700	719	0	116
20	13	0	521	633	571	702	720	0	115
21	96	0	521	648	569	705	722	0	117
22	187	0	522	652	563	714	719	0	117
23	218	0	524	657	562	715	693	0	71
24	221	0	522	680	582	719	656	0	43.1
25	223	0	524	691	612	719	648	0	100
26	225	0	530	689	622	720	644	0	102
27	225	0	534	638	635	722	644	0	83
28	225	0	534	574	643	727	644	0	0
29	184	0	534	574	659	726	644	0	0
30	105	0	532	564	675	727	644	0	0
31	105	------	------	598	------	727	641	------	0

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1931–32				
October	225	5.2	70.3	4,320
November 1–7	106	10	81.1	1,130
April 8–30	534	4.0	366	16,700
May	691	533	590	36,300
June	675	12.1	531	31,600
July	727	670	695	42,700
August	729	641	701	43,100
September 1–11	640	91	529	11,500
1932				
October 18–27	117	43.1	92.7	1,840

NOTE.—No flow during months omitted. Canal closed Oct. 27, 1932.

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 seasons, 1918–32.

REMARKS.—Records excellent. Discharge estimated Oct. 24, 25, 30, 31, 1932. 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, 1931–32

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.	Oct.
1	0	95	0	472	552	590	609	544	0
2	0	92	0	470	526	590	607	540	0
3	0	91	0	472	530	590	603	540	0
4	0	84	0	477	399	588	603	538	0
5	0	84	0	464	22	590	603	536	0
6	0	71	0	460	2	590	603	536	0
7	0	3	0	467	4	588	603	534	0
8	0	0	0	470	352	586	603	517	0
9	0	0	0	474	465	580	603	382	0
10	0	0	0	479	511	578	603	300	0
11	0	0	0	483	515	582	609	122	0
12	0	0	0	484	515	578	611	5	0
13	0	0	74	488	517	578	605	0	0
14	0	0	144	495	520	582	601	0	
15	0	0	220	511	526	578	599	0	0
16	0	0	295	524	524	582	599	0	0
17	0	0	374	528	515	584	599	0	0
18	0	0	438	454	515	586	601	0	29
19	0	0	452	510	511	592	601	0	105
20	0	0	459	540	508	592	603	0	105
21	34.4	0	454	559	502	596	609	0	104
22	141	0	459	567	499	601	607	0	111
23	181	0	462	567	497	603	594	0	37
24	186	0	465	573	504	603	557	0	20
25	188	0	464	582	528	603	550	0	18
26	190	0	467	582	540	603	546	0	95
27	192	0	472	563	550	605	544	0	92
28	190	0	468	497	557	605	544	0	30
29	182	0	470	488	569	605	544	0	10
30	102	0	470	488	582	605	544	0	0
31	94			528		607	544		0

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1931–32				
October 21–31	192	34.4	153	3,340
November 1–7	95	3	74.3	1,030
April 13–30	472	74	295	14,100
May	582	454	507	31,200
June	582	2	462	27,500
July	607	578	592	36,400
August	611	544	589	36,200
September 1–12	544	5	424	10,100
1932				
October 18–29	111	10	62.8	1,420

NOTE.—No flow during months omitted. Canal closed Oct. 29, 1932.

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, 1917–32.

REMARKS.—Records good. 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, 1931–32

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.	Oct.
1	0	98	0	464	559	577	596	539	0
2	0	95	0	462	550	577	594	541	0
3	0	90	0	466	544	585	594	550	0
4	0	90	0	479	526	583	590	550	0
5	0	87	0	481	235	581	590	550	0
6	0	91	0	472	38.2	579	588	548	0
7	0	14.4	0	472	8.2	581	585	550	0
8	0	0	0	470	42.2	581	588	552	0
9	0	0	.3	477	388	577	590	462	0
10	0	0	.4	479	491	581	588	374	0
11	0	0	.6	483	517	579	596	220	0
12	0	0	.4	489	522	581	596	98	0
13	0	0	.6	487	522	577	594	8	0
14	0	0	69	489	526	577	588	1	0
15	0	0	157	506	530	568	579	0	0
16	0	0	233	519	544	572	572	0	0
17	0	0	311	533	530	577	572	0	0
18	0	0	396	489	519	577	577	0	0
19	0	0	438	477	517	583	577	0	0
20	0	0	554	526	517	588	574	0	5
21	0	0	466	552	508	588	581	0	78
22	0	0	472	583	502	592	590	0	88
23	127	0	477	566	502	594	588	0	81
24	182	0	479	570	496	594	561	0	18
25	177	0	466	574	513	594	544	0	6
26	187	0	466	581	530	596	539	0	6
27	188	0	472	577	544	592	537	0	39
28	188	0	475	544	548	592	539	0	27
29	187	0	472	508	561	601	537	0	18
30	156	0	466	502	561	596	533	0	14
31	103			513		601	539		12

Month	Maximum	Minimum	Mean	Run-off in acre-feet
1931–32				
October 23–31	188	103	166	2,960
November 1–7	98	14.4	80.8	1,120
April 9–30	554	.3	312	13,600
May	583	462	509	31,300
June	561	8.2	463	27,600
July	601	568	585	36,000
August	596	533	575	35,400
September 1–14	552	1	397	11,000
1932				
October 20–31	88	5.0	32.7	778

NOTE.—No flow during months omitted. Canal closed Oct. 31, 1932.

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 1932.

EXTREMES.—Maximum discharge during year, 1,360 second-feet May 22 (gage height, 5.05 feet); minimum, 24.4 second-feet Oct. 30 (gage height, 1.62 feet).

1912–32: Maximum discharge, 1,550 second-feet June 17, 1916; minimum, 10 second-feet Nov. 6, 7, 1921 (gage height, 1.22 feet).

REMARKS.—Records excellent. Discharge estimated Oct. 31. Observations discontinued during winter. 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, 1931–32

Day	Oct.	May	June	July	Aug.	Sept.	Day	Oct.	May	June	July	Aug.	Sept.
1	78	------	537	362	122	64	16	34.0	432	667	168	95	51
2	75	------	740	351	110	66	17	32.8	380	634	187	106	51
3	77	------	624	333	106	59	18	31.6	452	524	201	115	49.6
4	73	------	558	366	110	55	19	30.4	487	448	190	115	47.0
5	66	------	504	391	117	55	20	29.2	589	376	170	120	44.4
6	66	------	406	326	117	56	21	28.0	819	409	160	127	43.1
7	61	------	330	273	113	60	22	28.0	1,250	533	160	127	37.9
8	56	------	355	251	106	64	23	30.4	865	576	165	115	33.0
9	49.6	------	413	236	106	60	24	31.6	516	558	173	106	31.0
10	46.6	662	452	221	108	57	25	29.2	355	475	170	95	32.0
11	42.4	657	440	204	122	56	26	31.6	270	428	160	85	31.0
12	41.0	647	537	193	127	54	27	30.4	221	391	157	83	31.0
13	38.2	839	657	187	101	54	28	28.0	193	366	147	83	31.0
14	36.8	891	740	181	89	51	29	26.8	179	376	157	87	31.0
15	35.4	611	765	170	87	51	30	25.6	221	398	163	79	31.0
							31	25.0	362	------	150	70	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off	
					Inches	Acre-feet
October	78	25	42.4	1.35	1.56	2,610
May 10–31	1,250	179	541	17.2	14.07	23,600
June	765	330	507	16.1	17.96	30,200
July	391	147	217	6.91	7.97	13,300
August	127	70	105	3.34	3.85	6,460
September	66	31	47.9	1.53	1.71	2,850

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 installed May 7, 1931; prior to that date staff gage used. 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 1932.

EXTREMES.—Maximum contents during year, 54,820 acre-feet July 12 (water-surface elevation, 4,781.2 feet).

1915, 1917–18, 1921–32: Maximum contents, 60,420 acre-feet June 20, 1925 (water-surface elevation, 4,784.6 feet).

REMARKS.—Records good. Some gage heights furnished by United States Bureau of Reclamation.

Contents, in acre-feet, 1932

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	-------	10,700	38,310	53,450	43,160	16,890	16	-------	21,900	53,150	53,300	29,820	8,190
2	-------	10,126	39,740	53,600	42,340	15,900	17	-------	22,710	52,840	52,840	28,770	7,965
3	-------	9,568	41,040	53,750	41,560	15,080	18	-------	23,480	52,360	52,520	27,890	7,740
4	-------	9,100	42,340	53,900	40,650	14,270	19	17,070	24,580	51,880	52,040	27,010	7,440
5	-------	8,872	43,440	54,050	39,740	13,440	20	16,500	25,700	51,560	51,720	26,240	7,298
6	-------	8,948	44,300	54,200	38,830	12,480	21	16,200	27,450	51,250	51,100	25,400	7,079
7	-------	9,178	44,900	54,500	37,400	11,580	22	15,710	30,060	51,250	50,500	24,690	6,860
8	-------	9,724	45,500	54,500	36,560	10,780	23	15,350	32,480	51,400	49,900	23,920	6,716
9	-------	10,780	46,340	54,660	35,680	10,208	24	15,080	33,820	51,720	49,150	23,150	6,500
10	-------	12,220	47,200	54,660	34,540	9,802	25	14,720	34,660	52,040	48,550	22,500	6,212
11	-------	13,840	48,100	54,660	33,700	9,490	26	14,180	35,290	52,360	47,950	21,800	6,140
12	-------	15,350	49,000	54,660	32,930	9,178	27	12,840	35,810	52,520	47,200	21,000	5,860
13	18,300	17,160	50,200	54,500	32,240	8,948	28	12,220	36,440	52,840	46,340	20,200	5,720
14	18,300	19,060	51,560	54,050	31,400	8,644	29	11,740	36,440	53,000	45,780	19,330	5,510
15	-------	20,800	52,840	53,750	30,630	8,416	30	11,260	36,800	53,150	44,900	18,630	5,372
							31	-------	37,660	-------	44,000	17,770	-------

NOTE.—Observers' readings used Apr. 13 to May 6, May 29, 30, June 23, 24, July 9–13, Aug. 2–6, Sept. 14–24.

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 1932.

EXTREMES.—Maximum discharge during year, 1,220 second-feet May 31 (gage height, 7.00 feet); minimum, 34 second-feet Oct. 20 (gage height, 1.66 feet). 1912–32: Maximum discharge, 2,280 second-feet June 17, 1916 (gage height 7.83 feet); no flow at different times when gates in dam were closed.

REMARKS.—Records good. Discharge estimated Oct. 31. Observations discontinued during winter. 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, 1931–32

Day	Oct.	May	June	July	Aug.	Sept.	Day	Oct.	May	June	July	Aug.	Sept.
1	66	------	191	363	593	546	16	46.5	131	739	478	601	183
2	62	------	160	347	588	543	17	45.1	131	798	459	604	173
3	62	------	160	340	616	533	18	43.7	129	789	452	608	170
4	59	------	160	340	639	526	19	40.9	132	663	455	611	162
5	56	------	162	340	628	546	20	37.4	135	599	464	611	156
6	54	------	164	338	651	563	21	279	142	560	498	608	153
7	53	423	164	335	660	553	22	281	145	531	533	608	147
8	53	331	165	312	663	447	23	312	139	528	533	553	143
9	52	196	166	305	663	349	24	316	142	528	535	493	140
10	51	117	166	278	642	264	25	299	143	487	538	500	142
11	51	122	168	250	584	223	26	236	142	379	550	516	139
12	51	125	168	284	577	217	27	184	147	354	571	546	138
13	51	126	171	370	546	204	28	179	146	349	571	553	135
14	50	128	212	423	536	191	29	139	145	363	574	553	129
15	47.9	131	478	443	584	185	30	59	139	365	605	550	125
							31	59	179	------	610	543	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	316	37.4	109	6,700
May 7–31	423	117	159	7,880
June	798	160	363	21,600
July	610	250	435	26,700
August	663	492	588	36,200
September	563	125	271	16,100

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 1932.

EXTREMES.—Maximum discharge during year, 138 second-feet May 21 (discharge measurement); minimum, 4.0 second-feet Oct. 31.

1918–32: Maximum discharge (estimated), 500 second-feet May 16, 1922 (gage height, 3.34 feet); minimum, 3.2 second-feet Oct. 26, 1929 (gage height, 0.35 foot).

REMARKS.—Records poor. Observations discontinued during winter. 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, 1931–32

Day	Oct.	May	June	July	Aug.	Sept.	Day	Oct.	May	June	July	Aug.	Sept.
1	17.0	------		a 55	a 17	a 12	16	a 8.0	------	57	25.0	a 17.3	8.8
2	15.8	------		a 50	a 16	a 11	17	a 8.0	------	62	26.1	a 17.1	7.8
3	15.4	------	a 81	a 42	a 16	a 11	18	a 8.0	------	72	26.1	16.9	8.1
4	13.8	------		a 43	a 16	11.6	19	a 8.0	------	81	24.0	a 17	7.2
5	13.0	------		a 50	a 17	11.6	20	a 7.0	------	87	21.4	a 17	7.2
6	12.7	------		a 46	a 17	11.6	21	a 7.0	------		20.0	a 17	6.9
7	11.6	------		a 40	16.5	11.6	22	a 8.0	------		19.6	a 17	6.3
8	10.5	------		32.8	16.5	11.6	23	a 8.0	a 138	a 78	20.0	a 17	5.7
9	10.5	------	a 42.9	32.8	16.5	11.3	24	a 8.0	------		20.0	16.9	5.4
10	9.8	------		30.1	17.3	11.0	25	a 8.0	------		a 19	a 17	5.4
11	9.1	------		27.8	18.4	10.3	26	a 8.0	------		a 18	a 17	5.7
12	9.1	------	57	26.7	a 18.2	10.0	27	a 8.0	------		a 17	a 17	5.7
13	8.5	------	49	26.7	a 18.0	9.4	28	a 7.0	a 52	a 53	a 16	a 16	5.1
14	8.2	------	45	24.5	a 17.7	10.0	29	a 6.0	------		a 18	a 15	5.1
15	a 8.0	------	47	24.0	a 17.5	9.1	30	4.5	------		a 20	a 14	6.0
							31	a 4.0	------	------	a 18	a 13	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches	Run-off in acre-feet
October	17.0	4.0	9.31	1.33	1.53	572
June	87	----------	62.5	8.93	9.96	3,720
July	55	16	28.4	4.06	4.68	1,750
August	18.4	13	16.7	2.39	2.76	1,030
September	12.0	5.1	8.65	1.24	1.38	515

a Estimated or interpolated.

RED RIVER BASIN

OTTERTAIL RIVER BELOW PELICAN RIVER, NEAR FERGUS FALLS, MINN.

LOCATION.—Water-stage recorder in NE¼ sec. 34, T. 132 N., R. 44 W., 8 miles southwest of Fergus Falls and 9 miles below mouth of Pelican River.

RECORDS AVAILABLE.—October 1930 to September 1932.

EXTREMES.—Maximum discharge during year, 551 second-feet June 14; maximum gage height, 3.77 feet Apr. 7, caused by ice jam; minimum discharge, 7.2 second-feet Sept. 30 (gage height, 0.60 foot, affected by debris).

1930–32: Maximum discharge, 810 second-feet Dec. 11, 1930 (gage height, 2.19 feet); maximum gage height, that of April 1932; minimum discharge, 4 second-feet Nov. 6, 1930; minimum gage height, 0.56 foot Aug. 25, 1931.

REMARKS.—Records good except those for Nov. 22 to Apr. 6, obtained by comparison with Ottertail River at Breckenridge, which are fair. Flow regulated by power plant above.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	12	46		51	48	20	29	29
2	11	39		42	53	50	36	28
3	34	27		78	43	37	31	30
4	41	25	70	64	37	20	30	25
5	22	20		46	27	19	29	28
6	33	29		21	25	49	29	31
7	31	24	100	22	21	34	34	31
8	11	20	130	61	104	120	26	32
9	9	45	149	104	46	30	27	34
10	31	51	242	88	50	21	31	35
11	40	36	120	40	40	15	29	33
12	30	21	94	91	83	15	27	34
13	28	22	52	45	97	17	26	33
14	23	28	54	44	133	13	27	32
15	47	36	94	46	44	13	28	43
16	24	24	72	25	23	17	37	30
17	24	25	146	86	23	68	30	29
18	49	24	93	82	55	45	25	30
19	25	34	85	38	47	27	26	31
20	29	37	26	83	56	40	28	30
21	22	26	78	22	54	46	25	33
22	34		84	19	44	19	30	40
23	21		31	18	52	18	30	33
24	25		49	24	44	36	35	31
25	45		47	60	31	32	26	31
26	32	25	49	40	58	31	24	32
27	31		53	29	47	29	11	29
28	28		44	43	39	34	12	31
29	61		61	69	45	31	12	31
30	35		78	20	41	37	24	22
31	42			68		31	29	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	61	9	30.0	1,840
November			28.8	1,710
December			30	1,840
January			40	2,460
February			45	2,590
March			60	3,690
April	242	26	81.7	4,860
May	104	18	50.6	3,110
June	133	21	50.3	2,990
July	120	13	32.7	2,010
August	37	11	27.2	1,670
September	43	22	31.4	1,870
The year			42.2	30,600

OTTERTAIL RIVER AT BRECKENRIDGE, MINN.

LOCATION.—Staff gage in SE¼ sec. 4, T. 132 N., R. 47 W., fastened to wooden abutment about 4 feet above crest of city of Breckenridge water-supply dam.
RECORDS AVAILABLE.—December 1931 to April 1932 (discontinued).
EXTREMES.—Maximum discharge during period, 237 second-feet Apr. 8 (gage height, 2.00 feet); minimum, 15 second-feet Dec. 17, 18 (gage height, 1.04 feet).
REMARKS.—Records good. Discharge estimated during period of ice effect, Jan. 6–16, Jan. 20 to Feb. 1, Feb. 3–5, 8, 10–13. Discharge interpolated Dec. 13, Mar. 6. Flow regulated by power plant 55 miles upstream.

Discharge, in second-feet, 1931–32

Day	Dec.	Jan.	Feb.	Mar.	Apr.	Day	Dec.	Jan.	Feb.	Mar.	Apr.
1	46	50	38	143	80	16	18	52	44	21	------
2	29	37	21	107	65	17	15	31	50	22	------
3	28	61	40	126	67	18	15	31	46	48	------
4	28	31	42	84	80	19	42	33	31	31	------
5	22	28	44	63	75	20	26	42	33	38	------
6	16	38	24	74	69	21	28	48	37	44	------
7	19	38	29	84	177	22	29	33	46	50	------
8	21	40	48	69	188	23	29	28	58	73	------
9	19	61	26	63	------	24	37	52	31	80	------
10	21	61	29	91	------	25	29	37	44	38	------
11	28	67	29	80	------	26	28	35	44	67	------
12	24	54	40	80	------	27	46	38	82	38	------
13	36	63	52	54	------	28	38	33	110	42	------
14	48	56	40	82	------	29	28	37	136	63	------
15	28	37	50	24	------	30	38	37	-------	89	------
						31	38	38	-------	71	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
December	48	15	28.9	1,780
January	67	28	42.8	2,630
February	136	21	46.3	2,660
March	143	21	65.8	4,050
April 1–8	188	65	100	1,590
The period				12,700

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 (1912 adjustment).

DRAINAGE AREA.—6,420 square miles.

RECORDS AVAILABLE.—May 1901 to September 1932.

EXTREMES.—Maximum discharge during year, 875 second-feet Apr. 11 (gage height, 9.45 feet); no flow July 25 to Aug. 31; minimum gage height, 6.63 feet Aug. 23.

1901–32: Maximum discharge, 7,740 second-feet July 11, 1916 (gage height, 17.34 feet); minimum, that of July and August 1932.

REMARKS.—Records fair. Discharge estimated Apr. 9, May 21, when changes were made in fishway opening.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	98	51	22	a 33	47	300	156	a 57	63	8.4	0	2.8
2	61	45	21	33	47	287	156	65	49	11	0	7.0
3	33	45	27	a 34	45	305	a 164	49	55	a 13	0	9.2
4	17	47	27	35	37	340	171	65	47	a 14	0	12
5	15	35	25	31	31	287	153	71	a 38	16	0	10
6	10	35	a 24	35	31	a 269	168	63	29	16	0	10
7	10	27	22	43	a 32	251	207	55	43	14	0	8.4
8	12	33	19	45	33	207	239	a 66	33	13	0	7.7
9	12	15	17	37	33	153	405	77	31	12	0	3.5
10	12	24	17	a 37	33	113	750	69	63	a 12	0	7.7
11	15	21	19	37	33	98	868	61	43	11	0	7.0
12	15	20	17	35	33	83	672	53	a 39	8.4	0	5.6
13	20	20	a 18	33	33	a 74	490	77	35	9.2	0	7.0
14	20	22	20	33	a 33	65	415	92	25	12	0	8.4
15	15	a 28	17	31	33	71	295	a 78	31	11	0	7.0
16	17	35	17	37	35	76	235	65	33	8.4	0	6.3
17	24	39	19	a 39	41	67	163	67	27	a 7.4	0	7.0
18	27	31	21	41	41	69	148	59	22	6.3	0	7.7
19	25	29	21	39	37	57	118	41	a 36	8.4	0	8.4
20	25	20	a 20	33	37	a 45	124	41	51	7.0	0	12
21	27	22	20	37	a 41	33	112	25	51	8.4	0	12
22	29	a 24	20	27	45	31	130	a 35	33	6.3	0	10
23	25	27	21	25	41	41	112	45	29	4.2	0	10
24	29	25	22	a 32	37	45	a 90	35	21	a 2.1	0	8.4
25	31	20	a 24	39	41	55	69	35	15	0	0	8.4
26	29	20	27	41	45	71	82	27	a 14	0	0	33
27	22	20	a 22	37	67	a 103	84	43	12	0	0	14
28	27	17	17	37	153	135	69	37	10	0	0	11
29	33	a 20	20	37	177	153	61	a 50	10	0	0	12
30	39	22	33	41	------	150	49	63	9.2	0	0	12
31	51	------	33	a 44	------	147	------	59	------	0	0	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	98	10	26.6	1,640
November	51	15	28.0	1,670
December	33	17	21.6	1,330
January	45	25	36.1	2,220
February	177	31	47.3	2,720
March	340	31	135	8,300
April	868	49	232	13,800
May	92	25	55.6	3,420
June	63	9.2	33.2	1,980
July	16	0	7.73	475
August	0	0	0	0
September	13	2.8	8.78	522
The year	868	0	52.4	38,100

a Interpolated.

RED RIVER AT GRAND FORKS, N.DAK.

LOCATION.—Staff gage in sec. 34, T. 152 N., R. 50 W., in Grand Forks, 2 miles below mouth of Red Lake River. Zero of gage is 784.10 feet above mean sea level.

DRAINAGE AREA.—25,500 square miles.

RECORDS AVAILABLE.—May 1901 to September 1932 (gage-height record 1882–1901 by United States Engineer Corps).

EXTREMES.—Maximum discharge during year, 10,400 second-feet Apr. 10 (gage height, 22.07 feet); minimum, 26 second-feet Sept. 30; minimum gage height, 1.30 feet Oct. 1.

1882–1932: Maximum discharge, 43,000 second-feet Apr. 10, 1897 (gage height, 50.2 feet); minimum, 20 second-feet Sept. 25, 1931 (gage height, 1.18 feet).

REMARKS.—Records good. Stage-discharge relation affected by ice Nov. 25 to Apr. 24 and by aquatic growth Oct. 1 to Nov. 2, June 14 to Sept. 30. Discharge estimated Feb. 25–27.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	42	208	152	179	136	a1,520	1,730	1,180	529	361	a 78	54
2	43	218	161	a 179	136	a1,950	2,140	1,100	499	336	76	55
3	39	218	144	179	128	a2,380	2,580	1,100	529	312	a 72	56
4	57	218	144	188	136	2,810	2,700	1,100	499	278	69	55
5	101	238	136	188	136	a2,620	2,920	1,140	499	278	a 68	a 54
6	188	228	136	208	136	2,420	3,150	1,140	499	255	67	52
7	152	249	120	179	144	1,780	4,200	974	499	234	a 64	a 52
8	144	249	128	161	152	1,580	5,700	1,010	499	213	60	51
9	108	238	a 125	152	136	1,400	8,710	1,010	470	194	a 57	51
10	91	228	a 123	161	144	1,400	10,200	1,140	442	175	54	49
11	90	218	120	161	136	1,320	10,100	1,220	414	158	51	a 48
12	95	218	128	152	128	1,280	9,120	1,260	387	150	a 51	46
13	107	218	107	161	144	1,090	8,020	1,180	387	166	51	a 49
14	97	218	a 104	152	144	974	7,200	1,140	387	166	a 52	52
15	85	198	101	161	152	830	6,090	1,100	414	166	54	a 50
16	77	198	113	161	144	796	4,910	1,100	414	158	a 56	48
17	87	188	120	161	136	762	4,020	1,050	387	150	57	46
18	87	188	110	152	144	728	3,330	1,010	387	150	a 54	43
19	88	179	113	152	120	762	2,810	935	361	142	52	a 41
20	88	179	120	152	104	660	2,090	824	336	158	54	39
21	88	179	128	152	98	628	1,880	789	336	158	a 52	40
22	94	179	128	152	83	596	1,930	720	336	158	50	38
23	92	179	128	144	67	660	2,040	622	336	150	a 53	37
24	90	170	128	144	78	596	1,980	622	312	128	a 56	32
25	136	170	136	152	113	596	1,880	559	a 300	121	58	a 30
26	144	161	144	a 152	144	a 565	1,580	590	289	114	a 60	28
27	161	161	144	152	628	534	1,400	590	278	107	61	27
28	a 174	161	161	144	974	a 621	1,220	590	312	100	60	27
29	188	152	161	136	1,090	a 708	1,180	590	336	100	a 58	a 26
30	198	152	170	144	------	796	1,180	559	361	88	57	26
31	208	------	179	a 140	------	1,010	------	559	------	81	a 56	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	208	39	111	6,820
November	249	152	199	11,800
December	179	101	133	8,180
January	208	136	160	9,840
February	1,090	67	207	11,900
March	2,810	534	1,170	71,900
April	10,200	1,180	3,930	234,000
May	1,260	559	919	56,500
June	529	278	401	23,900
July	361	81	178	10,900
August	78	50	58.6	3,600
September	56	26	43.4	2,580
The year	10,200	26	623	452,000

a Interpolated.

RED RIVER AT EMERSON, MANITOBA

[International gaging station]

LOCATION.—Chain gage on Canadian National Railway bridge in Emerson.

DRAINAGE AREA.—34,600 square miles.

RECORDS AVAILABLE.—March to November 1902; October 1929 to September 1932.

EXTREMES.—Maximum daily mean discharge during year, 18.900 second-feet Apr. 15 (gage height, 771.07 feet); maximum gage height, 772.42 feet Apr. 14, affected by backwater; minimum discharge, 24 second-feet Sept. 29 (gage height, 744.07 feet).

1929–32: Maximum discharge, 20,800 second-feet Apr. 10, 1930; minimum, that of September 1932.

Maximum stage known, 785.16 feet Apr. 24, 1916 (discharge, 46,200 second-feet).

REMARKS.—Stage-discharge relation affected by ice Nov. 25 to Apr. 14. This station is one of the international gaging stations maintained by Canada under agreement with the United States.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	52	193	206	162	150	291	900	2,630	847	361	126	57
2	49	206	214	163	145	345	870	2,520	847	345	115	49
3	44	206	219	164	142	390	1,000	2,440	811	361	104	52
4	40	220	228	165	140	403	1,350	2,440	802	368	99	52
5	37	234	228	165	140	419	1,800	2,440	779	384	95	52
6	40	240	226	165	140	520	2,320	2,410	758	400	89	55
7	41	243	214	166	140	950	2,950	2,410	726	393	85	52
8	46	240	201	168	139	1,360	5,390	2,420	706	377	83	52
9	49	249	193	170	137	2,140	7,780	2,440	686	368	81	52
10	49	240	181	171	136	2,730	9,930	2,450	646	352	79	52
11	61	240	178	172	135	2,700	12,800	2,470	618	329	75	49
12	73	240	176	174	135	2,650	15,200	2,470	618	297	70	47
13	79	240	176	174	135	2,640	18,500	2,470	618	265	66	44
14	89	249	174	174	133	2,450	18,800	2,440	582	256	61	37
15	99	256	174	173	132	2,150	18,900	2,360	565	246	55	26
16	99	265	174	172	130	1,990	18,100	2,220	530	234	52	28
17	99	249	174	170	129	1,830	16,200	2,220	530	220	46	30
18	95	234	176	170	129	1,710	14,000	2,000	565	211	44	30
19	93	220	176	170	128	1,540	11,700	1,870	558	220	43	30
20	83	226	176	170	127	1,420	9,770	1,750	554	206	40	33
21	73	234	178	167	126	1,330	7,980	1,660	519	193	38	33
22	89	220	181	168	125	1,270	6,710	1,550	495	169	37	33
23	93	200	183	167	125	1,200	5,660	1,430	449	162	30	34
24	99	185	183	165	124	1,150	4,750	1,300	432	166	26	37
25	104	164	183	164	123	1,090	4,230	1,210	425	169	30	37
26	110	171	181	163	123	973	3,920	1,090	400	162	34	37
27	115	178	178	162	140	914	3,680	982	384	157	37	30
28	133	183	176	161	176	930	3,150	959	377	152	43	26
29	157	191	169	158	217	950	3,040	914	377	145	49	24
30	162	200	162	154	------	932	2,880	869	377	138	52	30
31	176	------	160	153	------	911	------	856	------	133	55	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	176	37	84.8	5,210
November	265	164	221	13,200
December	228	160	187	11,500
January	174	153	166	10,200
February	217	123	138	7,940
March	2,730	291	1,360	83,600
April	18,900	870	7,810	465,000
May	2,630	856	1,930	119,000
June	847	377	586	34,900
July	400	133	256	15,700
August	126	26	62.5	3,840
September	57	24	40.0	2,380
The year	18,900	24	1,060	772,000

BOIS DES SIOUX RIVER NEAR FAIRMOUNT, N.DAK.

LOCATION.—Staff gage near center of sec. 22, T. 130 N., R. 47 W., at Soo 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 1932.
EXTREMES.—1919–32: Maximum discharge, 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 1932. June to November 1916 at a point 3½ miles downstream.
EXTREMES.—Maximum discharge during year, 210 second-feet Apr. 7 (gage height, 4.06 feet, affected by ice); no flow during several periods.
1917, 1919–24, 1931–32: 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. 16, Mar. 27 to Apr. 12, and by aquatic growth May 22 to July 16. No record Oct. 1 to Mar. 15, Mar. 17–26.

Discharge, in second-feet, 1932

Day	Mar.	Apr.	May	June	July	Day	Mar.	Apr.	May	June	July
1		50	1.4	0.4	0.2	16	0.5	8.4	3.5	2.6	0
2		32	1.8	.8	.2	17		6.5	1.9	2.4	
3		50	2.1	.8	.3	18		5.4	1.5	2.1	
4		41	2.4	.4	.3	19		5.4	2.8	1.4	
5		20	2.4	.5	.2	20		4.3	1.9	.7	
6		78	2.1	.4	.2	21		2.9	1.9	.5	
7		173	2.4	.3	.2	22		2.9	1.4	.4	
8		130	2.6	.3	.2	23		2.4	1.0	.3	
9		29	4.3	.9	.1	24		2.9	.8	.3	
10		18	6.5	.8	.1	25		2.4	1.0	.3	
11		20	8.4	.7	.1	26		2.1	1.2	.2	
12		27	9.8	.4	0	27	12	2.1	1.5	.2	
13		24	5.9	1.4	0	28	15	2.1	.8	.2	
14		15	4.3	3.7	.1	29	17	2.6	.6	.2	
15		9.0	4.0	2.9	0	30	32	3.7	.4	.2	
						31	24		.4		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April	173	2.1	25.7	1,530
May	9.8	.4	2.68	165
June	3.7	.2	.89	53
July 1–16	.3	0	.14	4

NOTE.—Practically no flow during period July 17 to Sept. 30.

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 to September 1932.
EXTREMES.—Maximum discharge during period, 28 second-feet Apr. 13 (gage height, 2.27 feet, affected by ice); no flow during August and September.
REMARKS.—Records good. Stage-discharge relation affected by ice. Apr. 4–13.

Discharge, in second-feet, 1932

Day	Apr.	May	June	July	Day	Apr.	May	June	July
1	------	7.0	2.0	2.1	16	17	7.2	2.0	0.4
2	------	6.8	2.0	2.0	17	16	6.3	2.7	.3
3	------	6.2	2.3	2.6	18	14	5.7	4.5	.4
4	13	6.2	4.3	2.1	19	11	4.9	4.5	.3
5	13	6.9	3.1	2.1	20	8.8	4.0	5.2	.2
6	14	6.3	2.6	1.5	21	7.4	4.0	6.2	.2
7	20	6.3	2.1	1.4	22	6.3	3.0	6.2	.1
8	18	7.7	2.1	1.2	23	5.7	2.4	5.3	.1
9	19	7.6	2.3	1.0	24	5.8	1.9	4.4	.1
10	19	6.8	2.2	.8	25	5.8	1.6	3.3	.1
11	18	6.9	1.7	.7	26	6.0	5.3	3.7	0
12	24	6.3	1.6	.7	27	6.6	11	4.3	0
13	28	6.4	1.7	.5	28	6.9	8.1	4.5	0
14	27	8.3	2.1	.6	29	7.2	4.7	3.6	0
15	22	8.5	2.2	.4	30	6.3	3.1	3.1	0
					31	------	2.5	------	0

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April 4–30	28	5.7	13.5	723
May	11	1.6	5.80	357
June	6.2	1.6	3.26	194
July	2.6	0	.71	44
The period				1,320

NOTE.—No flow during August and September.

SHEYENNE RIVER AT SHEYENNE, N.DAK.

LOCATION.—Wire gage in T. 150 N., R. 66 W., about 1 mile north of Sheyenne. Zero of gage is 1,410.14 feet above mean sea level (1912 adjustment).

RECORDS AVAILABLE.—April 1929 to July 1932.

EXTREMES.—Maximum discharge during year occurred during period of estimated flow; maximum stage, 5.62 feet Mar. 1, affected by ice; minimum discharge, 0.6 second-foot July 5 (gage height, 2.04 feet, affected by aquatic growth).

1929–32: Maximum discharge, 990 second-feet Feb. 24, 1930 (gage height, 8.79 feet); no flow for several periods.

REMARKS.—Records fair April and May, poor rest of year. Discharge estimated Mar. 1–31. No record Oct. 1 to Feb. 29, July 16 to Sept. 30.

Discharge, in second-feet, 1932

Day	Mar.	Apr.	May	June	July	Day	Mar.	Apr.	May	June	July
1		63	6.8	4.4	1.2	16		19	18	8.6	------
2		68	5.7	5.0	.8	17		15	12	13	------
3		68	4.4	7.0	.8	18		15	9.8	11	------
4		68	4.1	5.7	.7	19		15	5.8	11	------
5	60	73	5.8	5.5	.6	20	[a] 10	11	6.0	9.8	------
6		68	6.6	9.2	.7	21		9.8	4.6	9.2	------
7		63	7.4	9.8	.9	22		8.0	3.3	7.8	------
8		53	7.6	15	.8	23		7.0	4.4	6.6	------
9		56	8.6	19	1.0	24		8.0	2.9	5.7	------
10		56	11	17	1.4	25		7.8	2.5	5.0	------
11	[a] 10	46	21	15	1.5	26		7.4	6.4	3.8	------
12		36	30	15	1.7	27		5.8	7.0	3.4	------
13		30	30	13	2.0	28	45	4.9	6.4	2.9	------
14		24	28	11	2.3	29		6.6	5.8	2.2	------
15		18	24	9.5	2.3	30		7.4	4.6	1.9	------
						31		-------	3.6	-------	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
March	----------	----------	29.2	1,800
April	73	4.9	31.3	1,860
May	30	2.5	9.81	603
June	19	1.9	8.77	522
July 1–15	2.3	.6	1.25	37
The period	----------	----------	----------	4,820

[a] Mean discharge for Mar. 8–24.

SHEYENNE RIVER AT WEST FARGO, N.DAK.

LOCATION.—Chain gage in sec. 6, T. 139 N., R. 49 W., about half a mile north of West Fargo, formerly called Haggart.

RECORDS AVAILABLE.—September 1929 to September 1932; at station a quarter of a mile above March 1902 to June 1907, March to August 1919.

EXTREMES.—Maximum discharge during year, 1,110 second-feet Apr. 13 (gage height, 11.84 feet); minimum, 13 second-feet Feb. 15.

1902–7, 1919, 1929–32: Maximum discharge, 2,030 second-feet Apr. 9–11, 1902 (gage height, 18.0 feet, former datum); minimum, 6 second-feet Jan. 9, 24, 27, Feb. 5, 9, 1931; minimum stage, 2.53 feet July 30, Aug. 26, 1931.

REMARKS.—Records fair. Stage-discharge relation affected by ice Mar. 3 to Apr. 12. Low-water flow slightly regulated by operation of packing plant.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	18	e 31	41	29	e 30	35	e 179	301	113	97	e 32	32
2	17	33	41	29	29	e 58	188	268	113	97	32	31
3	18	33	43	e 33	25	81	246	257	113	92	31	28
4	e 18	33	43	37	22	138	290	236	113	e 87	34	24
5	17	31	45	29	24	138	e 365	197	e 113	82	34	22
6	16	e 31	47	31	e 24	138	440	179	113	82	34	22
7	18	31	e 46	29	24	138	540	179	107	82	34	22
8	16	33	45	29	22	131	648	179	107	e 80	32	e 22
9	16	35	45	e 26	e 19	e 272	696	170	107	77	30	22
10	17	37	45	22	16	412	860	e 170	e 107	e 73	26	22
11	16	35	51	20	17	386	960	170	107	69	28	22
12	16	37	47	24	16	e 386	1,040	146	113	69	e 26	e 22
13	17	39	41	22	14	386	1,040	139	119	69	25	22
14	17	41	37	20	e 14	386	804	132	119	69	28	20
15	16	43	35	19	13	373	732	e 126	119	e 67	26	22
16	18	47	29	22	15	312	632	119	113	65	25	20
17	19	45	e 28	33	14	e 301	632	113	107	61	28	19
18	19	45	27	e 31	e 14	290	632	e 110	107	53	e 29	19
19	20	e 45	29	29	14	301	600	107	107	47	30	19
20	e 21	45	31	25	14	279	570	107	102	45	26	19
21	22	47	31	19	17	268	540	e 102	107	41	32	18
22	22	47	e 28	20	20	226	510	97	e 120	37	31	18
23	20	45	25	e 20	22	188	482	97	132	37	e 31	17
24	22	43	25	19	24	170	482	e 94	312	36	31	18
25	25	e 42	24	e 20	e 24	146	482	92	290	e 36	30	19
26	27	41	25	20	24	e 158	454	92	197	36	31	18
27	29	45	e 24	22	25	170	454	92	154	34	34	e 18
28	e 31	45	22	29	33	170	399	87	107	32	36	19
29	33	e 43	20	e 27	35	162	336	92	107	31	36	19
30	33	41	24	25	------	170	301	102	102	31	34	18
31	29	------	25	31	------	170	------	e 108	------	32	26	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	33	16	20.7	1,270
November	47	31	39.6	2,360
December	51	20	34.5	2,120
January	37	19	25.5	1,570
February	35	13	20.8	1,200
March	412	35	224	13,800
April	1,040	179	551	32,800
May	301	87	144	8,850
June	312	102	128	7,620
July	97	31	59.5	3,660
August	36	25	30.4	1,870
September	32	17	21.1	1,260
The year	1,040	13	108	78,400

e Interpolated.

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.—1901–32 (fragmentary). Single gage heights in 1867, 1879, 1883, 1887, 1890, and 1896.

REMARKS.—All gage heights published previous to 1921 refer to a gage zero of which was 1,412.21 feet above mean sea level according to levels run by topographic branch of the United States Geological Survey in 1928.

Elevation, in feet, 1931–32

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	10.81			11.28	11.19	11.09	10.91	10.52
2	10.79			11.25	11.21	11.08	10.89	10.52
3	10.76		11.14	11.21	11.29	11.15	10.85	10.47
4	10.78			11.19	11.32	11.11	10.78	10.44
5	10.84			11.25	11.45	11.14	10.81	10.43
6	10.71			11.27	11.43	11.11	10.71	10.42
7	10.71			11.31	11.37	11.13	10.89	10.45
8	10.80	10.71		11.31	11.33	11.13	10.75	10.43
9	10.76			11.31	11.35	11.11	10.73	10.39
10	10.74			11.33	11.34	11.11	10.73	10.42
11				11.31	11.35	11.15	10.67	10.38
12	10.72			11.33	11.38	11.21	10.67	10.38
13	10.68			11.30	11.33	11.11	10.78	10.37
14	10.68			11.28	11.33	11.09	10.68	10.35
15	10.68			11.18	11.33	11.06	10.65	10.37
16	10.67	10.76		11.29	11.35	11.05	10.68	10.33
17	10.71	10.66		11.35	11.34	11.08	10.61	10.33
18	10.66			11.28	11.33	11.03	10.63	10.31
19	10.67			11.25	11.33	10.99	10.63	10.28
20	10.65			11.19	11.33	11.01	10.59	10.23
21	10.60			11.18	11.28	11.03	10.60	10.18
22	10.67			11.25	11.28	10.94	10.60	10.25
23	10.73		11.19	11.24	11.29	10.93	10.59	10.25
24	10.74		11.18	11.15	11.31	10.93	10.59	10.35
25	10.74		11.23	11.05	11.24	10.99	10.57	10.33
26	10.79		11.13	11.05	11.18	10.93	10.58	10.23
27	10.66		11.19	11.17	11.18	10.87	10.58	10.13
28	10.61		11.18	11.21	11.21	10.90	10.58	10.21
29	10.66		11.21	11.25	11.17	10.88	10.58	10.25
30	10.77		11.23	11.19	11.07	10.88	10.58	10.23
31	10.81			11.19		10.88	10.63	

NOTE.—Add 1,400 feet to obtain elevations above mean sea level.

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 1932.

EXTREMES.—Maximum discharge during year, 311 second-feet Apr. 12 (gage height, 8.83 feet); minimum, 0.5 second-foot Aug. 13 (gage height, 0.22 foot).

1931–32: Maximum discharge, that of April 1932; minimum, that of August 1932.

REMARKS.—Records good except those for period of ice effect Nov. 25 to Dec. 5, Mar. 1 to Apr. 13, which are poor. Discharge interpolated Mar. 8. No record Dec. 6 to Feb. 29.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.3	22	15	116	101	56	66	9.0	3.2	5.3
2	10	23	14	133	127	52	71	9.0	3.2	5.0
3	9.6	22	14	157	116	52	66	8.1	2.6	4.8
4	9.6	21	13	169	106	52	61	6.9	4.5	4.8
5	9.6	18	13	169	86	52	56	7.2	3.2	4.6
6	10	18	------	139	81	52	44	12	3.8	4.8
7	10	18	------	111	111	52	38	12	1.7	4.2
8	9.6	16	------	84	127	52	36	11	2.7	4.8
9	12	16	------	56	163	56	29	12	2.2	3.0
10	13	16	------	46	220	66	29	10	1.4	5.0
11	13	16	------	36	276	66	32	9.0	1.0	3.8
12	12	16	------	36	311	71	29	8.3	1.7	4.0
13	11	15	------	18	297	76	29	7.9	.5	4.4
14	13	18	------	16	234	71	34	6.9	.8	4.4
15	13	18	------	14	175	66	36	8.6	1.2	5.8
16	11	17	------	14	139	52	29	7.1	.6	4.4
17	13	17	------	13	116	46	29	6.4	.8	5.3
18	13	15	------	13	101	41	29	5.8	.7	5.0
19	13	16	------	13	86	38	28	4.6	.8	4.0
20	13	18	------	13	81	30	23	4.6	.8	3.4
21	12	19	------	14	76	26	24	3.9	.9	4.2
22	14	18	------	14	71	25	22	4.5	1.2	4.8
23	14	19	------	14	71	26	20	3.9	1.0	4.4
24	17	19	------	14	66	56	16	3.8	3.3	6.4
25	17	20	------	16	61	52	16	3.6	3.3	6.4
26	16	14	------	18	61	56	13	3.6	3.2	7.4
27	16	19	------	20	61	56	13	3.6	5.1	9.6
28	18	21	------	30	61	48	12	3.4	9.1	12
29	19	18	------	38	56	46	9.8	3.3	9.5	14
30	20	16	------	56	52	46	9.1	3.2	7.8	12
31	22	------	------	81	------	56	------	3.3	6.4	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	22	9.3	13.3	818
November	23	14	18.0	1,070
December 1–5	15	13	13.8	137
March	169	13	54.2	3,330
April	311	52	123	7,320
May	76	25	51.4	3,160
June	71	9.1	31.6	1,880
July	12	3.2	6.66	410
August	9.5	.5	2.85	175
September	14	3.0	5.73	341

WILD RICE RIVER AT TWIN VALLEY, MINN.

LOCATION.—Chain gage in SE¼ sec. 22, T. 144 N., R. 44 W., at highway bridge three quarters of a mile northeast of Twin Valley.

DRAINAGE AREA.—805 square miles.

RECORDS AVAILABLE.—July 1930 to September 1932. June 1909 to September 1917 at a station a quarter of a mile downstream.

EXTREMES.—Maximum discharge during year, 358 second-feet Apr. 9 (gage height, 3.62 feet, affected by ice); minimum, 1 second-foot Aug. 13 (gage height, 0.24 foot).

1909–17, 1930–32: Maximum discharge, 9,200 second-feet July 22, 1909 (not referred to present gage); minimum, that of Aug. 13, 1932.

REMARKS.—Records poor. Stage-discharge relation affected by ice Mar. 23 to Apr. 12. No records Dec. 2 to Mar. 22.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15	21	24	------	70	130	112	24	3.6	5.2
2	15	20	------	------	57	125	112	22	3.6	5.0
3	15	20	------	------	48	121	109	21	3.1	4.8
4	15	20	------	------	73	132	107	20	3.0	5.2
5	15	20	------	------	52	155	109	20	2.7	5.2
6	15	19	------	------	81	196	95	19	2.6	5.0
7	15	20	------	------	157	209	92	19	a 2.5	5.4
8	14	20	------	------	155	209	89	16	a 2.5	5.9
9	15	19	------	------	295	196	79	16	2.4	5.9
10	15	19	------	------	223	184	74	15	a 2.0	5.5
11	13	19	------	------	209	184	76	14	a 1.6	5.4
12	14	20	------	------	174	174	76	13	1.2	5.2
13	14	20	------	------	174	161	72	13	1.1	4.4
14	14	19	------	------	150	174	69	11	1.2	4.0
15	17	20	------	------	150	144	62	10	1.3	4.0
16	18	20	------	------	146	132	57	9.1	1.5	4.0
17	17	20	------	------	144	116	55	8.8	1.5	4.0
18	18	20	------	------	144	102	51	8.6	1.6	4.6
19	18	a 20	------	------	142	96	48	8.3	1.8	4.4
20	18	a 30	------	------	140	100	43	12	1.9	4.6
21	18	a 35	------	------	140	98	40	14	2.0	4.3
22	19	a 40	------	------	138	100	37	a 15	2.0	4.3
23	20	36	------	24	140	94	35	a 16	3.7	3.7
24	20				140	94	34	16	5.4	4.0
25	19			a 25	136	85	31	a 14	5.4	4.3
26	18	a 30			134	79	30	a 10	5.4	4.4
27	18				130	82	30	a 8	5.5	4.4
28	18			a 50	129	77	28	a 6	5.5	4.1
29	19			a 80	130	73	28	5.0	5.5	4.0
30	20			109	134	70	26	4.4	5.2	4.3
31	20	------		106	------	70	------	3.8	5.2	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	20	13	16.7	1,030
November	40	19	24.2	1,440
Mar. 23–31	109	24	52.1	930
April	295	48	138	8,210
May	209	70	128	7,870
June	112	26	63.5	3,780
July	24	3.8	13.3	818
August	5.5	1.1	3.02	186
September	5.9	3.7	4.65	277

a Estimated.

RED LAKE AT WASKISH, MINN.

LOCATION.—On line between secs. 8 and 9, T. 154 N., R. 30 W., on highway bridge across Tamarack River in village of Waskish, about a quarter of a mile from lake.

DRAINAGE AREA.—1,950 square miles above outlet of lower Red Lake.

RECORDS AVAILABLE.—April 1930 to September 1932.

EXTREMES.—Maximum water-surface elevation during year, 1,173.95 feet May 15; minimum, 1,172.36 feet Sept. 18, 19.

1930–32: Maximum water-surface elevation, 1,174.85 feet June 2, 1930; minimum, 1,172.36 feet Sept. 18, 19, 1932.

REMARKS.—Water level subject to fluctuation caused by direction and velocity of wind.

Elevation, in feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	72.80	72.60	------	------	------	------	------	73.25	73.34	72.95	72.90	73.35
2	72.80	72.55	------	72.50	------	------	72.40	73.35	73.15	72.90	72.95	72.80
3	72.80	72.60	------	------	------	------	------	73.35	73.20	72.90	73.20	72.90
4	73.05	72.65	------	------	------	------	------	73.30	73.25	72.90	72.90	72.90
5	72.70	72.70	72.50	------	------	72.50	------	73.20	73.20	73.00	73.05	72.85
6	72.70	72.65	------	------	72.55	------	------	73.20	73.25	73.50	73.10	72.70
7	72.80	72.60	------	------	------	------	------	73.20	73.20	73.30	72.90	72.70
8	72.90	72.60	------	------	------	------	------	73.30	73.15	73.00	72.80	72.65
9	72.70	72.60	------	------	------	------	73.00	73.35	73.20	73.00	72.80	72.65
10	72.80	72.60	------	------	------	------	73.10	73.38	73.15	73.05	72.80	72.65
11	72.60	72.60	------	------	------	------	73.10	73.40	73.10	72.90	72.60	72.65
12	72.80	72.80	72.50	------	------	72.50	73.10	73.40	73.15	73.00	72.60	72.68
13	72.60	72.60	------	------	72.50	------	73.10	73.40	73.15	73.00	72.60	72.68
14	72.60	72.55	------	------	------	------	73.10	73.40	73.20	72.85	72.60	72.90
15	72.70	72.50	------	------	------	------	73.10	73.95	73.25	72.90	72.60	73.35
16	72.65	72.50	------	------	------	------	73.00	73.90	73.20	73.10	72.60	72.95
17	72.70	------	------	------	------	------	73.10	73.40	73.00	72.90	72.60	72.85
18	72.60	72.50	------	------	------	------	73.10	73.40	73.50	72.90	72.60	72.36
19	72.60	72.50	72.50	------	------	72.50	73.10	73.35	73.35	72.85	72.60	72.36
20	72.60	72.50	------	------	72.50	------	73.10	73.35	73.30	72.90	72.60	72.55
21	72.60	72.50	------	------	------	------	73.10	73.30	73.25	72.90	72.56	72.84
22	72.60	72.50	------	------	------	------	73.10	73.20	73.15	73.00	72.65	72.50
23	72.70	72.50	------	72.55	------	------	73.10	73.30	73.10	73.00	72.60	72.60
24	72.60	------	------	------	------	------	73.10	73.40	73.00	72.90	72.64	72.54
25	72.65	------	------	------	------	------	73.10	73.20	73.10	72.90	72.60	72.75
26	72.60	------	72.52	------	------	72.40	73.08	72.70	73.50	72.90	------	72.75
27	------	------	------	------	72.50	------	73.08	73.15	73.30	72.90	------	72.74
28	72.70	------	------	------	------	------	73.05	73.35	73.00	72.90	72.56	72.70
29	72.60	------	------	------	------	------	73.08	73.35	73.10	72.95	72.46	72.76
30	72.70	------	------	72.55	------	------	73.12	73.20	73.50	72.90	72.72	72.60
31	72.75	------	------	72.57	------	------	------	73.04	------	72.90	73.80	------

NOTE.—Add 1,100 feet to obtain elevations above mean sea level.

RED LAKE AT REDBY, MINN.

LOCATION.—Staff gage in sec. 20, T. 151 N., R. 33 W., at mouth of Mud River, a quarter of a mile east of Redby.

DRAINAGE AREA.—1,950 square miles above outlet of lower Red Lake.

RECORDS AVAILABLE.—June 1930 to September 1932.

EXTREMES.—Maximum water-surface elevation during year, 1,173.35 feet May 15, 19, 20; minimum, 1,172.15 feet Sept. 25.

1930–32: Maximum water-surface elevation, 1,174.71 feet June 5, 6, 1930; minimum, that of Sept. 25, 1932.

REMARKS.—Water level subject to fluctuation caused by direction and velocity of wind. No records Nov. 15 to May 2.

Elevation, in feet, 1931–32

Day	Oct.	Nov.	May	June	July	Aug.	Sept.
1	72.54	72.49	-------	73.20	73.00	72.70	72.60
2	72.59	72.39	-------	73.18	72.95	72.75	72.60
3	72.59	72.49	73.05	73.17	72.92	72.80	72.63
4	72.59	72.44	73.00	73.14	72.90	72.80	72.60
5	72.48	72.44	73.10	73.10	72.91	72.85	72.70
6	72.59	72.34	73.15	73.12	72.94	72.80	72.59
7	72.54	72.39	73.15	73.15	72.92	72.78	72.54
8	72.44	72.39	73.15	73.20	72.92	72.72	72.57
9	72.44	72.49	73.15	73.12	72.99	72.70	72.55
10	72.39	72.39	73.20	73.16	72.98	72.75	72.53
11	72.39	72.39	73.22	73.08	72.90	72.68	72.56
12	72.34	72.39	73.21	73.14	72.91	72.67	72.54
13	72.39	72.34	73.20	73.12	72.90	72.54	72.60
14	72.39	72.34	73.24	73.10	72.90	72.56	72.50
15	72.44	-------	73.35	73.15	72.89	72.54	72.54
16	72.49	-------	73.25	73.10	72.85	72.58	72.62
17	72.44	-------	73.20	73.10	72.81	72.70	72.60
18	72.39	-------	73.18	73.11	72.95	72.68	72.55
19	72.34	-------	73.35	72.99	73.00	72.50	72.54
20	72.39	-------	73.35	73.05	72.95	72.55	72.54
21	72.34	-------	73.30	73.07	72.98	72.53	72.50
22	72.34	-------	73.25	73.10	72.94	72.48	72.45
23	72.39	-------	73.15	73.00	72.85	72.50	72.46
24	72.34	-------	73.10	73.10	72.90	72.70	72.40
25	72.34	-------	73.25	72.98	72.92	72.55	72.15
26	72.39	-------	73.30	72.99	72.90	72.50	72.50
27	72.39	-------	73.30	72.95	72.91	72.70	72.40
28	72.74	-------	73.19	72.90	72.95	72.58	72.55
29	72.79	-------	73.10	72.90	72.87	72.50	72.40
30	72.79	-------	73.15	73.10	72.85	72.69	72.38
31	72.49	-------	73.12	-------	72.82	72.55	-------

NOTE.—Add 1,100 feet to obtain elevations above mean sea level.

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 1932.

EXTREMES.—Maximum discharge during year, 216 second-feet Apr. 9 (gage height, 3.37 feet, affected by ice); no flow Oct. 11–14, June 8–12, 16–20, Sept. 15.

1930–32: Maximum discharge, 254 second-feet Apr. 3, 1931 (gage height, 2.38 feet, affected by ice); maximum gage height, 3.37 feet Apr. 9, 1932, affected by ice; no flow Oct. 11–14, June 8–12, 16–20, Sept. 15, 1932.

REMARKS.—Records good. Discharge estimated Oct. 7–14, June 13–15, July 22–25. Stage-discharge relation affected by ice Nov. 20 to Apr. 15 and by aquatic growth throughout remainder of year.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14	57	32	29	10	32	39	14	2.2	19	12	16
2	12	55	33	28	9.5	30	36	17	1.1	21	14	14
3	10	42	32	28	8.5	29	34	19	1.8	23	14	14
4	14	40	32	26	9.5	20	33	18	1.1	24	12	14
5	9.5	35	33	28	9.5	20	34	24	.3	23	12	14
6	8.5	30	24	29	12	19	43	24	.1	23	10	11
7	7	29	18	32	12	12	162	26	.1	23	12	9.5
8	5	32	14	34	12	9.5	172	26	0	22	13	7.5
9	3	35	14	38	14	7.0	216	24	0	20	12	2.6
10	1	38	17	38	14	5.4	193	22	0	16	11	.5
11	0	42	18	41	14	3.4	182	19	0	14	10	.8
12	0	45	20	39	18	3.0	162	18	0	13	9.0	1.8
13	0	41	19	41	20	3.8	162	19	.1	16	8.0	1.1
14	0	39	16	38	14	5.0	153	14	.1	14	8.5	.3
15	30	32	18	36	14	6.2	77	7.0	.1	11	7.5	0
16	26	37	20	30	13	9.5	55	6.6	0	8.5	8.5	.8
17	32	42	21	26	9.5	12	45	5.8	0	6.2	9.0	1.8
18	29	22	22	22	7.0	13	32	5.0	0	1.4	11	.3
19	26	36	23	24	7.0	12	26	3.8	0	1.1	12	.3
20	28	33	22	27	5.0	14	21	3.0	0	3.0	10	.2
21	30	57	21	30	3.0	17	19	3.0	2.2	1.8	9.5	1.1
22	36	63	22	30	3.8	17	18	3.4	11	.2	8.5	.5
23	32	79	22	32	4.6	17	18	2.6	17	.1	6.6	.3
24	41	69	23	30	5.0	17	17	1.1	18	.1	15	1.4
25	40	67	24	30	11	18	16	1.4	18	.1	16	.8
26	35	64	24	30	13	17	15	2.2	20	15	16	.1
27	31	51	25	25	16	19	12	3.0	21	13	15	.5
28	29	44	26	23	26	23	13	4.2	19	13	15	.2
29	53	32	28	21	30	36	12	4.2	20	12	14	.2
30	49	32	29	17	------	42	14	3.4	21	13	16	.1
31	48	------	30	14	------	38	------	2.2	------	12	19	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	53	0	21.9	1,350
November	79	22	44.0	2,620
December	33	14	23.3	1,430
January	41	14	29.5	1,810
February	30	3.0	11.9	684
March	42	3.0	17.0	1,050
April	216	12	67.7	4,030
May	26	1.1	11.2	689
June	21	0	5.81	346
July	24	.1	12.3	756
August	19	6.6	11.8	726
September	16	0	3.86	230
The year	216	0	21.7	15,700

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 1932.

EXTREMES.—Maximum discharge during year, 4,390 second-feet Apr. 9 (gage height, 9.78 feet); minimum, 8.8 second-feet Aug. 29, 30 (gage height, 2.38 feet, affected by aquatic growth).

1901–32: Maximum discharge, 14,700 second-feet July 5, 1919; minimum, 5 second-feet Aug. 6–8, 1925.

REMARKS.—Records good. Discharge interpolated Feb. 14. Stage-discharge relation affected by ice Nov. 25 to Apr. 8 and by aquatic growth nearly all the rest of the year. Flow regulated by power plant above station.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	19	59	94	68	35	528	219	296	138	63	17	11
2	19	102	78	95	35	200	290	356	102	59	19	11
3	19	68	57	57	39	311	216	452	114	63	20	11
4	21	83	106	53	38	430	184	448	99	59	2[illegible]	12
5	22	98	107	75	36	355	230	304	134	55	20	12
6	23	96	57	44	32	428	378	388	99	52	20	11
7	23	122	57	61	41	240	1,330	279	98	49	19	9.6
8	25	119	55	65	38	314	3,430	344	90	47	20	11
9	27	107	77	63	39	304	4,070	540	93	45	20	12
10	27	121	62	47	41	202	3,990	593	47	44	20	10
11	31	110	62	42	39	191	3,990	540	44	44	19	10
12	29	90	98	41	61	163	3,280	460	45	39	18	12
13	49	96	57	45	65	185	3,120	420	52	39	2[illegible]	13
14	21	132	55	50	58	329	2,270	460	95	38	25	14
15	23	89	55	56	50	147	1,870	468	65	36	23	14
16	24	142	55	86	45	158	1,500	460	61	35	2[illegible]	14
17	25	69	53	49	39	181	1,380	386	65	35	2[illegible]	14
18	27	91	53	42	36	78	1,250	293	69	35	2[illegible]	13
19	29	76	95	41	38	161	472	265	92	34	23	13
20	27	170	59	42	35	225	657	308	65	32	22	14
21	30	128	55	42	35	236	788	154	71	29	22	13
22	30	106	97	42	35	184	810	251	80	26	2[illegible]	13
23	31	94	80	86	31	55	742	157	82	25	36	13
24	35	126	69	49	25	92	540	216	80	25	17	12
25	41	65	66	41	26	112	484	157	78	23	14	12
26	41	65	88	41	27	115	300	184	80	21	14	12
27	45	100	52	42	25	110	272	164	78	21	10	17
28	49	114	53	36	38	101	279	160	75	21	10	18
29	52	78	89	47	557	151	282	170	71	20	8.8	17
30	102	76	77	47	------	297	290	88	69	21	8.8	16
31	92	------	79	44	------	223	------	90	------	19	10	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	102	19	34.1	2,100
November	170	59	99.7	5,930
December	107	52	70.9	4,360
January	95	36	52.9	3,250
February	557	25	56.5	3,250
March	528	55	220	13,500
April	4,070	184	1,300	77,400
May	593	88	318	19,600
June	138	44	81.0	4,820
July	63	19	37.2	2,290
August	36	8.8	19.1	1,170
September	18	9.6	12.8	762
The year	4,070	8.8	190	138,000

THIEF RIVER NEAR THIEF RIVER FALLS, MINN.

LOCATION.—Chain gage in sec. 3, T. 154 N., R. 43 W., 5 miles north of Thief River Falls.

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 1932.

EXTREMES.—Maximum discharge during year, 1,310 second-feet Apr. 8 (gage height, 8.85 feet); maximum gage height, 9.15 feet, affected by ice, Apr. 7; no flow for several months.

1909–17, 1920–21, 1922–24, 1928–32: Maximum discharge, 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. 27 to Apr. 7. No record Oct. 1 to Mar. 26.

Discharge, in second-feet, 1932

Day	Mar.	Apr.	May	June	Sept.	Day	Mar.	Apr.	May	June	Sept.
1		1	24	2.1	0	16		310	28	0.4	0
2		1	34	1.9	0	17		188	22	.4	0
3		1	34	1.7	0	18		109	18	.5	0
4		2	36	1.5	0	19		79	16	.3	0
5		4	38	.9	0	20		76	14	.3	0
6		546	38	.8	0	21		71	12	.2	0
7		1,090	44	.6	0	22		36	8.0	.2	0
8		1,310	46	.5	0	23		22	5.4	.2	0
9		1,230	53	.4	0	24		25	5.8	.1	1.2
10		1,090	59	.4	0	25		25	5.0	0	1.0
11		1,020	56	.4	0	26		22	4.4	0	1.3
12		776	53	.5	0	27	0.2	20	4.0	0	1.1
13		743	43	.5	0	28	1	21	3.1	0	1.2
14		743	39	.5	0	29	2	18	2.3	0	1.0
15		677	36	.5	0	30	3	.19	2.3	0	.8
						31	2		2.1		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
March 27–31	3	0.2	1.64	16
April	1,310	1	342	20,400
May	59	2.1	25.3	1,560
June	2.1	0	.53	32
September	1.3	0	.25	15
The period				22,000

NOTE.—No flow during July and August.

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 to September 1932.

EXTREMES.—Maximum discharge during period, 265 second-feet Apr. 9 (gage height, 11.19 feet, affected by ice); no flow for several days in August and September.

REMARKS.—Records good except those for period of ice effect, Mar. 30 to Apr. 18, which are fair.

Discharge, in second-feet, 1932

Day	Mar.	Apr.	May	June	July	Aug.	Sept.	Day	Mar.	Apr.	May	June	July	Aug.	Sept.
1	------	129	a 41	15	7.1	1.5	1.2	16	------	94	29	11	5.0	0.2	0
2	------	102	41	15	7.4	1.5	1.0	17	------	91	28	11	a 4.8	a .1	0
3	------	105	41	15	8.3	1.4	.8	18	------	91	25	12	4.6	a .1	0
4	------	84	38	14	8.3	.9	a .6	19	------	74	24	11	4.0	0	0
5	------	66	38	14	8.3	1.1	a .3	20	------	60	23	11	3.5	0	0
6	------	74	a 38	14	8.8	1.0	0	21	------	56	22	10	a 3.1	0	0
7	------	80	38	14	9.2	.8	.8	22	------	53	20	9.2	2.7	0	0
8	------	165	41	13	8.9	.7	.1	23	------	50	19	8.8	2.3	0	0
9	------	265	41	12	8.0	.6	0	24	------	50	18	8.6	2.3	0	0
10	------	195	44	11	a 7.2	.6	.1	25	------	50	18	8.3	2.1	0	0
11	------	165	41	11	6.5	.4	0	26	------	47	18	8.2	2.0	0	0
12	------	129	38	11	6.4	.4	0	27	------	44	17	7.7	2.4	0	0
13	------	109	35	13	6.0	.3	0	28	------	41	17	7.4	1.8	0	0
14	------	98	34	15	5.9	.3	0	29	------	41	17	7.1	1.8	0	0
15	------	88	32	13	5.3	.3	0	30	113	41	16	7.1	1.5	0	0
								31	145	------	16	------	1.5	0	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April	265	41	91.2	5,430
May	44	16	29.3	1,800
June	15	7.1	11.3	672
July	9.2	1.5	5.06	311
August	1.5	0	.39	24
September	1.2	0	.16	10
The period				8,250

a Interpolated.

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 1932.
EXTREMES.—Maximum discharge during period, 550 second-feet Apr. 8 (gage height, 11.05 feet, affected by ice); no flow for several days
1931–32: Maximum discharge, that of Apr. 8, 1932; no flow occasionally.
REMARKS.—Records good except those estimated for period of ice effect, Mar. 3 to Apr. 12, which are fair, and those during period of backwater effect from brush dam, May 24 to July 14, which are poor.

Discharge, in second-feet, 1932

Day	Mar.	Apr.	May	June	July	Day	Mar.	Apr.	May	June	Jul
1		46	33	7.3	0.4	16		125	21	1.6	
2		32	33	13	.4	17		102	17	21	
3		20	29	10	.6	18		95	15	8.1	
4		9	34	10	1.0	19		95	17	2.3	
5		79	39	8.1	1.0	20		81	17	2.6	
6		149	29	7.3	1.0	21		74	14	2.9	
7		205	33	12	1.1	22		67	12	1.8	
8		520	34	8.1	.7	23		67	12	1.2	
9		550	33	6.5	.6	24		67	7.3	1.3	
10		540	35	5.9	.3	25		56	8.1	1.1	
11		460	42	5.3	.6	26		50	8.1	.6	
12		331	32	8.1	.3	27		39	7.3	.5	
13		259	27	10	.2	28		35	8.1	.4	
14		181	28	6.5	.1	29		46	8.1	.4	
15		241	25	2.9	0	30	75	35	8.1	.7	
						31	60		7.3		

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April	550	9	155	9,2
May	42	7.3	21.7	1,3
June	21	.4	5.58	3
July	1.1	0	.27	
The period				10,9

NOTE.—No record Oct. 1 to Mar. 29. No flow during August and September.

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 1932.

EXTREMES.—Maximum discharge during year, 1,140 second-feet Apr. 9 (gage height, 8.02 feet, affected by ice); no flow for several months.

1928–32: Maximum discharge, 1,810 second-feet May 13, 1930 (gage height, 10.18 feet); no flow frequently.

REMARKS.—Records good except those for period Mar. 21 to Apr. 5 and for periods when discharge is less than 1 second-foot, which are poor. Stage-discharge relation affected by ice Mar. 21 to Apr. 10.

Discharge, in second-feet, 1931–32

Day	Mar.	Apr.	May	June	July	Aug.	Sept.	Day	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	2	180	4.0	0.4	1.2	[a].2	16	0	202	28	0.4	0.1	0	[a]0.1
2	0	[a]2	152	3.6	.7	.4	[a].3	17	0	118	24	.4	0	0	[a].1
3	0		145	3.6	.7	.2	.2	18	0	89	20	.4	0	0	0
4	0		118	3.6	.7	.1	[a].2	19	0	62	16	.4	0	0	0
5	0		89	2.0	.4	.1	[a].1	20	0	54	15	.4	0	0	0
6	0	132	159	1.4	.4	.1	.1	21		44	14	.3	0	0	0
7	0	450	210	1.4	.3	.1	.1	22	[a]1	34	12	.3	0	0	0
8	0	680	226	1.4	.3	[a].1	[a].1	23		29	9.3	.3	0	[a].1	0
9	0	1,140	226	1.0	.3	[a].1	.1	24		28	7.9	.4	0	[a]1.2	0
10	0	1,010	194	1.0	.3	0	[a].1	25	[b]3	28	7.2	.3	0	[a]3.0	0
11	0	876	138	1.0	.2	0	.1	26		23	6.5	.3	0	[a]14	0
12	0	680	84	.7	.2	0	[a].1	27		19	5.5	.3	0	17	0
13	0	570	62	.3	.2	0	[a].1	28	[a]2	19	5.5	.3	.3	[a]9	[a].1
14	0	450	47	.3	.1	0	[a].1	29		34	4.5	.3	.3	1.7	[a].1
15	0	330	34	.3	.1	0	.1	30		66	4.5	.4	[a].6	[a]4	.1
								31		------	4.0	------	[a].9	[a]5	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
March	----------	----------	0.6	37
April	1,140	----------	239	14,200
May	226	4.0	72.5	4,460
June	4.0	.3	1.03	61
July	----------	0	.24	15
August	17	0	1.85	114
September	----------	0	.14	8.3
The year	1,140	0	26.1	18,900

[a] Interpolated or estimated. [b] Field estimate.

NOTE.—No flow during months omitted.

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 (1928 adjustment by Geodetic Survey of Canada).

RECORDS AVAILABLE.—September 1928 to September 1932.

EXTREMES.—Maximum discharge during year, 1,310 second-feet Apr. 11 (gage height, 7.70 feet, affected by ice); maximum stage, 8.65 feet (affected by ice) Apr. 10; minimum discharge, 1.4 second-feet Sept. 22.

1928–32: Maximum discharge, 1,820 second-feet May 15, 1930 (gage height, 8.90 feet); minimum, that of Sept. 22, 1932.

REMARKS.—Records fair. Discharge estimated Oct. 1–6, 8–21, Nov. 25 to Dec. 6, Mar. 27 to Apr. 4, June 29, 30. No record Dec. 8 to Mar. 25.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		5.8				260	18	5.8	3.5	4.0
2		5.4				260	18	5.4	3.5	3.2
3		5.6			2	190	16	5.0	3.3	2.3
4	3.5	5.2	5			182	16	5.0	3.3	2.5
5		5.2			6	182	14	4.9	3.3	2.2
6		5.2			18	198	13	4.9	3.1	2.2
7	3.7	4.9	5.1		109	300	12	4.9	3.1	2.2
8		4.9			510	340	11	4.9	3.1	2.3
9		4.9			820	320	8.5	4.8	2.9	1.9
10		4.9			1,200	300	7.3	4.8	2.9	2.9
11		4.9			1,310	224	6.8	4.8	2.9	2.8
12		4.9			1,240	158	6.4	4.6	2.8	2.6
13		4.9			1,140	116	5.8	4.5	2.7	2.4
14		4.9			940	86	5.4	4.5	2.7	2.1
15	4	4.9			730	71	5.4	4.4	2.5	1.9
16		4.9			588	57	5.0	4.4	2.4	1.9
17		4.9			410	41	4.9	4.4	2.4	1.7
18		4.9			320	41	6.8	4.3	2.4	1.6
19		4.9			260	41	7.3	4.0	2.2	1.8
20		5.2			215	28	6.8	4.0	2.2	1.6
21		5.6			174	25	6.2	3.9	2.1	1.5
22	5.0	6.2			137	24	5.8	3.9	2.1	1.4
23	4.3	6.6			109	23	5.4	3.9	2.1	1.6
24	4.4	6.6			102	22	5.0	3.8	2.7	1.6
25	4.4				89	22	4.8	3.8	4.4	1.6
26	5.4			3	81	22	4.6	3.8	23	1.7
27	6.6	6			69	22	4.6	3.7	31	2.1
28	7.0				63	21	4.4	4.2	12	2.3
29	7.3			3	60	20	2.6	3.9	3.9	2.4
30	6.8				116	20	4.0	3.9	4.8	2.4
31	5.6					19		3.7	6.8	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	7.3		4.44	273
November	6.6	4.9	5.41	322
December 1–7			5.01	70
March 26–31			3.0	36
April	1,310		361	21,500
May	340	19	117	7,190
June	18	2.6	8.06	480
July	5.8	3.7	4.41	271
August	31	2.1	4.91	302
September	4.0	1.4	2.16	129

MIDDLE FORK OF TWO RIVERS NEAR HALLOCK, MINN.

LOCATION.—Vertical 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 1932.

EXTREMES.—Maximum discharge during year, 265 second-feet Apr. 19 (gage height, 5.64 feet); maximum gage height, 5.76 feet (affected by ice) Apr. 6; no flow for several months.

1931–32: Maximum discharge, that of Apr. 19, 1932; no flow for several months.

REMARKS.—Records fair except those for February and March, which are poor. Stage-discharge relation affected by ice Mar. 26 to Apr. 9. Discharge estimated Feb. 26 to Mar. 31.

Discharge, in second-feet, 1932

Day	Feb.	Mar.	Apr.	May	June	July	Day	Feb.	Mar.	Apr.	May	June	July
1	0	10	7	42	1.1	0.1	16	0		168	7.1	0.2	0
2	0		4	35	.7	0	17	0		216	6.3	.2	0
3	0		1	26	1.1	0	18	0		256	5.8	.3	0
4	0	5	1	20	.7	0	19	0		265	5.6	.2	0
5	0		17	19	.6	.1	20	0		256	4.8	.2	0
6	0		192	20	.5	.1	21	0		208	4.4	.2	0
7	0		131	28	.4	.1	22	0		152	3.4	.2	0
8	0	1.0	97	24	.3	0	23	0		117	3.4	.1	0
9	0		76	24	.3	0	24	0	.5	91	2.7	.1	0
10	0		76	21	.2	0	25	0		70	2.5	.1	0
11	0		73	18	.2	0	26			45	2.0	.1	0
12	0		138	14	.3	0	27			30	1.6	.1	0
13	0	.5	110	12	1.3	0	28	25		21	1.5	0	0
14	0		97	10	.6	0	29			20	1.2	0	0
15	0		145	8.7	.4	0	30			19	1.1	.1	0
							31				1.0		0

Month	Maximum	Minimum	Mean	Run-off in acre-feet
February		0	3.45	198
March			1.63	100
April	265	1	103	6,130
May	42	1.0	12.1	744
June	1.3	0	.36	21
July	.1	0	.013	1
The year	265	0	9.94	7,194

NOTE.—No flow during months omitted.

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 963.5 feet above mean sea level (1928 adjustment by Geodetic Survey of Canada).

RECORDS AVAILABLE.—April 1929 to September 1932.

EXTREMES.—Maximum discharge during year, 59 second-feet Apr. 15 (gage height, 1.90 feet); no flow for several months.

1929–32: Maximum discharge, 212 second-feet May 12, 1930 (gage height, 3.00 feet).

REMARKS.—Records poor.

Discharge, in second-feet, 1931–32

Day	Apr.	May	June	Day	Apr.	May	June	Day	Apr.	May	June
1	0	b15	a0.1	11	a40	7.8	0	21	28	a0.8	0
2	0	13	a.1	12	38	a6.7	0	22	21	a.7	0
3	0	6.1	.1	13	30	a5.5	0	23	a17	a.6	0
4	0	3.0	a.1	14	a44	a4.3	0	24	a14	a.5	0
5	0	5.2	0	15	59	a3.1	0	25	10	a.4	0
6	b2	b5.0	0	16	56	2.0	0	26	5.2	.2	0
7	b2		0	17	a52	a1.8	0	27	3.4	a.2	0
8	25	b10	0	18	48	a1.5	0	28	a2.4	.2	0
9	36		0	19	a44	1.3	0	29	1.3	a.2	0
10	43	13	0	20	40	1.0	0	30	b1.0	a.2	0
								31		a.2	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April	59	0	22.1	1,320
May		.2	4.18	257
June	.1	0	.01	1
The year	59	0	2.16	1,580

a Interpolated. b Estimated.

NOTE.—No flow during months omitted.

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 (1928 adjustment by Geodetic Survey of Canada).

RECORDS AVAILABLE.—April 1929 to September 1932.

EXTREMES.—Maximum discharge during year, 202 second-feet Apr. 18 (gage height, 4.90 feet); no flow several months of year.

1929–32: Maximum discharge, that of Apr. 18, 1932; no flow for several months most years.

REMARKS.—Records poor.

Discharge, in second-feet, 1931–32

Day	Apr.	May	June	Day	Apr.	May	June	Day	Apr.	May	June
1	0	[b] 90	[a] 1.6	11	[b] 100	45	[a] 0.2	21	148	[a] 4.7	0
2	0	89	[a] 1.4	12	160	[a] 38	[a] .1	22	118	[a] 4.3	0
3	0	69	1.3	13	136	[a] 32	0	23	[a] 110	[a] 3.8	0
4	0	45	[a] 1.2	14	[a] 157	[a] 25	0	24	[a] 102	[a] 3.4	0
5	0	43	[a] 1.1	15	178	[a] 19	0	25	94	[a] 3.0	0
6	[b] 1	[b] 40	[a] 1.0	16	184	12	0	26	74	2.6	0
7	[b] 2	[b] 60	.9	17	[a] 193	[a] 10	0	27	64	[a] 2.3	0
8	[b] 5		[a] .6	18	202	[a] 8.0	0	28	[a] 63	2.2	0
9	[b] 50		.4	19	[a] 190	6.3	0	29	62	[a] 2.1	0
10	[b] 60	62	[a] .3	20	178	5.1	0	30	[b] 62	[a] 1.9	0
								31		[a] 1.8	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April	202	0	89.8	5,340
May	90	1.8	27.4	1,680
June	1.6	0	.34	20
The year	202	0	9.71	7,040

[a] Interpolated. [b] Estimated.

NOTE.—No flow during months omitted.

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 1932.
EXTREMES.—Maximum discharge during year, 303 second-feet Apr. 13; minimum, 0.2 second-foot Oct. 8, 12.
1929–32: Maximum discharge 581 second-feet Apr. 10, 1930; minimum, 0.1 second-foot Aug. 18, 1931.
REMARKS.—Records furnished by the Dominion Water Power and Hydrometric Bureau. No record Nov. 13 to Apr. 12. Record not published for August and September because of uncertainty of backwater effect from beaver dams.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Apr.	May	June	July	Day	Oct.	Nov.	Apr.	May	June	July
1		6.5		168	67		16	0.3			109		
2						22.0	17					26.6	
3				158			18			239			14.1
4	0.3						19	.3			105	22.0	
5							20			203			
6		5.3					21						13.5
7				150	51	20.2	22				93		
8	.2	4.1		150			23	3.0		201			
9							24				81	16.8	12.9
10						16.7	25	1.1					
11	.3				40.5		26			182		14.1	15.0
12	.2	2.5		126	39.0		27						
13			303				28	3.0			74		13.5
14							29			174	72		
15			292			15.0	30					41.5	
							31	7.6					

Month	Maximum	Minimum	Mean	Run-off in Acre-feet
October	7.6	0.2	1.63	100
November 1–12	6.5	2.5	4.60	109
April 13–30	303	174	228	8,140
May	168	72	117	7,190
June	67	14.1	35.4	2,110
July	22	12.9	15.9	978

PEMBINA RIVER AT NECHE, N. DAK.

LOCATION.—Chain gage installed May 25, 1932, in sec. 36, T. 164 N., R. 54 W., half a mile north of Neche. Prior to that date a staff gage 300 feet upstream at same datum was used.

DRAINAGE AREA.—2,960 square miles.

RECORDS AVAILABLE.—May 1903 to September 1915; April 1919 to September 1932.

EXTREMES.—Maximum discharge during year, 1,240 second-feet Apr. 9 (gage height, 13.6 feet, affected by ice); no flow for several days in February (estimated).

1903–15, 1919–32: Maximum discharge, 3,870 second-feet May 2, 1904 (gage height, 20.9 feet); minimum, that of February 1932.

REMARKS.—Records good except those for period of shifting control, Oct. 1 to Nov. 15, and for period of ice effect, Nov. 16 to Apr. 16, which are poor. Discharge estimated Jan. 3–7, Jan. 9 to Mar. 25, Mar. 26 to Apr. 3, Apr. 21–23.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.5	3.0	2.5	0.5	0		150	262	114	32	8.4	7.8
2	.4	3.0	2.5	.2	0	50	100	240	114	30	9.6	5.9
3	.2	3.0	2.5		0		57	240	106	31	9.6	7.8
4	.2	5.0	2.5		0		57	229	106	31	8.0	7.0
5	.2	5.0	2.1	.2	0		83	229	98	30	8.0	5.9
6	.2	5.0	2.0		0		98	229	92	31	8.0	2.7
7	.2	5.0	2.0		0		152	251	98	30	8.4	1.9
8	.2	3.0	2.0	.1	0		690	240	96	29	8.4	1.5
9	.2	3.0	2.0		0		1,170	229	92	29	8.4	1.2
10	.2	3.0	2.0		0		1,060	229	86	26	8.0	1.0
11	.2	3.0	1.0		0		920	218	79	25	8.0	.6
12	.2	3.0	.5		0		920	207	75	25	6.4	.8
13	.2	3.0	.5		0		851	196	73	24	6.4	.7
14	.2	3.0	.5		0		805	196	76	22	5.4	.7
15	.2	3.0	.5		0	2.0	644	196	73	24	4.8	2.3
16	.2	3.0	.5		0		575	185	69	22	4.3	1.2
17	.2	5.0	.5		0		506	174	65	20	4.1	.8
18	.2	7.4	.5		0		394	174	72	20	3.6	.7
19	.2	5.0	.5		0		372	174	57	25	3.0	.4
20	.4	8.0	.5	.1	0		306	174	57	22	2.6	.4
21	.5	8.0	.5		0		300	163	57	17	2.4	.4
22	.5	8.0	.2		0		300	163	57	16	2.0	.3
23	.5	8.0	.2		0		300	152	53	15	1.6	.3
24	.5	8.0	.2		0		284	147	37	12	1.6	.3
25	1.0	8.0	.4		0		284	142	42	11	3.6	.3
26	1.0	8.0	.5			4.0	284	123	41	10	3.8	.4
27	2.0	8.0	.5		25		262	123	41	10	2.4	.4
28	2.0	5.0	.5			10	262	123	37	10	2.0	.4
29	2.0	2.6	.5				251	123	36	9.2	14	.5
30	2.0	2.6	.5		-------		251	123	36	8.4	13	.6
31	3.0	-------	.5		-------	200	-------	114	-------	8.4	9.2	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	3.0	0.2	0.64	39
November	8.0	2.6	4.92	293
December	2.5	.2	1.04	64
January	----------	----------	.13	8
February	----------	0	3.4	196
March	----------	----------	14.1	867
April	1,170	57	423	25,200
May	262	114	186	11,400
June	114	36	71.2	4,240
July	32	8.4	21.1	1,300
August	14	1.6	6.10	375
September	7.8	.3	1.84	109
The year	1,170	0	60.7	44,100

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 1932.
EXTREMES.—Maximum discharge during year, 468 second-feet Apr. 13 (gage height, 8.96 feet, affected by ice); maximum gage height, 9.10 feet, affected by ice, Apr. 7; no flow Aug. 16–24.
1928–32: Maximum discharge, that of Apr. 13, 1932; no flow during several periods.
REMARKS.—Records fair. Discharge estimated Dec. 1–4, May 20, 22, 23, June 13–22, 24. No record Dec. 6 to Mar. 31. Stage-discharge relation affected by ice Nov. 20 to Dec. 6, Apr. 1–13.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Apr.	May	June	July	Aug.	Sept.
1	0.9	12		2	90	18	6.7	4.4	1.6
2	.9	12	7	2	85	16	5.5	3.8	1.6
3	.8	11		2	90	16	5.2	3.4	1.3
4	.8	11		2	108	14	5.2	2.8	1.1
5	1.1	11	6.6	2	114	13	5.2	2.3	1.0
6	1.2	10		192	126	13	5.2	1.6	1.0
7	1.2	10		332	138	12	4.8	1.0	.9
8	1.2	9.5		332	144	9.8	4.8	.7	.9
9	1.2	9.1		340	144	8.8	4.8	.4	.9
10	1.2	8.6		366	138	7.5	4.8	.4	.9
11	1.2	7.3		415	132	5.9	4.8	.2	.9
12	1.1	7.7		445	120	5.9	4.8	.2	1.0
13	1.1	7.1		465	102		4.8	.1	1.6
14	1.2	6.9		268	90		4.8	.1	2.0
15	1.6	6.9		228	80		4.8	.1	2.6
16	1.6	6.9		199	70		4.8	0	3.0
17	1.8	6.9		178	65	5	4.8	0	2.6
18	1.6	6.9		164	60		4.8	0	2.2
19	1.3	7.3		157	58		5.2	0	1.8
20	1.3	8.2		150	54		5.5	0	1.4
21	1.4	10		126	50		5.9	0	1.3
22	1.4	11		120	48	4.0	5.9	0	1.2
23	4.3	12		120	47	3.7	6.3	0	1.3
24	4.6	11		120	45	6.0	6.7	0	1.3
25	5.3	10		114	42	9.3	7.1	7.1	2.0
26	6.3	8.8		108	42	8.8	7.1	8.8	2.8
27	6.7	7.7		102	36	8.4	7.5	2.8	4.1
28	9.1	7.7		90	27	8.8	7.9	2.6	5.2
29	11	7.7		85	26	8.8	7.9	2.3	4.8
30	12	7.7		90	24	7.9	5.5	2.0	4.8
31	12				22		4.8	1.8	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	12	0.8	3.17	195
November	12	6.9	9.00	536
December 1-5			6.92	69
April	465	2	177	10,500
May	144	22	78.0	4,800
June	18	3.7	8.35	497
July	7.9	4.8	5.61	345
August	8.8	0	1.58	97
September	5.2	.9	1.97	117

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 (1928 adjustment by Geodetic Survey of Canada).

DRAINAGE AREA.—1,030 square miles.

RECORDS AVAILABLE.—July 1928 to September 1932.

EXTREMES.—Maximum discharge for year, 1,550 second-feet Apr. 13 (gage height, 11.40 feet, affected by ice); minimum, 8.3 second-feet Aug. 23 (gage height, 0.03 foot).

1929–32: Maximum discharge, that of Apr. 13, 1932; minimum, 6 second-feet Jan. 23, 24, 1930, Sept. 15, 1931.

REMARKS.—Records excellent except those for period of ice effect, Nov. 22 to Apr. 17, and those affected by aquatic growth, Oct. 1 to Nov. 5, which are fair.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	23	119	92	44	18	23	17	772	108	122	21	126
2	22	116	86	42	18	25	18	754	102	133	20	105
3	21	112	80	36	16	26	18	754	92	119	19	83
4	20	105	77	35	15	25	19	754	89	98	17	68
5	20	95	67	34	15	24	25	736	80	89	16	57
6	19	89	62	35	15	22	122	754	68	98	14	49
7	18	83	52	35	14	22	605	772	60	116	14	42
8	18	77	45	30	13	23	872	792	57	119	14	36
9	18	74	42	30	14	22	1,040	812	66	112	13	31
10	18	74	41	28	15	22	1,190	792	68	145	12	28
11	18	68	40	28	14	21	1,370	792	64	157	11	26
12	18	68	40	28	10	21	1,490	754	57	141	10	24
13	18	66	40	28	9.1	20	1,520	718	54	141	9.8	23
14	18	64	39	28	8.9	19	1,520	685	60	122	9.7	23
15	18	63	38	26	8.6	18	1,520	637	67	102	9.4	21
16	18	62	36	25	9.4	18	1,490	589	86	83	9.3	19
17	18	63	40	24	11	16	1,430	547	71	71	9.1	18
18	18	55	38	23	14	15	1,400	505	80	58	8.9	17
19	19	54	38	22	17	15	1,310	451	86	51	8.8	18
20	19	54	40	22	18	13	1,250	401	77	58	8.6	18
21	21	68	40	22	21	12	1,190	343	83	71	8.7	17
22	27	102	42	22	20	12	1,110	288	77	67	8.8	16
23	38	130	42	22	18	12	1,060	253	62	52	8.5	16
24	48	122	44	23	16	12	1,010	238	62	40	9.2	15
25	50	130	45	23	17	15	992	224	157	34	16	16
26	50	145	46	24	18	15	952	201	210	29	26	20
27	48	130	46	24	18	17	892	178	192	28	36	26
28	62	112	46	24	20	18	852	157	157	27	41	30
29	92	102	47	25	22	16	792	141	122	25	44	33
30	119	95	48	22	-------	16	772	126	105	25	62	30
31	122	-------	48	19	-------	16	-------	116	-------	23	175	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	122	18	34.1	2,100
November	145	54	89.9	5,350
December	92	36	49.3	3,030
January	44	19	27.5	1,690
February	22	8.6	15.3	880
March	26	12	18.4	1,130
April	1,520	17	928	55,200
May	812	116	517	31,800
June	210	54	90.6	5,390
July	157	23	82.5	5,070
August	105	8.5	20.0	1,230
September	126	15	35.0	2,080
The year	1,520	8.5	158	115,000

ROSEAU RIVER NEAR BADGER, MINN.

LOCATION.—Water-stage recorder in SW½ 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 (1928 adjustment by Geodetic Survey of Canada).

RECORDS AVAILABLE.—August 1928 to September 1932.

EXTREMES.—Maximum water-surface elevation during year, 1,027.97 feet above sea level Apr. 14, 1932; minimum, 1,017.73 feet July 22, 1932.

1928–32: Maximum water-surface elevation, that of 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 record during periods omitted.

Elevation, in feet, 1928–32

Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.
1928			1928			1928		
1	-------	20.38	11	21.10	19.70	21	20.74	19.78
2	25.08	20.48	12	20.74	19.64	22	20.74	19.76
3	24.84	20.44	13	20.44	19.69	23	20.64	19.70
4	24.35	20.42	14	20.28	19.80	24	20.58	19.74
5	23.82	20.24	15	20.16	19.84	25	20.24	19.66
6	23.26	20.10	16	20.26	20.00	26	20.10	19.62
7	23.08	20.00	17	20.48	20.06	27	20.00	19.62
8	22.96	19.90	18	20.48	20.04	28	19.94	19.54
9	22.30	19.82	19	20.50	19.96	29	19.82	19.48
10	21.80	19.70	20	20.70	19.90	30	20.02	19.48
						31	20.28	-------

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1928–29										
1	19.48	19.20	19.32	-------	23.78	20.86	22.43	20.02	18.10	17.77
2	19.44	19.28	-------	-------	23.06	20.75	22.35	19.87	18.09	17.79
3	19.36	19.30	-------	-------	22.66	20.65	22.14	19.72	18.08	17.82
4	19.36	19.28	-------	-------	22.28	20.57	21.87	19.59	18.00	17.98
5	19.32	19.20	-------	-------	21.80	20.47	21.57	19.47	17.98	18.01
6	19.34	19.14	-------	-------	22.00	20.36	21.31	19.41	18.00	18.00
7	19.34	19.20	-------	-------	24.86	20.24	21.06	19.44	18.00	17.92
8	19.33	19.24	-------	-------	25.46	20.15	20.84	19.47	18.00	17.89
9	19.32	19.22	-------	-------	25.34	20.05	20.66	19.51	17.97	17.88
10	19.28	19.17	-------	-------	25.08	20.04	20.56	19.60	17.95	17.88
11	19.26	19.06	-------	-------	24.90	20.32	20.47	19.68	17.90	17.88
12	19.32	19.06	-------	-------	24.62	20.87	20.32	19.63	17.92	17.89
13	19.30	19.04	-------	-------	24.32	21.16	20.17	19.53	18.06	17.87
14	19.30	19.06	-------	20.00	24.00	21.24	20.05	19.40	18.04	17.85
15	19.32	19.34	-------	20.08	23.74	21.16	19.96	19.23	18.01	17.90
16	19.32	19.74	-------	20.60	23.50	21.01	19.83	19.10	18.01	17.89
17	19.33	20.00	-------	22.90	23.22	20.88	19.72	18.97	17.95	17.84
18	19.32	20.02	-------	25.46	22.88	20.70	19.60	18.86	17.88	17.80
19	19.32	20.08	-------	26.30	22.45	20.60	19.52	18.71	17.84	17.80
20	19.32	20.12	-------	26.00	22.23	20.47	19.57	18.60	17.88	17.78
21	19.31	20.18	-------	25.64	22.00	20.38	19.61	18.56	17.92	17.76
22	19.30	20.16	-------	25.78	21.81	20.31	19.62	18.62	17.98	17.78
23	19.30	20.08	-------	25.68	21.65	20.22	19.65	18.62	17.92	17.85
24	19.28	19.96	-------	25.60	21.58	20.13	19.67	18.59	17.90	18.00
25	19.26	19.88	-------	25.38	21.59	20.08	19.66	18.57	17.88	18.16
26	19.24	19.76	-------	25.14	21.45	20.09	19.66	18.58	17.82	18.26
27	19.26	19.62	-------	25.10	21.31	20.19	19.72	18.54	17.76	18.22
28	19.24	19.46	-------	25.34	21.19	20.57	19.87	18.50	17.76	18.20
29	19.16	19.42	-------	25.20	21.05	21.20	20.10	18.38	17.77	18.17
30	19.12	19.36	-------	24.98	20.92	21.81	20.15	18.28	17.78	18.12
31	19.16	-------	-------	24.66	-------	22.32	-------	18.18	17.77	-------

Elevation, in feet, of Roseau River near Badger, Minn., 1928–32—Continued

Day	Oct.	Nov.	Dec.	Apr.	May	June	July
1929–30							
1	18.10	18.52	18.40	-------	21.40	23.15	24.92
2	18.05	18.85	18.40	-------	23.10	22.77	25.11
3	18.00	19.12	18.42	-------	23.78	22.23	25.15
4	18.03	19.10	18.44	-------	23.90	21.60	25.13
5	18.04	19.07	18.46	-------	23.88	21.19	25.05
6	18.06	19.04	18.50	26.20	23.80	20.92	24.84
7	18.08	18.88	18.52	26.35	23.68	20.72	24.50
8	18.16	18.88	18.53	26.40	23.80	20.54	24.12
9	18.11	18.99	18.54	26.48	24.10	20.35	23.69
10	18.11	18.84	18.55	26.40	24.35	20.14	23.20
11	18.19	18.69	18.58	26.20	25.25	19.97	22.66
12	18.32	18.68	18.60	25.98	25.92	19.84	22.55
13	18.44	18.67	18.62	25.78	26.30	19.98	23.28
14	18.50	18.77	-------	25.48	-------	20.35	23.57
15	18.46	18.80	-------	25.15	-------	20.66	23.43
16	18.37	18.70	-------	24.78	27.25	20.82	22.90
17	18.30	18.53	-------	24.30	27.30	20.92	22.25
18	18.28	18.71	-------	23.95	27.20	20.79	21.59
19	18.27	18.78	-------	23.45	27.07	20.54	21.08
20	18.27	18.75	-------	23.05	26.90	20.30	20.69
21	18.24	18.70	-------	22.75	26.75	20.06	20.53
22	18.22	18.59	-------	22.38	26.51	19.98	20.60
23	18.22	18.50	-------	21.85	26.31	19.93	20.61
24	18.21	18.46	-------	21.40	26.10	19.96	20.35
25	18.23	18.46	-------	21.04	25.89	19.98	20.06
26	18.23	18.47	-------	20.78	25.57	20.09	19.86
27	18.20	18.48	-------	20.60	25.23	20.44	19.70
28	18.12	18.48	-------	20.50	24.92	20.72	-------
29	18.14	18.45	-------	20.50	24.50	22.48	-------
30	18.20	18.43	-------	20.65	24.06	24.32	-------
31	18.27	-------	-------	-------	23.60	-------	-------

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1930–31										
1	17.80	18.45	20.05	-------	21.17	20.15	21.13	18.48	17.91	18.17
2	17.82	18.43	19.95	-------	22.17	20.04	20.91	18.99	18.26	18.06
3	17.85	18.37	19.83	-------	23.84	19.94	20.71	19.19	18.61	18.00
4	17.88	18.38	-------	-------	24.55	19.92	20.49	19.00	18.71	17.93
5	17.97	18.33	-------	-------	24.86	20.09	20.29	18.95	18.68	17.90
6	18.03	18.42	19.56	-------	25.06	20.43	20.09	19.18	18.50	17.83
7	18.17	18.45	-------	-------	24.79	20.75	19.92	19.47	18.32	17.79
8	18.23	18.44	-------	-------	24.70	20.96	19.75	19.59	18.25	17.77
9	18.28	18.39	-------	-------	24.50	21.03	19.59	19.54	18.23	17.73
10	18.31	18.33	-------	-------	24.23	21.12	19.41	19.41	18.16	17.73
11	18.30	18.33	-------	-------	23.68	21.20	19.36	19.22	18.14	17.73
12	18.42	18.36	-------	-------	23.19	21.18	19.64	19.17	18.10	17.71
13	18.50	18.35	-------	-------	22.73	21.07	19.97	19.21	18.02	17.72
14	18.53	18.30	-------	-------	22.26	20.91	19.99	19.23	17.97	17.70
15	18.50	18.37	-------	-------	21.95	20.77	19.83	19.12	17.92	17.68
16	18.57	18.53	-------	-------	21.77	20.56	19.61	18.98	17.88	17.75
17	18.61	18.97	-------	-------	21.62	20.38	19.40	18.88	17.88	17.77
18	18.77	19.43	-------	-------	21.48	20.40	19.23	18.76	17.86	17.81
19	18.55	19.87	-------	-------	21.37	20.61	19.04	18.68	17.81	17.88
20	18.70	20.20	-------	-------	21.31	20.77	18.86	18.60	17.78	17.96
21	18.60	20.31	-------	-------	21.20	20.85	18.65	18.52	17.80	18.17
22	18.54	20.84	-------	-------	21.04	20.86	18.48	18.40	17.83	18.49
23	18.47	20.96	-------	-------	20.88	20.77	18.42	18.30	17.91	18.67
24	18.36	20.94	-------	-------	20.73	20.65	18.45	18.18	17.95	18.68
25	18.33	20.82	-------	-------	20.63	20.51	18.44	18.11	18.03	18.67
26	18.32	20.78	-------	21.81	20.53	20.36	18.37	18.05	17.98	18.64
27	18.35	20.69	-------	22.01	20.46	20.24	18.36	17.97	17.97	18.64
28	18.42	20.54	-------	21.93	20.37	20.34	18.33	17.98	18.19	18.63
29	18.42	20.37	-------	21.64	20.26	20.96	18.30	17.93	18.21	18.58
30	18.50	20.17	-------	21.34	20.20	21.26	18.28	17.89	18.23	18.53
31	18.41	-------	-------	21.14	-------	21.26	-------	17.83	18.21	-------

Elevation, in feet, of Roseau River near Badger, Minn., 1928–32—Continued

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1931–32										
1	18.44	20.06	20.29		20.40	24.88	19.84	20.10	18.48	20.12
2	18.35	19.97	20.20		20.40	24.81	19.76	20.28	18.45	20.00
3	18.29	19.93	20.12		20.40	24.75	19.63	20.14	18.43	19.69
4	18.29	19.84			20.42	24.69	19.57	19.92	18.38	19.43
5	18.26	19.73			20.51	24.61	19.46	19.75	18.33	19.22
6	18.24	19.58			21.54	24.72	19.28	19.83	18.30	19.05
7	18.22	19.47			24.52	24.82	19.14	20.05	18.27	18.90
8	18.22	19.40			26.13	24.90	19.04	20.17	18.24	18.80
9	18.21	19.34				24.96	19.18	20.09	18.21	18.65
10	18.20	19.33				24.96	19.25	20.37	18.18	18.55
11	18.17	19.28				24.90	19.20	20.57	18.11	18.46
12	18.15	19.25				24.79	19.10	20.46	18.08	18.40
13	18.13	19.23			27.94	24.61	19.01	20.42	18.04	18.39
14	18.12	19.19			27.95	24.39	19.07	20.27	18.02	18.37
15	18.14	19.16			27.86	24.19	19.22	20.03	18.01	18.38
16	18.15	19.16			27.69	23.93	19.50	19.78	17.99	18.29
17	18.13	19.17			27.46	23.64	19.39	19.58	17.99	18.20
18	18.11	19.07			27.22	23.34	19.43	19.37	17.93	18.13
19	18.14	19.02			26.96	23.03	19.58	19.22	17.89	18.17
20	18.13	19.01			26.78	22.67	19.52	19.24	17.85	18.18
21	18.12	19.20			26.57	22.20	19.52	19.50	17.80	18.14
22	18.27	19.72			26.36	21.76	19.52	19.51	17.78	18.11
23	18.54	20.30				21.41	19.30	19.30	17.77	18.08
24	18.83	20.33				21.27	19.18	19.08	17.82	18.04
25	18.92	20.43				21.15	20.24	18.91	18.08	18.06
26	18.89	20.49				20.90	21.00	18.79	18.32	18.13
27	18.87	20.52			25.49	20.67	20.92	18.71	18.62	18.26
28	19.09	20.50		20.38	25.27	20.47	20.58	18.69	18.80	18.47
29	19.60	20.45		20.39	25.03	20.28	20.22	18.61	18.87	18.57
30	20.02	20.37		20.40	24.92	20.10	19.98	18.58	19.04	18.55
31	20.10			20.39		19.93		18.52	19.58	

NOTE.—Add 1,000 feet to obtain elevations above mean sea level.

ROSEAU RIVER NEAR HAUG, MINN.

LOCATION.—Water-stage recorder in SE¼ sec. 21, T. 163 N., R. 43 W., 8¼ miles northwest of Haug and 5 miles south of international boundary. Zero of gage is 1,014.02 feet above mean sea level (1928 adjustment by Geodetic S urvey of Canada).

RECORDS AVAILABLE.—April to August 1932.

EXTREMES.—Maximum water-surface elevation during period, 1,023.19 feet Apr. 14; minimum, 1,015.30 feet Aug. 5.

REMARKS.—Records excellent.

Discharge measurements, 1931–32

Date	Gage height	Elevation above mean sea level	Discharge
1931	*Feet*	*Feet*	*Sec. feet*
May 13	3.89	1,017.91	261
Sept. 24	1.75	1,015.77	39.0
1932			
Apr. 14	9.17	1,023.19	1,170
Apr. 22	8.69	1,022.71	1,130
May 11	7.33	1,021.35	824
May 19	5.75	1,019.77	506
June 9	2.10	1,016.12	61.5

NOTE.—Above gage height of 5.50 feet there was extensive overflow, which is not included in above table

Elevation, in feet, 1932

Day	Apr.	May	June	July	Aug.	Day	Apr.	May	June	July	Aug.
1	------	21.72	16.83	16.82	------	16	23.10	20.56	16.35	16 58	------
2	------	21.54	16.78	16.98	------	17	23.03	20.32	16.44	16 40	------
3	------	21.38	16.66	16.97	15.36	18	22.97	20.04	16.35	16 22	------
4	------	21.23	16.58	16.80	15.34	19	22.91	19.78	16.45	16 12	------
5	------	21.16	16.51	16.66	15.30	20	22.85	19.48	16.55	16 03	------
6	------	21.22	16.39	16.61	------	21	22.78	19.11	16.45	16 11	------
7	------	21.29	16.25	16.72	------	22	22.71	18.69	16.45	16 23	------
8	------	21.36	16.14	16.86	------	23	22.63	18.31	16.33	16 13	------
9	------	21.41	16.13	16.88	------	24	22.55	18.05	16.16	15 99	------
10	------	21.41	16.27	16.90	------	25	22.50	17.98	16.52	15 85	------
11	------	21.37	16.25	17.20	------	26	22.40	17.80	17.36	15 73	------
12	------	21.30	16.21	17.20	------	27	22.29	17.59	17.60	15 65	------
13	------	21.15	16.11	17.12	------	28	22.15	17.41	17.44	15 63	------
14	23.19	20.98	16.06	17.02	------	29	21.97	17.24	17.17	15 57	------
15	23.16	20.78	16.18	16.81	------	30	21.89	17.09	16.90	15 53	------
						31	------	16.96	------	15 51	------

NOTE.—Add 1,000 feet to obtain elevations 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 No. 51, locally known as Caribou Cut-off Ditch. Zero of gage is 1,002.14 feet above mean sea level (1928 adjustment by Geodetic Survey of Canada).

RECORDS AVAILABLE.—April 1929 to September 1932.

EXTREMES.—Maximum discharge during year, 1,880 second-feet Apr. 13 (gage height, 8.80 feet, affected by ice); minimum, 6.4 second-feet Aug. 23 (gage height, 1.42 feet).

1929–32: Maximum discharge, that of Apr. 13, 1932; minimum, 6 second-feet Sept. 25, 26, 1930 (gage height, 1.40 feet).

REMARKS.—Records excellent except those for periods of ice effect, Nov. 22 to Dec. 5, Mar. 29 to Apr. 13, which are good. Stage-discharge relation affected by ice Nov. 23 to Apr. 8 and affected by aquatic growth Oct. 1–13, Aug. 30 to Sept. 30. This station is one of the international gaging stations maintained by the United States under agreement with Canada.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	28	123	99		19	1,040	125	109	27	86
2	26	123	92		20	980	114	114	26	117
3	25	116	83		22	920	109	126	22	110
4	25	109	81		22	890	96	116	20	92
5	22	107	78		27	860	92	101	20	77
6	23	101			126	890	83	92	18	65
7	22	96			320	890	76	95	17	56
8	20	89			556	920	67	104	15	46
9	19	86			684	920	61	114	14	43
10	21	82			830	920	67	109	13	38
11	20	81			1,010	890	72	130	12	34
12	20	79			1,390	860	69	150	11	32
13	20	76			1,590	830	65	139	9.5	29
14	20	76			1,630	800	57	132	8.0	27
15	20	76			1,670	770	58	119	8.0	26
16	18	73			1,710	710	67	96	8.0	25
17	18	69			1,710	684	82	82	8.0	26
18	19	62			1,710	606	81	68	7.0	23
19	19	76			1,670	568	76	62	7.0	24
20	17	68			1,630	520	90	57	7.0	22
21	19	55			1,590	472	88	52	7.0	23
22	24	55			1,510	400	82	59	6.7	22
23	25	93			1,470	338	79	62	6.7	22
24	29	53			1,470	287	69	56	14	20
25	38	58			1,350	270	62	47	19	20
26	43	92			1,270	254	126	39	14	23
27	51	128			1,190	226	188	35	18	23
28	52	141			1,150	198	188	33	26	23
29	63	132		18	1,110	174	160	31	40	28
30	90	116		17	1,080	154	134	28	50	32
31	116			18		141		27	53	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	116	17	31.4	1,930
November	141	53	89.7	5,340
December 1–5			86.6	859
April	1,710	19	1,050	62,500
May	1,040	141	625	38,400
June	188	57	92.8	5,520
July	150	27	83.4	5,130
August	53	6.7	17.2	1,060
September	117	20	41.1	2,450

NOTE.—No record Dec. 6 to Mar. 28.

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 1932.

EXTREMES.—Maximum discharge during year, 690 second-feet Apr. 7 (gage height, 12.00 feet, affected by ice); no flow at different times.

1911–14, 1928–32: Maximum discharge, 1,040 second-feet Oct. 1, 1912 (gage height, 10.3 feet, present datum); maximum stage, that of Apr. 7, 1932; no flow occasionally.

REMARKS.—Records fair. Stage-discharge relation affected by ice Apr. 1–14. Discharge estimated May 21–25, June 21–24.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Apr.	May	June	July	Aug.
1	0	0.1	2	18	0.7	0.6	0.1
2	0	.1	2	21	.6	.2	.1
3	0	.1	2	27	.6	.2	.1
4	0	.1	2	37	.4	.2	0
5	0	.1	4	46	.4	.2	0
6	0	0	395	68	.4	.1	0
7	0	0	626	74	.3	.1	0
8	0	0	610	65	.3	.1	0
9	0	0	409	65	.3	.1	0
10	0	0	409	62	.3	.1	0
11	0	0	356	59	.2	.1	0
12	0	0	282	56	.2	.1	0
13	0	0	165	54	.2	.1	0
14	0	0	127	51	.2	.1	0
15	0	0	74	46	.2	.1	0
16	0	0	68	44	.2	.1	0
17	0	0	59	35	.2	.1	0
18	0	0	46	22	.2	.1	0
19	0	.1	44	17	.2	.1	0
20	0	.1	37	14	.2	.1	0
21	0	.1	31	7.6	.2	.1	0
22	0	.1	29		.2	.1	0
23	0	0	23	7.0	.2	.1	0
24	0	0	21		.5	.1	0
25	.1	0	20		1.1	.1	7.0
26	.1	0	24	6.0	.8	.1	1.4
27	.1	0	20	4.5	.7	.1	.1
28	.2	0	13	4.1	.8	.1	.1
29	.2	0	13	2.8	1.1	.1	.1
30	.1	0	19	1.8	.7	.1	.1
31	.1			1.1		.1	0

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	0.2	0	0.03	2
November	.1	0	.03	2
April	626	2	131	7,800
May	74	1.1	30.2	1,860
June	1.1	.2	.42	25
July	.6	.1	.13	8
August	7.0	0	.29	18
The year	626	0	13.4	9,720

NOTE.—No flow during months omitted.

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.

DRAINAGE AREA.—162 square miles.

RECORDS AVAILABLE.—September 1928 to September 1932.

EXTREMES.—Maximum discharge during year, 406 second-feet Apr. 14 (gage height, 9.62 feet, ice affected); minimum, 0.4 second-foot Aug. 20 (gage height, 0.60 foot).

1928–32: Maximum discharge, 1,040 second-feet May 13, 1930 (gage height, 12.34 feet); minimum, that of Sept. 15–17, 1931, Aug. 20, 1932.

REMARKS.—Records excellent except those for period of ice effect, Apr. 2–18, which are fair. No record Nov. 14 to Apr. 1. This station is one of the international gaging stations maintained by the United States under agreement with Canada.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1	4.9	32	-------	226	30	72	5.4	78
2	4.8	31	2	212	28	58	5.1	53
3	4.5	29	2	206	26	48	4.9	40
4	4.2	27	2	195	26	37	4.3	32
5	4.0	25	8	180	22	42	3.9	27
6	3.6	24	34	234	19	64	3.7	23
7	3.5	22	101	242	18	74	3.6	20
8	3.3	22	160	234	36	65	3.3	17
9	3.3	21	180	234	38	74	3.1	14
10	3.3	20	195	219	36	92	3.2	11
11	3.3	19	234	200	30	74	3.4	10
12	3.1	19	300	180	26	78	3.0	8.3
13	3.0	20	354	170	30	70	2.6	8.9
14	2.8	-------	342	156	37	51	2.4	7.5
15	2.6	-------	260	148	27	37	2.1	6.1
16	2.5	-------	260	140	22	34	1.5	5.6
17	2.6	-------	260	132	20	25	1.3	5.2
18	2.8	-------	260	120	28	22	1.3	4.8
19	2.8	-------	251	112	23	20	1.1	4.8
20	2.6	-------	251	101	22	34	.7	4.4
21	3.1	-------	242	90	29	34	.6	4.4
22	6.1	-------	234	81	22	24	.8	4.2
23	10	-------	226	74	17	17	.8	4.2
24	12	-------	242	83	90	12	1.3	4.0
25	11	-------	242	70	128	9.6	3.5	3.7
26	9.8	-------	226	58	96	8.5	8.0	6.6
27	11	-------	206	50	78	8.3	15	9.4
28	20	-------	195	44	56	8.2	14	11
29	34	-------	185	38	39	9.0	21	10
30	33	-------	200	35	51	8.8	60	8.3
31	34	-------	-------	31	-------	6.4	96	-------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	34	2.5	8.11	499
November 1–13	32	19	23.9	616
April 2–30	354	2	195	11,200
May	242	31	139	8,550
June	128	17	38.3	2,280
July	92	6.4	39.3	2,420
August	96	.6	9.06	557
September	78	3.7	14.9	887

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 1,046.27 feet above mean sea level.

DRAINAGE AREA.—76 square miles.

RECORDS AVAILABLE.—August 1928 to September 1932.

EXTREMES.—Maximum discharge during year, 256 second-feet Apr. 10 (gage height, 8.67 feet, ice affected); minimum, 4.8 second-feet Aug. 21 (gage height, 1.13 feet).

1928–32: Maximum discharge, 449 second-feet May 12, 13, 1930 (gage height, 8.83 feet); minimum, 3.6 second-feet Aug. 17, 18, 20, 1930 (gage height, 1.20 feet).

REMARKS.—Records excellent except those for periods affected by ice, Nov. 25 to Dec. 3, Apr. 1–11, and by debris, Oct. 1 to Nov. 24, which are good. No records Dec. 4 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, 1931–32

Day	Oct.	Nov.	Dec.	Apr.	May	June	July	Aug.	Sept.
1	16	45	20	8.0	80	14	31	6.4	30
2	16	38	20	9.1	76	12	26	7.0	19
3	14	33	19	11	73	13	20	6.9	14
4	13	29		14	62	14	16	6.2	12
5	12	26		21	70	11	15	6.1	11
6	12	24		72	100	9.9	23	6.1	10
7	12	23		114	98	8.7	27	6.2	9.7
8	11	23		150	104	8.4	21	6.4	8.9
9	11	23		185	95	8.2	27	6.1	8.4
10	10	21		247	82	9.1	40	6.0	8.0
11	10	21		217	70	8.5	31	5.7	8.0
12	9.8	21		200	60	7.9	30	5.4	8.5
13	9.8	20		161	54	8.0	25	5.4	9.1
14	10	19		128	48	7.9	18	5.4	8.5
15	9.8	19		114	54	7.3	14	5.4	8.0
16	9.6	19		111	49	7.0	11	5.4	7.6
17	9.4	18		104	42	6.9	10	5.4	8.0
18	9.2	19		97	38	11	11	5.2	8.5
19	9.4	18		95	33	12	13	5.3	8.9
20	9.2	18		95	30	11	21	5.4	9.1
21	9.8	33		90	27	16	16	5.4	8.7
22	15	48		84	24	13	11	5.4	8.5
23	24	41		90	21	9.3	9.1	5.4	8.2
24	23	41		93	23	17	8.4	5.7	8.2
25	20	61		84	21	48	8.7	15	8.5
26	18	48		76	19	45	8.4	32	16
27	18	36		68	17	31	7.9	2[illegible]	25
28	39	30		60	15	22	7.8	13	22
29	63	24		58	14	16	7.3	2[illegible]	18
30	61	21		80	13	20	6.7	44	15
31	52				13		6.2	52	

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	63	9.2	18.3	1,130
November	61	18	28.7	1,710
December 1–3	20	19	19.7	117
April	247	8.0	97.9	5,830
May	104	13	49.2	3,030
June	48	6.9	14.4	857
July	40	6.2	17.0	1,050
August	52	5.2	11.1	682
September	30	7.6	11.8	702

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.

RECORDS AVAILABLE.—April 1929 to September 1930; October 1931 to September 1932.

EXTREMES.—Maximum discharge during year, 98 second-feet Apr. 10 (gage height, 5.40 feet); no flow for several months.

1929–30, 1931–32: Maximum discharge, 146 second-feet May 11, 1930 (gage height, 4.88 feet); no flow for several months each year.

REMARKS.—Records good except those estimated for period of ice effect, Apr. 1–12, which are poor.

Discharge, in second-feet, 1931–32

Day	Apr.	May	Day	Apr.	May	Day	Apr.	May
1	b 0.5	14	11	98	13	21	3.0	a 0.3
2	1.0	16	12	87	8.6	22	1.8	.1
3	a 1.0	20	13	a 67	5.3	23	1.2	.1
4	a 1.0	a 21	14	47	4.1	24	3.2	.1
5	1.0	22	15	27	3.7	25	2.8	0
6	33	30	16	19	a 2.8	26	1.4	0
7	67	28	17	12	2.0	27	.9	0
8	a 77	34	18	8.3	1.0	28	.8	0
9	a 88	30	19	6.2	1.0	29	.8	0
10	98	19	20	4.4	.5	30	19	0
						31		0

Month	Maximum	Minimum	Mean	Run-off in acre-feet
April	98	0.5	25.9	1,540
May	34	0	8.92	548
The year	98	0	2.88	2,090

a Interpolated. b Estimated. NOTE.—No flow during months omitted.

SOURIS RIVER AT MINOT, N.DAK.

LOCATION.—Staff gage at Ann Street footbridge, northeast of Great Northern Railway roundhouse at Minot.

DRAINAGE AREA.—10,270 square miles.

RECORDS AVAILABLE.—May 1903 to March 1924; April 1927 to September 1928; October 1929 to September 1932.

EXTREMES.—Maximum discharge during year, 260 second-feet June 8 (gage height, 7.20 feet); minimum, 0.1 second-foot, estimated for period Jan. 1 to Mar. 8.

1903–24; 1927–28; 1929–32: Maximum discharge, 12,000 second-feet Apr. 20, 1904 (gage height, 21.9 feet); no flow at times during February 1930.

REMARKS.—Records poor. Discharge estimated Oct. 1 to Feb. 29 and Sept. 1–30. Flow during low periods consists chiefly of industrial waste water.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						0.1	2.0	24	3.0	1.0	0.5	
2						.1	2.0	20	4.0	1.0	.5	
3						.1	2.0	20	4.0	1.0	.5	
4						.1	7.0	20	4.0	1.0	.5	
5						.1	8.0	24	4.0	1.0	.5	
6						.1	8.6	28	4.0	1.0	.5	
7						.1	9.0	26	4.0	.5	.5	
8						.1	9.6	28	77	.5	.4	
9		0.2				.3	10	26	202	.5	.2	
10						.3	10	24	26	1.5	.3	
11						.3	25	20	18	3.0	.3	
12						.3	61	20	24	6.0	.3	
13						.3	82	16	15	6.0	.3	
14						.3	94	15	11	5.0	.2	
15						.3	100	15	8.0	5.0	.2	
16	0.3		0.2	0.1	0.1	.5	94	13	6.2	3.0	.2	0.3
17		.2				.5	63	9.4	4.6	3.0	.2	
18						.5	39	9.0	3.8	2.5	.2	
19						1.0	40	9.0	2.5	2.5	.3	
20						1.0	37	9.0	2.2	2.0	.2	
21						1.0	34	9.0	1.8	2.0	.2	
22						1.0	77	9.0	1.0	1.5	.2	
23						2.0	216	8.0	1.0	1.5	.2	
24		.2				2.0	230	7.0	1.0	1.5	.2	
25						2.0	202	6.0	1.0	1.0	.2	
26						2.0	130	6.0	1.0	1.0	.2	
27						2.0	82	5.0	1.0	1.0	.2	
28						2.0	67	4.0	1.0	1.0	.3	
29						2.0	44	4.0	1.0	.5	.3	
30						2.0	30	4.0	1.0	.5	.2	
31		------			------	2.0	------	3.0	------	.5	.2	------

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October	----------	----------	0.3	18
November	----------	----------	.2	12
December	----------	----------	.2	12
January	----------	----------	.1	6.1
February	----------	----------	.1	5.8
March	2.0	0.1	.85	52
April	230	2.0	60.5	3,600
May	28	3.0	14.2	873
June	202	1.0	14.6	869
July	6.0	.5	1.90	117
August	.5	.3	.35	22
September	----------	----------	.3	18
The year	230	----------	7.72	5,600

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 1932.

EXTREMES.—Maximum discharge during year, 169 second-feet May 4 (gage height, 3.06 feet); maximum gage height, 3.98 feet Apr. 5, 6, 11, affected by ice; no flow Aug. 17 to Sept. 30.

1929–32: Maximum discharge, 1,130 second-feet Mar. 31 to Apr. 2, 1930 (gage height, 6.98 feet); no flow for several periods.

REMARKS.—Records fair except those for period of ice effect, Mar. 24 to Apr. 20, and for period June 21 to Aug. 17, which are poor. Discharge interpolated Oct. 21, 29, Nov. 2, Mar. 31 to Apr. 3. No records Nov. 19 to Mar. 23. This station is one of the international gaging stations maintained by the United States under agreement with Canada.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Mar.	Apr.	May	June	July	Aug.
1		5.3		27	63	21	26	14
2		5.3		31	88	23	27	12
3		5.3		34	148	20	28	9.2
4		4.9		38	169	20	31	7.3
5		7.7		70	141	20	29	6.1
6	5	7.7		70	134	17	26	4.3
7		8.1		70	128	14	22	2.3
8		9.0		78	98	13	21	1.4
9		10		93	74	28	21	.7
10		14		98	66	38	14	.4
11		12		134	60	33	14	.7
12	6.5	12		122	54	27	10	1.1
13	6.9	12		116	45	28	8.1	1.2
14	5.7	12		122	40	17	8.5	1.6
15	5.3	13		98	45	15	6.3	.9
16	3.8	12		104	57	14	4.7	.9
17	5.7	14		78	54	12	4.5	0
18	6.5	13		63	51	10	3.8	0
19	4.2			57	51	6.9	4.0	0
20	4.2			57	45	7.7	3.8	0
21	4.2			45	45	19	4.0	0
22	4.2			70	40	25	3.5	0
23	5.7			63	27	42	3.3	0
24	5.3		9	63	22	48	8.1	0
25	5.7		14	70	28	63	9.0	0
26	5.7		17	70	30	45	6.7	0
27	6.5		19	70	32	42	7.1	0
28	6.1		21	70	33	45	7.3	0
29	5.9		20	70	32	40	8.5	0
30	5.7		20	63	33	35	10	0
31	4.5		24		29		10	0

Month	Maximum	Minimum	Mean	Run-off in acre-feet
October			5.27	324
November 1–18	14	4.9	9.85	352
March 24–31	24	9	18.0	286
April	134	27	73.8	4,390
May	169	22	63.3	3,890
June	63	6.9	26.3	1,560
July	31	3.3	12.6	775
August	14	0	2.07	127

NOTE.—No flow during September.

LAKE METIGOSHE NEAR BOTTINEAU, N.DAK.

LOCATION.—Staff gage in SW¼ sec. 35, T. 164 N., R. 75 W., 15 miles north of Bottineau.

RECORDS AVAILABLE.—June 1931 to September 1932.

EXTREMES.—Maximum water-surface elevation during period, 2,135.88 feet June 13, 1931; minimum, 2,134.28 feet Sept. 17, 1932.

REMARKS.—Gage heights have been reduced to mean sea-level datum.

Elevation, in feet, 1931–32

Day	June	July	Aug.	Sept.	Day	June	July	Aug.	Sept.
1931					1931				
1			35.46		16		35.66	35.28	
2		35.68			17				
3		35.67			18				
4			35.45		19				
5				35.17	20	35.73			
6		35.76			21				
7		35.79			22				
8		35.77			23		35.56		
9		35.75			24	35.70		35.38	
10			35.41		25		35.52		35.18
11		35.71			26				
12				35.05	27	35.73	35.47		
13	35.88				28				
14					29				
15					30				
					31				

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Apr.	May	June	July	Aug.	Sept.
1931–32											
1											
2								34.88	34.98	34.88	
3	34.98		34.90	34.87			35.17				
4						35.13					
5								34.93			34.38
6			34.90		34.84		35.16		35.08		
7											
8		34.98								34.83	
9											34.38
10				34.86			35.16	35.08			
11	34.98					35.14			35.08		
12											34.33
13			34.89							34.78	
14					34.84		35.10	35.08			
15		34.98							34.98		
16										34.68	
17				34.86							34.28
18						35.14					
19							35.07				
20			34.88					34.98	34.98	34.68	
21					34.85						
22											34.29
23		34.98									
24				34.85			34.99			34.58	
25	34.98					35.17			34.98		
26											34.30
27			34.88					34.93			
28					35.12		34.95				
29			34.88						34.88	34.58	
30						35.18					34.29
31	34.98			34.85							

NOTE.—Add 2,100 feet to obtain elevations above mean sea level. No records for March 1932.

LAKE UPSILON NEAR ST. JOHN, N.DAK.

LOCATION.—Staff gage in SE¼ sec. 3, T. 163 N., R. 71 W., 7 miles west of St. John.
DRAINAGE AREA.—4 square miles.
RECORDS AVAILABLE.—September 1931 to September 1932.
EXTREMES.—Maximum water-surface elevation during period, 2,103.96 feet May 16; minimum, 2,103.07 feet Sept. 30, 1932.
REMARKS.—Gage heights have been reduced to mean sea-level datum. Gage read to hundredths twice a week. No record Nov. 15, 1931, to May 15, 1932.

Elevation, in feet, 1931–32

Day	Sept.	Oct.	Nov.	May	June	July	Aug.	Sept.
1						3.81	3.77	
2								
3		3.59					3.73	
4						3.85		
5		3.57						3.30
6							3.67	
7		3.55						
8						3.87		
9							3.64	
10		3.52						3.27
11								
12							3.58	
13						3.85		
14		3.50	3.51					3.24
15								
16				3.96			3.54	
17		3.49				3.79		3.20
18								
19							3.48	
20				3.94		3.77		3.15
21	3.64							
22	3.63						3.44	
23				3.92		3.75		3.12
24		3.47			3.84			
25							3.45	
26	3.64							
27				3.89		3.69		309
28					3.81			
29							3.44	
30		3.55				3.68	3.42	3.07
31								

NOTE.—Add 2,100 feet to obtain elevations above mean sea level.

RAINY RIVER BASIN

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.—1,200 square miles.

RECORDS AVAILABLE.—June, 1905, to June, 1907; October, 1917, to September, 1919, and September, 1923, to September, 1932.

EXTREMES.—1905–7, 1912–19, 1923–32: Maximum mean daily discharge, 6,030 second-feet Apr. 26, 1927; no flow a number of times 1905–7 and 1923–2[illegible].

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

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	220	183	308	629	635	571	141	1,690	2,240	1,020	573	663
2	192	244	308	539	712	603	129	1,910	1,880	887	564	631
3	134	227	308	603	700	603	129	1,940	1,810	855	554	482
4	289	227	308	700	700	571	379	2,040	1,450	855	461	577
5	188	195	375	635	700	668	376	2,080	1,240	855	570	258
6	223	183	353	610	700	571	517	1,990	1,260	855	615	418
7	252	183	337	635	703	603	396	2,050	1,220	799	483	494
8	220	206	449	635	690	603	428	2,330	1,220	631	612	532
9	192	195	384	668	605	571	462	2,360	1,220	494	608	499
10	192	292	433	546	668	571	444	2,370	1,220	502	526	634
11	160	227	436	615	700	635	517	2,540	1,140	709	522	569
12	220	292	528	635	700	539	446	2,540	1,030	1,000	522	566
13	220	150	512	564	700	297	561	2,580	887	855	522	663
14	220	215	276	598	668	431	496	2,650	823	685	415	695
15	220	183	295	603	635	442	639	2,660	823	663	475	631
16	160	282	564	411	668	506	716	3,040	855	631	495	631
17	160	339	437	514	635	418	758	3,040	952	595	463	545
18	192	134	590	501	635	496	920	3,070	952	413	430	525
19	205	131	614	635	744	506	879	3,100	984	505	430	590
20	168	323	580	603	630	233	889	3,060	1,020	729	495	473
21	195	453	669	635	657	341	937	3,020	952	643	250	495
22	196	220	668	635	491	431	984	2,990	942	760	430	526
23	215	265	700	635	586	322	984	2,810	984	460	554	495
24	183	256	668	297	635	440	984	2,740	952	511	537	496
25	150	287	635	528	668	240	952	2,730	1,020	566	613	273
26	198	321	668	603	635	258	1,020	2,460	952	571	635	463
27	233	230	575	603	635	311	1,160	2,460	920	559	614	496
28	260	288	445	603	605	230	1,300	2,230	920	606	692	431
29	227	321	712	635	566	376	1,430	2,200	952	508	631	528
30	215	211	607	635	-------	437	1,820	2,140	856	470	792	496
31	183	-------	581	539	-------	301	-------	2,000	-------	423	663	-------

Month	Observed			Gain or loss in storage mean (second-feet)	Corrected for storage [a]		
	Maximum	Minimum	Mean		Mean	Per square mile	Run-off in inches
October	289	134	203	+78	281	0.234	0.27
November	453	131	242	+562	804	.670	.75
December	712	276	494	+133	627	.522	.60
January	700	297	588	−211	377	.314	.36
February	744	491	655	−378	277	.231	.25
March	668	230	456	−280	176	.147	.17
April	1,820	129	726	+809	1,540	1.28	1.43
May	3,100	1,690	2,480	+78	2,560	2.13	2.46
June	2,240	823	1,120	−204	916	.763	.85
July	1,020	413	665	−105	560	.467	.54
August	792	259	541	−34	507	.422	.49
September	695	258	526	−99	427	.356	.40
The year	3,100	129	726	+29	755	.629	8.57

[a] 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, Bald Eagle, and Camp Six.

UPPER MISSISSIPPI RIVER BASIN

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 (corrected) above mean sea level (1912 adjustment). Staff gage about 600 feet upstream from present gage (zero of gage, 1,207.71 feet above mean sea level) used prior to July 28, 1931.

DRAINAGE AREA.—5,060 square miles.

RECORDS AVAILABLE.—April 1930 to September 1932.

EXTREMES.—Maximum discharge during year, 2,420 second-feet May 9 (gage height, 6.24 feet); minimum, 163 second-feet Aug. 24 (gage height, 1.69 feet).

1930–32: Maximum discharge, 2,890 second-feet May 16 1930 (gage height, 7.45 feet, recorder datum); minimum, that of Aug. 24, 193[illegible].

REMARKS.—Records excellent except those for periods of ice effect, Dec. 8 to Jan. 25, Jan. 30 to Feb. 5, which are good. Discharge estimated July 25–29. Flow regulated by Government reservoirs on headwaters.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	311	845	870	605	1,020	870	745	1,510	1,840	695	870	650
2	307	695	605	582	995	870	820	1,340	1,950	770	695	695
3	474	348	628	695	795	970	845	870	1,950	895	628	672
4	770	434	695	745	920	970	845	870	1,780	1,040	795	720
5	492	560	695	448	945	1,040	795	1,220	1,680	920	870	672
6	538	461	795	335	1,040	1,200	795	1,370	1,680	672	870	402
7	287	452	820	380	1,070	1,370	1,140	1,620	1,270	560	895	244
8	299	402	820	506	995	1,220	1,510	1,900	1,070	650	920	248
9	327	416	528	695	895	995	1,680	2,360	1,120	672	672	371
10	398	448	443	870	820	970	1,900	2,180	1,070	672	560	366
11	425	307	546	605	845	1,020	2,060	2,060	1,070	745	650	380
12	502	335	605	551	1,020	1,120	2,000	2,000	1,270	628	695	448
13	474	335	538	416	1,020	1,070	1,950	2,000	1,120	502	695	502
14	299	315	542	492	995	628	1,950	2,300	1,140	528	695	279
15	287	335	672	695	845	353	2,060	2,300	1,270	605	720	220
16	291	366	528	695	795	380	2,060	2,360	1,120	672	628	323
17	434	398	502	745	845	484	1,900	2,240	895	695	520	582
18	551	287	560	745	970	524	1,950	2,360	845	695	248	650
19	605	319	628	474	995	551	1,620	2,420	845	605	307	520
20	515	402	695	331	1,020	556	1,560	2,420	720	470	319	402
21	430	474	820	376	1,020	628	1,730	2,420	672	820	384	275
22	448	628	528	506	945	443	1,840	2,300	770	1,100	402	303
23	461	920	371	605	820	307	1,840	2,180	870	1,070	238	307
24	650	895	551	720	770	412	1,900	2,180	820	1,100	178	315
25	628	795	870	820	770	528	1,950	2,120	720	845	315	335
26	307	720	945	556	820	628	1,680	1,900	895	745	479	389
27	376	695	551	344	870	770	1,620	1,900	870	745	628	267
28	484	795	452	456	945	582	1,730	2,120	770	770	820	193
29	551	795	484	628	945	438	1,780	2,240	720	820	820	303
30	628	795	402	672	------	438	1,730	2,240	695	945	582	303
31	695	------	560	720	------	582	------	1,950	------	970	515	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	770	287	459	0.091	0.10
November	920	287	532	.105	.12
December	945	371	621	.123	.14
January	870	331	581	.115	.13
February	1,070	770	922	.182	.20
March	1,370	307	739	.146	.17
April	2,060	745	1,600	.316	.35
May	2,420	870	1,980	.391	.45
June	1,950	672	1,120	.221	.25
July	1,100	470	762	.151	.17
August	920	178	600	.119	.14
September	720	193	411	.081	.09
The year	2,420	178	859	.170	2.31

NOTE.—Gage read to hundredths once a day Oct. 1–6.

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 1932.

EXTREMES.—Maximum mean daily discharge during year, 5,380 second-feet May 12; minimum, 417 second-feet Sept. 18, 26.

1924–32: Maximum mean daily discharge, 12,600 second-feet Apr. 22, 1927; minimum, 351 second-feet Jan. 4, 1925.

REMARKS.—Records good except those for periods of high water, which are fair. Flow regulated by Government reservoirs on headwaters. Records collected by Minnesota Power & Light Co., under general supervision of the United States Geological Survey in connection with a Federal Power Commission project.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	859	1,040	1,990	1,650	1,420	1,820	1,880	2,850	3,600	1,580	1,580	1,120
2	990	1,030	1,870	1,360	1,570	2,030	1,690	2,610	3,520	1,400	2,460	980
3	1,170	1,710	2,090	1,400	1,590	1,980	1,710	3,370	3,380	1,260	2,760	1,160
4	958	1,530	1,890	1,200	1,400	2,070	1,540	3,320	3,190	980	2,140	980
5	894	1,640	1,440	1,410	1,580	1,810	1,950	3,100	3,270	1,110	1,760	1,170
6	683	1,220	1,530	1,600	1,760	1,640	2,200	2,760	3,020	1,470	1,250	723
7	1,340	1,370	1,060	1,670	1,770	1,780	2,960	2,760	3,320	1,620	1,200	887
8	1,270	828	1,290	1,600	1,430	2,160	3,040	3,100	2,890	1,770	668	1,040
9	1,180	1,020	1,690	1,570	1,310	1,840	4,310	3,820	2,950	1,670	1,260	980
10	958	1,270	1,650	1,480	1,530	1,960	4,140	4,750	3,000	1,470	1,540	927
11	1,020	1,320	1,870	1,350	1,570	1,900	4,300	4,950	2,780	1,120	1,320	801
12	980	1,140	1,600	1,310	1,470	1,840	4,770	5,380	1,890	1,020	1,250	758
13	923	1,200	1,350	1,840	1,380	1,400	4,610	5,040	2,400	1,140	1,150	725
14	1,200	1,110	1,390	1,620	1,490	1,580	4,680	5,350	3,080	1,080	1,110	1,010
15	1,200	974	1,360	1,600	1,410	1,760	4,390	4,030	2,620	1,180	766	916
16	1,310	928	1,420	1,610	1,340	1,810	3,670	5,190	2,520	917	1,400	632
17	1,120	1,200	1,380	1,570	1,440	1,660	3,970	4,810	2,420	783	1,550	549
18	916	1,190	1,620	1,420	1,560	1,480	3,610	4,910	2,050	793	1,190	417
19	667	1,140	1,580	1,770	1,550	1,300	3,780	4,710	1,730	1,160	980	550
20	1,080	1,400	1,640	1,900	1,440	1,150	3,780	4,630	1,960	1,150	860	762
21	1,200	1,610	1,560	1,800	1,350	1,160	3,550	4,370	2,530	1,280	1,070	875
22	1,340	1,280	1,740	1,810	1,320	959	3,470	4,140	2,480	998	912	936
23	1,240	1,660	1,800	1,810	1,350	1,330	2,910	3,880	1,860	1,170	1,180	767
24	1,200	1,810	1,700	1,600	1,720	1,430	2,880	3,840	2,130	1,070	1,250	732
25	901	1,620	1,780	1,390	1,650	1,380	2,770	3,860	1,380	1,050	1,180	775
26	682	1,800	1,670	1,290	1,450	1,380	3,500	3,680	1,200	1,650	968	417
27	1,360	2,080	1,820	1,500	1,470	1,470	3,550	3,640	1,340	1,530	1,020	760
28	1,470	1,920	1,730	1,780	1,660	1,270	3,230	3,400	1,580	1,600	783	975
29	1,400	1,580	1,830	1,740	1,710	1,480	3,060	3,300	1,810	1,370	969	817
30	1,510	1,440	1,970	1,480	-------	1,730	3,070	3,200	1,500	1,420	1,080	974
31	1,250	-------	1,870	1,200	-------	1,890	-------	3,630	-------	1,440	1,220	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	1,510	667	1,110	0.096	0.11
November	2,080	828	1,370	.118	.13
December	2,090	1,060	1,650	.142	.16
January	1,900	1,200	1,560	.134	.15
February	1,770	1,310	1,510	.130	.14
March	2,160	959	1,630	.141	.16
April	4,770	1,540	3,300	.284	.32
May	5,380	2,610	3,980	.343	.40
June	3,600	1,200	2,450	.211	.24
July	1,770	783	1,270	.109	.13
August	2,760	668	1,280	.110	.13
September	1,170	417	837	.072	.08
The year	5,380	417	1,830	.158	2.15

MISSISSIPPI RIVER AT ELK RIVER, MINN.

LOCATION.—Water-stage recorder in SE.¼ sec. 34, T. 33 N., R. 26 W. fourth principal meridian, in Elk River, 2,500 feet below mouth of Elk River. Prior to July 18, 1932, chain gage in sec. 10, T. 121 N., R. 23 W. fifth principal meridian, on highway bridge about 75 feet upstream, was used. Zero of gage is 847.92 feet above mean sea level (1912 adjustment).

DRAINAGE AREA.—14,500 square miles.

RECORDS AVAILABLE.—July 1915 to September 1932.

EXTREMES.—Maximum discharge during year, 8,050 second-feet May 13 (gage height, 5.30 feet); minimum, 696 second-feet Sept. 22 (gage height, 1.82 feet).

1915–32: Maximum discharge, 27,000 second-feet Apr. 7, 1916 (gage height, 10.8 feet); minimum, 633 second-feet Feb. 10, 1926.

REMARKS.—Records good except those for periods of ice effect, Nov. 25–28, Dec. 3 to Mar. 29, which are fair. Flow partly regulated by Government reservoirs on headwaters.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,730	1,570	1,980	1,900	1,650	2,810	2,810	3,630	4,530	2,160	1,360	1,230
2	1,180	1,340	1,900	1,730	1,410	2,620	2,620	3,420	4,770	1,900	1,650	1,350
3	1,110	1,260	1,900	1,410	1,570	2,430	2,810	3,210	4,200	1,820	2,430	1,320
4	1,180	2,070	2,250	1,410	1,980	2,620	2,620	3,850	4,070	1,730	3,110	1,220
5	1,490	1,980	1,980	1,490	1,650	2,810	3,210	3,630	3,850	1,570	2,720	1,300
6	1,180	2,070	1,570	1,040	1,410	2,810	4,070	3,850	3,850	1,180	2,040	1,170
7	1,340	1,570	1,410	1,410	1,820	1,980	4,070	3,630	3,850	1,260	1,820	1,350
8	1,410	1,570	1,260	1,490	1,900	2,160	4,300	4,070	3,850	1,730	1,290	991
9	1,730	1,490	1,490	1,570	1,820	2,620	4,770	4,530	3,420	2,250	1,260	1,020
10	1,410	1,180	1,900	1,570	1,730	2,620	6,590	5,770	3,420	1,900	872	1,140
11	1,410	1,260	2,430	1,730	1,490	2,430	6,040	6,590	3,420	2,160	1,320	1,160
12	1,410	1,730	2,160	1,570	1,980	2,430	6,040	6,870	3,420	1,650	1,710	1,280
13	1,180	1,650	2,070	1,730	1,570	2,430	6,590	7,750	3,010	1,340	1,520	1,180
14	1,490	1,490	1,730	1,730	1,730	2,250	6,310	6,870	2,620	1,490	1,440	1,060
15	1,730	1,410	1,570	1,820	1,490	2,070	6,310	7,160	3,420	1,730	1,260	965
16	1,490	1,340	1,570	1,820	1,730	1,980	5,770	6,310	3,010	1,490	1,260	1,180
17	1,570	1,410	1,730	1,820	1,650	2,250	5,260	6,870	2,810	1,410	991	1,140
18	1,410	1,650	1,900	1,980	1,570	2,070	5,010	6,040	3,010	1,490	1,920	991
19	1,260	1,490	1,980	1,980	1,650	2,250	5,010	6,310	2,810	1,220	1,550	939
20	1,180	1,490	2,430	1,570	1,650	2,070	4,770	6,040	2,430	1,160	1,240	900
21	1,110	1,980	2,160	2,070	1,820	1,730	4,770	6,040	2,620	1,440	1,140	780
22	1,180	2,160	2,160	2,160	1,340	1,570	4,300	5,510	2,430	1,520	1,130	748
23	1,980	2,160	2,070	2,070	1,490	1,490	4,070	5,260	3,010	1,670	1,260	1,100
24	1,820	2,250	2,160	1,980	1,570	1,410	4,070	5,010	2,430	1,440	1,060	1,130
25	1,650	2,250	2,070	2,250	1,570	2,070	3,420	5,010	2,250	1,460	1,510	965
26	1,490	2,250	2,250	2,160	1,980	1,980	3,630	4,770	1,980	1,340	1,520	913
27	1,110	2,070	2,620	1,730	1,900	1,900	4,300	4,530	1,650	1,640	1,350	913
28	1,110	2,430	2,250	1,490	2,250	1,980	4,070	4,530	1,240	3,300	1,060	816
29	1,650	2,430	2,620	1,730	2,430	2,430	4,530	4,070	1,410	1,700	1,340	991
30	1,980	1,980	2,250	1,900	-------	2,250	3,850	4,070	1,980	1,410	1,070	1,220
31	1,980	-------	2,430	1,650	-------	2,430	-------	4,530	-------	1,320	1,130	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	1,980	1,110	1,450	0.100	0.12
November	2,430	1,180	1,770	.122	.14
December	2,620	1,260	2,010	.139	.16
January	2,250	1,040	1,740	.120	.14
February	2,430	1,340	1,720	.119	.13
March	2,810	1,410	2,220	.153	.18
April	6,590	2,620	4,530	.312	.35
May	7,750	3,210	5,150	.355	.41
June	4,770	1,340	3,030	.209	.23
July	3,300	1,160	1,640	.113	.13
August	3,110	872	1,490	.103	.12
September	1,350	748	1,080	.074	.08
The year	7,750	748	2,320	.160	2.19

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. Prior to June 14, 1932, water-stage recorder located in sec. 26, T. 31 N., R. 24 W., 1,500 feet downstream from Coon Rapids hydroelectric plant of Northern States Power Co., 5 miles downstream from Anoka, and above Coon Creek, was used.

DRAINAGE AREA.—19,100 square miles (19,000 square miles at site used prior to June 14, 1932).

RECORDS AVAILABLE.—June 1931 to September 1932.

EXTREMES.—Maximum mean daily discharge during year, 9,310 second-feet Apr. 10; minimum, 912 second-feet Sept. 21 (gage height, 0.72 foot).

1931–32: Maximum mean daily discharge, that of Apr. 10, 1932; minimum, 870 second-feet Sept. 17, 1931 (gage height, 0.68 foot, present site).

REMARKS.—Records good. Discharge from power-house records Oct. 18–21, Dec. 6 to Apr. 12. Flow partly regulated by Government reservoirs on headwaters.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,880	1,860	2,010	2,200	1,820	3,250	3,800	4,150	4,770	2,490	1,540	1,350
2	1,400	1,590	1,850	2,150	1,580	3,080	3,880	4,130	5,110	2,250	1,690	1,540
3	1,170	1,470	2,070	1,760	1,780	3,310	3,820	3,790	4,600	2,230	2,550	1,540
4	1,060	1,660	2,540	1,750	1,920	3,260	3,530	4,190	4,550	1,980	3,360	1,300
5	1,580	1,970	2,210	1,770	2,080	3,270	3,890	4,350	4,280	2,130	3,070	1,460
6	1,410	2,170	1,770	1,560	1,740	3,280	5,040	4,320	4,150	1,610	2,400	1,300
7	1,500	2,000	1,490	1,660	2,020	2,680	6,420	4,330	4,170	1,630	2,100	1,470
8	1,330	1,730	1,500	1,920	2,200	2,280	6,680	4,440	3,980	1,970	1,540	1,230
9	1,770	1,770	1,640	1,930	2,090	2,840	7,680	5,060	4,040	2,590	1,370	1,050
10	1,660	1,250	2,070	1,890	2,010	3,010	9,310	6,160	3,860	2,520	1,290	1,200
11	1,560	1,620	2,680	1,980	1,790	2,860	9,000	7,730	3,890	2,380	1,210	1,190
12	1,440	1,860	2,290	1,940	1,990	2,860	8,760	7,980	3,920	2,170	1,830	1,390
13	1,320	1,980	2,240	2,290	1,800	2,760	8,780	8,820	3,930	1,690	1,800	1,260
14	1,530	1,690	2,020	1,860	1,890	2,500	8,340	8,240	3,150	1,640	1,530	1,240
15	1,830	1,720	1,670	2,020	1,760	2,310	7,910	8,440	3,700	2,070	1,380	1,130
16	1,760	1,650	1,820	1,950	1,850	2,310	7,510	7,680	4,130	1,870	1,530	1,140
17	1,740	1,820	1,880	1,950	1,910	2,550	6,540	7,960	3,460	1,550	1,260	1,270
18	1,720	1,840	2,070	1,980	1,820	2,450	6,140	7,010	3,760	1,770	1,820	1,100
19	1,490	1,970	2,060	1,960	1,850	2,410	6,110	6,820	3,490	1,590	1,900	1,160
20	1,420	1,910	2,350	2,010	1,860	2,310	5,750	6,900	3,150	1,290	1,420	1,040
21	1,280	2,240	2,250	2,210	1,990	2,050	5,650	6,820	3,000	1,540	1,250	998
22	1,460	2,510	2,250	2,320	1,700	1,880	5,260	6,100	2,710	1,730	1,320	994
23	1,710	2,640	2,470	2,300	1,720	1,870	4,910	5,660	3,730	1,710	1,460	1,020
24	1,980	2,390	2,300	2,130	1,780	1,580	4,790	5,710	3,080	1,730	1,340	1,250
25	1,560	2,610	2,520	2,220	1,870	2,260	4,260	5,260	2,680	1,720	1,530	1,110
26	1,490	2,230	2,390	2,230	2,160	2,160	4,330	5,190	2,650	1,630	1,830	1,050
27	1,610	2,340	2,710	2,060	2,200	2,250	4,610	5,080	2,100	1,390	1,530	1,070
28	1,160	3,130	2,380	1,730	2,460	2,380	4,810	4,720	1,700	3,600	1,370	1,010
29	1,900	2,530	2,580	2,030	2,960	2,820	5,050	4,610	1,720	2,160	1,560	1,010
30	2,210	2,120	2,310	1,770	-------	3,020	4,710	4,380	2,120	1,590	1,490	1,300
31	1,970	-------	2,600	1,940	-------	3,090	-------	4,760	-------	1,500	1,300	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	2,210	1,060	1,580	0.083	0.10
November	3,130	1,250	2,010	.106	.12
December	2,710	1,490	2,160	.114	.13
January	2,320	1,560	1,980	.104	.12
February	2,960	1,580	1,950	.103	.11
March	3,310	1,580	2,610	.137	.16
April	9,310	3,530	5,910	.311	.35
May	8,820	3,790	5,830	.307	.35
June	5,110	1,700	3,520	.185	.21
July	3,600	1,290	1,930	.101	.12
August	3,360	1,210	1,700	.089	.10
September	1,540	994	1,210	.063	.07
The year	9,310	994	2,700	.142	1.94

MISSISSIPPI RIVER AT ST. PAUL, MINN.

LOCATION.—Water-stage recorder 300 feet above Robert Street Bridge, in St. Paul, 6 miles below mouth of Minnesota River. Zero of gage is 684.16 feet above mean sea level (1912 adjustment).

DRAINAGE AREA.—36,800 square miles (revised).

RECORDS AVAILABLE.—March 1887 to September 1932.

EXTREMES.—Maximum mean daily discharge, 17,600 second-feet Apr. 12, 13; minimum, 1,250 second-feet Sept. 22.

1887–1932: Maximum discharge, 80,800 second-feet Apr. 6, 1897 (gage height, 18.0 feet); minimum, 1,060 second-feet Feb. 4, 1895.

Maximum known discharge, 117,000 second-feet July 22, 1867.

REMARKS.—Records good except those during period of backwater effect from Hastings Dam, Oct. 1 to Nov. 30 and Apr. 1 to Sept. 30, which are fair and were determined from records of the Mississippi River above the Minnesota River and of the Minnesota River. Stage-discharge relation affected by ice Dec. 5 to Mar. 25. Partial regulation by Government reservoirs on headwaters. Regulation negligible during summer of 1932.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,200	2,340	3,080	3,180	2,520	4,550	7,830	7,170	7,540	3,810	2,160	1,700
2	1,930	2,070	2,880	2,880	2,280	4,660	9,440	7,080	7,350	3,360	2,160	1,810
3	1,460	1,980	3,080	2,520	2,200	5,020	12,000	6,720	6,660	4,260	2,750	1,940
4	1,370	1,870	3,480	2,280	2,440	5,620	12,000	6,800	6,640	3,060	3,490	1,660
5	1,760	2,470	3,380	2,440	2,790	6,420	10,800	7,200	6,200	3,220	3,400	1,840
6	1,910	2,300	2,700	2,280	2,700	7,590	12,100	6,930	6,520	2,680	2,940	1,740
7	1,840	2,560	2,520	2,040	2,610	8,040	12,300	6,890	6,680	2,720	2,290	1,650
8	1,800	1,940	2,360	2,360	2,880	8,200	12,100	6,600	6,060	2,340	1,920	1,700
9	1,830	2,320	2,360	2,610	2,880	8,680	12,800	7,350	6,040	3,660	1,820	1,380
10	2,020	1,770	2,700	2,440	2,880	8,520	13,900	10,800	5,420	3,470	1,650	1,380
11	2,500	1,980	3,380	2,700	2,520	7,890	17,000	13,300	5,400	2,910	1,500	1,580
12	1,890	2,010	3,280	2,880	2,520	6,990	17,600	14,000	6,100	3,120	2,010	1,710
13	1,930	2,400	3,080	3,080	2,610	6,700	17,600	13,900	6,200	2,540	2,200	1,770
14	2,150	2,390	2,880	2,880	2,280	6,280	15,600	13,200	4,960	2,700	1,700	1,620
15	2,260	2,040	2,520	2,700	2,440	5,740	14,500	13,300	5,720	3,200	1,750	1,470
16	2,340	2,200	2,440	2,790	2,360	5,500	13,100	11,900	6,770	3,170	2,260	1,400
17	1,860	2,650	2,610	2,790	2,700	5,260	11,700	11,200	5,750	2,900	1,830	1,690
18	2,180	2,450	2,700	2,700	2,610	5,020	9,800	10,400	6,430	3,030	1,820	1,480
19	2,000	2,510	2,880	2,700	2,280	4,780	10,000	9,420	6,170	2,700	2,440	1,560
20	1,920	2,610	3,080	2,700	2,610	4,660	9,440	9,120	6,810	2,160	1,930	1,500
21	1,700	2,780	3,180	2,700	2,610	4,330	8,870	8,700	6,150	2,310	1,560	1,320
22	1,760	2,900	3,080	2,880	2,440	4,330	8,470	8,040	5,880	2,340	1,670	1,250
23	1,960	3,330	3,280	2,980	2,440	4,550	7,740	7,650	6,120	2,040	1,700	1,440
24	2,370	2,970	3,280	2,880	2,440	4,550	7,550	7,910	5,410	2,200	2,210	1,490
25	1,960	3,130	3,080	2,880	2,520	4,780	6,640	6,630	4,840	2,360	2,150	1,460
26	1,880	2,790	3,380	2,980	2,980	5,260	6,690	6,700	4,730	2,130	2,300	1,500
27	1,920	2,920	3,380	2,980	3,480	5,620	6,630	6,400	3,790	1,700	1,900	1,450
28	1,620	3,820	3,380	2,610	3,480	6,280	7,210	6,380	3,730	3,600	1,810	1,300
29	2,120	3,110	3,280	2,440	4,330	7,740	7,860	6,150	3,060	2,720	1,810	1,270
30	2,400	3,130	3,280	2,610	-------	9,170	7,840	5,930	3,290	2,130	2,100	1,540
31	2,270	-------	3,380	2,360	-------	10,000	-------	6,930	-------	2,060	1,640	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	2,500	1,370	1,970	0.054	0.06
November	3,820	1,770	2,520	.068	.08
December	3,480	2,360	3,010	.082	.09
January	3,180	2,040	2,690	.073	.08
February	4,330	2,200	2,680	.073	.08
March	10,000	4,330	6,220	.169	.19
April	17,600	6,630	10,900	.296	.33
May	14,000	5,930	8,730	.237	.27
June	7,540	3,060	5,760	.157	.18
July	4,260	1,700	2,790	.076	.09
August	3,490	1,500	2,090	.057	.07
September	1,940	1,250	1,550	.042	.05
The year	17,600	1,250	4,240	.115	1.57

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. Prior to Aug. 2 a staff gage on Chicago, Burlington & Quincy Railroad bridge over St. Croix River was used. Zero of gage is 669.28 feet above mean sea level (1912 adjustment).

DRAINAGE AREA.—45,000 square miles.

RECORDS AVAILABLE.—June 1928 to September 1932.

EXTREMES.—Maximum discharge during year, 30,300 second-feet Apr. 13 (gage height, 9.25 feet); minimum, 3,190 second-feet Sept. 23 (gage height, −2.81 feet).

1928–32: Maximum discharge, 49,600 second-feet Mar. 25, 1929 (gage height, 12.3 feet); minimum, 3,010 second-feet Sept. 16, 1931 (gage height, −2.92 feet).

REMARKS.—Records good except those for period of ice effect, Dec. 4 to Mar. 29, which are fair. Flow partly regulated by reservoirs and power plants.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4,070	4,760	8,370	6,260	4,520	6,650	12,500	13,100	10,700	5,870	4,180	3,830
2	3,960	4,640	7,920	6,000	4,400	7,210	14,100	12,000	10,900	5,740	4,290	3,830
3	4,070	4,520	7,920	5,360	4,400	7,490	15,500	11,800	11,100	5,870	4,180	3,940
4	3,850	4,640	7,770	5,000	4,520	7,490	15,500	12,000	10,900	5,870	4,400	3,940
5	3,740	5,120	7,350	4,640	4,520	7,350	16,200	12,000	10,900	5,870	4,640	3,830
6	3,850	5,240	6,930	4,290	4,520	7,920	16,700	12,500	10,500	5,740	4,640	3,830
7	4,290	5,480	6,260	4,070	4,520	8,520	17,700	12,700	10,300	5,480	4,520	3,830
8	4,180	5,360	5,610	3,960	4,640	9,000	19,100	12,700	10,500	5,240	4,180	3,720
9	4,070	5,000	5,360	4,070	4,640	9,700	21,200	13,100	10,300	5,120	3,960	3,720
10	4,180	5,240	5,360	4,290	4,880	10,100	24,800	14,300	10,100	5,870	3,850	3,610
11	4,400	5,120	5,360	4,760	5,000	10,500	28,400	16,900	9,520	5,610	3,740	3,610
12	4,180	5,360	5,360	4,880	5,000	10,700	30,300	20,000	9,160	5,360	3,410	3,720
13	4,180	5,740	5,360	4,880	4,880	10,100	30,300	21,500	8,840	5,610	3,410	3,830
14	4,520	6,130	5,360	4,760	4,880	9,340	29,300	21,500	8,840	5,120	3,520	3,610
15	4,290	6,390	5,240	4,880	4,640	9,000	27,600	21,500	8,520	5,120	3,410	3,610
16	4,400	6,260	5,360	5,000	4,520	8,840	25,200	20,600	8,520	5,240	3,630	3,500
17	4,290	6,520	5,480	5,000	4,640	8,680	23,600	19,100	8,370	5,120	3,850	3,390
18	4,180	6,650	5,480	5,120	4,640	8,370	21,500	18,000	8,370	4,880	3,520	3,390
19	4,290	6,790	5,610	5,000	4,760	8,220	19,700	17,500	8,370	4,760	3,610	3,390
20	4,290	7,070	5,610	5,000	4,640	7,920	18,600	16,900	8,520	4,640	3,610	3,390
21	4,180	7,350	5,610	5,120	4,640	7,770	17,200	16,200	8,370	4,640	3,500	3,290
22	4,070	7,490	5,480	5,120	4,640	7,630	16,700	15,200	8,070	4,400	3,390	3,390
23	4,180	7,770	5,610	5,120	4,520	7,490	16,400	14,300	7,630	4,180	3,390	3,290
24	4,290	7,920	5,870	5,120	4,520	7,210	15,700	14,100	7,770	4,070	3,500	3,290
25	4,400	8,520	6,000	5,120	4,520	7,070	14,500	13,600	7,630	4,070	3,830	3,290
26	4,400	9,000	5,870	4,880	4,640	7,210	13,600	12,500	7,070	4,290	3,830	3,290
27	4,180	9,160	5,740	5,000	5,000	7,490	13,400	11,800	6,930	4,070	3,940	3,500
28	4,400	9,000	5,870	4,880	5,740	7,630	13,100	11,100	6,390	3,960	3,940	3,290
29	4,400	9,700	6,000	4,640	6,390	7,770	13,100	10,700	6,130	4,520	3,940	3,190
30	4,290	9,160	6,130	4,640	------	8,680	13,600	10,500	5,740	4,290	3,940	3,190
31	4,640	------	6,260	4,640	------	10,700	------	10,500	------	4,180	4,050	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	4,640	3,740	4,220	0.094	0.11
November	9,900	4,520	6,600	.147	.16
December	8,370	5,240	6,050	.134	.15
January	6,260	3,960	4,890	.109	.13
February	6,390	4,400	4,750	.106	.11
March	10,700	6,650	8,380	.186	.21
April	30,300	12,500	19,200	.427	.48
May	21,500	10,500	14,800	.329	.38
June	11,100	5,740	8,830	.196	.22
July	5,870	3,960	4,990	.111	.13
August	4,640	3,390	3,860	.086	.10
September	3,940	3,190	3,550	.079	.09
The year	30,300	3,190	7,500	.167	2.27

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 (1912 adjustment).

DRAINAGE AREA.—59,200 square miles.

RECORDS AVAILABLE.—June 1928 to September 1932.

EXTREMES.—Maximum discharge, 62,600 second-feet Apr. 14, 15 (gage height, 9.76 feet); minimum, 7,000 second-feet Sept. 30 (gage height, —1.70 feet).

1928–32: Maximum discharge, 78,300 second-feet Apr. 3, 4, 1929 (gage height, 11.50 feet); minimum, 6,790 second-feet Sept. 19, 20, 1931 (gage height, —1.70 feet).

REMARKS.—Records excellent except those for period of ice effect, Jan. 1 to Mar. 28, which are fair. Flow partly regulated by reservoirs and power plants.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8,860	9,090	21,300	13,200	12,700	17,000	25,100	25,100	19,600	13,600	8,800	8,400
2	8,860	9,090	20,000	13,000	12,700	18,400	26,100	24,600	19,200	13,300	8,800	8,400
3	8,860	9,090	18,800	13,200	13,000	20,400	27,700	23,600	18,800	13,100	8,800	8,400
4	9,090	9,320	18,000	13,200	13,200	22,700	28,800	23,100	18,400	12,800	8,800	8,400
5	9,090	9,320	17,300	12,700	13,200	17,000	29,900	22,700	18,400	12,600	8,800	8,400
6	8,860	9,320	16,600	12,200	13,200	17,000	31,000	23,100	18,400	12,300	8,800	8,400
7	9,090	9,320	16,300	12,200	13,500	17,000	32,200	24,100	18,000	12,100	8,800	8,200
8	10,000	9,550	16,000	12,200	13,500	17,700	33,800	24,600	18,400	12,100	8,800	8,000
9	10,000	9,550	15,100	12,000	13,500	17,300	36,200	26,100	18,000	11,800	8,600	7,800
10	9,800	10,000	14,500	11,700	13,500	18,000	39,200	27,200	17,700	12,300	8,400	7,800
11	9,550	10,000	14,500	12,200	13,500	18,000	44,000	27,700	17,700	13,600	8,400	7,800
12	9,800	10,000	14,500	12,700	13,500	18,400	51,200	27,700	17,300	13,300	8,400	7,800
13	9,550	10,300	14,300	11,700	13,200	19,200	59,200	28,300	16,600	12,800	8,200	7,800
14	9,800	10,300	13,800	11,700	13,200	19,600	61,700	28,800	16,600	12,300	8,200	7,800
15	9,800	10,800	13,800	11,700	13,200	19,600	62,600	29,900	16,000	11,800	8,000	7,800
16	10,000	11,200	13,500	11,700	13,200	19,200	60,000	31,000	16,000	11,600	8,200	7,800
17	10,000	12,000	13,500	11,500	13,200	19,200	57,600	31,600	15,700	11,400	10,200	7,600
18	10,000	12,500	13,200	12,200	13,000	19,200	53,600	31,000	16,600	11,100	9,300	7,600
19	9,800	13,000	13,200	12,000	13,200	19,200	49,600	30,500	16,300	10,900	8,400	7,400
20	9,800	13,500	13,200	12,000	13,200	19,200	46,100	29,900	15,700	10,700	8,200	7,800
21	9,550	14,000	13,000	12,500	13,200	19,200	42,600	29,400	15,400	10,400	8,200	7,600
22	9,320	15,400	13,000	12,700	13,000	18,800	39,200	28,800	15,100	10,200	8,000	7,400
23	9,320	16,000	13,000	12,700	13,000	18,800	36,800	27,700	14,800	10,000	7,800	7,400
24	9,320	17,300	13,200	12,500	13,000	20,000	34,400	26,600	14,500	9,700	7,800	7,400
25	9,320	18,000	13,500	12,700	13,000	21,300	32,200	26,100	15,100	9,500	8,000	7,400
26	9,090	18,800	13,500	13,000	13,200	23,100	30,500	25,600	15,100	9,300	8,200	7,200
27	8,630	19,200	13,200	13,200	13,800	23,100	28,800	24,600	14,800	9,300	8,400	7,200
28	8,860	20,000	13,200	13,200	14,000	23,600	27,700	24,100	14,800	9,000	8,400	7,200
29	9,090	20,900	13,200	13,200	15,100	24,600	26,100	22,700	14,500	9,000	8,400	7,200
30	9,090	21,300	13,200	13,000	------	24,600	25,100	21,800	13,900	8,800	8,600	7,000
31	9,090	------	13,200	12,700	------	24,100	------	20,900	------	8,800	8,400	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	10,000	8,630	9,400	0.159	0.18
November	21,300	9,090	12,900	.218	.24
December	21,300	13,000	14,700	.248	.29
January	13,200	11,500	12,500	.211	.24
February	15,100	12,700	13,300	.225	.24
March	24,600	17,000	19,800	.334	.39
April	62,600	25,100	39,300	.664	.74
May	31,600	20,900	26,400	.446	.51
June	19,600	13,900	16,600	.280	.31
July	13,600	8,800	11,300	.191	.22
August	10,200	7,800	8,490	.143	.16
September	8,400	7,000	7,750	.131	.15
The year	62,600	7,000	16,000	.270	3.67

MISSISSIPPI RIVER AT LACROSSE, 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 626.43 feet above mean sea level (1912 adjustment).
DRAINAGE AREA.—62,800 square miles.
RECORDS AVAILABLE.—June 1929 to September 1932.
EXTREMES.—Maximum discharge during year, 64,800 second-feet Apr. 15, 16 (gage height, 9.5 feet); minimum, 8,040 second-feet Sept. 30 (gage height, −1.70 feet).
1929–32: Maximum discharge, that of Apr. 15, 16, 1932; minimum, 7,600 second-feet Sept. 14, 1931 (gage height, −1.90 feet).
Maximum stage known, 16.2 feet June 19, 1880.
REMARKS.—Records good except those for period of ice effect, Jan. 9 to Mar. 30, which are fair. Flow partly regulated by reservoirs and power plants.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9,800	10,200	26,600	15,100	14,500	19,800	35,400	28,800	23,000	16,300	9,800	9,400
2	10,000	10,200	25,500	15,100	14,500	21,500	37,100	27,700	22,000	15,700	10,000	9,400
3	10,000	10,400	24,000	15,400	14,500	21,500	38,200	27,700	21,000	15,700	10,200	9,200
4	10,000	10,200	22,500	15,100	14,500	22,000	38,200	26,600	20,600	15,100	10,000	9,200
5	9,800	10,400	21,000	14,800	14,500	26,000	38,200	25,500	20,600	14,800	10,000	9,200
6	9,800	10,400	20,200	14,800	14,800	23,500	38,200	27,100	20,200	14,500	9,800	9,200
7	12,000	10,600	19,000	14,500	15,100	22,000	39,400	28,200	20,200	14,200	9,800	9,000
8	14,000	10,600	18,200	14,000	15,100	22,000	39,900	29,300	20,600	14,000	9,600	8,800
9	13,200	10,600	17,500	14,000	15,400	22,000	42,200	32,100	22,000	13,700	9,600	8,800
10	12,200	10,800	17,200	13,500	15,700	22,000	48,000	38,200	21,000	14,000	9,400	8,800
11	11,700	11,000	17,500	13,000	15,700	22,000	53,300	39,400	20,200	14,200	9,200	8,610
12	11,500	11,200	18,200	13,500	16,300	22,000	55,300	38,800	19,400	16,300	9,200	8,610
13	11,200	11,200	17,800	13,200	16,300	22,500	57,500	37,100	18,600	16,900	9,200	8,800
14	11,000	11,200	16,900	13,500	15,700	23,000	62,200	35,400	18,600	16,300	9,000	8,800
15	11,200	11,700	16,300	13,500	15,400	23,500	64,800	34,300	18,200	15,100	9,000	8,800
16	11,200	12,700	15,400	13,200	15,700	23,500	64,800	34,300	17,500	13,700	8,800	8,610
17	11,500	13,700	15,400	13,000	15,700	23,000	63,500	34,300	17,500	13,200	11,700	8,610
18	11,500	15,100	15,700	13,500	15,400	22,500	61,000	34,900	18,600	12,700	11,200	8,420
19	11,500	16,600	15,700	13,500	15,700	22,500	56,400	34,300	19,800	12,500	11,000	8,420
20	11,200	17,500	15,700	13,500	15,700	22,000	53,300	33,800	19,400	12,200	10,000	8,610
21	11,000	19,800	15,700	13,700	15,700	22,000	48,800	33,200	18,200	11,700	9,400	9,000
22	10,800	21,500	15,400	13,700	15,400	21,500	45,800	32,100	17,500	11,500	9,200	8,800
23	10,600	23,000	15,400	14,000	15,400	22,000	43,300	31,000	16,900	11,200	9,000	8,610
24	10,600	24,500	15,400	14,000	15,100	22,000	39,900	30,400	16,300	10,800	8,800	8,420
25	10,400	26,600	15,400	14,200	15,400	24,000	37,700	29,900	16,000	10,600	8,800	8,420
26	10,400	26,600	15,400	14,500	15,400	25,000	35,400	29,300	16,900	10,400	9,600	8,420
27	10,400	27,700	15,700	14,500	15,700	26,600	33,800	28,200	17,800	10,400	9,600	8,420
28	10,200	28,800	15,700	14,500	16,300	27,700	32,100	27,100	18,200	10,400	9,800	8,230
29	10,200	28,800	15,400	14,500	17,200	29,300	31,000	26,600	17,500	10,000	9,600	8,230
30	10,200	27,700	15,100	14,500	------	34,300	29,900	26,000	16,600	9,800	9,600	8,040
31	10,200	------	15,100	14,500	------	34,300	------	24,000	------	9,800	9,600	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	14,000	9,800	10,900	0.174	0.20
November	28,800	10,200	16,400	.261	.29
December	26,600	15,100	17,600	.280	.32
January	15,400	13,000	14,100	.225	.26
February	17,200	14,500	15,400	.245	.26
March	34,300	19,800	23,800	.379	.44
April	64,800	29,900	45,500	.725	.81
May	39,400	24,000	31,100	.495	.57
June	23,000	16,000	19,000	.303	.34
July	16,900	9,800	13,200	.210	.24
August	11,700	8,800	9,660	.154	.18
September	9,400	8,040	8,730	.139	.16
The year	64,800	8,040	18,800	.299	4.07

MISSISSIPPI RIVER AT CLAYTON, IOWA

LOCATION.—Staff gage in sec. 35, T. 94 N., R. 3 W., a quarter of a mile upstream from railroad station in Clayton and 200 feet above junction of Wyalusing Slough with Mississippi River. Zero of gage is 602.63 feet above mean sea level (1912 adjustment).

DRAINAGE AREA.—79,200 square miles.

RECORDS AVAILABLE.—April 1930 to September 1932.

EXTREMES.—Maximum discharge during year, 95,200 second-feet Apr. 18 (gage height, 12.36 feet); minimum, 13,200 second-feet Sept. 30 (gage height, 0.06 foot).

1930–32: Maximum discharge, that of Apr. 18, 1932; minimum, 11,800 second-feet Sept. 14, 1931 (gage height, −0.29 foot).

REMARKS.—Records good except those for period of ice effect, Jan. 3–12, 24–27, 30, 31; Feb. 1–6, Mar. 6–16, which are fair. Discharge interpolated Dec. 16, Apr. 3.

Discharge, in second-feet 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	19,400	16,300	47,900	25,400	23,200	34,400	47,000	47,000	38,000	25,800	15,000	15,000
2	19,400	16,600	48,700	25,000	22,400	32,900	47,000	44,900	36,200	24,500	15,500	14,700
3	18,700	17,000	47,900	25,000	22,000	34,400	48,600	43,500	34,400	24,000	17,000	14,500
4	17,700	17,000	45,500	23,800	22,000	36,800	50,200	42,100	33,400	24,000	17,000	14,200
5	17,300	16,300	42,300	23,400	21,600	36,800	52,600	46,300	33,400	23,600	16,700	14,200
6	17,300	15,900	40,100	21,900	21,200	32,900	54,400	44,900	33,400	23,200	15,800	14,000
7	17,300	15,900	37,300	19,800	21,600	28,500	58,900	45,600	33,400	23,200	15,200	14,000
8	18,400	15,900	34,200	18,400	21,600	26,700	61,600	47,800	36,200	22,800	15,000	14,000
9	20,500	15,900	32,400	18,000	22,400	27,600	63,400	47,800	35,600	22,000	14,700	14,000
10	21,500	17,300	31,400	17,300	22,800	29,000	63,400	46,300	33,900	22,000	14,700	13,700
11	21,200	17,300	31,400	17,000	25,400	30,900	63,400	46,300	32,900	24,000	14,700	13,500
12	20,800	17,300	32,400	18,000	28,500	32,900	65,200	49,400	31,900	26,700	14,700	13,500
13	20,800	17,300	31,900	20,800	29,900	35,000	67,000	51,800	31,400	28,100	14,500	15,500
14	20,500	17,300	30,900	20,400	31,900	35,600	71,000	54,400	30,400	27,200	14,200	15,200
15	19,800	18,000	29,500	21,600	31,900	35,600	76,000	55,300	29,900	26,700	14,000	15,000
16	19,100	18,000	28,600	22,400	31,900	36,200	85,800	57,100	28,500	24,900	14,000	14,500
17	18,400	19,100	27,800	23,200	33,900	37,400	91,600	56,200	27,200	23,600	14,700	14,000
18	18,000	20,500	27,000	23,600	33,900	38,000	95,200	54,400	31,400	22,000	17,300	13,700
19	19,100	22,200	25,800	23,600	34,400	38,600	92,800	52,600	33,400	21,200	19,700	13,500
20	19,800	23,400	26,600	24,500	33,400	39,300	89,200	51,000	33,400	20,400	19,400	15,000
21	19,400	25,000	28,600	24,900	33,400	38,000	82,500	49,400	31,900	19,400	18,000	15,000
22	18,400	27,000	28,200	25,800	31,900	36,800	78,100	47,800	29,900	19,000	17,000	15,200
23	17,700	29,500	27,800	27,600	30,400	36,800	74,000	46,300	28,500	18,300	16,100	15,000
24	17,000	33,000	27,400	28,500	29,400	36,800	71,000	44,900	27,200	17,300	15,500	14,200
25	17,700	38,700	26,200	28,100	29,000	35,600	67,000	44,200	26,300	17,000	15,500	13,700
26	18,400	43,100	25,800	28,500	29,000	39,300	61,600	43,500	25,400	17,000	15,500	13,700
27	17,700	45,500	25,800	28,500	29,900	43,500	58,000	42,800	24,900	16,400	16,400	13,700
28	17,000	46,300	26,200	28,500	31,900	44,900	54,400	42,100	25,400	16,100	16,700	13,700
29	16,600	47,100	26,200	27,200	32,900	45,600	51,800	41,400	25,400	15,500	16,700	13,500
30	16,300	47,900	26,200	26,700	-------	46,300	49,400	40,000	25,800	15,200	16,100	13,200
31	16,300	-------	26,200	25,800	-------	47,000	-------	38,600	-------	15,000	15,500	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	21,500	16,300	18,600	0.235	0.27
November	47,900	15,900	24,600	.311	.35
December	48,700	25,800	32,100	.405	.47
January	28,500	17,000	23,700	.299	.34
February	34,400	21,200	28,100	.355	.38
March	47,000	26,700	36,500	.461	.53
April	95,200	47,000	66,400	.838	.94
May	57,100	38,600	47,300	.597	.69
June	38,000	24,900	31,000	.391	.44
July	28,100	15,000	21,500	.271	.31
August	19,700	14,000	15,900	.201	.23
September	15,500	13,200	14,200	.179	.20
The year	95,200	13,200	29,900	.378	5.15

CROW WING 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 1932.

EXTREMES.—Maximum discharge during period, 552 second-feet May 9 (gage height, 3.00 feet); minimum, 82 second-feet Aug. 15 (gage height, 2.4[illegible] feet). 1910–14, 1930–32: Maximum discharge, 2,000 second-feet June 9, 1914; minimum, 59 second-feet Aug. 25, 1930 (gage height, 2.52 feet); minimum gage height, 2.42 feet May 26, 1931, Aug. 15, 1932.

REMARKS.—Records fair. Stage-discharge relation affected by aquatic growth May 9 to Sept. 30. No record Oct. 1 to Apr. 8.

Discharge, in second-feet, 1932

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	------	379	424	165	127	160	16	448	440	365	155	123	135
2	------	372	432	155	135	160	17	416	440	351	151	123	131
3	------	358	424	155	139	160	18	400	440	344	170	115	131
3	------	358	416	155	123	160	19	372	424	358	185	112	135
5	------	386	400	160	119	160	20	365	408	379	185	112	135
6	------	416	400	155	115	155	21	358	379	379	170	115	135
7	------	440	416	155	115	151	22	344	365	365	160	139	135
8	------	543	456	155	109	151	23	330	372	344	143	139	139
9	464	552	448	155	106	151	24	304	351	291	135	147	139
10	448	516	432	147	106	151	25	298	351	247	160	190	139
11	456	489	432	139	97	151	26	317	358	217	155	235	143
12	464	472	432	147	91	160	27	310	456	200	139	235	143
13	448	448	464	155	88	165	28	330	440	195	135	229	147
14	448	448	432	155	85	151	29	344	432	185	131	205	147
15	448	456	393	155	82	151	30	379	432	180	127	185	143
							31	------	416	------	127	175	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
April 9–30	464	298	386	0.382	0.31
May	552	351	424	.420	.48
June	464	180	360	.356	.40
July	185	127	153	.151	.17
August	235	82	136	.135	.16
September	165	131	147	.146	.16

LITTLE SAND LAKE OUTLET NEAR DORSET, MINN.

LOCATION.—Staff gage in NE.¼ sec. 36, T. 141 N., R. 34 W., 2 miles northeast of Dorset.

RECORDS AVAILABLE.—July 1930 to September 1932.

EXTREMES.—Maximum discharge during year, 24 second-feet June 9, 10 (gage height, 5.30 feet); minimum, 3.4 second-feet Sept. 25, 29, 30 (gage height, 4.26 feet).

1930–32: Maximum discharge, 31 second-feet Aug. 6, 1931 (gage height, 5.55 feet); minimum, 0.1 second-foot Oct. 1, 3, 4, Nov. 7–12, 1930 (gage height, 3.74 feet).

REMARKS.—Records good. No record Oct. 1 to Mar. 31.

Discharge, in second-feet, 1932

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	10	15	22	16	7.6	5.3	16	16	21	21	11	4.7	4.0
2	10	15	22	15	7.9	4.9	17	16	21	21	11	4.8	3.9
3	10	15	22	15	7.6	5.1	18	16	20	21	12	4.5	3.8
4	11	14	22	15	7.3	5.1	19	16	20	20	11	4.4	3.7
5	12	16	22	16	6.9	4.9	20	16	20	20	11	4.2	3.6
6	14	18	22	16	6.5	4.7	21	16	19	19	11	4.0	3.8
7	14	18	23	16	6.0	4.6	22	16	19	19	10	3.9	3.8
8	14	22	23	15	5.8	4.5	23	15	18	18	10	4.0	3.7
9	14	23	24	14	5.6	4.2	24	15	19	18	9.3	4.7	3.6
10	16	23	23	14	5.3	4.0	25	14	19	19	10	4.5	3.4
11	17	22	22	13	5.1	4.2	26	15	19	18	9.5	4.7	3.8
12	17	22	22	13	4.9	4.7	27	14	22	17	9.1	4.5	3.8
13	16	22	22	12	4.7	4.6	28	14	22	16	9.1	4.7	3.6
14	17	22	22	12	4.5	4.5	29	14	22	16	8.8	5.2	3.4
15	16	22	22	11	4.2	4.5	30	15	21	17	8.5	5.6	3.4
							31	------	21	------	7.9	5.6	------

Month	Maximum	Minimum	Mean	Month	Maximum	Minimum	Mean
April	17	10	14.5	July	16	7.9	12.
May	23	14	19.7	August	7.9	3.9	5.29
June	24	16	20.5	September	5.3	3.4	4.17

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 1932.
EXTREMES.—Maximum discharge during period, 543 second-feet Apr. 10 (gage height, 4.00 feet); minimum, 4.0 second-feet Aug. 20 (gage height, 1.42 feet, affected by aquatic growth), minimum gage height, 1.32 feet Sept. 26–29.
1929–32: Maximum discharge, 1,330 second-feet May 30, 1931 (gage height, 5.90 feet); minimum, 3 second-feet Sept. 19–21, 1930 (gage height, 1.20 feet).
REMARKS.—Records good except those for period affected by aquatic growth, July 2 to Sept. 16, which are fair. No records Oct. 1 to Mar. 31.

Discharge, in second-feet, 1932

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	272	62	61	34	7.2	7.2	16	198	240	47	13	4.5	17
2	209	60	57	30	7.7	7.7	17	167	198	53	13	4.5	16
3	220	67	53	36	7.2	7.7	18	147	167	53	11	4.2	16
4	230	66	49	35	5.9	8.2	19	127	137	49	10	4.2	15
5	147	64	47	30	5.0	9.5	20	109	118	49	9.5	4.0	13
6	167	74	43	27	4.5	9.0	21	102	99	52	8.2	4.2	13
7	188	78	43	26	4.5	8.6	22	92	86	51	8.6	5.4	12
8	316	118	40	22	5.4	8.2	23	90	76	44	8.6	5.4	12
9	515	188	32	20	5.4	9.0	24	86	67	41	7.2	5.0	12
10	543	272	29	19	4.8	11	25	78	61	36	7.7	5.0	12
11	488	360	38	20	4.8	13	26	74	62	36	7.7	5.0	11
12	409	384	41	18	5.4	15	27	67	57	33	8.6	5.0	11
13	360	360	43	15	5.4	18	28	62	51	32	8.6	6.4	11
14	294	338	40	15	5.0	18	29	67	47	30	7.7	9.0	11
15	251	283	42	14	5.0	15	30	66	52	33	6.8	8.6	12
							31	------	57	------	7.2	7.2	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
April	543	62	205	0.607	0.68
May	384	47	140	.414	.48
June	61	29	43.3	.128	.14
July	36	6.8	16.3	.048	.06
August	9.0	4.0	5.51	.016	.02
September	18	7.2	12.0	.036	.04

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 1932.

EXTREMES.—Maximum discharge during period, 724 second-feet Apr. 5 (gage height, 3.91 feet); minimum, 5 second-feet July 12 (gage height, 2.44 feet); minimum gage height, 1.53 feet Apr. 24.

1909–13, 1929–32: Maximum discharge, 1,620 second-feet May 11, 1912 (gage height not referred to present datum); minimum, 4 second-feet Nov. 22, 1930 (gage height, 1.24 feet).

REMARKS.—Records fair. Stage-discharge relation affected by aquatic growth May 27 to Sept. 30. Discharge interpolated July 31. Diurnal fluctuation caused by power plants above. No record Oct. 1 to Mar. 31.

Discharge, in second-feet, 1932

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr	May	June	July	Aug.	Sept.
1	240	92	112	57	13	35	16	188	53	143	141	23	17
2	350	47	43	55	40	43	17	81	132	164	122	18	26
3	316	134	30	67	30	48	18	44	92	139	35	28	20
4	164	79	23	43	34	42	19	34	82	126	78	34	17
5	504	47	20	34	16	35	20	32	96	54	87	35	21
6	284	213	24	46	17	27	21	42	94	72	62	22	22
7	213	99	39	61	18	21	22	37	58	137	53	33	19
8	213	122	70	53	15	28	23	39	39	101	57	37	23
9	226	101	137	38	16	30	24	27	74	86	48	26	27
10	103	188	128	57	15	28	25	33	176	78	42	30	16
11	54	200	124	26	18	34	26	176	164	57	14	50	15
12	148	213	145	6	22	30	27	176	118	24	33	42	13
13	226	200	61	62	24	27	28	152	112	27	67	44	13
14	213	164	213	118	26	19	29	152	110	51	15	51	11
15	284	89	152	152	26	19	30	55	40	39	15	38	11
							31	------	35	------	14	33	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
April	504	27	160	0.196	0.22
May	213	35	112	.137	.16
June	213	20	87.3	.107	.12
July	152	6	56.7	.069	.08
August	51	13	28.2	.035	.04
September	48	11	24.6	.030	.03

ELK RIVER NEAR BIG LAKE, MINN.

LOCATION.—Chain gage 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. Gage at same site and datum as used 1911–17.

DRAINAGE AREA.—615 square miles.

RECORDS AVAILABLE.—April 1911 to September 1917; April 1931 to September 1932.

EXTREMES.—Maximum discharge during period, 436 second-feet Apr. 11 (gage height, 1.96 feet); minimum, 18 second-feet Sept. 11 (gage height, 0.51 foot); minimum gage height, 0.44 foot Sept. 28.

1911–17, 1931–32: Maximum discharge, 5,100 second-feet May 7, 1912 (gage height, 10 feet); minimum, 11 second-feet July 30, 31, 1931.

REMARKS.—Records good except those for period affected by aquatic growth, June 21 to Sept. 30, which are fair. No record Oct. 1 to Mar. 31.

Discharge, in second-feet, 1932

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	144	116	108	40	19	27	16	322	226	88	70	26	24
2	142	114	104	38	22	25	17	305	212	83	64	34	23
3	133	114	100	63	30	24	18	272	185	77	59	28	23
4	133	116	94	75	32	23	19	212	172	72	57	25	25
5	151	120	88	73	28	23	20	185	160	73	54	24	25
6	226	137	81	66	27	22	21	172	146	81	52	24	25
7	212	144	77	59	27	20	22	160	135	77	50	23	24
8	226	198	77	54	26	21	23	153	126	70	44	23	25
9	256	226	77	50	25	19	24	144	122	63	39	24	25
10	340	226	77	61	25	18	25	139	124	54	33	24	24
11	436	241	73	59	24	18	26	137	120	56	34	25	24
12	416	256	77	50	23	20	27	131	116	56	32	25	24
13	377	256	81	56	23	26	28	124	112	54	27	26	23
14	358	241	81	72	22	27	29	120	108	49	24	38	25
15	340	226	88	77	22	25	30	120	102	44	21	33	26
							31	------	100	------	20	28	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
April	436	120	220	0.358	0.40
May	256	100	161	.262	.30
June	108	44	76.0	.124	.14
July	77	20	50.7	.082	.09
August	38	19	26.0	.042	.05
September	27	18	23.4	.038	.04

CROW RIVER AT ROCKFORD, MINN.

LOCATION.—Chain gage in sec. 29, T. 119 N., R. 24 W., at Rockford, 1 mile below junction of North and South Forks. Gage used since April 1929 is at practically same site but at different datum from gage used 1909–17.

DRAINAGE AREA.—2,520 square miles.

RECORDS AVAILABLE.—June 1909 to September 1917; April 1929 to September 1932.

EXTREMES.—Maximum discharge during period, 2,170 second-feet Apr. 8 (gage height, 4.20 feet); minimum, 23 second-feet Aug. 16, 24, Sept. 29, 30 (gage height, 0.76 foot).

1909–17, 1929–32: Maximum discharge, 10,600 second-feet Apr. 2, 3, 1916; minimum, 8 second-feet Sept. 10–12, 1931 (gage height, 0.62 foot).

REMARKS.—Records good. Stage-discharge relation affected by aquatic growth June 21 to Aug. 17. No record Oct. 1 to Mar. 31.

Discharge, in second-feet, 1932

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	752	147	98	112	93	65	16	491	254	434	142	28	30
2	781	137	98	98	93	60	17	406	210	434	137	39	30
3	752	127	98	147	74	60	18	377	199	366	147	28	30
4	693	127	98	178	60	57	19	321	178	299	157	42	30
5	635	127	98	189	60	48	20	287	168	265	132	42	30
6	1,280	127	98	184	60	48	21	254	168	315	117	42	30
7	1,850	157	98	178	54	39	22	238	168	315	117	42	30
8	2,170	243	147	168	54	33	23	199	157	304	157	33	26
9	2,090	377	238	168	54	30	24	189	157	248	199	45	26
10	1,770	491	299	168	54	30	25	189	157	216	168	93	26
11	1,420	462	310	147	51	30	26	184	157	189	122	98	26
12	1,140	434	248	117	48	30	27	157	157	162	107	98	26
13	900	377	232	117	36	30	28	157	147	142	69	102	26
14	781	287	271	132	36	30	29	157	122	132	93	98	25
15	664	287	406	142	28	30	30	157	98	127	93	98	23
							31		98		93	79	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
April	2,170	157	715	0.284	0.32
May	491	98	210	.083	.10
June	434	98	226	.090	.10
July	189	69	139	.055	.06
August	102	28	60.1	.024	.03
September	65	23	34.5	.014	.02

RUM RIVER NEAR ST. FRANCIS, MINN.

LOCATION.—Chain gage on bridge between secs. 19 and 30, T. 33 N., R. 24 W., 5 miles south of St. Francis and 15¾ miles above junction with Mississippi River.

DRAINAGE AREA.—1,360 square miles.

RECORDS AVAILABLE.—May 1929 to September 1932.

EXTREMES.—Maximum discharge during period, 1,420 second-feet Apr. 12 (gage height, 4.53 feet); minimum, 46 second-feet July 4, 5 (gage height, 2.10 feet).

1929–32: Maximum discharge, 3,760 second-feet May 18, 1930 (gage height, 6.53 feet); minimum, that of July 4, 5, 1932.

REMARKS.—Records fair except those for September, which are poor. No record Oct. 1 to Mar. 31. Discharge interpolated Sept. 4–7; discharge estimated Sept. 16–31.

Discharge, in second-feet, 1932

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept
1	303	240	232	94	50	66	16	568	766	144	75	50	
2	294	248	228	105	48	68	17	508	665	141	75	50	
3	294	244	220	105	48	68	18	452	600	135	75	50	
4	303	244	212	108	46	67	19	399	538	135	75	50	
5	326	244	197	108	46	67	20	349	480	135	75	50	
6	452	244	190	105	48	67	21	349	426	135	75	50	
7	600	256	182	94	48	67	22	326	374	122	71	50	
8	766	290	172	94	48	66	23	303	349	111	71	54	66
9	982	326	168	94	48	66	24	286	326	105	66	56	
10	1,140	399	164	94	50	66	25	273	294	102	64	58	
11	1,320	480	161	92	50	66	26	273	282	100	62	62	
12	1,420	600	161	82	48	66	27	269	260	100	62	66	
13	1,140	872	154	80	48	66	28	260	244	97	58	66	
14	732	1,060	150	78	48	66	29	248	244	94	56	66	
15	665	1,060	147	75	50	66	30	240	236	94	54	66	
							31	------	236	------	50	66	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
April	1,420	240	528	0.388	0.43
May	1,060	236	423	.311	.36
June	232	94	150	.110	.12
July	108	50	79.7	.059	.07
August	66	46	52.7	.039	.04
September	----------	----------	66.3	.049	.05

MINNESOTA RIVER NEAR MONTEVIDEO, MINN.

LOCATION.—Chain gage installed Feb. 5, 1932, in sec. 19, T. 117 N., R. 40 W., at highway bridge 200 feet below mouth of Chippewa River, 1 mile south of Montevideo. Prior to Feb. 5, 1932, chain gage 300 feet downstream at same datum was used. Zero of gage is 910.87 feet above mean sea level (1912 adjustment).

DRAINAGE AREA.—6,300 square miles.

RECORDS AVAILABLE.—July 1909 to September 1932.

EXTREMES.—Maximum discharge during year, 765 second-feet Mar. 1 (gage height, 7.45 feet); minimum, 0.9 second-foot Sept. 27 (gage height, 0.89 foot).

1909–32: Maximum discharge, about 22,000 second-feet June 25, 1919 (gage height, about 18.85 feet); minimum, 0.5 second-foot Sept. 17, 18, 1931 (gage height, 0.94 foot).

REMARKS.—Records good except those for period of ice effect, Nov. 24 to Mar. 29, which are fair.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.6	12	20	37	15	765	258	239	40	53	5.0	2.3
2	1.0	11	15	39	14	575	258	230	44	56	4.4	2.0
3	1.0	6.0	16	31	19	550	258	188	44	52	9.0	1.0
4	2.2	10	14	29	17	525	278	188	46	46	7.0	1.4
5	2.8	10	13	31	16	340	298	152	43	41	4.4	1.2
6	2.8	12	13	31	15	278	298	188	41	41	3.2	1.2
7	1.9	12	17	30	15	239	407	204	36	36	4.4	1.4
8	2.5	10	15	29	16	212	384	239	36	41	8.0	1.4
9	5.0	10	17	29	15	188	407	258	40	46	11	1.4
10	3.1	10	15	31	15	159	430	221	54	36	7.5	1.2
11	1.6	12	17	26	14	140	384	221	50	32	2.9	1.3
12	1.6	13	15	28	16	134	384	212	48	30	2.9	1.9
13	5.5	13	16	29	15	134	362	212	86	22	2.6	1.9
14	4.0	14	18	23	15	128	319	230	134	22	2.0	1.9
15	4.0	18	18	23	14	128	298	212	118	20	2.6	3.2
16	4.0	13	20	25	14	123	258	188	106	12	3.8	2.3
17	6.0	16	17	24	30	134	278	173	91	33	2.0	2.0
18	6.0	16	22	22	33	128	258	146	68	21	1.4	4.4
19	5.0	14	22	22	33	134	258	123	72	11	1.8	1.4
20	8.5	28	21	25	33	128	239	123	76	4.1	1.8	7.0
21	2.2	28	22	26	30	123	221	134	81	8.5	1.8	1.0
22	3.4	39	22	28	24	128	204	101	58	4.4	1.5	1.0
23	2.8	34	26	26	23	123	188	68	44	3.8	1.2	1.0
24	2.2	32	25	25	22	123	180	54	42	3.8	6.0	1.4
25	2.2	21	23	18	61	134	221	68	40	14	9.0	1.4
26	7.0	29	26	17	63	134	258	76	36	8.5	11	1.2
27	7.0	28	29	23	430	140	230	72	33	10	6.0	.9
28	7.0	22	33	23	626	146	212	68	29	14	10	1.3
29	4.0	21	33	23	708	159	221	61	43	5.0	8.5	1.6
30	6.0	22	34	19	-------	166	221	56	49	3.8	6.0	1.4
31	7.5	-------	39	15	-------	196	-------	52	-------	5.0	3.2	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	8.5	1.0	3.92	0.00062	0.0007
November	39	6.0	17.9	.0028	.003
December	39	13	21.1	.0033	.004
January	39	15	26.0	.0041	.005
February	708	14	81.4	.013	.01
March	765	123	217	.034	.04
April	430	180	282	.045	.05
May	258	52	153	.024	.03
June	134	29	57.6	.0091	.01
July	56	3.8	23.7	.0038	.004
August	11	1.2	4.90	.00078	.0009
September	7.0	.9	1.80	.00029	.0003
The year	765	.9	74.0	.012	.16

MINNESOTA RIVER AT MANKATO, MINN.

LOCATION.—Water-stage recorder in sec. 7, T. 108 N., R. 26 W., at Main Street highway bridge in Mankato, 2 miles below mouth of Blue Earth River. Zero of gage is 748.82 feet above mean sea level (1912 adjustment).

DRAINAGE AREA.—14,600 square miles.

RECORDS AVAILABLE.—March 1922 to September 1932 at present site; May 1903 to October 1921 about 1,000 feet below mouth of Blue Earth River.

EXTREMES.—Maximum discharge during year, 8,310 second-feet Mar. 30 (gage height, 12.88 feet, affected by ice); minimum, 57 second-feet Oct. 3 (gage height, 2.20 feet).

1903–32: Maximum discharge, 43,800 second-feet June 26, 1908 (gage height at old site, 21.2 feet); minimum, 40 second-feet Sept. 13, 1931 (gage height, 2.02 feet).

Maximum known stage, about 27 feet at old site in 1881 (discharge, about 65,000 second-feet).

REMARKS.—Records good except those for periods of ice effect, Jan. 3 to Apr. 10, which are fair. Discharge estimated Mar. 6–8.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	59	82	298	231	201	2,800	6,080	2,000	1,500	890	204	213
2	58	80	320	169	285	4,120	5,480	1,800	1,650	852	317	224
3	58	80	298	221	268	4,560	4,780	1,750	1,750	717	265	212
4	62	75	238	183	253	5,600	4,450	1,550	1,750	745	192	253
5	59	78	207	335	214	6,080	4,450	1,600	1,360	745	230	110
6	102	75	268	488	158	5,500	4,340	3,900	1,320	610	215	127
7	593	76	192	463	218	5,000	5,960	4,560	1,120	569	182	167
8	231	75	152	381	147	4,200	6,560	4,560	1,750	532	144	132
9	163	82	207	398	224	3,700	6,440	3,680	1,410	574	161	124
10	130	89	221	556	204	3,200	5,720	3,570	1,600	890	151	124
11	108	91	228	298	228	2,800	5,000	3,130	1,800	970	148	108
12	100	119	204	355	221	2,500	4,120	2,800	2,000	1,060	147	113
13	108	98	231	261	218	2,300	3,900	2,600	2,050	1,180	148	139
14	106	137	174	268	204	2,000	3,130	2,200	2,100	1,230	131	137
15	98	192	174	325	140	1,800	3,130	2,000	2,250	1,060	116	135
16	91	123	174	345	218	1,800	2,800	1,800	2,800	760	169	116
17	84	147	192	355	231	1,800	2,500	1,650	2,800	618	167	105
18	82	130	174	249	235	1,800	2,300	1,500	2,600	541	172	113
19	80	158	183	345	224	1,800	2,100	1,280	2,100	480	311	370
20	74	163	211	307	238	1,900	2,050	1,180	1,850	416	340	125
21	72	253	150	311	246	2,000	1,750	1,110	1,900	371	288	122
22	70	265	183	355	147	2,100	1,750	1,000	1,800	324	235	112
23	70	457	238	365	221	2,100	1,550	922	1,360	257	177	116
24	70	571	246	320	221	2,200	1,750	938	1,460	320	187	89
25	69	345	228	195	231	2,200	2,300	1,040	1,180	258	376	86
26	69	307	189	242	257	2,600	2,300	1,040	1,140	446	261	90
27	78	289	261	242	272	2,700	2,400	1,650	1,140	571	164	118
28	76	311	214	242	398	3,130	2,300	1,900	978	571	158	109
29	82	398	289	238	1,140	4,230	2,200	1,750	1,110	368	227	83
30	91	238	320	268	-------	6,920	2,100	1,550	922	347	210	86
31	88	-------	350	285	-------	6,800	-------	1,550	-------	302	209	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	593	58	106	0.0073	0.008
November	571	75	186	.013	.01
December	350	150	226	.015	.02
January	556	169	310	.021	.02
February	1,140	140	257	.018	.02
March	6,920	1,800	3,300	.226	.26
April	6,560	1,550	3,520	.241	.27
May	4,560	922	2,050	.140	.16
June	2,800	922	1,680	.115	.13
July	1,230	257	631	.043	.05
August	376	116	207	.014	.02
September	370	83	139	.0095	.01
The year	6,920	58	1,050	.072	.98

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.

DRAINAGE AREA.—420 square miles (revised).

RECORDS AVAILABLE.—March 1931 to September 1932; September 1909 to November 1912 at site 2 miles downstream.

EXTREMES.—Maximum discharge during period, 271 second-feet Mar. 1 (gage heigh, 5.7 feet, affected by ice); minimum, 0.2 second-foot Sept. 2 (gage height, 1.62 feet).

1931–32: Maximum discharge, 1,320 second-feet May 2? (gage height, 7.1 feet); no flow Sept. 13–15, 1931.

REMARKS.—Records good except those for period of ice effect, Feb. 25 to Apr. 2, which are poor. Discharge interpolated Feb. 28, Mar. 13–17, 19–23, 25, 27. No record Oct. 1 to Feb. 24.

Discharge, in second-feet, 1932

Day	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-------	219	23	26	17	1.6	0.4	0.3
2	-------	112	25	22	14	1.3	5.1	.2
3	-------	68	25	19	11	3.0	1.0	.2
4	-------	37	25	16	9.1	4.0	.6	.2
5	-------	31	26	15	7.8	4.5	.6	.2
6	-------	20	37	14	7.5	3.7	.5	.2
7	-------	18	51	15	6.7	3.5	.4	.2
8	-------	16	84	18	6.1	3.5	.4	.3
9	-------	8	51	19	6.4	2.5	.3	.3
10	-------	6	44	24	4.5	1.6	.3	.4
11	-------	6	38	26	4.8	1.6	.4	.4
12	-------	6	35	20	7.5	1.3	.4	1.3
13	-------	6	32	17	7.5	1.0	.4	.7
14	-------	5	28	14	13	2.5	.4	.5
15	-------	5	26	12	14	2.5	.4	.4
16	-------	5	23	9.8	12	1.6	.4	.4
17	-------	4	22	8.5	11	1.3	.4	.4
18	-------	4	18	8.1	9.8	.7	.4	.4
19	-------	4	17	7.5	8.8	.7	.4	.4
20	-------	4	16	5.6	12	.6	.4	.4
21	-------	4	13	7.2	9.8	.6	.4	.4
22	-------	4	14	5.9	8.8	.5	.4	.4
23	-------	4	13	5.6	7.5	.4	.4	.4
24	-------	4	15	4.8	6.9	.4	.3	.5
25	120	5	19	5.9	5.3	.4	.3	.4
26	208	6	29	6.9	5.1	.4	.2	.4
27	165	7	38	7.8	4.0	.4	.3	.4
28	186	8	42	7.5	3.7	.4	.6	.4
29	208	13	39	8.8	3.0	.4	.6	.5
30	-------	14	35	18	3.0	.4	.7	.4
31	-------	17	-------	17	-------	.4	.7	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
February 25–29	208	120	177	0.421	0.78
March	219	4	21.6	.051	.06
April	84	13	30.1	.072	.08
May	26	4.8	13.3	.032	.04
June	17	3.0	8.25	.020	.02
July	4.5	.4	1.54	.0037	.004
August	5.1	.2	.60	.0014	.002
September	1.3	.2	.40	.00095	.001

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 AREA.—950 square miles.

RECORDS AVAILABLE.—March 1931 to September 1932.

EXTREMES.—Maximum discharge during period, 212 second-feet Feb. 27 (gage height, 3.66 feet, affected by ice); minimum, 4.0 second-feet July 31 (gage height, 0.58 foot); minimum stage, 0.47 foot Sept. 26.

1931–32: Maximum discharge, that of Feb. 29, 1932; minimum, 2.2 second-feet Sept. 11–15, 1931 (gage height, 0.50 foot); minimum stage, that of Sept. 26, 1932.

REMARKS.—Records fair except those for period of ice effect, which are poor. Stage-discharge relation affected by ice Feb. 29 to Apr. 3 and by aquatic growth May 9 to Sept. 30. No record Oct. 1 to Feb. 28. Discharge estimated Mar. 7–14, June 24, 25, 27, July 6–10, 12.

Discharge, in second-feet, 1932

Day	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		98	50	20	43	5.5	4.4	8.7
2		100	48	20	48	5.5	6.4	8.7
3		44	42	17	45	7.9	8.7	7.9
4		43	44	17	50	7.5	6.1	7.5
5		32	53	17	43	7.9	5.5	7.5
6		22	67	17	35	7.4	5.5	7.1
7		18	72	22	22	7.0	5.2	6.1
8		14	56	26	19	6.6	5.8	5.8
9		10	48	31	16	6.1	6.1	5.8
10		9	51	28	10	5.6	5.8	5.8
11		8	47	31	7.9	5.2	4.9	6.4
12		7	44	29	6.4	7.6	5.2	7.1
13		6	40	29	6.7	10	5.2	7.9
14		6	38	28	8.3	16	5.5	6.7
15		6	46	26	7.5	14	5.5	6.4
16		4	52	27	6.4	9.5	6.1	6.1
17		5	39	26	6.4	6.7	6.4	6.1
18		4	38	26	6.1	10	5.8	6.1
19		4	36	32	6.7	9.1	5.5	6.4
20		6	34	32	9.1	10	4.9	5.8
21		6	30	35	8.3	7.5	5.2	5.8
22		6	28	34	11	6.1	5.5	5.8
23		6	26	36	7.9	5.8	5.2	6.1
24		7	31	35	7.3	6.1	5.8	6.1
25		10	40	34	6.7	6.7	6.7	5.8
26		11	35	33	6.1	9.5	6.7	5.5
27		10	29	34	7.0	6.7	6.1	6.1
28		14	25	42	7.9	4.9	10	6.1
29	195	16	24	44	9.5	5.2	12	6.4
30		20	21	46	6.7	4.6	12	6.4
31		33		44		4.2	10	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
March	100	4	18.9	0.020	0.02
April	72	21	41.1	.043	.05
May	46	17	29.6	.031	.04
June	50	6.1	16.0	.017	.02
July	16	4.2	7.50	.0079	.009
August	12	4.4	6.44	.0068	.008
September	8.7	5.5	6.53	.0069	.008

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 1932. April 1910 to November 1914 at station 2 miles downstream.

EXTREMES.—Maximum discharge during year, 830 second-feet Mar. 1 (gage height, 4.17 feet); no flow for long periods.

1910–14, 1931–32: Maximum discharge, 1,550 second-feet May 5, 6, 1912 (gage height, 7.6 feet at old station); no flow for various periods.

REMARKS.—Records fair except those for period of ice effect, Mar. 5–30, which are poor. Discharge estimated Feb. 26, 27, Mar. 6–14, 16.

Discharge, in second-feet, 1931–32

Day	Feb.	Mar.	Apr.	May	June	July	Day	Feb.	Mar.	Apr.	May	June	July
1	0	750	76	27	5.0	3.9	16	0	14	37	19	31	0.7
2	0	489	71	25	4.8	3.2	17	0	13	35	16	28	.6
3	0	302	69	23	5.3	2.8	18	0	18	34	15	24	.6
4	0	186	69	24	4.6	3.5	19	0	17	31	14	19	.5
5	0	69	62	25	4.3	3.9	20	0	18	27	12	16	.4
6	0	50	50	27	4.1	4.3	21	0	19	25	9.2	13	.3
7	0	30	53	27	3.9	3.9	22	0	20	22	8.0	12	.1
8	0	25	51	26	3.9	3.2	23	0	17	19	7.1	10	0
9	0	20	47	26	3.7	2.6	24	0	20	17	6.5	8.4	0
10	0	18	44	25	4.1	2.2	25	0	22	15	6.5	7.7	0
11	0	18	41	23	3.9	1.7	26	20	26	16	5.9	7.1	0
12	0	18	40	22	238	1.4	27	80	28	17	5.6	5.9	0
13	0	17	40	22	168	.9	28	250	38	19	5.3	4.8	0
14	0	17	39	21	58	.8	29	597	49	22	5.2	4.3	0
15	0	16	38	19	35	.7	30	------	51	24	5.0	3.9	0
							31	------	67	------	5.3	------	0

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
February	597	0	32.7	0.031	0.03
March	750	13	79.4	.076	.09
April	76	15	38.3	.037	.04
May	27	5.0	16.4	.016	.02
June	238	3.7	24.7	.024	.03
July	4.3	0	1.36	.0013	.002
The year	750	0	16.0	.015	.21

NOTE.—No flow during months omitted.

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. Gage is at same site as gage used 1910–17 but at different datum.

DRAINAGE AREA.—1,850 square miles.

RECORDS AVAILABLE.—April 1910 to September 1917; March 1931 to September 1932.

EXTREMES.—Maximum discharge during year, 223 second-feet Feb. 29 (gage height, 6.85 feet, affected by ice); minimum, 0.7 second-foot Aug. 7–10, Sept. 8 (gage height, 2.42 feet).

1910–17, 1931–32: Maximum discharge, 9,600 second-feet Apr. 4, 1917 (gage height, 17.86 feet, old datum); minimum, that of 1932.

REMARKS.—Records good April 5 to September, fair October to December, and poor January to March. Stage-discharge relation affected by ice or debris Oct. 11 to Nov. 21, Nov. 24 to Dec. 31, Feb. 29 to Apr. 2. Discharge estimated Jan. 1 to Feb. 28.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.5	12	10			134	48	55	27	9.3	0.7	1.3
2	5.0	12	10			59	55	51	25	7.9	1.5	1.1
3	4.7	11	10			68	64	48	26	12	1.9	1.1
4	8.1	11	8.4			59	104	51	25	19	1.9	.9
5	7.4	12	8.1			48	68	51	25	21	1.3	.9
6	6.5	12	6.3		2	35	149	48	24	12	1.1	1.1
7	7.1	11	5.0			21	172	48	20	14	.7	.9
8	7.1	11	5.0	5		17	134	59	23	14	.7	.7
9	6.3	11	5.0			14	119	64	21	15	.7	.9
10	6.3	12	4.2			11	134	73	25	15	.7	1.1
11	6.5	12	4.2			12	119	78	21	12	.9	1.1
12	6.8	13	4.0		2.2	13	112	78	36	12	.9	4.7
13	8.1	12	3.8			12	104	78	44	10	1.1	3.5
14	9.4	12	3.6			11	97	73	51	10	1.3	2.7
15	10	12	3.2			12	90	68	48	9.3	1.3	1.9
16	9.7	12	3.3		2	13	78	68	44	7.2	1.5	1.3
17	9.4	12	3.6			12	78	59	41	6.5	3.1	1.3
18	9.0	12	4.5			10	73	51	33	6.5	2.3	1.5
19	8.1	12	5.8			13	68	48	25	6.5	1.9	1.3
20	7.4	16	6.3			14	64	43	32	5.9	1.1	1.5
21	7.1	25	8.4			12	59	41	26	4.7	1.5	1.5
22	7.8	24	9.0			9.3	59	38	21	3.5	1.1	1.5
23	8.1	27	9.7		3	7.2	55	36	19	2.7	1.1	1.9
24	8.1	29	12	3		7.9	59	35	18	2.3	1.9	1.5
25	8.1	22	13			13	68	32	16	2.7	4.1	1.1
26	8.1	18	8.1		50	25	68	30	16	2.3	3.1	1.3
27	9.4	16	8.7		100	27	59	30	14	2.3	2.3	1.3
28	11	14	14		150	33	59	26	12	1.5	4.1	1.9
29	12	12	14		223	33	59	26	13	1.1	5.3	1.9
30	13	12	14		------	32	59	26	12	1.1	4.1	1.5
31	13	------	14		------	33	------	26	------	.9	2.3	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	13	4.7	8.20	0.0044	0.005
November	29	11	14.6	.0079	.009
December	14	3.2	7.72	.0042	.005
January	------	------	4.0	.0022	.003
February	223	------	19.9	.011	.01
March	134	7.2	26.5	.014	.02
April	172	48	84.5	.046	.05
May	78	26	49.6	.027	.03
June	51	12	26.1	.014	.02
July	21	.9	8.07	.0044	.005
August	5.3	.7	1.85	.0010	.001
September	4.7	.7	1.54	.00083	.0009
The year	223	.7	20.9	.011	.16

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 1932.

EXTREMES.—Maximum discharge during period, 476 second-feet Mar. 1 (gage height, 4.20 feet); minimum, 0.1 second-foot Sept. 7, 16 (gage height, 1.90 feet).

1931–32: Maximum discharge, that of Mar. 1, 1932; no flow July 26 to Aug. 27, 1930 (gage height, 1.89 feet).

REMARKS.—Records fair. Stage-discharge relation affected by ice Mar. 6–27. Discharge interpolated June 30, July 1. No record Oct. 1 to Feb. 29.

Discharge, in second-feet, 1932

Day	Mar.	Apr.	May	June	July	Aug.	Sept.
1	476	53	24	9.8	13	4.3	1.3
2	360	56	24	9.8	11	3.5	.5
3	254	49	23	10	22	3.5	.8
4	105	29	20	8.0	24	3.5	1.3
5	55	41	19	9.2	19	1.1	1.3
6	48	43	19	8.0	13	1.1	.2
7	44	40	18	6.2	9.8	.8	.1
8	38	37	17	7.4	9.8	1.3	1.2
9	29	36	19	8.0	21	1.3	.7
10	32	34	30	6.2	33	.3	.7
11	26	32	44	9.2	24	.6	.9
12	25	30	35	8.0	16	1.1	4.3
13	22	27	32	30	9.2	1.3	1.7
14	19	26	30	30	8.0	1.1	3.2
15	20	32	24	76	6.8	1.1	1.2
16	19	30	24	58	4.6	2.0	.1
17	21	24	21	46	3.9	1.2	1.1
18	21	22	17	33	2.4	.5	4.3
19	21	21	15	25	3.2	.8	2.0
20	21	20	14	25	2.0	1.3	2.0
21	21	18	15	22	9.8	1.1	1.3
22	21	18	15	22	4.6	.6	2.8
23	21	16	10	19	1.3	.8	2.8
24	22	18	11	25	1.3	.9	2.0
25	22	18	9.2	25	2.4	4.3	3.2
26	22	19	11	23	3.5	1.7	3.2
27	26	19	11	15	3.5	.8	3.2
28	27	24	8.0	12	5.0	.8	2.8
29	29	26	8.6	18	5.6	2.8	2.8
30	30	26	8.0	16	5.0	3.2	1.7
31	44	-------	10	-------	5.0	1.1	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
March	476	19	62.6	0.116	0.13
April	56	16	29.5	.055	.06
May	44	8.0	18.9	.035	.04
June	76	6.2	20.7	.038	.04
July	33	1.3	9.76	.018	.02
August	4.3	.3	1.61	.0030	.003
September	4.3	.1	1.82	.0034	.004

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. Zero of present gage is 0.22 foot higher than zero of gage used 1909–14.

DRAINAGE AREA.—703 square miles.

RECORDS AVAILABLE.—July 1909 to September 1914; August 1930 to September 1932.

EXTREMES.—Maximum discharge during period, 387 second-feet Mar. 4 (gage height, 3.16 feet); minimum, 1.2 second-feet Sept. 6–11 (gage height, 1.30 feet).

1909–14, 1930–32: Maximum discharge, 781 second-feet, by current-meter measurement, July 2, 1909 (gage height, 3.98 feet, present datum); minimum, 0.4 second-foot July 19–22, 1911, July 24, 1931 (gage height, 1.30 feet).

REMARKS.—Records good except those for period of ice effect, Mar. 6–26, which are poor. Discharge interpolated July 2–6, Sept. 12–15. No record Oct. 1 to Mar. 1.

Discharge in second-feet, 1932

Day	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-------	144	48	14	48	4.5	1.8
2	268	137	42	14	44	9.6	1.8
3	346	121	40	14	40	8.4	1.8
4	366	104	35	21	37	3.7	1.8
5	234	97	71	9.6	34	3.7	1.8
6	204	104	38	9.6	30	3.7	1.5
7	157	87	36	13	26	3.0	1.2
8	173	89	35	15	24	3.3	1.2
9	132	84	35	9.6	85	6.0	1.2
10	104	74	30	51	41	6.0	1.2
11	99	64	28	27	25	4.5	1.2
12	85	62	48	37	18	3.0	1.3
13	56	59	48	32	14	2.6	1.4
14	57	51	41	52	11	2.2	1.4
15	62	50	32	48	11	3.0	1.5
16	59	48	31	46	8.4	4.9	1.6
17	46	42	27	57	8.4	5.6	1.6
18	67	42	24	67	6.6	2.1	1.6
19	50	37	24	69	5.2	1.7	1.8
20	69	35	24	71	5.2	1.7	1.8
21	76	32	21	69	5.2	1.8	1.8
22	69	30	18	74	5.2	1.8	1.8
23	71	28	15	78	5.2	1.8	1.8
24	67	38	15	74	4.5	1.8	1.8
25	69	41	15	74	3.7	1.8	1.8
26	76	46	17	71	3.7	1.8	1.8
27	99	51	15	66	3.7	1.8	1.8
28	119	54	14	60	3.0	1.8	1.8
29	126	60	11	51	4.5	1.8	1.8
30	165	62	12	57	4.5	1.8	1.8
31	165	-------	15	-------	4.5	1.8	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
March 2-31	366	46	125	0.178	0.20
April	144	28	65.8	.094	.10
May	71	11	29.2	.042	.05
June	78	9.6	45.0	.064	.07
July	85	3.0	18.4	.026	.03
August	9.6	1.7	3.32	.0047	.005
September	1.8	1.2	1.62	.0023	.003

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.

DRAINAGE AREA.—1,190 square miles.

RECORDS AVAILABLE.—March 1931 to September 1932; July 1909 to December 1913 at station 2 miles downstream (relation between gage datums not determined).

EXTREMES.—Maximum discharge during period, 4,580 second-feet Feb. 29 (gage height, 11.20 feet, affected by ice); minimum, 3.0 second-feet Sept. 30 (gage height, 2.30 feet).

1909–13; 1931–32: Maximum discharge, that of Feb. 29, 1932; minimum, 2.0 second-feet July 25, 26, Sept. 17, 1931 (gage height, 2.20 feet).

REMARKS.—Records good except those for periods of ice effect, Feb. 28, 29, Mar. 5–28, and for period of back water caused by debris, Mar. 29 to May 12, which are fair. No record Oct. 1 to Feb. 26. Discharge estimated Feb. 27.

Discharge, in second-feet, 1932

Day	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		4,490	399	168	81	63	18	8.2
2		3,440	370	149	69	72	29	7.0
3		1,940	356	132	59	79	23	5.4
4		1,370	370	123	54	73	15	5.4
5		1,250	356	149	48	63	11	4.6
6		792	342	177	43	53	11	6.2
7		328	342	197	55	55	11	4.6
8		399	328	158	60	45	9.4	4.6
9		460	315	149	75	59	8.2	3.8
10		429	302	140	115	85	9.4	3.8
11		370	264	140	72	356	11	3.8
12		302	229	123	58	596	9.4	9.4
13		252	197	115	73	356	11	9.4
14		229	177	96	158	177	9.4	6.2
15		208	187	94	158	132	13	5.4
16		218	187	96	208	101	22	4.6
17		276	158	81	187	75	17	3.8
18		264	149	74	140	63	13	3.8
19		252	140	72	102	44	11	5.4
20		252	123	69	88	36	9.4	7.0
21		240	115	68	81	30	9.4	7.0
22		229	106	64	74	26	8.2	8.2
23		240	106	54	69	20	7.0	8.2
24		229	132	60	102	24	5.4	7.0
25		240	158	63	132	35	11	5.4
26		276	187	61	107	30	9.4	5.4
27	200	328	218	61	86	26	7.0	4.6
28	4,160	429	208	54	66	23	7.0	3.8
29	4,490	492	197	60	73	22	11	3.8
30		492	197	70	82	19	9.4	3.0
31		460		85		17	7.0	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
March	4,490	208	683	0.574	0.66
April	399	106	230	.193	.22
May	197	54	103	.087	.10
June	208	43	92.5	.078	.09
July	596	17	92.1	.077	.09
August	29	5.4	11.7	.0098	.01
September	9.4	3.0	5.63	.0047	.005

ST. CROIX RIVER AT SWISS, WIS.

LOCATION.—Chain gage in sec. 33, T. 42 N., R. 15 W., at highway bridge at Swiss, 10 miles northeast of Danbury. Namakagon River enters 3½ miles above station.

DRAINAGE AREA.—1,550 square miles.

RECORDS AVAILABLE.—March 1914 to September 1932.

EXTREMES.—Maximum discharge during year, 3,240 second-feet Apr. 8 (gage height, 3.35 feet); minimum, 435 second-feet Aug. 15 (gage height, 0.05 foot).

1914–32: Maximum discharge, 8,480 second-feet Apr. 22, 1916 (gage height, 6.73 feet); minimum, that of Aug. 15, 1932.

REMARKS.—Records good except those for period of ice effect, Dec. 1 to Apr. 7, which are fair.

Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	693	988	1,030	988	a 632	905	1,350	1,270	1,440	661	577	988
2	693	945	945	945	661	a 905	1,440	1,270	1,270	632	631	865
3	693	905	945	865	a 692	905	1,520	1,270	1,270	661	632	790
4	756	865	945	905	723	a 885	1,770	1,270	1,190	723	604	723
5	723	865	828	988	a 723	865	2,020	1,270	1,110	723	577	692
6	723	828	828	945	723	a 865	2,190	1,350	1,030	723	550	692
7	828	790	756	790	a 708	865	2,630	1,440	945	692	550	661
8	865	790	945	756	692	a 846	3,130	1,600	905	632	550	632
9	828	790	945	790	a 692	828	2,630	1,770	865	604	550	632
10	828	790	945	865	692	a 809	2,920	1,940	828	604	550	604
11	790	865	945	988	a 692	790	2,820	1,770	790	604	550	604
12	723	865	945	988	692	a 741	2,720	1,690	790	577	525	632
13	790	865	790	1,110	a 692	692	2,540	1,600	790	604	500	632
14	756	905	604	945	692	a 692	2,450	1,600	723	692	478	632
15	756	905	604	756	a 692	692	2,450	1,520	723	632	455	604
16	723	945	723	828	692	a 676	2,280	1,440	692	723	577	577
17	723	1,190	756	790	a 692	661	2,190	1,440	692	632	577	577
18	692	1,350	905	790	692	a 661	2,020	1,350	723	632	577	577
19	661	1,440	945	790	a 692	661	1,860	1,350	790	604	478	550
20	692	1,440	1,030	790	692	a 661	1,770	1,270	945	604	478	577
21	692	1,520	1,110	790	a 676	661	1,770	1,270	790	632	550	577
22	723	1,600	1,110	790	661	a 676	1,690	1,190	790	604	577	577
23	692	1,600	1,110	790	a 661	692	1,600	1,110	790	577	577	577
24	692	1,600	1,110	a 790	661	a 741	1,520	1,110	756	577	577	577
25	692	1,600	1,030	790	a 661	790	1,440	988	723	577	577	577
26	632	1,520	945	a 756	661	a 856	1,440	1,030	723	756	604	525
27	723	1,440	988	723	a 692	a 922	1,350	1,190	723	723	604	577
28	790	1,350	1,030	a 692	723	988	1,270	1,440	692	790	631	577
29	945	1,190	1,030	661	a 814	a 1,090	1,270	1,440	661	723	915	577
30	945	1,030	1,030	a 632	-------	1,190	1,350	1,520	661	692	1,030	577
31	988	-------	905	604	-------	1,270	-------	1,440	-------	661	1,030	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	988	632	756	0.488	0.56
November	1,600	790	1,130	.729	.81
December	1,110	604	928	.599	.69
January	1,110	604	827	.534	.62
February	814	632	692	.446	.48
March	1,270	661	822	.530	.61
April	3,130	1,270	1,980	1.28	1.43
May	1,940	988	1,390	.897	1.03
June	1,440	661	861	.555	.62
July	790	577	654	.422	.49
August	1,030	455	604	.390	.45
September	988	525	632	.408	.46
The year	3,130	455	939	.606	8.25

a Estimated or interpolated.

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 1932.

EXTREMES.—Maximum discharge during year, 8,280 second-feet Apr. 10 (gage height, 9.06 feet); minimum 638 second-feet Aug. 16 (gage height, 3.28 feet). 1923–32: Maximum discharge, 13,300 second-feet Mar. 18, 1927 (gage height, 11.4 feet); minimum, that of Aug. 16, 1932.

REMARKS.—Records good except those for period of ice effect, Dec. 6 to Apr. 6, which are fair.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,240	1,660	2,540	1,090	1,090	1,480	2,420	2,180	2,190	945	870	1,480
2	1,170	1,660	2,300	945	1,090	1,480	2,540	2,180	2,070	945	945	1,320
3	1,170	1,660	2,180	1,090	1,170	1,480	2,670	2,180	1,850	1,020	945	1,240
4	1,170	1,570	2,070	1,170	1,090	1,480	2,790	2,070	1,750	1,020	870	1,170
5	1,240	1,660	1,960	1,170	1,170	1,480	3,050	2,070	1,660	1,090	835	1,090
6	1,170	1,570	1,850	1,090	1,090	1,320	3,850	2,180	1,660	1,020	835	1,090
7	1,320	1,480	1,750	1,240	1,170	1,240	4,890	2,540	1,570	1,020	835	1,090
8	1,400	1,480	1,660	1,240	1,170	1,240	5,690	3,180	1,480	1,020	800	1,020
9	1,320	1,480	1,570	1,240	1,170	1,170	7,380	4,280	1,400	945	735	945
10	1,400	1,480	1,480	1,240	1,170	1,240	8,280	4,890	1,320	945	768	945
11	1,400	1,480	1,480	1,320	1,170	1,170	7,380	4,730	1,240	870	768	945
12	1,320	1,480	1,480	1,750	1,170	1,170	6,530	4,280	1,240	870	735	945
13	1,320	1,480	1,480	1,570	1,170	1,170	6,020	3,580	1,240	870	702	1,020
14	1,320	1,570	1,400	1,660	1,090	1,170	5,210	3,180	1,240	1,020	670	945
15	1,320	1,660	1,400	1,480	1,090	1,170	4,730	2,920	1,170	1,090	670	945
16	1,320	1,660	1,400	1,240	1,090	1,170	4,430	2,670	1,170	1,020	735	1,020
17	1,320	1,850	1,750	1,480	1,090	1,240	4,130	2,540	1,090	1,020	835	945
18	1,320	2,180	1,400	1,480	1,090	1,240	3,850	2,540	1,090	945	870	945
19	1,320	2,540	1,400	1,480	1,090	1,320	3,580	2,420	1,170	870	800	945
20	1,240	2,540	1,400	1,400	1,090	1,320	3,310	2,180	1,240	870	735	945
21	1,320	2,790	1,480	1,480	1,090	1,320	3,180	2,070	1,240	945	768	1,020
22	1,320	3,050	1,400	1,480	1,090	1,400	3,050	1,960	1,170	945	835	1,020
23	1,320	3,450	1,400	1,480	1,020	1,400	2,920	1,850	1,170	835	835	1,020
24	1,240	3,450	1,480	1,400	1,020	1,400	2,670	1,660	1,090	835	835	1,020
25	1,240	3,450	1,480	1,320	1,020	1,400	2,540	1,660	1,090	835	835	1,020
26	1,240	3,180	1,400	1,400	1,020	1,480	2,540	1,570	1,090	835	945	1,020
27	1,240	3,050	1,400	1,320	1,090	1,660	2,300	1,750	1,090	1,020	945	945
28	1,320	2,790	1,480	1,320	1,240	1,660	2,180	2,180	1,090	1,020	870	1,020
29	1,480	2,670	1,400	1,320	1,320	1,850	2,070	2,420	1,020	1,020	1,020	1,020
30	1,660	2,540	1,480	1,240	-------	1,240	2,180	2,420	1,020	1,020	1,320	1,020
31	1,660	-------	1,240	1,170	-------	2,420	-------	2,300	-------	945	1,400	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	1,660	1,170	1,320	0.468	0.54
November	3,450	1,480	2,150	.762	.85
December	2,540	1,240	1,600	.567	.65
January	1,750	945	1,330	.472	.54
February	1,320	1,020	1,120	.397	.43
March	2,420	1,170	1,390	.493	.57
April	8,280	2,070	3,950	1.40	1.56
May	4,890	1,570	2,600	.922	1.06
June	2,180	1,020	1,330	.472	.53
July	1,090	835	957	.339	.39
August	1,400	670	857	.304	.35
September	1,480	945	1,040	.369	.41
The year	8,280	670	1,630	.578	7.88

ST. CROIX RIVER NEAR RUSH CITY, MINN.

LOCATION.—Chain gage in SW ¼ 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 1932.

EXTREMES.—Maximum discharge during year, 14,600 second-feet Apr. 9 (gage height, 8.2 feet); minimum, 755 second-feet Aug. 15, 16 (gage height, 2.5 feet). 1923–32: Maximum discharge, 26,700 second-feet Mar. 18, 1927 (gage height, 10.2 feet); minimum, that of Aug. 15, 1932.

REMARKS.—Records good except those for period of ice effect, Nov. 29 to Apr. 6, which are fair.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,220	1,900	4,400	2,150	1,320	2,900	2,400	3,650	3,650	1,060	1,140	1,900
2	1,220	1,900	4,150	2,020	1,530	2,780	2,400	3,650	3,150	1,060	1,140	1,780
3	1,220	1,900	3,900	2,150	1,530	2,780	2,650	3,650	3,150	1,220	1,140	1,650
4	1,220	1,900	3,650	1,900	1,530	2,520	2,900	3,400	3,150	1,220	1,140	1,650
5	1,220	1,650	2,900	1,900	1,530	2,150	3,150	3,400	3,400	1,220	1,060	1,530
6	1,220	1,650	2,150	1,900	1,320	2,150	5,650	3,650	3,650	1,220	1,060	1,410
7	1,410	1,650	1,060	1,900	1,320	1,650	7,150	4,150	3,150	1,220	1,060	1,320
8	1,650	1,650	1,410	1,900	1,530	1,650	9,900	5,400	2,400	1,220	1,060	1,320
9	1,410	1,650	1,900	1,900	1,530	1,410	14,600	9,150	2,150	1,060	982	1,220
10	1,410	1,650	2,650	1,900	1,220	1,220	13,600	12,100	2,150	1,060	982	1,220
11	1,410	1,650	3,150	1,900	1,220	1,220	12,400	11,100	2,150	1,060	982	1,220
12	1,410	1,650	2,780	1,900	1,220	1,410	11,900	10,400	1,900	1,060	982	1,220
13	1,410	1,650	2,650	1,900	1,060	1,410	10,600	8,900	1,650	1,060	905	1,140
14	1,410	1,650	2,280	1,900	1,060	1,410	9,150	8,400	1,900	1,320	905	1,140
15	1,410	1,650	1,900	2,150	1,410	1,410	8,400	7,900	1,650	1,410	755	1,060
16	1,410	1,650	1,650	1,900	1,410	1,410	7,650	7,150	1,530	1,410	755	1,060
17	1,410	2,400	1,650	1,650	1,410	1,410	7,150	6,400	1,530	1,320	1,060	1,060
18	1,410	2,650	1,530	1,650	1,650	1,410	6,400	5,900	1,410	1,220	1,060	1,060
19	1,410	2,900	1,650	1,650	1,410	1,410	5,900	5,150	1,530	1,220	905	1,060
20	1,410	3,150	1,780	1,650	1,410	1,410	5,400	4,400	1,410	1,140	905	1,060
21	1,410	3,150	1,650	1,900	1,410	1,410	5,150	3,900	1,410	1,060	905	1,060
22	1,410	3,900	1,530	1,900	1,410	1,410	4,900	3,400	1,410	1,060	1,060	1,060
23	1,410	4,650	1,650	2,150	1,650	1,410	4,650	2,900	1,320	1,060	1,060	1,060
24	1,220	4,900	1,780	1,900	1,410	1,410	4,400	2,900	1,220	1,060	1,060	1,060
25	1,220	5,400	2,020	1,650	1,650	1,410	4,150	2,650	1,220	1,060	1,060	1,060
26	1,220	5,150	1,900	1,650	1,900	1,410	3,900	2,650	1,220	1,060	1,060	1,060
27	1,220	4,650	2,020	1,650	2,150	1,410	3,650	2,650	1,220	1,060	1,060	1,060
28	1,410	4,400	2,150	1,650	2,520	1,780	3,400	2,650	1,220	1,220	1,060	1,060
29	1,650	4,400	2,280	1,650	3,020	2,280	3,400	3,650	1,220	1,220	1,220	1,060
30	1,900	4,400	2,150	1,410	-------	2,400	3,400	3,900	1,060	1,140	1,410	1,140
31	1,900	-------	2,280	1,410	-------	2,400	-------	3,900	-------	1,140	1,650	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	1,900	1,220	1,400	0.273	0.31
November	5,400	1,650	2,780	.543	.61
December	4,400	1,060	2,280	.445	.51
January	2,150	1,410	1,830	.357	.41
February	3,020	1,060	1,540	.301	.32
March	2,900	1,220	1,740	.340	.39
April	14,600	2,400	6,340	1.24	1.38
May	12,100	2,650	5,260	1.03	1.19
June	3,650	1,060	1,970	.385	.43
July	1,410	1,060	1,160	.227	.26
August	1,650	755	1,050	.205	.24
September	1,900	1,060	1,230	.240	.27
The year	14,600	755	2,380	.465	6.32

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 1932.

EXTREMES.—Maximum mean daily discharge during year, 18,500 second-feet Apr. 10; minimum, 401 second-feet Jan. 30.

1910–32: Maximum mean 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 Nevers Dam, 10 miles upstream. Records of daily discharge computed from power-house records, furnished by Northern States Power Co.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,600	1,650	3,360	947	2,140	2,670	2,350	2,540	3,800	1,310	1,350	1,610
2	1,600	2,940	3,300	2,160	1,860	2,480	2,660	4,010	3,690	1,180	1,270	1,610
3	1,600	4,020	3,170	664	1,540	2,990	1,960	4,250	3,660	1,370	1,310	1,670
4	1,530	3,050	3,080	2,060	1,550	2,340	3,310	4,250	3,590	1,350	1,270	1,660
5	1,600	2,190	2,750	1,850	1,460	2,180	3,180	4,190	2,960	1,350	1,220	1,610
6	1,600	2,030	1,300	1,780	1,540	1,190	3,440	4,060	3,610	1,440	1,140	1,600
7	1,680	2,240	2,260	1,900	647	2,730	5,190	3,690	4,020	1,440	1,130	1,600
8	1,550	1,860	1,950	1,480	1,580	1,920	10,400	3,200	3,480	1,310	1,140	1,600
9	1,600	2,080	1,880	1,910	1,780	1,860	18,200	6,490	2,890	1,310	1,080	1,550
10	1,600	2,240	1,460	419	1,650	1,980	18,500	13,400	2,500	1,330	1,010	1,340
11	1,600	1,940	2,340	2,060	1,610	1,860	16,600	13,200	2,140	1,270	1,000	1,120
12	1,630	1,970	2,700	2,090	2,150	875	14,300	11,400	1,760	1,200	973	1,300
13	1,650	1,970	1,290	2,310	916	1,040	11,200	9,200	2,540	1,250	942	1,300
14	1,600	2,750	2,800	2,120	423	2,620	10,400	8,020	2,180	1,390	952	1,210
15	1,600	1,460	2,720	1,980	2,120	1,740	8,100	7,660	2,030	1,530	900	1,320
16	1,600	2,140	2,720	2,400	1,720	1,600	8,400	7,080	1,960	1,480	1,080	1,210
17	1,600	3,060	2,500	746	1,580	1,580	7,510	6,750	1,710	1,370	1,000	1,180
18	1,600	2,750	1,990	2,030	1,470	1,660	7,200	5,000	1,730	1,380	1,150	1,130
19	1,730	3,580	2,110	2,090	1,500	1,660	6,640	6,790	1,620	1,290	1,130	1,260
20	1,610	3,030	825	2,180	1,570	693	5,980	5,440	1,700	1,250	1,160	1,250
21	1,680	3,710	2,540	2,340	412	2,220	6,420	5,570	1,770	1,210	1,040	1,170
22	1,950	1,880	2,820	2,100	1,790	1,560	5,950	4,580	1,620	1,260	998	1,360
23	1,870	4,660	2,920	2,080	1,470	1,690	4,860	3,840	1,690	1,210	1,200	1,200
24	1,760	5,230	2,200	583	1,460	1,570	2,100	3,380	1,480	1,170	1,230	1,150
25	1,600	5,660	599	2,080	1,860	1,470	4,720	2,980	1,490	1,140	1,250	1,180
26	1,900	5,650	2,820	2,230	1,790	1,780	4,270	3,310	1,370	1,240	1,320	1,190
27	1,960	5,960	1,320	1,930	2,030	632	4,290	2,890	1,440	1,120	1,230	1,260
28	1,820	4,100	2,920	1,980	596	2,260	4,560	3,370	1,290	1,370	1,210	1,230
29	1,890	2,080	2,830	1,800	2,400	2,280	4,250	2,970	1,360	1,280	1,340	1,200
30	1,930	2,450	2,680	401	------	2,490	3,880	3,900	1,350	1,390	1,480	1,250
31	1,960	------	2,350	1,900	------	2,630	------	3,770	------	1,340	1,600	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	1,960	1,530	1,690	0.285	0.33
November	5,960	1,460	3,010	.508	.57
December	3,360	599	2,340	.395	.46
January	2,400	401	1,760	.297	.34
February	2,400	412	1,540	.260	.28
March	2,990	632	1,880	.317	.37
April	18,500	1,960	7,030	1.19	1.33
May	13,400	2,540	5,520	.931	1.07
June	4,020	1,290	2,280	.384	.43
July	1,530	1,120	1,310	.221	.25
August	1,600	900	1,160	.196	.23
September	1,670	1,120	1,340	.226	.25
The year	18,500	401	2,570	.433	5.91

NAMAKAGON RIVER NEAR TREGO, WIS.

LOCATION.—In SW ¼ sec. 17, T. 40 N., R. 12 W., at power house of Wisconsin Hydroelectric Co., 5 miles northwest of Trego.
DRANAGE AREA.—476 square miles.
RECORDS AVAILABLE.—October 1927 to September 1932. Records collected at Trego, 5 miles upstream (drainage area, 420 square miles), 1914 to 1927.
EXTREMES.—Maximum mean daily discharge during year, 727 second-feet Apr. 11; minimum, 172 second-feet Aug. 11. Extremes caused by regulation.
1927–32: Maximum mean daily discharge, 1,360 second-feet Sept. 14, 1928; minimum, 113 second-feet Aug. 17, Sept. 7, 1930.
REMARKS.—Records good. Discharge is computed from hourly records of load and head on power plant.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	311	341	408	330	235	445	425	436	455	299	271	371
2	310	407	398	382	372	465	471	494	462	298	272	371
3	328	407	348	312	278	400	388	494	456	328	271	371
4	300	407	442	350	369	458	442	494	469	321	271	371
5	307	372	378	350	376	432	337	511	486	352	271	372
6	306	407	220	277	373	332	462	524	332	352	271	281
7	302	367	372	243	293	355	619	570	308	314	197	276
8	391	326	352	256	337	376	666	584	350	314	271	276
9	391	407	352	372	327	354	689	569	355	314	271	276
10	393	372	445	323	362	349	667	562	356	287	274	276
11	266	407	511	377	340	344	727	576	358	316	172	278
12	340	407	468	407	345	339	650	590	402	276	187	255
13	338	433	295	486	285	267	625	590	302	267	183	252
14	346	424	455	379	353	338	691	595	297	394	206	251
15	346	371	364	368	332	336	534	443	264	269	218	250
16	339	430	343	380	318	380	612	566	274	310	446	251
17	339	561	341	322	318	372	526	550	249	295	195	252
18	252	551	409	376	316	394	470	515	378	271	194	204
19	338	427	470	376	344	465	494	523	440	271	298	250
20	339	487	306	377	344	322	496	520	339	271	266	250
21	339	571	409	403	320	387	524	476	396	269	219	250
22	339	369	443	377	374	370	521	381	396	308	354	250
23	341	637	425	376	315	325	491	421	361	309	284	250
24	338	529	471	352	315	324	497	431	365	290	281	250
25	218	539	319	376	375	375	502	431	396	292	282	202
26	284	357	457	377	434	367	406	370	382	308	250	250
27	282	459	325	376	474	322	500	427	352	314	248	250
28	355	586	451	376	328	372	503	562	312	314	287	280
29	374	296	401	377	461	419	484	472	308	314	268	250
30	381	421	392	352	------	427	484	467	305	315	435	250
31	396	------	354	303	------	435	------	535	------	316	413	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	396	218	330	0.693	0.80
November	637	296	436	.916	1.02
December	511	220	391	.821	.95
January	486	243	358	.752	.87
February	474	235	345	.725	.78
March	465	267	376	.790	.91
April	727	337	530	1.11	1.24
May	595	370	506	1.06	1.22
June	486	249	364	.765	.85
July	394	267	309	.649	.75
August	446	172	269	.565	.65
September	372	202	274	.576	.64
The year	727	172	374	.786	10.68

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 1932.
EXTREMES.—Maximum mean daily discharge during year, 1,220 second-feet Apr. 8; minimum, 7 second-feet July 19.
1904–32: Maximum mean daily discharge, 2,280 second-feet in June 1905; no flow Sept. 30, 1929.
REMARKS.—Records fair. Regulation at power plant. Records of discharge, computed from power-house records, furnished by Northern States Power Co.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	159	183	123	143	123	403	285	230	178	100	76	152
2	145	147	152	145	150	427	314	214	201	57	67	74
3	170	144	166	138	176	404	392	194	160	118	64	96
4	162	138	194	103	120	347	207	264	150	92	61	123
5	90	124	170	181	156	201	444	234	138	119	84	47
6	159	121	121	184	161	172	661	218	161	147	64	50
7	177	139	150	184	147	253	701	322	161	100	90	99
8	240	133	138	173	135	305	1,220	304	123	101	52	76
9	131	136	240	173	155	242	1,010	200	148	118	70	64
10	153	127	188	132	161	205	861	318	132	115	67	58
11	139	137	182	170	161	120	626	274	120	149	52	118
12	130	162	186	179	123	174	691	256	239	51	55	66
13	205	174	129	242	161	132	277	228	89	38	58	102
14	187	148	122	166	150	154	330	227	141	78	87	79
15	187	187	122	179	122	144	425	277	129	111	46	87
16	124	185	191	195	170	166	374	204	112	83	138	81
17	142	220	141	225	161	179	328	178	121	78	67	96
18	121	274	165	152	161	195	254	230	100	34	81	69
19	136	312	181	158	155	173	249	199	110	7	55	87
20	140	237	140	155	150	195	244	174	120	54	52	89
21	156	229	144	184	138	213	249	163	132	66	57	128
22	162	233	236	161	144	176	294	183	126	54	64	116
23	124	251	218	201	138	201	252	178	114	54	52	111
24	151	257	214	123	169	195	227	208	65	84	75	116
25	145	356	181	166	167	178	196	197	96	72	82	110
26	139	172	126	169	188	255	238	155	139	57	102	84
27	145	172	184	199	293	365	234	144	187	58	105	99
28	122	247	111	140	298	237	201	115	151	52	153	96
29	130	224	204	190	370	278	212	138	19	63	94	87
30	153	153	191	97	-------	487	194	120	117	58	85	87
31	142	-------	210	120	-------	541	------	128	-------	81	118	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	240	90	151	0.275	0.32
November	356	121	191	.347	.39
December	240	111	168	.305	.35
January	242	97	165	.300	.35
February	370	120	169	.307	.33
March	541	120	249	.453	.52
April	1,220	194	406	.738	.82
May	322	115	209	.380	.44
June	239	18	133	.242	.27
July	149	7	79.0	.144	.17
August	153	46	76.5	.139	.16
September	152	47	91.6	.167	.19
The year	1,220	7	174	.316	4.31

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. Zero of present gage is 3.0 feet above that of previous gage.

DRAINAGE AREA.—1,290 square miles.

RECORDS AVAILABLE.—June 1909 to January 1914; November 1930 to September 1932.

EXTREMES.—Maximum discharge during year, 4,270 second-feet Apr. 7; maximum gage height, 10.70 feet Mar. 7, affected by ice; minimum discharge, 30 second-feet Sept. 12 (gage height, 1.67 feet).

1909–14, 1930–32: Maximum discharge, 4,900 second-feet Oct. 17, 1911 (gage height, 9.42 feet, present gage datum); maximum gage height, that of Mar. 7, 1932; minimum discharge, that of Sept. 12, 1932.

REMARKS.—Records good except those estimated, Jan. 24–30, Feb. 12–27, Mar. 1, 7–20, July 7–18, July 21 to Aug. 22, which are poor. Stage-discharge relation affected by ice Feb. 2–11. Discharge regulated by power plants above.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	75	77	242	192	128	974	1,860	642	328	204	50	131
2	75	72	225	173	225	734	1,660	612	273	162	80	124
3	75	92	170	142	248	708	1,580	561	226	125	100	124
4	73	75	115	149	211	666	1,440	488	310	68	110	103
5	69	74	160	182	231	708	1,580	453	244	89	75	57
6	74	77	161	177	225	657	2,320	605	172	126	75	72
7	136	77	134	188	186		3,620	1,350	276	140	80	122
8	188	82	203	198	142		2,720	1,480	298	160	45	118
9	91	88	164	212	307		2,330	1,530	282	200	60	118
10	88	93	149	220	469		1,810	1,620	285	220	65	109
11	104	90	146	104	613		1,910	1,530	304	300	70	63
12	77	93	198	210			1,620	1,200	260	270	50	56
13	91	85	178	260			1,440	980	245	180	50	94
14	102	91	112	193	500	650	1,080	914	346	190	60	94
15	102	135	172	262			762	820	344	200	45	88
16	96	109	151	348			584	762	329	170	70	90
17	88	136	151	248			485	589	301	170	150	90
18	87	149	167	409			406	618	324	60	150	82
19	72	136	134	389	450		538	570	236	164	150	54
20	90	153	132	292			566	579	202	138	90	84
21	88	176	132	225		600	538	579	298	130	100	86
22	78	209	172	236		657	554	393	288	130	65	86
23	74	201	272	266	300	622	477	288	288	130	136	61
24	77	483	210			598	383	340	193	130	114	63
25	80	442	131			765	350	311	160	70	110	94
26	78	412	234	220	600	1,620	428	330	127	120	120	65
27	75	248	211		900	1,170	625	347	136	140	124	94
28	104	337	149		1,320	882	627	351	145	140	109	92
29	109	267	232	200	1,550	762	620	205	142	100	87	94
30	88	170	230			956	623	107	154	100	116	90
31	85		257	211		2,160		248		110	140	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	188	69	90.0	0.070	0.08
November	483	72	164	.127	.14
December	272	112	177	.137	.16
January	409	104	225	.174	.20
February	1,550	128	478	.371	.40
March	2,160		785	.609	.70
April	3,620	350	1,180	.915	1.02
May	1,620	107	690	.535	.62
June	346	127	251	.195	.22
July	300	60	150	.116	.13
August	150	45	91.8	.071	.08
September	131	54	89.9	.070	.08
The year	3,620	45	363	2.81	3.83

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, used since Oct. 1, 1931. Prior to that date a chain gage at same site and datum was used.

DRAINAGE AREA.—775 square miles.

RECORDS AVAILABLE.—February 1912 to September 1932.

EXTREMES.—Maximum discharge during year, 1,250 second-feet many days in December, January, and February (gage height, 5.80 feet); minimum, 17 second-feet June 8, 9 (gage height, 3.30 feet).

1912–32: 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. 22 to Feb. 1, Feb. 12–14, 19–22. Part of table of monthly discharge corrected for regulation by storage in Chippewa and Moose Lake Reservoirs.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	116	495	675	1,250	1,250	520	102	149	520	610	580	135
2	116	495	1,050	1,250	1,250	470	102	149	610	610	610	135
3	116	495	1,250	1,250	1,250	470	102	149	610	610	610	135
4	288	495	1,250	1,250	1,250	189	102	149	610	610	610	135
5	520	495	1,250	1,250	1,250	138	102	149	610	610	610	135
6	520	495	1,250	1,250	1,250	135	102	149	330	610	580	138
7	495	495	1,250	1,250	1,250	193	185	149	19	610	580	138
8	309	495	1,250	1,250	1,250	200	166	149	18	610	580	142
9	288	495	1,250	1,250	1,250	228	132	149	19	610	580	142
10	288	495	1,250	1,250	1,250	236	149	149	352	610	610	146
11	288	495	1,250	1,250	1,250	268	142	142	420	610	610	146
12	288	495	1,250	1,250	1,250	272	138	132	420	610	610	152
13	280	495	1,250	1,250	1,250	288	126	132	445	610	580	152
14	185	470	1,250	1,250	1,250	288	123	132	520	610	580	152
15	113	268	1,250	1,250	1,250	288	160	132	640	610	580	152
16	110	208	1,250	1,250	1,200	288	149	132	640	610	580	193
17	110	185	1,250	1,250	1,200	288	156	132	640	610	580	470
18	113	120	1,250	1,250	1,200	288	163	149	640	580	352	470
19	152	120	1,250	1,250	1,200	288	166	149	640	610	330	470
20	330	120	1,250	1,250	1,200	170	166	149	640	610	288	470
21	550	120	1,250	1,250	1,200	149	166	149	640	610	288	470
22	550	120	1,250	1,250	1,200	149	166	132	640	610	288	470
23	550	120	1,250	1,250	1,200	152	102	132	640	610	288	470
24	550	120	1,250	1,250	1,200	142	102	132	640	610	288	470
25	550	120	1,250	1,250	1,250	92	102	135	640	610	288	470
26	550	163	1,250	1,250	1,150	92	102	135	640	610	288	470
27	495	352	1,250	1,250	1,100	92	102	138	640	610	260	470
28	495	520	1,250	1,250	675	92	132	138	640	610	142	470
29	495	520	1,250	1,250	520	92	193	142	610	610	152	470
30	495	520	1,250	1,250	------	92	197	142	640	580	149	470
31	495	------	1,250	1,250	------	92	------	288	------	580	146	------

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	550	110	348	+228	433	0.559	0.64
November	520	120	353	+1,465	918	1.18	1.32
December	1,250	675	1,220	−1,730	579	.747	.86
January	1,250	1,250	1,250	−2,060	481	.621	.72
February	1,250	520	1,180	−2,260	279	.360	.39
March	520	92	217	+1,130	639	.825	.95
April	197	102	137	+3,440	1,460	1.89	2.11
May	288	132	146	+1,830	829	1.07	1.23
June	640	18	524	−610	289	.373	.42
July	610	580	607	−1,070	207	.267	.31
August	610	142	439	−630	204	.263	.30
September	470	135	297	+280	405	.523	.58
The year	1,250	18	560	+15	560	.723	9.83

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 1932.

EXTREMES.—Maximum discharge during year, 8,460 second-feet Apr. 8 (gage height, 8.6 feet); minimum, 155 second-feet June 10 (gage height, 0.9 foot).

1914–32: Maximum discharge, 14,900 second-feet Apr. 10, 1922 (gage height, 13.7 feet); minimum, that of June 10, 1932.

REMARKS.—Records good except those for period of ice effect, Dec. 15–26 Jan. 3 to Apr. 7, which are fair. Discharge estimated Sept. 24. Part of table of monthly discharge corrected for regulation by storage in Chippewa and Moose Lake Reservoirs.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	434	873	1,110	1,520	1,190	1,190	1,520	606	718	834	795	434
2	402	834	1,280	1,600	1,190	1,360	951	606	834	834	795	434
3	402	795	1,520	1,690	1,360	1,190	1,440	606	873	834	795	402
4	402	795	1,690	1,690	1,280	873	1,600	570	873	873	795	402
5	570	795	1,690	1,690	1,280	680	1,860	606	873	834	756	371
6	756	795	1,520	1,690	1,440	643	3,100	643	873	834	756	341
7	834	756	1,360	1,690	1,360	606	5,110	756	500	795	756	311
8	756	756	1,360	1,770	1,360	570	7,980	912	255	795	756	311
9	680	756	1,600	1,860	1,440	535	7,180	951	179	795	756	311
10	643	795	1,600	1,860	1,520	500	5,110	873	155	795	756	311
11	680	873	1,520	1,860	1,440	467	4,110	795	606	795	756	311
12	680	873	1,690	1,860	1,360	402	3,190	718	606	795	756	311
13	643	912	1,690	1,860	1,360	402	2,470	680	570	795	756	311
14	606	951	1,600	1,860	1,440	402	2,030	643	680	834	756	311
15	500	1,030	1,520	1,860	1,520	402	1,690	606	795	834	756	311
16	467	1,030	1,520	1,940	1,520	402	1,440	643	834	795	834	311
17	402	1,190	1,520	1,940	1,520	402	1,280	756	834	795	873	500
18	402	1,690	1,520	1,940	1,520	402	1,190	718	834	795	756	643
19	371	1,690	1,520	1,690	1,520	402	1,030	643	834	795	570	643
20	371	1,360	1,520	1,940	1,440	402	951	570	873	795	434	643
21	718	1,360	1,520	1,860	1,360	341	951	535	873	1,030	570	643
22	795	1,360	1,520	1,860	1,360	341	873	500	834	912	570	643
23	795	1,360	1,520	1,770	1,280	341	834	500	834	873	535	643
24	795	1,690	1,520	1,600	1,190	341	795	467	834	834	500	643
25	795	1,940	1,520	1,360	1,280	341	718	467	873	834	570	643
26	795	1,520	1,520	1,520	1,360	402	680	467	873	834	606	643
27	795	1,280	1,520	1,520	1,190	467	643	467	873	795	535	643
28	795	1,280	1,440	1,520	1,190	570	606	500	834	834	500	643
29	873	1,280	1,360	1,520	1,110	873	606	500	834	795	437	643
30	912	1,280	1,360	1,030	-------	1,280	643	500	834	795	437	643
31	912	-------	1,520	1,030	-------	1,360	-------	500	-------	795	500	-------

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	912	371	645	+228	730	0.456	0.53
November	1,940	756	1,130	+1,465	1,700	1.06	1.18
December	1,690	1,110	1,510	−1,730	864	.540	.62
January	1,940	1,030	1,690	−2,060	921	.576	.66
February	1,520	1,110	1,360	−2,260	458	.286	.31
March	1,360	341	609	+1,130	1,030	.644	.74
April	7,980	606	2,090	+3,440	3,420	2.14	2.39
May	951	467	623	+1,830	1,310	.819	.94
June	873	155	736	−610	501	.313	.35
July	1,030	795	825	−1,070	426	.266	.31
August	873	434	666	−630	431	.269	.31
September	643	311	478	+280	586	.366	.41
The year	7,980	155	1,030	+13	1,030	.644	8.75

CHIPPEWA RIVER AT CHIPPEWA FALLS, WIS.

LOCATION.—In lot 1, sec. 12, T. 28 N., R. 9 W., at Chippewa Falls, 1 mile below mouth of Duncan Creek. Prior to June 19, 1932, gage was at a site a quarter of a mile (corrected) below Duncan Creek.

DRAINAGE AREA.—5,600 square miles.

RECORDS AVAILABLE.—June 1888 to September 1932.

EXTREMES.—Maximum mean daily discharge during year 37,100 second-feet Apr. 9; minimum, 750 second-feet Jan. 31.

1888–1932: Maximum discharge, 78,000 second-feet Mar. 27, 1920 (gage height, 17.0 feet, at old site); minimum, 23 second-feet Sept. 22, 1929.

Maximum stage known, 26.94 feet Sept. 10, 1884.

REMARKS.—Records Oct. 1 to June 18 fair. Discharge computed from records at Chippewa Falls power plant and estimated inflow between plant and gaging station. Records June 19 to Sept. 30 good. Discharge computed from record of water-stage recorder. 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, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,130	1,700	3,820	1,500	4,150	4,520	6,240	1,280	1,920	2,630	1,940	2,760
2	2,420	3,400	4,920	3,380	3,250	6,190	5,810	4,350	2,020	2,160	1,980	2,850
3	2,110	3,120	4,080	1,890	2,400	6,610	1,680	4,840	1,900	2,050	2,090	1,950
4	845	3,190	3,520	3,510	3,180	5,650	6,420	5,340	1,750	1,920	2,080	807
5	2,110	3,240	3,700	2,660	2,950	5,260	6,250	5,350	870	2,120	2,020	790
6	2,220	2,850	1,450	2,530	2,850	2,880	6,620	5,570	2,360	2,250	1,800	1,840
7	2,570	2,910	3,400	2,580	1,220	5,560	14,700	5,180	2,920	2,320	927	1,840
8	1,920	1,080	3,350	2,650	3,950	5,250	33,900	1,670	2,520	2,360	2,120	1,430
9	2,540	2,850	2,880	3,050	4,020	5,020	37,100	6,000	2,160	1,980	2,140	1,400
10	3,640	3,050	2,760	2,000	3,550	5,220	32,700	6,210	2,070	1,240	1,890	1,490
11	1,970	2,520	3,270	3,400	3,700	5,340	26,800	5,900	1,860	2,220	1,410	931
12	2,570	3,450	3,560	3,650	2,700	4,340	19,400	5,940	860	2,480	1,370	1,620
13	3,520	3,870	3,830	4,430	2,950	1,050	18,300	5,860	1,910	2,300	1,470	1,710
14	4,260	4,750	4,280	5,180	900	4,480	12,900	5,100	2,590	2,060	765	1,490
15	3,450	6,030	3,810	5,180	3,520	4,250	10,900	1,260	2,460	2,040	1,350	1,480
16	2,950	6,440	3,830	5,760	4,080	3,420	8,700	4,040	2,030	1,800	1,720	1,350
17	2,390	7,750	3,640	5,320	3,700	3,250	6,570	4,400	2,080	868	1,650	1,380
18	890	8,850	3,750	5,600	4,450	3,280	7,050	4,660	1,690	1,810	2,000	856
19	2,120	10,400	3,980	5,610	4,320	2,810	5,880	4,800	793	1,480	1,890	1,610
20	2,090	9,520	3,320	5,110	4,720	1,150	6,700	4,620	1,780	1,340	1,650	1,840
21	2,080	9,840	5,540	5,040	2,340	3,270	6,600	4,030	1,970	1,400	856	1,910
22	2,040	7,150	4,610	5,660	3,440	3,220	5,600	1,020	2,060	1,500	1,730	1,530
23	1,990	8,970	4,330	3,800	4,090	3,170	4,700	4,380	1,870	1,800	2,000	1,480
24	1,700	10,300	4,660	1,730	4,150	2,970	3,920	3,770	1,830	1,070	2,200	1,390
25	850	11,300	3,220	4,080	4,040	2,600	4,640	2,850	1,890	2,080	2,530	902
26	2,250	11,400	3,850	4,300	4,260	2,620	4,640	3,180	1,300	2,170	3,010	1,810
27	2,620	8,210	2,120	3,940	4,580	810	4,760	2,490	3,470	2,210	2,780	1,750
28	2,420	8,790	5,490	4,350	2,120	2,760	5,000	2,500	2,880	2,120	843	1,900
29	2,520	5,780	5,020	3,720	4,470	3,780	5,160	1,100	2,570	2,130	1,550	1,740
30	2,840	4,100	5,120	2,850	-------	5,920	4,400	1,180	3,140	1,670	1,840	1,680
31	3,000	-------	5,020	750	-------	6,330	-------	1,960	-------	896	2,180	-------

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	4,260	845	2,390	+762	2,670	0.477	0.55
November	11,400	1,080	5,890	+2,672	6,920	1.24	1.38
December	5,540	1,450	3,880	−1,847	3,190	.570	.66
January	5,760	750	3,720	−2,637	2,740	.489	.56
February	4,720	900	3,450	−2,887	2,300	.411	.44
March	6,610	810	3,970	+868	4,290	.766	.88
April	37,100	1,680	10,800	+6,074	13,100	2.34	2.61
May	6,210	1,020	3,900	+3,730	5,290	.945	1.09
June	3,470	793	2,050	−1,249	1,577	.280	.31
July	2,630	868	1,890	−2,130	1,100	.196	.23
August	3,010	765	1,800	−1,300	1,320	.236	.27
September	2,850	790	1,580	+190	1,650	.295	.33
The year	37,100	750	3,760	+2,246	3,830	.684	9.31

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 1932.
EXTREMES.—Maximum discharge during year, 44,300 second-feet Apr. 10 (gage height, 11.85 feet); minimum, 1,900 second-feet Aug. 15 (gage height, 1.58 feet).
1928–32: Maximum discharge, that of Apr. 10, 1932; minimum (estimated), 646 second-feet Feb. 10, 1930.
Maximum stage known, 18.4 feet Sept. 12, 1884.
REMARKS.—Records fair except those for period of ice effect, Dec. 8, 9, 12–17, Jan. 5–10, Jan. 15 to Mar. 25, 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, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5,280	4,580	6,850	7,000	5,280	8,670	17,200	6,160	3,590	4,700	2,070	3,380
2	4,810	3,700	6,850	4,360	5,040	10,000	15,000	4,130	3,700	4,360	2,750	4,240
3	4,360	4,920	6,850	5,640	4,920	10,700	12,300	6,570	3,700	3,700	3,270	4,360
4	3,910	5,040	6,850	4,240	4,020	11,500	8,670	6,850	3,700	3,700	3,060	3,270
5	2,960	4,470	6,030	5,160	3,700	10,700	11,500	7,580	3,480	3,270	2,960	2,370
6	3,480	4,810	6,160	4,810	4,360	8,040	12,300	7,430	2,850	3,700	2,850	2,030
7	4,130	4,700	4,020	4,700	4,470	5,640	15,000	9,000	3,700	3,910	2,650	2,280
8	4,240	4,360	4,810	4,470	3,160	7,280	28,100	11,500	4,240	3,800	2,080	2,750
9	3,910	3,380	5,640	4,580	3,910	7,430	40,800	10,400	4,130	3,800	2,650	2,750
10	4,580	4,360	5,400	3,060	5,160	7,730	44,300	11,100	3,700	3,590	3,160	2,560
11	5,640	5,040	5,400	4,580	4,700	7,730	39,000	10,400	3,590	2,460	2,960	2,280
12	4,130	4,240	5,520	6,850	4,920	7,430	33,900	9,330	3,480	3,700	2,460	2,150
13	4,920	5,400	5,520	6,570	4,130	6,570	24,700	8,350	2,750	3,700	2,370	2,460
14	6,030	5,640	5,400	7,140	4,020	7,280	23,200	8,350	3,270	3,800	2,120	2,750
15	6,030	7,280	5,400	7,140	3,060	6,160	17,200	7,140	3,700	3,270	1,910	2,560
16	5,280	8,040	5,400	7,140	3,800	6,710	13,400	4,470	3,700	3,380	2,120	2,650
17	4,580	8,350	5,640	7,000	4,920	6,440	13,000	6,710	3,380	2,850	2,750	2,280
18	4,470	10,700	6,030	6,030	5,160	6,850	9,330	6,850	3,590	2,070	2,460	2,460
19	3,380	12,300	6,030	6,440	4,920	7,140	10,700	6,850	3,270	2,650	3,060	2,100
20	3,910	15,900	6,300	5,770	4,920	7,000	9,000	6,710	2,560	2,370	3,060	2,650
21	3,910	14,200	5,400	5,400	4,470	5,640	9,330	6,570	3,060	2,170	2,850	2,850
22	3,800	13,000	7,140	5,400	3,590	7,730	9,000	5,770	3,480	2,100	2,120	3,060
23	3,800	10,700	6,710	5,280	3,700	8,040	8,350	3,910	3,480	2,370	2,560	2,850
24	3,910	13,400	6,710	5,040	4,240	8,040	7,000	5,770	3,380	2,650	3,060	2,560
25	3,590	14,600	7,140	4,240	4,130	8,670	6,710	5,640	3,590	2,210	3,590	2,560
26	2,650	18,100	5,640	5,640	4,240	8,350	7,730	4,920	4,130	3,060	4,060	2,050
27	4,204	15,000	6,300	5,900	4,920	10,400	6,850	5,040	3,700	2,850	5,280	2,650
28	4,470	13,000	4,810	6,160	5,770	10,700	7,000	4,580	5,040	3,270	4,130	2,850
29	4,240	11,900	6,710	5,280	5,280	11,900	7,430	4,360	4,470	3,270	2,460	3,060
30	4,470	8,670	6,850	5,040	-------	15,900	7,000	3,380	4,470	3,160	2,750	2,960
31	4,580	-------	6,850	4,920	-------	15,900	-------	3,160	-------	2,650	3,060	-------

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	6,030	2,650	4,310	+762	4,590	0.509	0.59
November	18,100	3,380	8,660	+2,672	9,690	1.08	1.20
December	7,140	4,020	6,010	−1,847	5,320	.590	.68
January	7,140	3,060	5,520	−2,637	4,540	.504	.58
February	5,770	3,060	4,450	−2,887	3,300	.366	.39
March	15,900	5,640	8,650	+868	8,970	.996	1.15
April	44,300	6,710	15,800	+6,074	18,100	2.01	2.24
May	11,500	3,160	6,740	+3,730	8,130	.902	1.04
June	5,040	2,560	3,630	−1,249	3,150	.350	.39
July	4,700	2,100	3,180	−2,130	2,380	.264	.30
August	5,280	1,910	2,870	−1,300	2,380	.264	.30
September	4,360	2,030	2,730	+190	2,800	.311	.35
The year	44,300	1,910	6,040	+2,246	6,110	.678	9.21

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 Flambeau Reservoir.

DRAINAGE AREA.—620 square miles.

RECORDS AVAILABLE.—September 1927 to September 1932.

EXTREMES.—Maximum discharge during year, 727 second-feet Feb. 3–12, 16–20, 26 (gage height, 4.80 feet); minimum, 121 second-feet Aug. 29, 30 (gage height, 3.45 feet).

1927–32: Maximum discharge, 2,140 second-feet Oct. 21, 1928 (gage height, 6.76 feet); minimum, 11 second-feet June 15, 1930 (gage height, 2.52 feet).

REMARKS.—Records excellent. No ice effect during year. Part of table of monthly discharge corrected for storage in Flambeau and Rest Lake Reservoirs.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	305	344	286	364	616	698	470	154	344	590	643	124
2	324	426	344	590	616	698	405	154	344	590	643	124
3	324	493	364	590	670	470	324	197	426	590	616	124
4	324	493	364	590	727	493	324	249	516	590	616	124
5	324	493	364	590	727	493	324	224	516	590	616	204
6	324	493	364	616	727	493	324	194	516	590	616	305
7	267	493	493	616	727	493	324	152	516	590	616	305
8	231	493	643	616	727	493	249	152	516	643	616	305
9	267	493	616	616	727	493	182	152	540	670	616	448
10	286	493	616	616	727	493	182	154	698	670	616	643
11	286	516	616	616	727	493	157	154	698	670	616	643
12	286	516	616	616	727	493	140	154	698	643	616	643
13	286	493	616	616	698	493	137	154	698	643	616	643
14	286	405	616	616	698	590	140	157	698	643	616	643
15	286	305	616	616	698	698	140	166	698	643	616	643
16	286	305	616	616	727	698	140	178	698	643	616	643
17	305	267	616	616	727	698	140	172	698	643	616	643
18	305	207	616	616	727	698	140	169	698	643	616	643
19	305	211	616	616	727	698	140	169	698	643	616	643
20	344	188	616	616	727	698	140	166	643	643	616	643
21	344	169	616	616	698	698	140	169	590	643	616	643
22	344	169	616	616	698	698	140	178	590	643	616	643
23	344	172	616	616	698	698	140	178	590	643	616	643
24	364	231	616	616	698	698	140	214	643	643	616	643
25	364	231	616	616	698	698	140	267	643	643	616	643
26	364	231	470	616	727	698	140	344	590	643	540	643
27	364	231	364	616	698	698	140	344	590	643	448	643
28	448	249	364	616	698	698	152	344	590	643	470	643
29	540	249	364	616	698	698	152	344	590	643	286	643
30	540	249	364	616	-------	565	154	344	590	643	124	643
31	448	-------	364	616	-------	470	-------	344	-------	643	124	-------

Month	Observed			Gain or loss in storage (millions of cubic feet)	Corrected for storage		
	Maximum	Minimum	Mean		Means	Per square mile	Run-off in inches
October	540	231	336	+534	535	0.863	0.99
November	516	169	344	+1,207	810	1.31	1.46
December	643	286	516	−117	472	.761	.88
January	616	364	605	−577	390	.630	.73
February	727	616	706	−627	456	.735	.79
March	698	470	609	−262	511	.824	.95
April	470	137	199	+2,634	1,220	1.97	2.20
May	344	152	209	+1,900	978	1.48	1.71
June	698	344	595	−639	348	.561	.63
July	670	590	634	−1,060	273	.384	.44
August	643	124	563	−670	313	.505	.58
September	643	124	519	−90	484	.781	.87
The year	727	124	486	+2,233	557	.897	12.23

FLAMBEAU RIVER NEAR BUTTERNUT, WIS.

LOCATION.—Staff gage installed Apr. 27, 1932, at new highway bridge in lot 10, sec. 28, T. 41 N., R. 1 E., 6 miles southeast of Butternut; prior to that date a chain gage 600 feet downstream was used. Datum of the two gages practically same as staff gage was set to read same as chain gage, and slope is very small.

DRAINAGE AREA.—660 square miles.

RECORDS AVAILABLE.—July 1914 to September 1932.

EXTREMES.—Maximum discharge during year, 808 second-feet June 11–19; minimum, 169 second-feet Sept. 5 (gage height, 0.98 foot).

1914–32: Maximum discharge, 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, Dec. 8 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, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	354	482	482	389	628	725	482	286	400	717	633	518
2	354	482	555	613	627	740	400	273	384	674	633	415
3	384	633	633	611	681	526	340	273	354	633	633	273
4	354	633	448	610	737	553	326	369	555	633	633	224
5	354	633	448	609	736	557	326	340	555	633	633	169
6	354	593	448	637	735	553	326	326	555	633	633	326
7	326	593	312	638	734	549	400	312	633	633	633	326
8	286	593	673	638	734	543	415	384	555	633	633	312
9	326	633	648	639	734	536	299	400	555	717	633	312
10	340	633	650	638	735	527	326	384	633	717	633	593
11	354	633	649	638	737	518	415	354	808	674	633	633
12	354	633	648	641	736	514	326	340	808	674	674	674
13	354	674	647	643	708	509	415	260	808	717	762	674
14	340	674	645	659	708	605	326	273	808	717	633	674
15	340	482	645	675	711	712	326	273	808	717	633	674
16	340	448	645	661	743	710	340	326	808	674	593	633
17	340	593	645	648	741	709	340	312	808	674	593	633
18	340	555	645	646	738	708	340	326	808	674	593	633
19	340	518	647	643	738	708	340	312	808	717	593	633
20	354	482	648	642	738	707	369	273	717	674	593	674
21	369	448	647	640	709	707	384	286	674	674	593	674
22	369	384	645	637	709	708	400	236	633	674	593	674
23	384	369	648	634	709	709	384	248	633	674	593	674
24	384	415	650	633	709	712	369	273	633	674	593	674
25	369	482	650	632	708	714	326	273	633	674	593	674
26	369	415	504	631	737	723	299	384	633	674	593	674
27	384	415	396	630	713	732	273	400	633	674	633	633
28	400	384	393	629	719	763	286	400	633	674	633	633
29	555	312	391	629	722	794	286	415	674	674	762	633
30	633	555	388	629	------	680	286	415	674	674	518	633
31	633	------	389	629	------	604	------	448	------	674	674	------

Month	Observed			Gain or loss in storage (millions of cubic feet)	Corrected for storage		
	Maximum	Minimum	Mean		Means	Per square mile	Run-off in inches
October	633	286	379	+534	578	0.876	1.01
November	674	312	526	+1,207	992	1.50	1.67
December	673	312	563	−117	519	.786	.91
January	675	389	628	−577	413	.626	.72
February	743	627	718	−627	468	.709	.76
March	794	509	647	−262	549	.832	.96
April	482	273	349	+2,634	1,360	2.06	2.30
May	448	236	328	+1,900	1,040	1.58	1.82
June	808	354	654	−639	407	.617	.69
July	717	633	676	−1,060	280	.424	.49
August	762	518	626	−670	376	.570	.66
September	674	169	553	−90	518	.785	.88
The year	808	169	553	+2,233	624	.945	12.87

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 1932.

EXTREMES.—Maximum discharge during year, 1,550 second-feet Apr. 13 (gage height, 11.85 feet); minimum, 328 second-feet Sept. 6 (gage height, 10.17 feet). 1929–32: Maximum discharge, 2,010 second-feet June 27, 1931 (gage height, 12.40 feet); minimum, 218 second-feet July 9, 1930 (gage height, 9.73 feet).

REMARKS.—Records fair. No records Dec. 7 to Apr. 13. Part of table of monthly discharge corrected for storage in Flambeau and Rest Lake Reservoirs.

Discharge, in second-feet, 1931–32

Day	Oct	Nov.	Dec.	Apr.	May	June	July	Aug.	Sept.
1	567	830	614	-------	567	439	830	614	955
2	567	772	567	-------	460	590	717	772	772
3	544	717	567	-------	382	544	522	717	717
4	544	717	522	-------	480	544	664	664	590
5	522	772	501	-------	590	664	717	717	480
6	460	717	501	-------	614	614	717	664	346
7	567	717	-------	-------	830	664	614	717	590
8	664	717	-------	-------	664	614	717	567	522
9	664	544	-------	-------	717	830	717	717	439
10	567	717	-------	-------	1,020	772	664	717	522
11	522	830	-------	-------	890	772	614	717	590
12	522	830	-------	-------	717	717	772	717	501
13	501	890	-------	-------	717	614	772	717	772
14	522	890	-------	1,470	664	717	772	717	717
15	522	955	-------	1,320	567	772	890	590	717
16	501	717	-------	1,090	522	772	830	717	717
17	480	830	-------	830	614	830	830	717	772
18	460	1,390	-------	830	717	830	614	664	772
19	480	1,240	-------	890	614	717	717	590	544
20	439	1,240	-------	955	717	717	717	664	772
21	439	1,240	-------	890	717	717	830	664	772
22	439	1,090	-------	955	567	772	772	664	717
23	480	955	-------	955	363	717	890	717	717
24	501	1,020	-------	830	439	717	664	717	717
25	522	1,090	-------	567	480	664	664	664	590
26	567	1,170	-------	830	480	567	717	664	614
27	614	890	-------	717	522	664	772	614	717
28	664	830	-------	614	664	772	772	664	717
29	717	614	-------	590	501	830	830	717	717
30	890	664	-------	590	420	830	717	664	717
31	890	-------	-------	-------	772	-------	772	955	-------

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	890	439	559	+534	758	0.786	0.91
November	1,390	544	886	+1,207	1,350	1.40	1.56
December 1–6	614	501	545	+15	574	.595	.13
April 14–30	1,470	567	878	+1,602	1,970	2.04	1.29
May	1,020	363	613	+1,900	1,320	1.37	1.58
June	830	439	699	−639	452	.469	.52
July	890	522	736	−1,060	340	.353	.41
August	955	567	690	−670	440	.456	.53
September	955	346	660	−90	625	.648	.72

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 1932. January 1914 to September 1923 about 8 miles below present site. From February 1903 to December 1906 at Ladysmith.

EXTREMES.—Maximum mean daily discharge during year, 7,460 second-feet Apr. 10; minimum, 347 second-feet July 10.

1903–6, 1914–32: Maximum discharge, 19,500 second-feet Apr. 11, 1922; minimum, 176 second-feet Aug. 30, 1925.

REMARKS.—Records good. Discharge computed from power-house records. Part of table of monthly discharge corrected for storage in Flambeau and Rest Lake Reservoirs. Daily-discharge records furnished by Lake Superior District Power Co.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,090	1,550	1,270	734	940	1,730	1,820	1,430	1,190	885	835	1,520
2	1,020	1,390	1,240	1,190	947	1,610	1,690	1,290	967	810	90[illegible]	1,170
3	1,270	1,350	1,260	922	1,080	1,640	1,330	1,280	1,020	616	1,040	1,220
4	737	1,330	1,260	1,010	1,070	1,490	1,400	1,310	1,290	693	1,070	711
5	945	1,410	1,280	856	1,090	1,470	1,420	1,390	1,440	1,150	978	627
6	995	1,370	891	1,200	1,330	939	1,900	1,590	1,310	1,290	756	789
7	1,160	1,420	1,060	1,270	955	1,190	3,510	1,850	1,280	1,210	367	733
8	1,140	1,510	630	1,050	1,200	1,350	5,630	1,860	1,230	732	643	833
9	1,500	1,180	1,100	1,210	1,120	1,270	6,370	1,880	1,250	753	795	886
10	1,390	1,080	1,310	948	1,210	1,330	7,460	2,210	1,070	347	846	629
11	1,340	1,380	1,470	1,220	1,200	1,080	6,940	2,010	954	696	807	605
12	1,350	1,500	1,470	1,180	1,010	1,060	6,280	1,840	650	980	863	851
13	1,440	1,660	1,470	1,510	1,340	768	5,550	1,500	769	970	95[illegible]	793
14	1,190	1,820	1,400	1,540	1,060	1,290	4,580	1,480	972	954	579	1,110
15	1,220	1,790	1,120	1,450	1,190	642	4,120	1,340	1,070	815	705	1,100
16	1,290	1,690	1,190	1,530	1,180	1,040	3,510	1,260	1,070	1,020	849	718
17	1,070	2,210	1,430	1,260	1,360	1,100	2,740	1,540	1,160	735	858	789
18	757	2,880	1,390	1,370	1,190	890	2,440	1,660	1,340	1,060	915	1,050
19	1,010	2,870	1,100	1,310	1,140	1,100	2,650	1,560	1,280	906	863	989
20	923	2,690	1,380	1,340	1,200	880	2,530	1,460	1,320	935	746	1,120
21	869	2,630	1,420	1,260	1,070	1,270	2,320	1,540	1,020	1,170	529	995
22	855	2,460	1,400	1,260	1,190	1,130	2,210	1,170	1,040	961	750	1,090
23	881	2,090	1,200	1,500	1,190	1,020	2,210	1,110	1,060	1,000	90[illegible]	940
24	1,120	2,580	1,180	760	1,310	1,170	2,000	1,060	873	455	870	838
25	616	2,900	1,460	1,250	1,180	990	1,580	1,390	839	654	89[illegible]	585
26	933	2,590	1,300	1,360	1,100	1,050	1,960	1,070	879	914	72[illegible]	784
27	947	2,210	1,250	1,120	1,020	716	1,770	995	1,090	1,040	757	806
28	1,040	1,960	1,260	1,420	953	968	1,530	844	1,140	1,010	646	1,070
29	1,210	1,570	1,190	1,140	1,570	1,280	1,600	713	1,160	811	823	1,020
30	1,350	1,190	980	1,250	-------	1,600	1,520	1,160	1,190	946	1,650	906
31	1,410	-------	1,030	473	-------	1,740	-------	1,280	-------	919	1,710	-------

Month	Observed			Gain or loss in storage (millions of cubic feet)	Corrected for storage		
	Maximum	Minimum	Mean		Means	Per square mile	Run-off in inches
October	1,440	616	1,100	+534	1,300	0.681	0.79
November	2,900	1,080	1,880	+1,207	2,350	1.23	1.37
December	1,470	630	1,240	−117	1,200	.628	.72
January	1,540	473	1,190	−577	975	.510	.59
February	1,570	940	1,150	−627	900	.471	.51
March	1,740	642	1,190	−262	1,090	.571	.66
April	7,460	1,330	3,090	+2,634	4,110	2.15	2.40
May	2,210	713	1,420	+1,900	2,130	1.12	1.29
June	1,440	650	1,100	−639	853	.447	.50
July	1,290	347	885	−1,060	489	.256	.30
August	1,710	367	859	−670	609	.319	.37
September	1,520	585	909	−90	874	.458	.51
The year	7,460	347	1,330	+2,233	1,400	.733	10.01

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 1932.
EXTREMES.—Maximum discharge during year, 4,180 second-feet Apr. 11 (gage height, 10.50 feet); minimum, 68 second-feet Aug. 24 (gage height, 4.36 feet).
1929–32: Maximum discharge, that of Apr. 11, 1932; minimum, that of Aug. 24, 1932.
REMARKS.—Records fair. Station discontinued during winter.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Apr.	May	June	July	Aug.	Sept.
1	575	552	622		729	398	196	126	398
2	529	529	622		729	398	205	126	359
3	484	506	622		785	398	205	126	246
4	440	506	575		729	398	196	118	225
5	398	462	575		729	359	186	118	196
6	398	440	575		729	325	177	111	151
7	440	419	575	3,000	785	325	168	111	142
8	440	419	622	3,270	905	282	160	104	142
9	529	440		3,090	1,030	269	151	104	134
10	622	440		4,090	969	258	151	104	126
11	622	440		4,180	905	236	151	104	118
12	622	484		3,720	905	215	151	104	118
13	622	506		3,270	905	215	151	98	126
14	622	552		2,740	844	215	142	98	126
15	575	729		2,300	844	215	142	91	126
16	529	785		2,060	785	215	126	91	126
17	506	969		1,980	785	215	126	85	118
18	462	1,030		1,660	785	225	126	85	118
19	419	1,100		1,500	785	236	126	85	104
20	398	1,230		1,430	785	236	126	35	104
21	359	1,230		1,430	529	225	142	79	111
22	359	1,160		1,290	506	215	151	79	111
23	342	1,230		1,230	484	215	151	74	111
24	342	1,230		1,160	462	205	142	68	111
25	359	1,230		1,030	440	186	134	74	111
26	378	1,230		969	398	186	118	85	111
27	398	1,160		844	419	196	118	85	111
28	419	1,030		785	462	205	126	126	111
29	440	785		785	440	196	134	142	111
30	622	674		729	462	186	142	398	111
31	552				419		134	506	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	622	342	477	0.716	0.83
November	1,230	410	783	1.18	1.32
December 1–8	622	575	598	.898	.27
April 7–30	4,180	729	2,020	3.03	2.70
May	1,030	398	693	1.04	1.20
June	398	186	255	.383	.43
July	205	118	150	.225	.26
August	506	68	122	.183	.21
September	398	104	147	.221	.25

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 1932.
EXTREMES.—Maximum discharge during year, 4,570 second-feet Apr. 11 (gage height, 7.3 feet); minimum, 30 second-feet July 24, Aug. 14, 19.
1915–32: Maximum discharge, 15,600 second-feet Mar. 26, 1920 (gage height, 11.48 feet); minimum (estimated), 14 second-feet Jan. 25–31, 1924.
REMARKS.—Records good except those for period of ice effect, Dec. 8 to Apr. 10, which are fair.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	250	298	550	318	152	350	940	520	124	135	42	62
2	218	298	432	296	142	532	1,130	550	113	124	38	55
3	183	264	432	273	135	715	1,420	520	135	113	38	50
4	162	227	376	257	128	768	1,700	461	142	113	55	47
5	142	192	350	241	112	820	2,000	432	150	135	90	42
6	142	183	350	262	96	768	2,290	520	150	135	62	47
7	183	162	363	283	93	715	2,700	970	113	124	55	35
8	298	142	376	286	90	632	2,990	1,220	106	106	47	42
9	376	142	404	288	93	550	3,470	1,310	113	90	42	38
10	323	192	432	283	96	434	4,000	1,220	113	100	35	35
11	432	350	418	278	124	318	4,380	970	90	80	35	38
12	461	490	404	314	120	264	3,300	820	100	55	38	42
13	432	550	390	350	122	209	2,160	680	80	42	35	38
14	376	615	376	550	124	192	1,700	550	80	47	30	38
15	323	890	376	750	166	175	1,310	520	69	50	33	38
16	313	1,400	376	577	209	156	1,050	615	69	47	35	50
17	236	1,600	376	404	176	138	930	785	100	42	33	62
18	227	1,920	376	377	142	131	855	715	205	50	35	55
19	192	2,160	390	350	142	124	750	550	142	38	30	50
20	162	1,810	404	329	142	122	715	461	142	47	33	42
21	142	1,700	390	308	140	120	582	432	106	47	35	42
22	142	1,600	376	268	138	133	550	404	80	38	33	42
23	135	1,500	404	227	138	146	520	350	69	33	42	47
24	124	2,160	432	214	138	176	490	175	55	30	42	47
25	113	2,420	432	201	131	205	461	227	150	33	50	42
26	124	1,920	432	190	124	246	404	227	227	35	55	38
27	175	1,500	404	179	196	288	376	192	236	33	80	38
28	192	1,130	376	170	268	360	350	162	236	62	90	38
29	250	750	344	162	309	432	298	162	175	62	80	35
30	323	615	313	162	------	591	404	142	124	38	80	47
31	313	------	316	162	------	750	------	135	------	38	74	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	461	113	241	0.473	0.55
November	2,420	142	973	1.91	2.13
December	550	313	393	.771	.89
January	750	162	300	.588	.68
February	309	90	144	.282	.30
March	820	120	373	.731	.84
April	4,380	298	1,470	2.88	3.21
May	1,310	135	548	1.07	1.23
June	236	55	126	.247	.28
July	135	30	68.5	.134	.15
August	90	30	48.5	.095	.11
September	62	35	44.1	.086	.10
The year	4,380	30	393	.771	10.47

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 1932.

EXTREMES.—Maximum discharge during year, 4,170 second-feet Apr. 8 (gage height, 4.75 feet); minimum, 158 second-feet July 25 (gage height, 0.73 foot).

1914–32: Maximum discharge, 7,610 second-feet Mar. 26, 1920 (gage height, 6.95 feet); minimum, 148 second-feet July 24, 1931 (gage height, 0.70 foot).

REMARKS.—Records fair except those interpolated Dec. 1–4 and those for period of ice effect, Dec. 5 to Apr. 2, which are poor. Flow regulated by 4 storage reservoirs upstream. Discharge, estimated, Dec. 5–19.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	373	326	586	293	599	1,500	804	469	317	239	176	335
2	382	325	598	293	599	1,130	880	510	297	241	228	325
3	391	306	609	293	568	1,310	960	451	295	257	206	306
4	400	330	621	379	454	880	632	393	313	284	180	271
5	441	324	632	379	768	880	1,040	395	276	260	185	292
6	384	328	599	356	920	842	1,900	465	291	247	193	306
7	443	281	568	732	768	768	3,750	371	265	251	209	281
8	486	313	538	732	599	732	4,170	389	270	240	220	290
9	439	331	538	538	404	880	2,820	407	299	204	235	282
10	359	369	510	804	454	842	2,340	425	243	216	207	251
11	512	384	510	698	428	920	1,900	435	226	234	210	259
12	415	366	481	568	481	880	1,400	367	229	203	205	333
13	440	370	481	732	568	768	1,220	384	247	214	201	353
14	471	436	481	632	454	920	1,080	372	235	215	204	359
15	506	613	481	698	481	880	880	346	233	290	181	297
16	534	447	481	698	481	842	880	416	279	248	296	302
17	420	594	599	664	538	1,000	960	438	238	240	336	316
18	419	836	664	698	568	880	1,040	395	244	244	272	296
19	390	570	632	599	538	804	960	353	281	222	262	341
20	439	552	568	568	510	768	880	409	311	211	252	365
21	475	878	568	568	568	632	732	410	235	205	242	423
22	406	622	428	538	568	632	664	359	251	275	232	350
23	417	696	293	510	481	632	538	389	235	245	309	352
24	428	1,080	293	404	428	632	404	333	222	172	313	355
25	431	970	538	379	481	632	454	321	372	176	361	367
26	389	614	334	404	568	632	664	306	393	236	409	365
27	378	590	404	379	568	632	568	368	293	213	457	255
28	411	773	379	538	599	632	454	345	238	196	314	250
29	398	669	379	510	804	664	428	322	249	169	323	259
30	379	575	379	538	------	698	428	368	240	195	315	270
31	355	------	274	510	------	768	------	343	------	184	350	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	534	355	423	0.385	0.44
November	1,080	281	529	.481	.54
December	664	274	498	.453	.52
January	804	293	537	.488	.56
February	920	404	560	.509	.55
March	1,500	632	826	.751	.87
April	4,170	404	1,190	1.08	1.20
May	510	306	389	.354	.41
June	393	222	270	.245	.27
July	290	169	227	.206	.24
August	457	176	261	.237	.27
September	423	250	314	.285	.32
The year	4,170	169	501	.455	6.19

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 1932.

EXTREMES.—Maximum discharge during year, 6,890 second-feet Apr. 8 (gage height, 4.80 feet); minimum, 124 second-feet Aug. 28 (gage height, 0.88 foot). 1907–8, 1913–23, 1925–32: Maximum discharge, 14,000 second-feet Mar. 26, 1920 (gage height, 8.0 feet); minimum, 21 second-feet Dec. 9, 1929 (gage height, 0.65 foot).

REMARKS.—Records excellent. Regulation by operation of power plants at Menomonie and Cedar Falls and by storage in 4 reservoirs upstream.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	588	571	689	696	696	2,810	2,810	908	635	571	421	428
2	689	569	580	750	641	2,810	2,180	648	588	571	421	521
3	571	641	1,100	641	529	2,620	944	908	635	489	421	489
4	696	521	796	689	489	2,440	1,570	908	588	489	421	481
5	504	641	1,030	563	554	1,540	1,320	648	588	481	421	451
6	436	504	529	696	635	1,380	1,900	580	451	635	421	393
7	750	512	546	571	689	1,380	2,670	750	443	571	421	428
8	696	521	563	571	580	1,380	5,190	696	443	571	421	458
9	648	696	571	804	641	1,380	5,460	856	443	496	414	529
10	804	689	571	521	641	1,380	3,030	1,170	538	421	414	458
11	641	588	979	856	696	1,310	3,190	917	554	421	414	451
12	648	588	1,170	856	689	1,170	2,180	856	481	458	414	551
13	750	689	979	750	696	979	1,920	696	521	504	436	588
14	641	988	848	856	696	1,170	1,680	689	538	489	407	588
15	689	804	521	856	696	1,240	1,460	571	571	466	407	563
16	641	1,040	554	917	696	1,100	504	750	546	519	443	554
17	689	1,040	696	635	696	1,170	521	588	529	443	458	571
18	641	926	750	750	696	1,100	594	588	571	428	466	466
19	641	1,040	804	594	696	1,030	1,040	641	521	421	400	509
20	696	1,100	804	917	696	856	1,170	750	546	414	393	554
21	466	979	1,030	979	689	1,030	1,100	594	571	421	407	546
22	466	796	856	917	689	969	1,030	529	563	407	443	563
23	641	1,230	1,040	917	689	796	917	529	529	407	451	571
24	641	1,320	1,100	750	750	641	554	750	546	400	407	546
25	489	1,460	689	796	750	804	794	856	554	400	496	481
26	594	750	1,040	696	804	979	1,030	796	481	400	1,100	529
27	563	988	689	641	856	1,590	856	689	648	400	1,170	538
28	641	1,240	563	696	1,170	2,620	804	917	529	407	451	554
29	696	750	917	750	2,620	2,440	908	635	571	414	466	563
30	689	917	750	641	------	2,810	750	635	554	421	458	546
31	571	------	856	648	------	3,000	------	635	------	428	458	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	804	436	630	0.348	0.40
November	1,460	504	837	.462	.52
December	1,170	521	794	.439	.51
January	979	521	739	.408	.47
February	2,620	489	761	.420	.45
March	3,000	641	1,550	.856	.99
April	5,460	504	1,670	.923	1.03
May	1,170	529	732	.404	.47
June	648	443	543	.300	.33
July	635	400	463	.256	.30
August	1,170	393	476	.263	.30
September	588	393	516	.285	.32
The year	5,460	393	808	.446	6.09

ZUMBRO RIVER AT ZUMBRO FALLS, MINN.

LOCATION.—Chain gage near east line of sec. 36, T. 110 N., R. 14 W., at Zumbro Falls, 1,500 feet below mouth of Spring Creek. Gage used since April 1929 is at same site and datum as gage used 1909–17.

DRAINAGE AREA.—1,120 square miles.

RECORDS AVAILABLE.—June 1909 to September 1917; April 1929 to September 1932.

EXTREMES.—Maximum discharge during year, 5,880 second-feet Mar. 27 (gage height, 13.60 feet); minimum, 50 second-feet Aug. 8 (gage height, 4.66 feet).

1909–17, 1929–32: Maximum discharge, about 14,800 second-feet Mar. 25, 1917 (gage height, 19.04 feet); minimum, that of Aug. 8, 1932.

Maximum stage known, 29.7 feet in April 1888.

REMARKS.—Records fair. Diurnal fluctuation caused by operation of power plant 10½ miles upstream.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	216	89	202	260	202	3,220	1,320	336	333	216	176	320
2	202	148	260	230	230	2,080	1,020	352	33[illegible]	245	102	305
3	189	148	230	171	245	1,220	922	352	333	189	100	230
4	133	82	230	245	260	1,220	1,220	336	333	189	95	140
5	202	80	245	245	260	874	1,620	368	203	176	91	121
6	93	78	202	245	245	624	2,440	1,070	33[illegible]	260	153	189
7	1,220	74	189	245	230	624	4,400	1,020	450	245	93	216
8	305	82	230	245	216	588	2,520	1,220	662	202	89	143
9	171	133	202	260	155	552	1,560	2,360	320	202	128	202
10	155	138	189	168	230	484	1,120	1,620	305	588	173	216
11	153	82	305	202	245	518	1,020	1,070	290	384	202	140
12	189	107	89	230	202	450	828	784	171	336	189	216
13	216	93	173	290	216	416	784	702	245	290	131	202
14	138	78	202	245	189	433	702	624	362	305	95	230
15	133	124	216	230	230	450	624	484	202	275	163	320
16	124	158	216	216	216	450	552	518	87	290	450	305
17	128	202	202	260	216	433	450	518	305	166	588	352
18	126	114	202	260	216	450	484	518	290	230	352	416
19	176	109	124	245	202	450	484	484	176	230	320	290
20	202	189	131	230	189	384	484	450	260	230	305	368
21	119	114	189	245	305	433	484	484	290	202	168	400
22	112	131	245	245	216	433	450	433	290	126	260	368
23	114	245	216	245	230	433	450	450	245	102	290	384
24	119	290	216	230	216	450	416	433	245	107	230	384
25	112	305	145	171	133	416	450	450	219	168	305	336
26	155	275	189	230	216	1,800	484	433	275	189	336	275
27	166	275	138	216	245	4,100	484	368	202	133	290	173
28	100	275	176	230	1,620	4,400	450	368	219	102	245	78
29	93	173	202	216	2,600	2,770	484	320	219	95	245	74
30	93	245	140	166	-------	2,440	450	290	202	216	290	60
31	91	-------	80	216	-------	1,870	-------	352	-------	121	290	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	1,220	91	185	0.165	0.19
November	305	74	155	.138	.15
December	305	80	193	.172	.20
January	290	166	230	.205	.24
February	2,600	133	351	.313	.34
March	4,400	384	1,140	1.02	1.18
April	4,400	416	972	.868	.97
May	2,360	290	631	.563	.65
June	662	87	280	.250	.28
July	588	95	220	.196	.23
August	588	89	224	.200	.23
September	416	60	248	.221	.25
The year	4,400	60	403	.360	4.91

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 1932.
EXTREMES.—Maximum discharge during year, 11,900 second-feet Apr. 7 (gage height, 13.85 feet); minimum, 19 second-feet July 25, 30, 31, Aug. 2, Sept. 16–18. 1905–09, 1913–32: Maximum discharge, 37,100 second-feet June 6, 1905 (gage height, 22.4 feet); minimum, 5 second-feet during February 1918.
REMARKS.—Records fair except those for period of ice effect, Dec. 6–19, Jan. 1–11, Jan. 30 to Feb. 25, Feb. 29 to Mar. 26, which are poor.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	117	140	430	212	240	2,100	3,290	319	100	140	21	49
2	104	123	336	226	255	2,020	2,710	302	130	140	19	41
3	89	123	336	186	255	2,020	1,940	286	91	140	28	41
4	75	119	302	212	255	1,860	1,860	270	140	123	21	39
5	68	108	186	174	255	1,710	2,890	286	212	110	54	30
6	64	108	186	186	255	1,360	4,660	3,510	270	140	110	28
7	98	100	186	174	255	920	11,900	5,410	174	123	74	21
8	162	86	186	155	255	694	10,600	3,950	136	119	62	21
9	174	86	174	162	255	642	6,780	3,090	110	100	54	24
10	270	113	186	186	255	566	4,300	2,180	86	100	45	24
11	451	151	286	199	302	542	2,990	1,500	74	82	37	24
12	286	186	410	270	372	495	2,180	980	65	68	34	96
13	240	199	319	1,570	372	451	1,640	668	65	62	26	26
14	226	302	286	2,260	354	430	1,230	473	51	58	24	21
15	186	1,040	286	1,780	336	410	920	372	45	51	21	21
16	162	1,640	270	1,500	336	372	694	319	45	51	123	19
17	136	2,530	240	1,290	319	354	566	226	41	54	91	19
18	121	4,900	212	861	302	336	518	174	51	49	68	19
19	121	3,510	199	668	302	319	451	391	62	39	58	24
20	106	2,440	186	642	286	302	410	319	91	39	39	65
21	91	2,530	174	566	286	286	336	302	82	30	34	51
22	87	2,020	199	518	286	286	319	270	65	34	30	54
23	87	1,780	319	391	286	270	286	240	54	26	26	39
24	87	5,280	566	336	302	270	286	212	49	21	21	34
25	79	3,950	642	302	302	270	255	162	804	19	34	34
26	62	2,530	518	302	518	451	286	151	642	270	41	28
27	58	1,710	430	286	566	2,350	286	140	319	51	41	30
28	87	1,160	336	255	804	4,180	255	130	240	34	54	26
29	91	642	286	240	1,100	4,780	270	123	162	21	65	24
30	110	566	270	240	-------	4,900	255	119	130	19	65	26
31	136	-------	270	240	-------	4,180	-------	110	-------	19	58	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	451	58	136	0.176	0.20
November	5,280	86	1,340	1.73	1.93
December	642	174	297	.384	.44
January	2,260	155	535	.691	.80
February	1,100	240	354	.457	.49
March	4,900	270	1,290	1.67	1.92
April	11,900	255	2,180	2.82	3.15
May	5,410	110	870	1.12	1.29
June	804	41	155	.200	.22
July	270	19	75.2	.097	.11
August	123	19	47.7	.062	.07
September	96	19	33.3	.043	.05
The year	11,900	19	608	.786	10.67

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.
DRAINAGE AREA.—2,120 square miles.
RECORDS AVAILABLE.—December 1931 to September 1932.
EXTREMES.—Maximum discharge during period, 15,100 second-feet Apr. 9 (gage height, 11.41 feet); minimum, 277 second-feet Sept. 7 (gage height, 2.17 feet).
REMARKS.—Records good except those for period of ice effect, Jan. 4 to Mar. 28, which are fair.

Discharge, in second-feet, 1931–32

Day	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		1,130	905	2,360	11,500	1,480	1,010	975	452	420
2		1,210	975	3,490	10,300	1,300	1,010	940	590	420
3		1,130	1,010	4,480	8,250	1,300	975	975	625	420
4		1,300	975	6,130	5,750	1,300	940	1,010	520	362
5		3,180	1,010	5,190	4,830	1,390	870	905	452	331
6		3,330	940	4,660	5,750	1,580	940	870	381	295
7		3,330	940	3,810	7,670	5,010	1,480	940	368	277
8		2,610	940	2,880	12,700	12,900	1,300	730	362	337
9		2,120	940	2,360	15,100	12,700	1,050	730	319	355
10		2,360	1,210	1,790	13,700	11,700	1,050	1,210	319	319
11		2,610	1,130	2,240	10,900	7,090	1,010	1,390	355	289
12		2,610	1,130	2,240	7,280	4,830	870	905	368	343
13		3,490	1,130	2,120	5,370	3,330	835	1,300	325	313
14		3,330	1,300	1,890	4,140	2,610	905	730	331	331
15		3,970	1,300	1,790	3,180	2,000	800	695	355	331
16		5,370	1,300	1,790	2,480	2,120	730	660	381	319
17		5,370	1,790	1,790	2,240	2,000	695	590	590	319
18		5,370	1,890	1,790	1,890	1,580	940	520	520	337
19		4,310	2,000	1,790	1,890	1,790	835	485	485	355
20		3,650	1,480	1,680	1,790	1,480	765	520	420	343
21		3,180	1,580	1,680	1,480	1,390	765	520	452	381
22		3,030	1,390	1,680	1,580	1,300	730	485	420	381
23		2,610	1,480	1,680	1,480	1,300	660	485	381	368
24		2,120	1,300	1,680	1,390	1,390	660	485	349	368
25		1,680	1,480	1,480	1,300	1,300	1,300	452	555	420
26		1,480	1,580	1,480	1,300	1,300	1,300	485	660	452
27		1,390	1,480	1,680	1,390	1,210	1,130	520	420	388
28	1,300	1,480	1,580	3,330	1,300	1,130	975	420	452	420
29	1,390	1,300	1,890	7,860	1,390	1,130	1,050	420	452	355
30	1,300	1,390	-------	7,090	1,480	1,130	940	485	420	394
31	1,300	1,050	-------	9,850	-------	1,050	-------	452	420	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
January	5,370	1,050	2,660	1.25	1.44
February	2,000	905	1,310	.618	.67
March	9,850	1,480	3,090	1.46	1.68
April	15,100	1,300	5,030	2.37	2.64
May	12,900	1,050	3,000	1.42	1.64
June	1,480	660	951	.449	.50
July	1,390	420	719	.339	.39
August	625	319	435	.205	.24
September	452	277	358	.169	.19

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 1932.

EXTREMES.—Maximum discharge during year, 2,220 second-feet June 8 (gage height, 6.30 feet); minimum, 94 second-feet Aug. 15 (gage height, 1.16 feet).

1913–32: Maximum discharge, 4,780 second-feet Sept. 15, 1928 (gage height, 9.8 feet); minimum, 56 second-feet Feb. 20, 1927 (gage height, 2.40 feet).

REMARKS.—Records fair except those for periods of ice effect, Dec. 7–9, 13, Jan. 14–19, 24–26, Jan. 30 to Feb. 28, Mar. 6–19, which are poor. Slight diurnal fluctuation caused by operation of power plants a few miles above station.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	219	219	288	240	199	698	342	301	240	328	199	230
2	219	219	263	252	147	542	328	288	240	288	240	230
3	180	230	263	252	108	434	328	276	240	301	276	240
4	172	240	252	263	163	402	301	276	263	342	252	219
5	199	219	252	230	180	371	342	263	252	371	252	190
6	219	219	252	219	155	252	434	580	328	328	230	209
7	371	219	240	288	140	301	739	1,270	1,040	301	240	209
8	698	219	240	328	155	314	1,220	1,220	2,010	276	219	190
9	739	199	230	328	172	301	866	739	1,270	263	199	209
10	402	230	230	402	180	252	580	505	580	314	180	209
11	342	209	434	342	180	288	371	402	402	542	209	190
12	314	219	434	276	180	276	342	342	288	658	199	219
13	276	219	402	505	199	240	314	314	314	434	190	230
14	276	219	371	402	190	276	288	314	288	301	180	263
15	276	230	301	263	163	288	288	276	288	276	147	219
16	263	276	263	263	190	314	288	288	276	252	781	219
17	230	371	276	252	190	301	276	314	301	252	910	219
18	276	434	240	314	180	301	276	288	434	240	1,040	155
19	263	468	240	301	209	276	276	276	823	230	739	230
20	252	434	219	288	209	230	276	263	866	252	371	240
21	240	342	240	301	219	276	263	288	402	252	263	252
22	240	301	240	276	219	252	252	252	371	219	252	240
23	230	342	252	263	209	263	263	252	276	209	230	209
24	240	371	263	263	155	276	263	240	276	172	230	209
25	209	505	240	263	276	276	263	263	252	190	252	172
26	252	434	276	230	434	371	252	276	371	209	371	209
27	252	371	263	314	910	402	252	301	580	219	434	209
28	230	288	263	342	1,040	402	263	288	434	219	328	209
29	219	263	240	276	823	342	263	263	342	219	314	180
30	240	263	240	252	------	342	276	240	328	209	276	199
31	240	------	276	301	------	328	------	252	------	209	263	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	739	172	283	0.687	0.79
November	505	199	292	.709	.79
December	434	219	274	.665	.77
January	505	219	293	.711	.82
February	1,040	108	268	.651	.70
March	698	230	329	.799	.92
April	1,220	252	368	.894	1.00
May	1,270	240	378	.918	1.06
June	2,010	240	479	1.16	1.29
July	658	172	286	.694	.80
August	1,040	147	331	.803	.93
September	263	155	214	.519	.58
The year	2,010	108	316	.767	10.45

ROOT RIVER NEAR HOUSTON, MINN.

LOCATION.—Chain gage in sec. 32, T. 104 N., R. 6 W., 1 mile west of Houston and 2½ miles above mouth of South Fork of Root River.

DRAINAGE AREA.—1,280 square miles (revised 1932).

RECORDS AVAILABLE.—May 1929 to September 1932. May 1909 to September 1917 about 1½ miles downstream.

EXTREMES.—Maximum discharge during year, 6,900 second-feet, Mar. 27 (gage height, 9.31 feet); minimum, 182 second-feet Oct. 3 (gage height, 2.19 feet); minimum gage height, 2.12 feet Sept. 10.

1909–17, 1929–32: Maximum discharge, 17,000 second-feet Mar. 24, 1917; minimum, 175 second-feet Jan. 18, 1931 (gage height, 3.16 feet, affected by ice); minimum gage height, 2.10 feet Aug. 29, 1931.

REMARKS.—Records fair. Stage-discharge relation affected by ice Jan. 30 to Feb. 27, Mar. 8–19. Diurnal fluctuation caused by operation of power plant at Rushford very pronounced during year.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	340	260	620	440	540	4,360	1,870	500	440	420	300	400
2	320	280	620	400	580	3,720	1,420	480	420	400	360	360
3	213	260	580	420	580	2,080	1,240	500	440	460	340	360
4	300	260	540	360	540	1,480	1,240	480	420	460	340	340
5	300	260	540	400	540	1,240	1,600	480	440	480	340	300
6	280	260	480	420	540	940	2,080	1,800	540	460	260	320
7	5,600	280	420	460	540	710	3,720	2,320	460	420	300	320
8	1,540	240	420	440	540	1,090	2,640	1,300	1,190	420	320	280
9	845	260	420	400	540	1,090	1,800	2,640	800	400	320	320
10	665	260	440	420	540	1,090	1,300	1,540	660	620	340	220
11	540	260	665	480	580	990	1,190	1,090	540	620	320	320
12	500	300	1,140	480	755	990	1,040	890	540	480	340	320
13	500	280	755	990	710	940	940	800	500	400	300	340
14	480	260	580	1,540	580	845	845	755	540	420	300	360
15	440	580	500	990	620	890	800	665	480	400	280	360
16	380	540	500	755	620	890	755	755	480	380	260	340
17	360	665	500	800	540	845	710	890	460	360	1,540	320
18	360	1,240	500	710	620	845	665	710	3,300	340	665	280
19	360	845	500	580	620	845	620	620	1,480	340	540	280
20	260	755	480	620	665	580	620	580	940	320	500	710
21	340	665	460	620	710	620	580	580	800	320	440	500
22	320	620	460	620	710	540	580	500	665	300	460	400
23	320	940	440	580	665	540	540	500	580	320	420	360
24	320	3,720	460	480	710	540	440	480	540	280	420	320
25	300	2,480	440	480	710	540	500	480	540	300	440	360
26	300	1,600	460	500	845	3,500	540	500	480	320	665	340
27	320	1,140	420	500	1,090	6,900	540	580	500	360	665	340
28	300	940	440	540	2,480	5,400	540	500	460	320	500	320
29	260	800	440	540	5,020	3,720	540	480	460	300	460	300
30	300	710	440	540	-------	3,100	500	460	440	320	440	260
31	280	-------	420	500	-------	2,910	-------	460	-------	320	420	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	5,600	213	579	0.452	0.52
November	3,720	240	732	.572	.64
December	1,140	420	519	.405	.47
January	1,540	360	581	.454	.52
February	5,020	540	853	.666	.72
March	6,900	540	1,770	1.38	1.59
April	3,720	440	1,080	.844	.94
May	2,640	460	817	.638	.74
June	3,300	420	685	.535	.60
July	620	280	389	.304	.35
August	1,540	260	439	.343	.40
September	710	220	345	.270	.30
The year	6,900	213	732	.572	7.79

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 1932. December 1905 to September 1915 at station 3 miles upstream.

EXTREMES.—Maximum discharge during year, 3,000 second-feet (estimated) Apr. 9; minimum, 249 second-feet (estimated) Sept. 24.

1915–32: Maximum discharge, 5,410 second-feet Apr. 10, 1929 (gage height, 5.70 feet); minimum, 165 second-feet July 7, 1918 (gage height, 0.65 foot).

REMARKS.—Records poor. Discharge interpolated Apr. 16. Flow is regulated by 14 reservoirs and 3 power plants above station. Owing to unsatisfactory operation of water-stage recorder, discharge for periods indicated by braced figures was determined by comparison with records for Wisconsin River at Merrill.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,750		1,600			1,280		860	1,510		337	1,560
2	1,420					1,280		950	1,240		357	1,700
3	1,080					1,380		910	782		365	
4	1,060	815				1,380		1,010	685		361	
5	708					1,120	1,910	1,020	546		365	742
6	708							1,460	702		391	
7	1,050		1,070	1,100		1,280		1,600	730		332	
8	1,330	546						1,080	685		351	
9	1,030	767						1,630	708		448	663
10	990	1,330			1,390	1,600	2,180	1,750	722			488
11	1,110						2,640	1,900	570			
12		1,200					2,830	2,180				
13							2,460	1,850		526		432
14			1,050	1,850			2,280	1,650				
15		1,030		1,900			1,850	1,210				
16		1,280		1,460			1,560	1,410			439	
17	770	1,960	1,180	1,000		1,100	1,280					
18				692			1,750					
19				965			1,800					
20				1,240	1,330		1,750		568			453
21			1,650	1,510	1,000							
22			1,750	1,330	1,280			1,110				
23	910	2,110			1,160							
24	798				655						485	
25	722		1,110		1,420	760	1,230				675	
26	649			1,230		613				414	1,000	
27	828		1,010		1,430	485			387	414		432
28	835		1,050			619		627	365	396	740	
29	902	1,600	1,160			960		566	414	391		368
30	910	1,960	1,420			960		509	460	357	1,600	
31	1,160		1,080			1,340		1,140		325	1,510	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	1,750		917	0.791	0.91
November			1,470	1.27	1.42
December			1,170	1.01	1.16
January			1,200	1.03	1.19
February		655	1,340	1.16	1.25
March		485	1,110	.957	1.10
April			1,730	1.49	1.66
May			1,210	1.04	1.20
June			634	.547	.61
July			498	.429	.49
August			547	.472	.54
September			590	.509	.57
The year			1,030	.888	12.10

WISCONSIN RIVER AT MERRILL, WIS.

LOCATION.—Water-stage recorder near highway bridge at east end of Merrill, on line between secs. 12 and 13, T. 31 N., R. 6 E., half a mile below mouth of Prairie River.

DRAINAGE AREA.—2,630 square miles.

RECORDS AVAILABLE.—November 1902 to September 1932.

EXTREMES.—Maximum discharge during year, 11,000 second-feet Apr. 11 (gage height, 8.87 feet); minimum, 507 second-feet Sept. 26 (gage height, 3.16 feet).

1902–32: 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. Discharge estimated Sept. 13–18 Flow regulated by 17 reservoirs and 8 power plants above station.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,360	1,540	2,760	2,250	2,100	3,900	3,020	2,170	2,080	1,090	1,230	1,700
2	1,980	1,420	2,510	2,310	2,490	4,010	3,250	1,850	2,430	1,140	1,470	1,680
3	1,570	1,740	2,620	1,760	2,560	4,010	2,130	2,040	2,190	858	1,220	2,370
4	1,360	1,740	2,730	1,600	2,560	3,900	2,360	2,510	2,190	1,120	1,260	1,440
5	1,460	1,680	2,040	2,190	2,560	3,480	2,890	2,590	1,490	1,240	1,260	1,270
6	1,410	1,680	2,100	2,430	2,730	2,900	3,400	5,370	1,280	1,270	1,220	1,260
7	1,790	1,740	2,130	2,130	2,480	2,440	7,620	6,590	1,070	1,390	1,220	1,310
8	1,810	1,460	2,140	1,980	1,930	2,810	8,660	6,090	1,220	1,320	1,170	1,260
9	1,680	1,340	2,150	2,140	3,260	2,990	9,210	5,370	1,750	1,090	1,360	1,220
10	1,910	2,020	1,980	2,310	3,160	2,990	10,400	5,970	1,810	1,130	1,310	1,260
11	1,930	1,960	2,380	2,290	3,060	3,190	9,800	5,490	1,380	1,040	1,220	1,040
12	2,150	2,330	2,590	2,450	4,010	3,060	8,400	4,120	1,140	1,230	1,310	1,190
13	1,980	2,370	2,060	3,160	4,120	2,430	6,840	3,900	907	1,180	1,170	1,200
14	1,790	2,130	1,770	3,480	3,900	1,930	5,850	3,440	1,750	1,230	1,090	1,210
15	1,790	3,580	1,960	3,620	3,160	2,510	5,260	2,660	1,980	1,260	1,310	1,220
16	1,790	3,580	2,680	4,340	3,580	2,680	4,560	2,510	1,620	1,420	1,120	1,230
17	1,680	3,400	2,320	3,020	3,480	2,490	4,120	2,810	1,700	1,170	1,040	1,240
18	1,370	6,590	2,320	2,560	3,580	2,630	4,120	2,660	1,280	1,280	1,040	1,250
19	1,180	6,840	2,370	2,660	3,580	2,590	4,010	2,450	970	1,280	1,040	1,270
20	1,440	6,340	2,320	3,360	3,260	1,910	4,010	2,370	1,150	1,320	960	1,170
21	1,740	5,910	2,100	3,060	3,370	1,910	3,620	2,630	1,280	1,310	793	1,080
22	1,520	6,150	2,480	3,480	2,840	2,370	3,370	2,610	1,190	1,310	980	1,040
23	1,270	6,840	3,090	3,090	3,060	1,960	3,220	2,060	1,060	1,130	1,000	1,040
24	1,970	5,420	3,060	2,750	2,900	1,960	3,250	2,020	1,180	1,110	1,000	929
25	1,320	7,360	2,450	2,380	3,060	1,910	2,560	2,210	1,350	1,170	1,000	770
26	1,180	6,590	1,970	2,660	2,900	2,020	2,610	2,250	884	1,230	1,080	920
27	1,540	5,970	2,020	2,780	3,260	1,760	2,080	2,450	968	1,270	1,000	1,060
28	1,850	4,470	2,230	2,870	2,780	2,430	2,510	2,330	1,130	1,440	885	979
29	1,850	4,120	2,390	2,700	3,110	2,680	2,330	1,770	1,220	1,290	1,120	970
30	1,910	2,960	2,080	2,700	-------	3,220	2,480	1,130	1,030	1,360	1,120	920
31	1,790	-------	2,310	2,990	-------	3,050	-------	1,640	-------	1,080	1,220	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	2,360	1,180	1,690	0.643	0.74
November	7,360	1,340	3,710	1.41	1.57
December	3,090	1,770	2,330	.886	1.02
January	4,340	1,600	2,690	1.02	1.18
February	4,120	1,930	3,060	1.16	1.25
March	4,010	1,760	2,710	1.03	1.19
April	10,400	2,080	4,600	1.75	1.95
May	6,590	1,130	3,100	1.18	1.36
June	2,430	894	1,420	.540	.60
July	1,440	858	1,220	.464	.53
August	1,470	793	1,140	.433	.50
September	2,370	770	1,220	.464	.52
The year	10,400	770	2,400	.913	12.41

WISCONSIN RIVER AT KNOWLTON, WIS.

LOCATION.—Water-stage recorder in N ½ 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 1932.

EXTREMES.—Maximum discharge during year, 30,400 second-feet (estimated) Apr. 18; minimum, 317 second-feet Aug. 8 (gage height, 0.9 foot).

1921–32: Maximum discharge, 49,800 second-feet Apr. 10, 1922 (gage height, 19.5 feet); minimum, that of Aug. 8, 1932.

REMARKS.—Records excellent except those for period of ice effect, Dec. 7–9, 14–17, Dec. 31 to Jan. 2, Jan. 7–10, Jan. 14 to Apr. 1, and those estimated Apr. 6–11, May 31 to June 13, June 27, July 4–12, Aug. 26–29, Sept. 2–5, which are fair. Flow regulated by many storage reservoirs and power plants above station.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,970	1,900	4,750	1,810	5,860	7,570	12,400	3,140	2,910	1,730	892	1,580
2	2,730	2,180	4,190	2,240	6,080	7,790	11,900	2,730	2,910	1,620	1,740	2,130
3	2,810	2,180	3,400	2,890	5,450	7,790	9,180	3,060	3,080	1,480	2,100	1,120
4	2,340	2,490	4,280	2,730	5,250	7,570	5,510	3,400	2,910	1,470	1,820	830
5	1,800	2,420	4,280	2,340	4,650	6,080	6,290	3,650	2,340	2,030	1,660	1,580
6	2,030	2,260	2,570	2,650	5,250	5,450	15,500	6,350	3,430	2,050	1,580	1,430
7	2,340	2,340	2,840	2,440	6,500	5,860	21,800	14,800	2,990	2,120	1,140	2,030
8	2,420	1,840	2,200	2,770	6,080	5,660	30,400	16,000	2,660	2,120	944	1,500
9	2,650	1,860	2,770	2,310	5,050	5,450	28,700	12,700	2,220	1,140	1,640	1,460
10	2,070	2,260	3,140	2,380	4,460	5,250	23,100	10,600	1,850	1,580	1,850	1,400
11	2,810	2,730	3,220	2,970	6,080	5,050	19,600	9,840	1,280	1,980	1,680	1,010
12	2,890	2,890	3,920	3,140	6,290	4,850	16,600	7,850	1,030	1,890	1,330	847
13	2,890	2,970	4,750	3,740	6,290	4,650	13,000	6,290	2,100	1,790	1,480	1,760
14	3,060	3,480	3,040	4,650	6,500	4,460	10,400	5,890	1,460	1,320	965	1,680
15	2,970	3,830	3,010	4,650	6,500	4,080	8,840	4,940	2,490	1,570	814	1,290
16	2,810	5,700	2,680	4,650	6,500	3,620	7,380	4,370	2,570	1,520	1,630	1,330
17	2,490	6,500	2,770	4,750	6,500	3,100	7,150	4,370	2,340	1,310	1,820	1,300
18	1,800	11,200	3,310	5,050	6,700	2,920	5,890	4,370	2,570	822	1,420	838
19	1,750	13,000	3,400	4,360	7,350	2,680	5,320	4,280	1,340	1,540	1,180	778
20	1,820	11,900	3,480	5,250	5,450	2,850	4,940	4,100	1,140	1,550	1,190	1,780
21	2,030	11,400	2,970	4,850	4,750	2,680	4,940	3,830	2,030	1,860	768	1,610
22	2,420	10,900	2,810	4,070	5,450	2,600	5,320	3,830	2,030	1,580	620	1,550
23	2,180	10,900	3,740	4,070	4,650	2,600	4,560	3,920	1,840	1,660	1,050	1,440
24	1,860	10,900	3,140	3,440	4,360	2,770	4,660	3,140	1,360	909	1,160	1,250
25	1,860	15,900	4,280	3,990	4,750	2,770	4,660	2,810	1,660	832	1,220	710
26	1,680	15,400	3,310	3,350	4,360	2,920	4,280	2,730	1,350	1,570	1,650	687
27	1,860	11,900	3,140	3,620	3,520	4,800	4,100	2,890	1,290	1,730	646	1,120
28	2,260	8,840	3,060	3,620	4,170	7,790	3,830	3,140	1,230	1,850	725	1,290
29	2,570	7,380	3,140	4,360	4,550	10,900	4,370	3,220	2,180	1,660	1,440	1,130
30	2,650	6,290	3,140	2,850	-------	10,900	3,220	2,650	1,860	1,620	1,520	1,090
31	2,650	-------	2,770	3,620	-------	12,200	-------	2,580	-------	1,010	1,600	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	3,060	1,680	2,370	0.544	0.63
November	15,900	1,840	6,520	1.50	1.67
December	4,750	2,200	3,340	.766	.88
January	5,250	1,810	3,540	.812	.94
February	7,350	3,520	5,490	1.26	1.36
March	12,200	2,600	5,340	1.22	1.41
April	30,400	3,220	10,300	2.36	2.63
May	16,000	2,580	5,400	1.24	1.43
June	3,430	1,030	2,080	.477	.53
July	2,120	822	1,580	.362	.42
August	2,100	620	1,330	.305	.35
September	2,130	687	1,320	.303	.34
The year	30,400	620	4,030	.924	12.59

WISCONSIN RIVER NEAR NEKOOSA, WIS.

LOCATION.—Water-stage recorder in sec. 15, T. 21 N., R. 5 E., 1½ miles below Nekoosa. Tenmile Creek enters 4 miles below station.

DRAINAGE AREA.—5,500 square miles.

RECORDS AVAILABLE.—May 1914 to September 1932.

EXTREMES.—Maximum discharge during year, 37,000 second-feet Apr. 9 (gage height, 12.82 feet); minimum, 140 second-feet Aug. 14, 21 (gage height, —0.60 foot).

1914–32: Maximum discharge, 61,000 second-feet Apr. 12, 1922 (gage height, 16.1 feet); minimum, that of Aug. 14, 21, 1932.

REMARKS.—Records excellent except those for period of ice effect, Jan. 15–18, Feb. 14–18, Mar. 8–15, which are fair. Flow regulated by many storage reservoirs and power plants above station.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,990	2,200	6,030	3,180	4,160	5,230	14,000	3,390	2,900	2,160	1,320	1,290
2	3,180	1,710	5,120	2,080	6,740	8,700	14,300	3,300	3,270	1,910	1,780	1,390
3	2,200	1,910	4,680	2,580	6,980	8,950	13,000	3,950	3,270	1,360	1,760	2,390
4	1,670	2,160	4,470	3,950	6,260	8,950	10,500	2,990	3,460	1,290	1,870	1,260
5	1,950	2,530	4,470	2,800	6,030	8,700	9,450	3,650	3,270	1,560	1,910	933
6	2,460	2,800	2,990	2,990	5,340	6,980	12,000	7,460	2,630	2,160	2,080	1,770
7	2,360	2,800	3,650	2,900	6,030	6,260	17,800	12,500	3,850	2,180	553	2,030
8	2,340	1,400	3,270	2,800	7,460	6,740	25,000	18,400	3,360	2,250	1,220	1,780
9	2,180	1,610	2,530	3,180	6,980	6,500	34,900	18,100	2,900	2,250	1,520	1,760
10	3,080	1,910	3,180	2,650	5,800	6,260	33,000	15,100	2,490	1,210	1,810	1,520
11	1,970	2,180	3,650	2,740	5,120	6,030	26,500	14,000	2,080	1,680	2,300	749
12	2,250	2,620	4,050	3,360	6,980	5,800	22,500	11,500	1,440	2,100	1,640	1,130
13	3,950	2,990	4,580	4,470	7,220	5,570	18,700	7,950	1,160	2,010	1,290	1,710
14	3,560	3,270	5,570	5,460	7,220	5,340	14,500	8,450	2,360	1,760	683	1,830
15	3,080	3,080	3,490	5,340	7,460	5,120	12,000	5,240	2,440	1,690	792	1,830
16	2,990	4,400	3,460	5,340	7,460	4,680	10,200	4,950	2,340	1,440	1,710	1,640
17	2,900	8,200	3,080	5,340	7,460	4,160	8,450	4,900	2,180	871	1,440	1,280
18	2,200	8,450	3,180	5,460	7,460	3,560	7,950	4,790	2,010	1,210	1,650	672
19	1,450	13,000	4,050	5,800	7,700	3,360	6,980	4,790	1,320	1,280	1,440	1,160
20	1,590	14,000	3,460	5,010	8,450	3,080	5,740	4,900	1,200	1,500	1,360	1,620
21	1,930	13,200	4,050	6,030	6,260	3,270	6,030	4,260	2,270	1,380	683	1,930
22	2,080	12,000	4,160	5,570	5,460	3,080	6,560	4,050	1,980	2,200	924	1,850
23	2,710	13,500	3,460	4,680	6,260	2,990	5,460	4,470	1,930	1,990	1,100	1,380
24	2,160	13,000	4,950	4,680	5,340	2,990	4,790	4,050	2,100	1,040	1,180	1,710
25	1,480	15,300	6,030	3,950	5,010	3,180	5,570	3,650	2,710	1,060	1,190	792
26	1,590	18,400	4,090	4,580	5,460	3,180	5,120	3,560	1,270	1,490	1,180	1,150
27	2,530	15,100	6,260	3,850	5,010	3,360	4,900	3,360	1,320	1,150	1,850	1,290
28	2,100	12,000	3,460	4,160	4,050	5,510	4,680	3,360	1,870	1,620	726	1,290
29	2,830	9,700	4,050	4,160	4,790	8,950	5,230	2,900	2,000	1,690	815	1,410
30	2,740	7,050	3,650	5,010	------	12,500	4,050	2,360	2,100	1,870	1,620	1,340
31	3,180	------	4,160	3,270	------	12,500	------	3,270	------	742	1,410	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	3,950	1,450	2,440	0.444	0.51
November	18,400	1,400	7,080	1.29	1.44
December	6,260	2,530	4,110	.747	.86
January	6,030	2,080	4,110	.747	.86
February	8,450	4,050	6,270	1.14	1.23
March	12,500	2,990	5,850	1.06	1.22
April	34,900	4,050	12,300	2.24	2.50
May	18,400	2,360	6,440	1.17	1.35
June	3,850	1,160	2,320	.422	.47
July	2,250	742	1,620	.295	.34
August	2,300	553	1,380	.251	.29
September	2,390	672	1,460	.265	.30
The year	34,900	553	4,600	.836	11.37

WISCONSIN RIVER AT MUSCODA, WIS.

LOCATION.—Chain gage 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 1932.

EXTREMES.—Maximum discharge during year, 40,800 second-feet Apr. 14 (gage height, 8.00 feet); minimum, 2,700 second-feet Aug. 1 (gage height, 0.30 foot).

1902–3, 1913–32: Maximum discharge, 72,100 second-feet Apr. 16, 1922 (gage height, 10.60 feet); minimum (estimated), 1,600 second-feet Dec. 20, 1921.

Maximum stage known, 11.1 feet during August, 1868.

REMARKS.—Records good except those for periods of ice effect, Dec. 4–9, 14–18, Jan. 2–5, 8–12, Jan. 16 to Mar. 28, which are fair. Flow regulated by storage reservoirs and power plants upstream.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7,260	6,260	20,400	7,620	7,260	8,720	7,980	9,500	6,590	4,400	2,850	3,200
2	5,600	5,030	15,200	7,620	7,260	7,260	9,500	8,340	6,590	4,400	3,200	3,200
3	4,800	5,300	13,200	7,980	7,260	7,620	13,700	8,340	5,930	4,200	3,400	3,200
4	6,260	4,400	11,100	7,260	7,260	7,620	14,700	8,340	6,260	4,400	3,400	3,200
5	5,600	4,400	9,900	7,620	7,260	7,620	16,200	7,980	5,930	4,800	3,200	3,020
6	5,300	4,400	9,500	5,930	7,260	7,980	17,700	8,340	7,980	5,300	3,200	3,200
7	5,030	4,600	8,720	6,590	6,590	9,500	19,800	9,500	9,500	4,800	3,020	3,200
8	4,600	5,030	9,100	5,930	6,590	10,300	18,800	10,300	7,260	4,200	3,020	3,200
9	4,400	5,930	9,100	5,930	6,920	9,100	18,200	7,980	5,600	4,400	3,200	3,200
10	4,800	4,800	7,980	6,260	6,260	9,900	17,700	8,720	5,300	5,930	3,400	3,200
11	7,260	4,600	7,980	7,980	6,590	8,720	21,000	12,800	7,260	6,590	3,600	3,200
12	6,260	4,800	7,980	6,590	7,620	9,500	22,800	14,200	5,930	7,260	3,600	3,400
13	6,590	5,030	7,980	5,600	6,590	9,500	27,900	17,700	7,260	4,800	3,200	3,800
14	5,300	5,030	8,340	5,930	5,930	9,500	38,400	21,000	5,930	4,400	3,020	3,800
15	5,030	5,030	9,100	6,260	6,590	9,900	40,000	20,400	4,600	4,400	3,200	3,600
16	4,800	5,030	8,720	6,590	7,260	10,700	37,600	15,200	4,400	4,400	3,200	3,400
17	5,300	5,930	8,720	5,930	7,620	10,300	31,400	14,200	4,400	5,030	3,800	3,400
18	7,260	5,600	7,980	6,260	7,620	10,300	24,600	13,200	4,600	4,800	4,200	3,400
19	6,260	5,930	7,980	6,260	7,980	10,300	18,200	11,900	4,400	4,800	4,000	3,600
20	5,300	6,920	7,980	5,930	7,620	9,500	12,800	10,700	4,200	4,000	4,400	3,800
21	4,400	8,720	7,980	6,260	7,260	9,900	14,200	10,300	4,400	4,200	4,200	4,000
22	4,600	9,100	9,100	7,260	6,590	10,300	14,700	9,500	4,800	3,600	4,400	3,800
23	4,800	11,500	7,980	7,260	7,620	9,900	14,700	8,720	4,800	3,600	4,600	3,400
24	6,920	16,700	6,920	7,260	8,720	8,340	10,300	8,720	4,400	3,200	3,800	3,400
25	6,260	17,700	7,260	6,920	9,900	7,980	8,720	7,980	4,400	3,020	3,600	3,600
26	4,800	17,700	7,620	6,590	10,700	8,720	9,900	8,340	4,600	3,200	3,800	4,000
27	4,800	15,200	7,980	6,260	8,720	11,100	9,900	8,720	4,400	3,200	3,600	4,000
28	4,400	18,200	7,980	6,590	9,500	10,300	10,300	8,720	4,600	3,020	3,600	3,600
29	4,800	16,200	7,260	7,260	8,720	9,500	9,100	8,720	5,030	3,020	3,400	3,400
30	4,800	19,800	7,260	6,590	-------	9,100	9,500	7,620	4,800	2,850	3,400	3,600
31	5,030	-------	6,260	6,590	-------	8,720	-------	8,720	-------	3,200	3,200	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	7,260	4,400	5,440	0.528	0.61
November	19,800	4,400	8,500	.825	.92
December	20,400	6,260	9,050	.879	1.01
January	7,980	5,600	6,670	.648	.75
February	10,700	5,930	7,550	.733	.79
March	11,100	7,260	9,280	.901	1.04
April	40,000	7,980	18,000	1.75	1.95
May	21,000	7,620	10,800	1.05	1.21
June	9,500	4,200	5,540	.538	.60
July	7,260	2,850	4,300	.417	.48
August	4,600	2,850	3,540	.344	.40
September	4,000	3,020	3,470	.337	.38
The year	40,000	2,850	7,670	.745	10.14

TOMAHAWK RIVER AT TOMAHAWK, WIS.

LOCATION.—In sec. 28, T. 35 N., R. 6 E., at Jersey power plant of Wisconsin Valley Electric Co., 1 mile north of Tomahawk.

DRAINAGE AREA.—547 square miles.

RECORDS AVAILABLE.—January 1930 to September 1932.

EXTREMES.—Maximum mean daily discharge during year, 1,120 second-feet Jan. 23; no flow Oct. 1, 4.

1930–32: Maximum mean daily discharge, 1,220 second-feet Sept. 13, 1930; no flow several times in 1931.

REMARKS.—Records good. Records of discharge, computed from power house records, furnished by Wisconsin Valley Electric Co. Flow completely regulated by 4 reservoirs operated by Wisconsin Valley Improvement Co. in the interest of power development.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	368	401	532	989	768	524	350	503	746	645	180
2	66	366	390	516	968	720	312	350	449	746	609	184
3	21	402	308	496	933	754	343	350	302	714	609	199
4	0	386	216	615	934	601	384	446	280	650	609	181
5	110	390	217	657	965	560	362	485	318	646	609	191
6	175	395	216	678	954	544	382	561	334	542	609	209
7	238	366	216	678	952	506	350	539	549	362	557	209
8	175	384	320	651	901	549	272	561	651	305	670	209
9	175	622	441	778	924	670	236	579	600	422	666	209
10	196	587	509	935	935	679	174	602	639	438	574	209
11	214	281	528	961	978	672	174	500	651	466	480	197
12	176	117	271	1,060	935	649	158	406	632	645	317	226
13	186	144	271	1,060	934	619	107	356	617	858	261	239
14	214	238	423	1,060	934	649	102	341	647	741	261	194
15	186	220	504	1,060	911	730	109	315	637	691	261	261
16	189	170	519	873	898	734	143	340	660	649	261	334
17	202	268	536	770	911	667	152	354	772	612	275	364
18	177	145	548	841	925	659	153	302	698	619	293	327
19	257	161	540	994	1,000	646	153	302	616	613	278	460
20	278	174	573	1,080	1,000	616	153	327	651	613	278	459
21	218	152	595	939	1,000	579	153	383	665	587	267	313
22	323	157	532	1,080	1,000	612	153	335	699	650	257	313
23	479	233	553	1,110	985	583	153	327	720	650	257	313
24	456	550	536	923	943	572	145	329	746	650	295	311
25	367	565	683	991	949	572	143	439	746	650	382	292
26	486	544	523	1,120	868	572	144	586	720	650	227	306
27	457	462	533	1,050	689	572	240	587	732	625	226	312
28	434	419	533	1,100	753	581	338	502	746	664	179	312
29	365	412	533	1,110	756	579	350	531	746	609	238	453
30	383	412	520	976	-------	572	350	489	730	636	204	423
31	401	-------	533	1,000	-------	586	-------	481	-------	609	156	-------

Month	Observed			Gain or loss in storage [a] (millions of cubic feet)	Corrected for storage		
	Maximum	Minimum	Mean		Mean	Per square mile	Run-off in inches
October	486	0	245	+640	484	0.885	1.02
November	622	117	336	+1,100	760	1.39	1.55
December	683	216	453	−110	412	.753	.87
January	1,120	496	893	−1,434	358	.654	.75
February	1,000	689	925	−1,772	219	.399	.43
March	768	506	625	−457	454	.830	.96
April	524	102	230	+2,460	1,189	2.16	2.41
May	602	302	431	+401	581	1.06	1.22
June	772	280	615	−1,181	159	.291	.32
July	858	305	615	−1,080	212	.388	.45
August	670	156	381	−292	272	.497	.57
September	460	180	280	+236	371	.678	.76
The year	1,120	0	502	−1,489	455	.832	11.31

[a] Corrected for storage at all 4 reservoirs upstream.

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 1932.

EXTREMES.—Maximum discharge during year, 9,080 second-feet Apr. 7 (gage height, 9.00 feet); minimum, 13 second-feet July 22, Sept. 12 (gage height, 1.68 feet).

1925–32: Maximum discharge, 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, Dec. 2 to Apr. 5, and those during periods of extremely low water, which are fair. Discharge interpolated June 9.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	56	104	195	78	116	950	890	195	49	45	19	20
2	52	94	170	69	116	830	830	188	88	42	19	18
3	49	83	164	67	116	800	740	174	154	42	20	18
4	45	69	110	65	116	770	710	188	202	49	24	16
5	45	69	78	67	116	498	830	181	174	45	20	14
6	45	60	78	69	116	404	1,150	3,110	174	45	19	14
7	56	60	71	69	116	339	8,780	2,700	104	42	19	14
8	154	56	67	69	116	278	4,810	1,710	65	35	19	14
9	122	56	65	69	116	220	2,970	1,370	52	32	19	14
10	104	88	65	69	116	184	2,110	950	38	32	19	14
11	104	181	78	69	116	150	1,710	574	38	27	19	14
12	167	167	202	74	195	141	1,080	498	30	27	19	13
13	141	202	174	167	548	134	830	360	30	24	19	24
14	122	258	150	548	474	128	682	278	27	24	14	22
15	122	427	119	498	278	119	523	220	24	22	14	20
16	94	1,010	104	450	239	116	474	239	32	20	14	18
17	83	1,080	94	382	220	113	427	239	32	18	19	18
18	69	2,570	91	318	202	110	360	220	32	18	19	22
19	56	1,710	91	298	181	104	339	188	32	18	19	20
20	60	1,010	91	258	167	104	298	181	32	18	14	154
21	56	1,530	94	202	167	104	298	167	35	16	14	65
22	52	1,150	119	178	147	104	278	134	35	13	14	32
23	52	890	167	167	122	107	239	122	27	14	19	24
24	56	2,700	167	144	125	122	220	94	27	14	19	24
25	78	1,710	147	134	134	134	220	78	38	14	19	20
26	78	950	119	128	167	239	220	78	49	16	32	18
27	78	710	116	125	239	548	195	74	42	20	30	18
28	99	498	116	122	298	830	174	69	35	20	24	20
29	110	318	110	119	548	890	174	65	38	20	27	20
30	128	318	104	119	------	1,220	174	56	45	20	24	18
31	116	------	91	119	------	1,010	------	56	------	20	22	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	167	45	85.5	0.277	0.32
November	2,700	56	671	2.17	2.42
December	202	65	116	.375	.43
January	548	65	171	.553	.64
February	548	116	197	.638	.69
March	1,220	104	381	1.23	1.42
April	8,780	174	1,090	3.53	3.94
May	3,110	56	476	1.54	1.78
June	202	24	59.3	.192	.21
July	49	13	26.2	.085	.10
August	32	14	18.5	.060	.07
September	154	13	24.7	.080	.09
The year	8,780	13	275	.890	12.11

YELLOW RIVER AT SPRAGUE, WIS.

LOCATION.—Chain gage in NW ¼ 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 1932.

EXTREMES.—Maximum discharge during year, 2,340 second-feet Apr. 8 (gage height, 13.1 feet); minimum, 8.9 second-feet Sept. 19 (gage height, 2.57 feet).

1926–32: Maximum discharge (estimated), 2,660 second-feet Sept. 17, 1928; minimum, that of Sept. 19, 1932.

REMARKS.—Records poor. Stage-discharge relation affected by ice Dec. 16–18, Jan. 5–11, Jan. 17 to Mar. 29. Discharge interpolated for Sundays and holidays.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	68	49	322	138	143	264	1,680	126	84	96	20	12
2	55	49	264	133	133	307	1,650	118	78	78	22	11
3	55	52	237	124	133	322	1,500	114	74	76	22	11
4	48	49	212	114	133	353	1,350	118	74	73	19	10
5	40	46	188	105	128	386	1,130	118	79	71	18	10
6	37	46	160	105	123	370	1,100	143	84	65	16	10
7	43	46	133	96	123	353	1,350	386	78	58	16	9.8
8	46	44	123	96	123	322	2,340	1,030	71	52	15	9.8
9	52	43	123	96	123	322	2,020	1,680	65	49	14	9.5
10	55	43	123	94	123	307	1,850	1,620	62	50	14	9.2
11	63	43	133	92	133	292	1,680	1,380	58	52	14	9.5
12	71	46	165	114	143	278	1,480	1,070	54	46	14	9.8
13	96	46	188	143	165	258	1,190	669	49	43	14	10
14	123	46	212	250	165	237	868	458	49	38	14	9.8
15	114	57	212	353	165	224	623	368	49	36	13	9.2
16	96	68	176	579	176	212	477	278	43	33	12	9.2
17	84	188	165	579	176	212	400	224	43	32	15	9.2
18	78	386	143	579	176	212	322	188	46	30	16	9.0
19	71	558	143	558	188	212	264	188	44	26	15	8.9
20	65	841	133	497	188	206	250	176	43	26	13	10
21	55	924	123	386	188	200	224	143	40	24	13	12
22	55	870	123	307	188	188	212	130	40	23	13	11
23	52	815	143	278	188	188	188	118	40	22	12	10
24	52	764	165	264	188	176	171	123	37	20	12	9.8
25	49	815	188	250	188	176	154	110	40	18	12	9.8
26	46	1,080	212	237	200	188	154	123	181	24	13	9.8
27	46	1,350	194	212	224	287	154	118	322	26	13	10
28	49	1,250	176	188	230	386	154	105	250	24	13	9.8
29	49	854	165	165	237	623	143	102	165	26	13	9.5
30	49	458	154	154	-------	1,040	133	99	118	24	13	9.5
31	49	-------	143	148	-------	1,480	-------	96	-------	22	12	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	123	37	61.6	0.141	0.16
November	1,350	43	398	.913	1.02
December	322	123	172	.394	.45
January	579	92	240	.550	.63
February	237	123	165	.378	.41
March	1,480	176	341	.782	.90
April	2,340	133	840	1.93	2.15
May	1,680	96	378	.867	1.00
June	322	37	82.0	.188	.21
July	96	18	41.4	.095	.11
August	22	12	14.7	.034	.04
September	12	8.9	9.9	.023	.03
The year	2,340	8.9	228	.523	7.11

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 September 1932.

EXTREMES.—Maximum discharge during year, 4,240 second-feet July 12 (gage height, 11.35 feet); minimum, 53 second-feet Oct. 3 (gage height, 0.56 foot).

1913–32: Maximum discharge, about 6,300 second-feet Mar. 24, 1917 (gage height, 15.05 feet); minimum, 48 second-feet July 27, 1931 (gage height, 0.51 foot).

REMARKS.—Records poor. Stage-discharge relation affected by ice Jan. 31 to Feb. 10, Mar. 8–17. Considerable diurnal fluctuations in stage caused by operation of power plant a short distance above gage.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	142	271	320	302	224	667	427	230	230	230	197	213
2	140	196	302	286	224	526	355	230	230	230	53?	230
3	69	196	286	302	240	454	355	230	378	248	402	248
4	215	206	286	206	240	427	355	230	310	478	289	205
5	175	147	302	271	240	378	427	248	289	454	24?	197
6	134	196	286	302	240	332	609	667	601	310	213	205
7	256	175	256	256	240	190	783	958	1,300	248	213	197
8	594	256	240	271	240	197	987	930	2,010	248	213	197
9	480	206	271	224	256	197	805	609	2,010	230	213	197
10	286	286	320	286	286	197	526	512	619	1,810	20?	197
11	286	240	742	286	704	197	478	402	497	3,430	19?	190
'2	256	271	877	339	1,490	197	402	355	355	3,620	19)	268
'3	271	302	577	478	1,380	205	355	355	378	1,130	19)	619
'4	256	320	358	632	1,040	205	332	289	289	497	19)	478
'5	186	339	286	526	594	213	310	289	289	355	19)	268
'6	215	320	302	380	526	248	289	289	268	310	213	248
'7	256	380	286	480	742	289	289	289	268	332	1,04)	230
'8	256	507	302	380	584	454	268	268	1,010	268	1,10)	205
'9	256	538	286	320	550	402	248	268	762	268	63?	197
20	256	380	286	380	454	289	230	268	454	230	26?	1,410
21	286	271	271	380	427	268	230	230	332	248	26?	704
22	152	427	286	339	584	332	230	230	355	230	24?	378
23	240	403	320	320	512	355	230	213	310	230	230	310
24	256	704	320	240	478	355	230	213	248	230	230	289
25	240	877	320	286	454	355	230	230	268	230	47?	248
26	271	569	339	320	704	1,070	230	378	402	230	58?	230
27	175	453	320	320	783	1,530	230	454	289	213	378	230
28	271	380	286	302	852	742	230	268	230	213	310	230
29	164	358	302	320	852	550	230	230	230	213	310	230
30	256	339	302	157	------	497	213	230	230	213	268	213
31	256	------	302	196	------	454	------	230	------	205	248	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	594	69	244	0.388	0.45
November	877	147	350	.556	.62
December	877	240	340	.541	.62
January	632	157	325	.517	.60
February	1,490	224	557	.886	.96
March	1,530	190	412	.655	.76
April	987	213	370	.588	.66
May	958	213	349	.555	.64
June	2,010	230	515	.819	.91
July	3,620	205	561	.892	1.03
August	1,100	190	338	.537	.62
September	1,410	190	309	.491	.55
The year	3,620	69	388	.617	8.42

ROCK RIVER AT WATERTOWN, WIS.

LOCATION.—Chain gage near center of sec. 4, T. 8 N., R. 15 E., at highway bridge on Milwaukee Street, Watertown, 1 mile below mouth of Silver Creek.
DRAINAGE AREA.—791 square miles.
RECORDS AVAILABLE.—June 1931 to September 1932.
EXTREMES.—Maximum discharge during period of record, 1,570 second-feet Jan. 13, 1932 (gage height, 2.39 feet); minimum, 1 second foot several times during August and September 1931, and September 1932.
REMARKS.—Records fair except those for low stage, which are poor. At low stages the accuracy of mean daily gage height is seriously impaired by fluctuation of stage owing to operation of power plant just above station. Records at medium and high stage fair, at low stage poor.

Discharge, in second-feet, 1931–32

Day	June	July	Aug.	Sept.	Day	June	July	Aug.	Sept.
1931					1931				
1	------	16	25	2	16	13	13	4	10
2	------	41	16	2	17	14	11	4	11
3	32	38	8	2	18	25	15	4	8
4	32	62	13	1	19	34	14	5	10
5	38	77	11	3	20	24	16	3	8
6	38	36	25	2	21	19	16	5	8
7	24	18	19	2	22	17	193	6	8
8	43	31	22	2	23	17	98	2	23
9	24	23	14	4	24	14	98	3	53
10	27	62	12	4	25	16	41	2	73
11	22	31	14	3	26	14	53	2	62
12	20	15	14	4	27	18	38	3	137
13	17	21	11	6	28	15	20	2	154
14	16	16	10	11	29	40	43	1	107
15	16	16	7	13	30	18	24	1	107
					31	------	29	1	------

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1931-32												
1	65	365	1,120	988	408	632	548	261	193	34	23	13
2	70	324	1,240	925	452	584	572	252	279	31	27	8
3	51	419	988	740	500	596	548	243	354	29	25	11
4	56	344	925	680	354	608	572	306	279	29	18	8
5	73	315	800	862	344	620	596	354	185	36	15	6
6	62	324	644	988	321	500	572	315	297	38	20	4
7	67	354	397	572	306	500	572	365	178	90	19	6
8	77	297	560	440	279	608	584	386	270	45	18	6
9	137	207	584	608	236	560	608	536	193	86	17	4
10	429	221	572	668	261	548	608	524	185	38	17	3
11	315	279	740	862	386	512	524	680	171	40	20	4
12	270	261	988	988	572	476	572	354	115	27	14	3
13	288	306	1,050	1,380	560	397	596	500	160	29	8	4
14	252	365	862	1,380	548	333	596	376	165	26	6	2
15	221	429	740	1,120	668	315	584	440	107	27	10	2
16	252	429	680	988	620	344	488	396	154	22	16	1
17	315	419	584	1,050	862	344	452	344	132	19	16	1
18	207	800	740	988	740	354	344	297	126	21	15	1
19	193	925	596	800	800	365	376	297	132	23	16	1
20	160	1,120	429	925	800	354	344	333	154	32	12	1
21	185	1,180	560	1,050	740	354	365	279	121	24	14	1
22	171	1,180	656	988	740	270	386	354	115	23	14	2
23	149	1,180	656	862	800	376	440	236	111	25	14	1
24	261	1,440	800	680	680	376	440	252	90	24	15	1
25	333	1,440	988	632	656	386	333	229	121	24	16	2
26	408	1,180	988	740	680	584	324	306	111	21	14	3
27	354	1,120	1,050	668	608	584	324	548	45	22	13	2
28	344	1,050	988	644	644	680	261	584	73	21	6	2
29	397	1,120	925	656	572	632	297	584	41	21	6	3
30	344	1,120	1,050	333	------	560	243	476	27	21	8	2
31	386	------	988	344	------	572	------	344	------	10	11	------

Discharge, in second-feet, of Rock River at Watertown, Wis., 1931–32—Continued

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
1931					
June 3–30	43	13	23.1	0.024	0.02
July	193	11	39.5	.041	.05
August	25	1	8.68	.0090	.01
September	154	1	28.0	.029	.03
1931–32					
October	429	51	222	.229	.26
November	1,440	207	684	.704	.79
December	1,240	397	803	.827	.95
January	1,380	333	824	.849	.98
February	862	236	557	.574	.62
March	680	270	481	.495	.57
April	608	243	469	.483	.54
May	680	229	376	.387	.45
June	354	27	156	.161	.18
July	90	10	30.9	.032	.04
August	27	6	14.9	.015	.02
September	13	1	3.60	.0037	.004
The year	1,440	1	385	.396	5.40

ROCK RIVER AT AFTON, WIS.

LOCATION.—Water-stage recorder installed Aug. 23, 1932, 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. Prior to that date a chain gage at same location and datum. Zero of gage is 743.18 feet above mean sea level.

DRAINAGE AREA.—3,190 square miles.

RECORDS AVAILABLE.—February 1914 to September 1932.

EXTREMES.—Maximum discharge during year, 4,270 second-feet Mar. 27 (gage height, 5.67 feet); minimum, 70 second-feet Sept. 14 (gage height −0.43 foot). 1914–32: Maximum discharge, 13,000 second-feet Mar. 23, 1929 (gage height 10.81 feet); minimum, that of Sept. 14, 1932.

REMARKS.—Records good except those for low stages and those for periods of ice effect, Jan. 30 to Feb. 5, Mar. 7–14, which are fair, and those for extremely low stages before the water-stage recorder was installed Aug. 23, which are poor. Regulation by operation of power plants above.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	722	890	3,720	2,890	2,180	1,940	2,710	1,010	1,010	620	226	538
2	776	722	3,610	2,530	1,100	2,100	2,710	1,010	950	506	226	305
3	722	776	3,290	2,180	2,020	1,940	2,620	1,140	1,290	506	258	342
4	423	776	3,390	1,940	2,020	2,020	2,620	1,010	1,070	242	242	369
5	365	776	3,290	2,020	1,940	2,020	2,350	1,380	890	423	144	324
6	776	776	2,710	2,180	1,860	1,700	2,440	1,260	1,010	620	138	446
7	832	832	1,630	1,560	1,780	1,940	2,530	1,010	1,370	506	136	278
8	890	776	2,260	1,860	1,780	1,940	2,530	1,440	1,140	620	328	230
9	832	832	2,180	2,260	1,700	1,940	2,440	1,440	722	188	346	396
10	645	776	2,100	2,350	1,630	1,940	2,440	1,320	950	1,010	226	184
11	950	776	2,180	2,180	1,500	1,940	2,350	1,440	890	1,200	328	262
12	890	890	2,350	2,260	1,500	1,860	2,350	1,500	722	776	242	310
13	722	832	2,260	2,350	1,560	1,860	2,260	1,200	950	572	275	302
14	890	890	2,260	2,440	1,560	1,860	2,180	1,010	776	722	96	178
15	722	1,070	2,180	2,890	1,630	1,860	2,100	1,200	670	365	292	122
16	832	1,070	2,180	2,990	1,630	1,630	2,100	1,140	630	384	226	193
17	832	1,010	2,180	2,990	1,700	1,630	2,100	776	378	226	346	159
18	776	1,860	2,180	2,620	1,940	1,630	1,940	890	494	346	242	198
19	484	2,020	2,100	2,350	1,700	1,630	1,700	776	630	464	403	126
20	722	2,020	2,100	2,710	1,700	1,560	1,630	1,010	394	464	242	240
21	722	2,180	2,020	2,890	1,780	1,630	1,560	776	506	403	346	282
22	722	2,440	2,020	2,710	1,860	1,560	1,500	1,140	310	310	292	170
23	722	3,090	1,940	2,710	1,860	1,500	1,560	950	385	196	251	244
24	1,010	3,500	2,100	2,440	1,860	1,500	1,560	832	506	196	304	147
25	950	3,390	2,020	2,180	1,860	1,500	1,630	596	328	365	260	161
26	950	4,050	2,100	2,440	1,860	2,440	1,560	950	168	242	209	129
27	1,260	4,160	2,260	2,440	1,860	3,720	1,200	832	527	226	152	241
28	776	4,050	2,350	2,350	1,940	2,620	1,070	620	550	484	269	138
29	776	3,940	2,710	2,020	1,940	2,350	1,010	722	403	346	286	130
30	1,140	3,720	2,890	2,180	-------	2,350	776	832	464	226	204	120
31	1,380	-------	3,090	2,180	-------	2,440	-------	950	-------	242	386	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	1,380	365	813	0.255	0.29
November	4,160	722	1,830	.574	.64
December	3,720	1,630	2,440	.765	.88
January	2,990	1,560	2,390	.749	.86
February	2,180	1,500	1,800	.564	.61
March	3,720	1,500	1,950	.611	.70
April	2,710	776	1,980	.621	.69
May	1,500	596	1,040	.326	.38
June	1,320	168	696	.218	.24
July	1,200	188	451	.141	.16
August	403	96	256	.080	.09
September	538	120	242	.076	.08
The year	4,160	96	1,320	.414	5.62

ROCK RIVER AT LYNDON, ILL.

LOCATION.—Chain gage in NE¼ sec. 21, T. 20 N., R. 5 E., at highway bridge in Lyndon, 14 miles above Rock Creek.

DRAINAGE AREA.—9,010 square miles.

RECORDS AVAILABLE.—November 1914 to September 1932.

EXTREMES.—Maximum discharge during year, 24,600 second-feet Oct. 11 (gage height, 13.40 feet); minimum, 1,090 second-feet Sept. 21 (gage height, 3.94 feet).

1914–32: Maximum discharge, 39,500 second-feet Mar. 28, 1916; maximum gage height, backwater from ice, 19.6 feet Feb. 16, 1918; minimum discharge, 655 second-feet Sept. 27, 1918 (gage height, 3.72 feet).

REMARKS.—Records good. Discharge estimated Dec. 18, 19, Jan. 3, 4, 17, and for period of ice effect, Feb. 3–9, Mar. 11–16. Discharge interpolated Apr. 19. 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, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,690	2,790	10,910	6,750	3,140	4,970	14,600	3,140	2,640	2,360	2,230	2,100
2	2,760	2,790	10,600	7,910	3,140	4,340	13,500	3,140	2,960	2,230	1,970	1,730
3	2,120	2,640	10,600	7,670	4,500	5,410	13,500	3,330	2,960	2,360	1,310	1,730
4	1,770	1,970	8,150	8,630	5,000	5,410	12,200	3,520	3,140	2,640	1,140	1,490
5	1,770	2,100	8,150	6,980	5,100	5,850	10,400	3,520	2,960	2,790	1,200	1,430
6	1,570	2,100	6,070	6,980	4,800	6,750	9,110	2,960	5,190	2,500	1,140	1,430
7	1,640	2,100	5,630	7,210	4,900	7,670	8,630	3,140	5,190	2,640	1,200	1,370
8	1,380	1,970	5,630	7,210	5,000	6,290	7,210	4,760	5,410	3,330	1,610	1,490
9	1,320	2,230	5,850	6,290	4,900	3,720	6,980	4,970	6,980	3,140	1,610	1,430
10	1,320	1,730	4,550	5,190	4,970	5,190	6,980	5,190	6,520	3,920	1,250	1,370
11	23,200	2,100	6,980	4,970	5,630	5,600	6,980	5,190	4,760	3,920	1,430	1,430
12	13,800	2,100	6,750	7,210	5,850	6,100	6,750	4,550	4,760	3,720	1,610	1,430
13	5,630	2,500	8,630	7,670	7,440	6,400	6,750	4,340	4,760	3,720	1,140	1,550
14	5,410	2,640	9,610	6,980	6,070	4,700	6,290	4,130	5,850	3,720	1,200	1,730
15	3,920	4,760	9,610	8,150	4,970	5,000	5,850	3,920	4,550	3,520	1,430	1,850
16	3,140	4,970	8,390	8,630	4,970	5,000	5,190	3,140	4,130	2,790	1,200	1,610
17	3,140	4,970	7,210	9,000	6,520	5,190	4,970	3,720	3,140	2,500	1,430	1,370
18	2,960	5,190	7,100	9,110	5,850	4,970	4,970	3,330	4,550	2,790	1,730	1,200
19	2,790	6,980	7,000	9,110	4,970	4,970	4,860	2,500	6,070	2,100	1,730	1,140
20	2,640	7,670	6,750	8,390	5,190	5,410	4,760	2,790	2,500	1,730	1,610	1,090
21	2,500	10,600	6,290	7,670	5,190	5,630	4,760	2,360	2,790	1,730	1,730	1,090
22	2,360	10,600	6,750	7,670	5,410	5,190	4,760	2,360	2,790	1,610	1,610	1,200
23	2,360	10,900	6,520	7,910	6,520	5,410	4,340	2,360	3,330	1,730	1,850	1,310
24	2,360	11,400	6,520	7,210	4,970	5,630	4,130	2,360	3,520	1,610	1,610	1,250
25	2,360	13,800	6,750	6,980	5,190	5,410	4,130	2,640	2,360	1,850	1,610	1,250
26	2,640	12,200	6,520	6,980	5,190	5,410	4,130	5,630	2,790	1,550	1,730	1,200
27	2,960	12,700	5,190	6,750	4,970	13,800	4,130	5,410	3,140	1,550	1,730	1,140
28	2,960	12,200	6,290	6,750	4,970	17,100	4,130	5,410	2,360	1,310	1,850	1,310
29	3,140	12,200	6,290	6,290	4,760	16,800	3,920	8,870	2,360	1,200	2,360	1,310
30	3,330	11,200	6,290	5,850	-------	16,500	3,330	2,790	2,360	1,140	1,550	1,310
31	3,140	-------	6,750	3,720	-------	16,000	-------	4,130	-------	1,200	1,730	-------

Month	Maximum	Minimum	Mean	Month	Maximum	Minimum	Mean
October	23,200	1,320	3,740	May	8,870	2,360	3,860
November	13,800	1,730	6,140	June	6,980	2,360	3,890
December	10,900	4,550	7,240	July	3,920	1,140	2,420
January	9,110	3,720	7,220	August	2,360	1,140	1,570
February	7,440	3,140	5,170	September	2,100	1,090	1,410
March	17,100	3,720	7,160				
April	14,600	3,300	6,740	The year	23,200	1,090	4,710

CRAWFISH RIVER AT MILFORD, WIS.

LOCATION.—Chain gage in sec. 4, T. 7 N., R. 14 E., on highway bridge on County Trunk Highway A in Milford, 1 mile below mouth of Rock Creek and 8 miles above mouth.

DRAINAGE AREA.—764 square miles.

RECORDS AVAILABLE.—June 1931 to September 1932.

EXTREMES.—Maximum discharge during period of record, 1,350 second-feet Nov. 26, 1931 (gage height 4.44 feet); minimum, 6.0 second-feet Sept. 1, 1932 (gage height 1.08 feet).

REMARKS.—Records fair except those for period of ice effect, Dec. 7, 8, Jan. 7–10, 25, Jan. 30 to Feb. 16, Mar. 5–24, which are poor.

Discharge, in second-feet, 1931–32

Day	June	July	Aug.	Sept.	Day	June	July	Aug.	Sep
1931					1931				
1	-------	43	14	24	16	62	40	26	
2	50	48	23	25	17	46	42	30	
3	46	69	21	20	18	38	48	29	
4	98	75	20	30	19	31	46	26	
5	78	66	22	24	20	58	56	24	
6	75	38	28	23	21	39	48	17	
7	106	48	32	14	22	35	43	21	
8	64	48	28	12	23	66	42	20	
9	29	46	26	18	24	45	24	17	
10	33	62	62	12	25	62	23	15	
11	45	42	50	13	26	54	12	12	1
12	30	29	32	10	27	72	15	9.5	1
13	75	46	31	11	28	66	12	26	1
14	80	31	22	20	29	66	30	36	1
15	56	36	20	28	30	58	20	29	1
					31	-------	17	12	----

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep
1931-32												
1	102	251	927	621	197	429	476	193	138	130	18	36
2	106	213	772	572	173	360	476	72	106	50	22	43
3	72	222	721	429	161	383	429	102	78	33	33	39
4	66	213	721	429	150	360	294	130	45	78	29	39
5	120	193	671	429	146	316	383	112	78	43	35	26
6	78	146	572	500	130	294	406	126	66	42	29	38
7	109	120	406	572	126	285	429	165	72	86	28	24
8	142	134	316	524	120	272	452	169	62	66	39	20
9	98	36	360	452	116	260	476	230	58	20	22	17
10	66	157	338	429	112	243	476	316	54	58	46	17
11	189	134	360	429	126	226	572	338	50	60	22	16
12	112	116	476	452	169	213	524	277	50	26	33	19
13	123	123	452	452	272	201	406	222	50	40	26	32
14	161	134	452	596	338	189	383	222	45	33	22	32
15	173	173	452	524	360	185	316	201	33	54	24	38
16	247	157	548	621	406	181	294	205	33	48	26	38
17	201	205	406	596	476	181	264	185	31	52	50	23
18	134	500	383	572	572	209	251	89	45	36	64	13
19	95	646	360	548	646	251	217	72	43	26	38	7.
20	146	772	360	572	671	272	177	123	36	21	32	17
21	109	875	360	548	621	285	205	146	52	40	31	23
22	102	1,030	406	548	671	285	209	86	36	48	32	30
23	112	1,080	429	524	721	285	197	62	60	38	31	28
24	197	1,140	524	406	621	338	157	75	29	31	33	22
25	268	1,300	524	500	452	360	193	75	48	21	23	15
26	247	1,350	646	406	429	383	222	123	64	30	29	20
27	189	1,350	721	429	429	406	153	173	89	40	56	23
28	222	1,190	721	383	338	452	80	217	39	48	42	36
29	281	1,030	646	360	429	383	98	201	29	39	42	25
30	294	1,030	621	316	-------	429	109	161	22	30	12	16
31	316	-------	621	230	-------	548	-------	112	-------	26	43	----

Discharge, in second-feet, of Crawfish River at Milford, Wis., 1931–32—Continued

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
1931					
June 2–30	106	29	57.3	0.075	0.08
July	75	12	40.2	.053	.06
August	62	9.5	25.2	.033	.04
September	185	10	50.0	.065	.07
1931–32					
October	316	66	157	.205	.24
November	1,350	36	534	.699	.78
December	927	316	525	.687	.79
January	621	230	483	.632	.73
February	721	112	351	.459	.50
March	548	181	305	.399	.46
April	572	80	311	.407	.45
May	338	62	161	.211	.24
June	138	22	54.7	.072	.08
July	130	20	44.9	.059	.07
August	64	12	32.6	.043	.05
September	43	7.7	25.8	.034	.04
The year	1,350	7.7	248	.325	4.43

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 1932.

EXTREMES.—Maximum discharge during year ending Sept. 30, 1932, 353 second-feet Nov. 24–29; minimum, 25 second-feet July 9.

1930–32: Maximum discharge, that of Nov. 24–29, 1931; minimum, 13 second-feet June 13, 1931.

RECORDS.—Record fair. Stage-discharge relation affected by growth of grass in the channel the greater part of each summer. Stage-discharge relation affected by ice Nov. 25, Dec. 26–31, 1930, Jan. 1, Jan. 14 to Mar. 18, 1931, Jan. 3–10, Jan. 28 to Feb. 1, Mar. 5–15, 1932.

Discharge, in second-feet, 1930–32

Day	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1930-31													
1	-------	152	128	126	e 90	111	107	135	114	22	60	38	46
2	-------	152	118	e 124	93	e 120	e 108	135	111	19	76	52	46
3	-------	164	118	123	e 90	128	109	135	109	18	71	56	46
4	-------	164	114	e 122	88	e 122	e 110	138	109	18	69	63	46
5	-------	164	114	121	e 87	116	111	130	107	19	69	63	42
6	-------	176	111	e 118	86	e 124	e 110	133	116	19	61	63	41
7	-------	199	109	116	e 86	133	109	130	123	20	56	63	38
8	-------	211	104	e 114	86	e 132	e 110	130	121	20	54	61	40
9	-------	211	102	111	e 86	130	111	130	126	17	52	76	41
10	152	211	102	e 109	86	e 126	e 102	130	109	18	48	71	42
11	140	211	100	107	e 87	121	93	121	107	17	46	65	41
12	138	211	100	e 107	88	e 130	e 100	116	102	15	46	60	41
13	140	211	104	107	e 90	140	107	114	88	13	47	56	41
14	140	211	107	e 110	91	e 133	e 107	116	79	15	48	52	41
15	138	211	114	114	e 86	126	107	123	71	15	48	48	47
16	128	211	111	e 106	81	e 126	e 110	130	63	21	48	46	67
17	128	199	111	98	e 84	126	114	135	58	18	48	47	79
18	118	199	111	e 98	88	e 128	e 115	138	58	16	48	47	74
19	114	187	111	98	e 90	130	116	135	52	17	47	42	104
20	111	176	118	e 93	93	e 128	e 117	140	56	18	58	40	100
21	107	164	123	88	e 94	126	118	164	42	20	58	40	111
22	104	164	116	e 88	95	e 118	e 118	164	38	22	54	38	133
23	107	152	118	88	e 93	109	118	152	34	32	52	36	138
24	107	152	118	e 88	91	e 106	e 123	152	32	34	47	33	138
25	111	152	116	88	e 92	104	128	140	30	46	46	34	187
26	138	152	104	e 88	93	e 106	e 128	140	24	48	44	32	187
27	140	152	107	e 88	e 92	107	128	140	24	50	42	32	199
28	140	152	135	e 88	91	e 107	e 129	135	24	52	38	41	199
29	140	140	138	88	e 91	-------	130	130	28	56	42	41	187
30	140	140	132	e 87	91	-------	e 132	121	24	60	38	44	187
31	-------	133	-------	86	e 101	-------	135	-------	21	-------	36	44	-------

e Interpolated.

Discharge, in second-feet, of Yahara River near McFarland, Wis., 1930–32—Cont.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1931-32												
1	187	135	329	246	187	a 211	246	199	164	42	34	116
2	176	114	329	246	187	211	a 246	a 188	a 158	34	30	116
3	176	116	306	258	176	a 211	246	176	152	36	35	121
4	164	116	306	246	164	211	a 246	a 194	a 164	36	38	121
5	164	109	294	246	164	a 211	246	211	176	36	36	104
6	164	116	282	246	176	211	a 258	a 211	a 158	36	36	100
7	164	98	258	246	176	a 211	270	211	140	34	38	98
8	164	98	294	246	176	211	a 270	a 217	a 132	32	33	95
9	152	93	282	246	164	a 211	270	223	123	25	35	93
10	164	88	282	235	a 182	211	a 270	a 217	a 112	71	36	88
11	152	91	282	235	199	a 211	270	211	100	71	38	93
12	152	116	282	235	a 188	211	a 264	a 205	a 92	63	41	93
13	164	118	282	235	176	a 211	258	199	83	60	40	81
14	164	138	270	246	a 170	211	a 258	a 188	a 78	58	38	76
15	164	152	270	246	164	a 217	258	176	74	54	40	71
16	164	152	258	235	a 182	223	a 252	a 170	a 72	52	42	74
17	152	199	258	235	199	a 223	246	164	71	48	67	71
18	152	258	246	270	a 199	223	a 246	a 152	a 83	46	71	67
19	140	258	235	235	199	a 223	246	140	95	44	76	69
20	140	282	235	187	a 199	223	a 240	a 130	a 86	42	76	60
21	135	282	235	199	199	a 223	235	121	76	42	81	56
22	133	294	235	211	a 205	223	a 235	a 118	a 70	44	86	58
23	138	329	235	211	211	a 223	235	116	63	38	81	58
24	140	353	246	223	a 205	223	a 235	a 116	a 60	36	88	56
25	140	353	246	199	199	a 234	235	116	56	32	91	54
26	152	353	246	187	a 188	246	a 235	a 122	60	41	88	54
27	152	353	246	176	176	a 252	235	128	61	41	98	52
28	152	353	246	187	a 194	258	a 223	a 136	56	40	104	46
29	140	353	246	187	211	a 252	211	a 144	47	40	114	46
30	140	329	246	187	------	246	a 205	152	44	36	111	46
31	140	------	246	187	------	a 246	------	a 158	------	34	111	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
1930					
September 10-30	152	104	128	0.380	0.30
1930-31					
October	211	133	177	.525	.61
November	138	100	114	.338	.38
December	126	86	103	.306	.35
January	101	81	89.7	.266	.31
February	140	104	122	.362	.38
March	135	93	115	.341	.39
April	164	114	134	.398	.44
May	126	21	71.0	.211	.24
June	60	13	25.8	.077	.09
July	76	36	51.5	.153	.18
August	76	32	49.2	.146	.17
September	199	38	91.0	.270	.30
The year	211	13	95.1	.282	3.84
1931-32					
October	187	133	154	.457	.53
November	353	88	207	.614	.68
December	329	235	266	.789	.91
January	270	176	225	.668	.77
February	211	164	187	.555	.60
March	258	211	223	.662	.76
April	270	205	246	.730	.81
May	223	116	168	.499	.58
June	176	44	96.9	.288	.32
July	71	25	43.4	.129	.15
August	114	30	62.4	.185	.21
September	121	46	77.8	.231	.26
The year	353	25	163	.484	6.58

a Interpolated.

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 1932.

EXTREMES.—Maximum discharge during year, 5,650 second-feet Mar. 29 (gage height, 16.24 feet); minimum, 203 second-feet Sept. 27 (gage height, 3.66 feet).

1914–32: Maximum discharge, 18,400 second-feet Mar. 16, 1929 (gage height, 19.76 feet); minimum, 148 second-feet Aug. 25, 1931.

REMARKS.—Records poor. Discharge estimated during period of ice effect, Jan. 31 to Feb. 2.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	529	362	1,160	840	510	644	2,580	506	420	441	344	344
2	400	381	1,020	915	570	667	1,430	484	400	441	381	290
3	400	362	965	840	667	965	1,160	484	400	441	381	290
4	381	381	915	690	621	890	1,040	462	400	441	484	290
5	362	326	890	621	598	1,070	965	644	529	462	400	308
6	362	381	815	940	621	940	940	1,100	1,220	621	400	272
7	400	326	790	965	621	740	965	1,190	2,620	790	381	254
8	420	344	644	765	598	644	1,070	990	3,120	840	344	272
9	644	290	598	644	598	715	1,310	940	3,330	740	362	272
10	484	326	790	740	598	690	1,100	865	3,500	644	344	272
11	1,100	362	1,020	790	644	690	940	715	2,680	915	362	254
12	990	1,020	1,580	915	1,040	667	840	575	1,400	1,280	344	290
13	690	1,130	1,520	990	1,400	644	765	552	840	1,220	344	272
14	506	1,100	1,190	1,040	1,250	621	715	484	765	790	326	272
15	575	1,070	940	1,160	940	598	667	462	700	552	326	290
16	441	940	790	965	840	598	644	441	667	420	326	272
17	420	940	667	865	1,190	990	621	441	575	400	344	272
18	381	2,820	740	915	1,520	1,580	598	420	1,190	381	462	290
19	344	2,980	765	890	1,930	1,900	575	420	1,980	381	420	254
20	344	2,900	667	840	1,720	1,930	552	400	1,520	381	400	254
21	362	3,220	715	840	1,220	1,250	575	400	965	381	308	290
22	344	3,020	715	840	865	484	575	400	644	362	326	272
23	400	2,500	715	790	644	915	575	381	575	344	308	272
24	715	3,070	740	765	715	915	598	381	484	362	290	254
25	815	3,330	740	690	644	815	529	441	462	308	290	237
26	552	3,270	840	575	667	2,040	644	1,680	575	344	308	254
27	462	2,900	890	740	598	3,970	575	1,580	890	506	308	237
28	420	2,070	790	715	644	5,070	575	890	1,070	765	441	272
29	400	1,520	765	644	552	5,650	484	598	690	484	506	272
30	400	1,280	715	484	------	5,350	506	484	529	381	420	254
31	400	------	715	485	------	4,210	------	441	------	308	381	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	1,100	344	498	0.374	0.43
November	3,330	290	1,500	1.13	1.26
December	1,580	598	865	.650	.75
January	1,160	484	803	.604	.70
February	1,930	510	863	.649	.70
March	5,650	484	1,580	1.19	1.37
April	2,580	484	837	.629	.70
May	1,680	381	653	.491	.57
June	3,500	400	1,170	.880	.98
July	1,280	308	552	.415	.48
August	506	290	366	.275	.32
September	344	237	273	.205	.23
The year	5,650	237	828	.623	8.49

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 1932.
EXTREMES.—Maximum discharge during year, 4,350 second-feet Mar. 27 (gage height, 7.38 feet); minimum, 58 second-feet July 26 (gage height, 0.48 foot).
1914–32: Maximum discharge, about 13,000 second-feet Sept. 13, 1915 (gage height, 11.4 feet); minimum, about 47 second-feet Aug. 26, 1923.
REMARKS.—Records fair except those for periods of ice effect, Jan. 30 to Feb. 9, Feb. 12–16, Mar. 6–13, which are poor. Flow slightly regulated by operation of power plant in Brodhead.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	235	210	457	393	289	289	559	210	184	109	148	210
2	222	235	425	425	289	347	490	248	222	101	184	148
3	197	222	393	393	289	318	425	210	197	148	148	148
4	197	235	362	332	289	289	490	222	210	109	172	109
5	210	222	393	332	289	362	425	275	184	109	148	148
6	235	222	425	425	289	289	425	289	222	118	127	160
7	197	197	393	289	235	222	490	318	347	138	127	109
8	222	148	393	490	275	210	595	457	318	101	160	138
9	235	197	362	362	248	235	559	425	393	210	138	184
10	222	210	393	318	235	262	490	362	303	303	148	160
11	275	210	393	393	275	235	457	289	235	631	101	101
12	275	303	559	393	631	222	303	248	172	1,120	160	101
13	275	275	524	393	631	222	318	248	197	1,310	127	109
14	275	393	524	393	425	275	318	222	184	706	127	148
15	303	393	425	559	425	262	347	197	148	303	172	172
16	275	425	393	457	332	235	275	210	184	235	172	109
17	248	490	393	425	393	393	275	210	184	138	109	148
18	184	1,210	303	393	524	524	289	197	138	210	210	101
19	235	1,260	262	332	631	595	275	197	138	118	197	184
20	184	1,310	275	425	744	524	289	197	184	138	138	172
21	262	1,160	303	347	457	524	262	197	210	160	148	160
22	172	1,120	362	393	332	425	262	172	109	222	138	160
23	457	1,210	393	318	332	347	235	160	160	210	172	160
24	524	1,310	393	318	222	303	262	184	109	210	172	138
25	425	1,410	425	303	262	303	275	210	138	160	184	93
26	393	1,210	490	303	275	862	275	197	109	127	160	172
27	332	862	490	248	262	3,990	262	275	148	222	148	127
28	248	631	425	289	248	3,240	262	275	118	262	72	86
29	248	490	393	332	362	1,620	262	222	148	262	184	172
30	248	457	362	318	------	862	248	184	138	184	184	138
31	262	------	362	303	------	595	------	184	------	76	184	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	524	172	267	0.505	0.58
November	1,410	148	608	1.15	1.28
December	559	262	401	.758	.87
January	559	248	368	.696	.80
February	744	222	362	.684	.74
March	3,990	210	625	1.18	1.36
April	595	235	357	.675	.75
May	457	160	242	.457	.53
June	393	109	191	.361	.40
July	1,310	76	273	.516	.59
August	210	72	154	.291	.34
September	210	86	142	.268	.30
The year	3,990	72	332	.628	8.54

SOUTH BRANCH OF KISHWAUKEE RIVER AT DE KALB, ILL.

LOCATION.—Chain gage in NE¼ sec. 22, T. 40 N., R. 4 E., at Lincoln Highway Bridge in De Kalb. Zero of gage is 835.83 feet above mean sea level.

DRAINAGE AREA.—70 square miles.

RECORDS AVAILABLE.—July 1925 to September 1932.

EXTREMES.—Maximum discharge during year, 406 second-feet Mar. 27 (gage height, 5.25 feet); minimum, 0.01 second-foot Oct. 4, 5 (gage height, 0.08 foot).

1925–32: Maximum discharge, 960 second-feet June 12, 1929 (gage height, 8.84 feet); minimum, 0.01 second-foot July 31, 1930, Oct. 4, 5, 1931.

REMARKS.—Records good except those estimated for periods of ice effect, Jan. 31 to Feb. 7, Mar. 6–15, 22, which are fair, and those below 1.0 second-foot, which are poor.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.04	4.9	62	136	48	33	172	23	10	2.6	0.1	0.5
2	.04	4.7	51	136	37	163	154	21	9.5	2.4	.6	.3
3	.03	4.3	48	103	28	246	119	21	9.5	7.2	.2	.3
4	.01	4.7	51	83	22	202	99	31	7.9	4.1	.2	.2
5	.01	4.5	58	79	19	182	91	36	11	4.9	.2	.1
6	.03	4.7	54	136	19	163	76	33	79	3.6	.1	.1
7	.4	5.1	48	127	20	136	72	68	111	24	.2	.1
8	.07	3.9	30	103	21	99	58	103	58	21	.1	.1
9	.05	3.9	40	79	25	72	52	83	36	11	.2	.1
10	.16	4.3	32	68	29	54	49	65	26	9.8	.1	.09
11	19	8.1	79	54	172	48	46	55	20	11	.2	.09
12	24	7.3	182	54	292	48	38	46	16	8.2	.2	1.0
13	22	19	145	103	145	40	36	41	13	4.6	.3	23
14	24	16	119	119	111	33	33	34	13	3.3	.3	11
15	19	18	99	172	91	33	31	30	41	2.4	.3	3.6
16	14	21	87	163	79	44	29	27	36	1.8	.2	1.1
17	11	23	76	172	76	33	28	22	23	1.3	.1	.5
18	8.1	32	68	163	51	28	27	20	20	1.1	.1	.3
19	6.4	38	68	119	51	29	25	20	18	1.0	.1	.3
20	5.3	54	65	103	42	23	26	19	13	.6	.1	.3
21	4.3	119	62	95	40	18	25	18	10	.5	.1	.2
22	4.1	136	62	91	36	19	22	16	7.9	.4	.1	.2
23	5.1	316	58	91	24	20	22	14	5.2	.3	.2	.2
24	5.8	268	54	79	30	24	29	13	4.1	.3	.2	.1
25	8.8	202	48	72	28	35	36	15	4.4	.3	.1	.1
26	7.6	145	43	72	28	163	36	30	6.9	.3	.2	.1
27	7.8	111	43	65	28	406	29	19	11	.2	.3	.1
28	7.6	99	43	68	29	367	27	14	7.2	.2	23	.09
29	6.4	83	36	83	30	280	26	12	4.6	.2	.3	.1
30	6.0	76	36	76	-------	257	26	11	3.3	.08	.2	.09
31	5.3	-------	48	62	-------	202	-------	10	-------	.06	3.8	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	24	0.01	7.18	0.103	0.12
November	316	3.9	61.2	.874	.98
December	182	30	64.4	.920	1.06
January	172	54	101	1.44	1.66
February	292	19	56.9	.813	.88
March	406	18	113	1.61	1.86
April	172	22	51.3	.733	.82
May	103	10	31.3	.447	.52
June	111	3.3	21.2	.303	.34
July	24	.06	4.15	.059	.07
August	23	.1	1.05	.015	.02
September	23	.09	1.48	.021	.02
The year	406	.01	42.8	.611	8.35

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 and 25 feet below the new hydraulic laboratory of the State University of Iowa. Zero of gage at elevation 39.00 feet, Iowa City datum, since Oct. 1, 1930.

DRAINAGE AREA.—3,140 square miles.

RECORDS AVAILABLE.—June 1903 to July 1906; October 1913 to September 1932.

EXTREMES.—Maximum discharge during year, ending Sept. 30, 1932. 7,880 second-feet Dec. 1 (gage height, 48.5 feet); minimum, 42 second-feet Sept. 30 (gage height, 38.73 feet).

1903–6, 1913–32: Maximum discharge, 36,200 second-feet June 7, 1918 (gage height, 19.45 feet, old datum, and 58.45 feet, Iowa City datum); practically no flow Sept. 3, 1925, caused by regulation.

REMARKS.—Records excellent. Considerable diurnal fluctuation occurs at low stages, owing to operation of power plant above station. Records furnished by State University of Iowa.

Discharge, in second-feet, 1930–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1930–31												
1	280	143	194	152	740	214	385	510	165	108	136	424
2	284	179	198	108	640	170	415	465	224	104	143	280
3	235	143	165	103	590	217	495	405	239	112	115	403
4	154	120	206	137	540	218	690	380	247	146	172	260
5	232	125	395	96	505	211	815	415	293	109	115	224
6	168	136	510	142	535	211	900	415	595	105	116	260
7	445	132	356	142	530	199	925	313	655	110	176	144
8	455	148	356	110	445	165	925	342	660	125	175	235
9	263	139	329	119	900	187	900	355	550	159	79	195
10	207	134	342	114	264	190	740	435	455	130	112	180
11	267	121	324	163	267	203	690	353	380	104	66	141
12	255	125	302	122	380	193	590	415	380	141	67	154
13	194	143	255	127	344	210	515	380	445	375	68	114
14	139	146	259	139	218	219	490	342	380	259	62	102
15	214	158	235	112	218	228	455	296	293	535	62	90
16	239	284	144	108	298	151	495	347	284	740	121	81
17	280	214	103	121	328	231	495	302	224	640	73	99
18	207	179	188	147	338	217	455	288	228	490	52	83
19	259	214	154	111	298	207	565	339	200	500	48	77
20	293	221	180	84	284	191	749	290	200	990	198	379
21	259	344	207	90	259	165	1,500	282	243	259	52	377
22	243	930	144	154	259	214	1,250	244	134	218	52	943
23	188	604	135	94	235	149	980	224	159	179	76	805
24	173	390	165	130	243	197	815	286	185	176	51	696
25	200	380	156	122	255	205	815	190	122	151	57	2,040
26	154	233	138	102	235	200	715	241	151	141	56	1,870
27	156	145	127	225	261	185	640	241	136	110	52	2,340
28	132	100	164	587	275	183	615	220	182	112	172	2,790
29	173	185	128	840	-------	199	565	273	121	125	76	2,260
30	173	282	147	950	-------	251	525	288	106	104	63	1,500
31	159	-------	112	925	-------	275	-------	218	-------	110	115	-------

Discharge, in second-feet, of Iowa River at Iowa City, Iowa, 1930–32—Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1931–32												
1	1,200	372	7,750	3,800	1,230	2,630	3,550	1,270	1,300	2,550	1,260	692
2	995	277	7,180	4,500	1,080	3,060	3,550	1,270	1,360	2,240	1,300	880
3	880	326	6,480	4,700	1,360	3,450	3,550	1,340	1,430	2,010	1,860	910
4	800	300	5,950	4,700	1,430	3,700	3,550	1,460	1,520	1,860	1,590	825
5	700	344	5,000	4,800	1,590	3,700	3,350	1,520	1,620	1,800	1,140	750
6	675	200	3,550	5,100	1,620	3,700	3,060	1,660	1,660	1,660	938	610
7	675	272	2,970	4,800	1,800	2,730	3,350	3,140	1,720	1,520	775	580
8	565	250	2,710	4,200	1,940	2,390	3,700	3,450	1,620	1,460	625	502
9	575	254	2,550	3,060	1,800	2,310	3,060	3,550	1,690	1,520	615	493
10	720	264	2,390	2,550	1,800	2,630	2,800	3,700	1,940	2,280	570	457
11	1,200	308	2,550	2,630	2,010	2,880	2,550	3,800	1,800	1,940	620	421
12	850	502	2,800	2,710	2,010	2,710	2,310	3,700	1,860	1,660	615	412
13	910	620	3,160	3,550	2,010	2,310	2,240	3,350	1,860	2,010	700	462
14	880	2,020	3,450	4,300	1,860	2,230	2,080	2,470	1,800	2,080	775	498
15	880	3,250	3,550	4,700	1,860	2,230	2,010	2,160	1,800	1,860	965	850
16	800	2,470	3,350	4,900	1,800	2,310	1,940	2,080	1,800	1,720	1,200	800
17	700	2,630	2,970	5,400	2,010	2,470	1,800	1,800	1,870	1,590	2,200	675
18	625	2,630	2,630	5,300	2,080	2,710	1,720	1,860	2,970	1,430	1,380	516
19	620	2,800	2,550	5,200	2,710	2,710	1,620	2,390	2,710	1,300	1,060	498
20	520	3,350	2,390	5,000	2,880	2,880	1,590	2,470	3,250	1,180	995	493
21	502	3,450	2,310	4,500	3,160	2,630	1,560	2,010	3,350	1,060	910	484
22	457	2,970	2,310	3,900	2,970	2,310	1,520	1,760	3,350	965	880	625
23	550	4,250	2,310	3,800	2,470	2,160	1,460	1,590	3,250	850	775	750
24	545	6,350	2,240	3,550	2,080	2,240	1,460	1,490	3,250	750	725	605
25	466	5,950	2,240	3,250	2,080	2,470	1,460	1,360	3,450	750	750	511
26	408	6,600	2,240	3,060	2,010	4,570	1,460	1,340	3,620	750	700	448
27	470	7,400	2,160	2,800	2,010	3,550	1,430	1,240	3,700	675	650	416
28	439	6,920	2,160	2,710	2,010	3,450	1,300	1,200	3,800	625	700	380
29	403	6,600	2,160	2,630	2,160	3,450	1,300	1,430	3,800	560	650	344
30	385	7,300	2,160	2,080	-------	3,620	1,300	1,490	3,350	511	650	264
31	358	-------	2,630	1,400	-------	3,620	-------	1,300	-------	535	620	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
1930–31					
October	455	132	228	0.073	0.08
November	930	100	227	.072	.08
December	510	103	220	.070	.08
January	950	84	215	.068	.08
February	900	218	382	.122	.13
March	275	149	202	.064	.07
April	1,500	385	704	.224	.25
May	510	190	326	.104	.12
June	660	106	288	.092	.10
July	990	104	247	.079	.09
August	143	48	83	.026	.03
September	2,790	77	652	.208	.23
The year	2,790	48	312	.099	1.34
1931–32					
October	1,200	358	669	.213	.25
November	7,400	200	2,710	.863	.96
December	7,750	2,160	3,250	1.04	1.19
January	5,400	1,400	3,860	1.23	1.42
February	3,160	1,080	1,990	.634	.68
March	4,570	2,160	2,900	.924	1.06
April	3,700	1,300	2,250	.717	.80
May	3,800	1,200	2,090	.666	.77
June	3,800	1,300	2,420	.771	.86
July	2,550	511	1,410	.449	.52
August	2,200	570	942	.300	.35
September	910	264	572	.182	.20
The year	7,750	200	2,090	.666	9.06

IOWA RIVER AT WAPELLO, IOWA

LOCATION.—Chain gage in sec. 27, T. 74 N., R. 3 W., at highway bridge half a mile from Wapello and 20 miles above mouth of river.
DRAINAGE AREA.—12,480 square miles.
RECORDS AVAILABLE.—February 1915 to September 1932.
EXTREMES.—Maximum discharge during year ending Sept. 30, 1932, 27,800 second-feet Dec. 2 (gage height, 8.8 feet); minimum, 1,160 second-feet Nov. 10–11 (gage height, −0.15 foot).
1915–32: 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 poor. Records furnished by Mississippi River Power Co.

Discharge, in second-feet, 1927–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1927-28												
1	5,390	4,220	3,510	e 3,600	e 2,300	6,040	6,740	6,270	3,340	8,270	3,510	23,200
2	6,040	4,220	3,510	e 3,400	e 2,300	7,230	6,500	5,820	3,170	6,270	3,340	27,800
3	12,200	4,040	3,510	e 3,200	e 2,300	8,270	6,270	5,600	3,000	5,390	4,040	26,000
4	15,000	4,040	e 2,700	e 3,000	e 2,300	8,820	6,040	5,180	3,000	11,900	11,900	21,900
5	12,900	4,040	e 2,500	e 3,000	e 2,300	9,980	5,820	4,980	2,840	16,900	12,500	16,900
6	13,900	3,860	e 2,300	e 2,900	e 2,300	9,680	7,740	4,780	2,840	13,900	14,200	15,000
7	22,400	3,860	e 2,000	e 2,800	e 8,000	8,820	8,820	4,590	2,840	15,700	15,300	13,900
8	27,800	3,510	e 1,500	e 2,700	e12,500	8,000	9,680	4,590	2,680	12,900	13,600	11,200
9	28,800	3,340	e 1,500	e 2,600	e12,600	8,540	9,680	4,400	2,840	11,200	9,980	9,680
10	23,200	3,340	e 1,500	e 2,500	e12,800	10,600	9,390	4,400	2,680	11,200	8,540	8,540
11	15,300	3,340	e 1,600	e 2,500	e13,000	11,500	9,680	4,400	2,680	9,980	9,390	8,000
12	15,700	3,510	e 1,700	e 2,500	13,200	15,700	9,390	4,220	2,530	7,230	7,740	8,820
13	13,600	3,340	e 1,800	e 2,500	21,400	16,900	8,820	4,220	2,680	6,040	6,980	12,200
14	11,200	3,340	e 1,900	e 2,600	23,200	21,900	8,270	4,040	2,680	5,820	6,040	12,500
15	9,680	3,680	e 2,000	e 2,700	27,800	23,200	8,270	3,860	2,530	5,600	5,600	10,600
16	8,270	3,860	e 2,000	e 2,600	e28,000	20,600	8,270	3,860	2,530	5,180	4,980	9,980
17	6,500	4,590	e 2,000	e 2,600	e20,000	19,300	8,820	4,040	2,380	4,400	4,780	9,680
18	7,230	4,780	e 2,000	e 2,600	e15,000	16,100	9,390	4,400	2,840	4,040	5,600	9,680
19	6,980	4,400	e 1,800	e 2,600	e14,500	11,900	9,680	4,980	3,000	7,230	4,780	9,680
20	6,740	4,040	e 1,700	e 2,300	e14,000	10,300	9,100	7,740	2,840	12,500	4,400	9,680
21	6,500	3,680	e 1,600	e 2,500	11,900	9,100	9,100	8,270	2,680	13,600	6,740	9,680
22	6,040	3,680	e 1,500	e 2,500	9,390	8,270	9,100	8,270	3,860	11,900	6,980	8,820
23	5,820	3,860	e 1,400	e 2,500	7,480	7,230	9,390	6,740	5,600	8,820	7,480	7,740
24	5,600	3,680	e 1,300	e 2,400	7,230	7,480	9,680	5,600	7,480	6,980	9,980	6,980
25	5,180	3,680	e 1,300	e 2,400	6,980	7,230	9,680	4,980	9,390	5,820	9,680	6,500
26	4,980	3,680	e 1,300	e 2,400	7,230	7,740	9,390	4,590	7,480	4,980	9,100	6,040
27	4,780	3,680	e 1,300	e 2,400	6,500	8,000	8,270	4,400	6,740	4,400	8,000	5,820
28	4,590	3,680	e 2,000	e 2,400	6,270	8,000	7,480	4,220	6,270	4,220	8,000	5,600
29	4,400	3,680	e 4,000	e 2,300	6,500	7,740	6,980	3,860	9,680	4,040	11,200	5,390
30	4,400	3,680	e 4,500	e 2,300	-------	7,230	6,740	3,680	8,270	3,860	15,000	5,180
31	4,400	-------	e 4,000	e 2,300	-------	6,980	-------	3,510	-------	4,590	18,500	-------

e Estimated.

Discharge, in second-feet, of Iowa River at Wapello, Iowa, 1927–32—Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1928–29												
1	4,780	6,980	12,500	e 7,000	e 4,000	e 11,500	25,500	22,800	7,740	4,780	3,340	e 2,380
2	4,780	6,980	12,200	e 5,500	e 4,000	e 13,000	24,200	26,000	7,740	8,270	3,340	2,380
3	4,590	7,480	11,900	e 4,800	e 3,900	e 14,000	20,100	29,700	8,000	6,500	16,900	2,380
4	4,590	11,200	e 12,000	e 4,300	e 3,900	e 15,500	18,500	30,200	8,270	5,390	e 15,400	2,380
5	4,400	13,900	e 12,000	e 4,000	e 3,900	e 16,500	17,200	e 25,800	8,270	5,180	13,900	2,380
6	4,780	15,700	e 11,500	e 3,700	e 3,800	e 18,000	16,100	21,400	8,000	6,980	11,500	2,380
7	4,780	15,700	e 10,500	e 3,700	e 3,800	e 20,000	16,100	17,600	8,540	e 6,500	11,200	2,230
8	4,590	15,300	e 9,000	e 3,700	e 3,800	e 22,000	16,900	15,300	6,980	5,600	11,500	e 2,230
9	4,400	14,600	e 7,800	e 3,700	e 3,800	e 23,500	17,600	13,200	e 6,500	5,600	11,500	2,380
10	4,400	13,900	e 7,300	e 3,800	e 3,800	e 24,000	19,300	12,200	6,040	5,390	10,900	2,230
11	4,400	13,200	e 7,100	e 3,900	e 3,700	e 24,500	21,900	11,200	6,040	4,780	9,980	2,080
12	4,220	12,900	e 7,000	e 4,000	e 3,700	24,600	24,200	e 10,600	6,980	4,400	9,680	2,380
13	4,040	11,900	9,100	e 4,100	e 3,700	26,900	24,600	10,600	6,980	4,040	7,740	2,380
14	4,220	13,600	12,200	e 4,200	e 3,700	30,700	23,200	11,500	8,540	e 5,390	6,270	2,680
15	5,180	12,900	13,200	e 4,400	e 3,700	35,600	20,600	12,900	6,980	5,390	5,180	e 2,680
16	5,180	12,200	15,300	e 4,500	e 3,600	48,400	18,900	13,900	e 6,500	11,900	4,780	2,680
17	5,390	20,600	17,600	e 4,500	e 3,600	56,700	19,300	14,600	6,040	9,100	4,040	2,680
18	7,480	25,100	18,000	e 4,500	e 3,600	60,000	19,700	14,200	5,600	9,100	3,680	2,680
19	8,000	27,800	17,600	e 4,500	e 3,600	57,200	21,400	13,200	5,600	8,000	3,680	2,680
20	8,270	27,800	16,900	e 4,500	e 3,600	63,400	26,900	12,200	6,980	7,480	3,340	2,530
21	8,540	25,500	e 14,000	e 4,500	e 3,500	57,800	26,900	11,200	5,180	6,500	3,340	2,380
22	10,600	22,400	e 11,000	e 4,500	e 3,500	55,000	21,400	10,300	4,780	6,040	3,170	e 2,380
23	13,600	20,600	e 9,200	e 4,500	e 3,500	49,500	17,600	9,680	e 4,590	5,180	3,170	2,230
24	14,600	18,000	e 8,700	e 4,500	e 3,800	44,600	18,500	9,390	4,400	4,780	3,000	2,080
25	14,200	16,100	e 8,100	e 4,500	e 4,500	41,300	24,600	9,100	4,040	4,590	2,840	2,080
26	13,900	14,200	e 7,200	e 4,400	e 8,500	38,200	25,500	8,540	4,040	5,180	2,680	2,080
27	10,600	13,200	8,000	e 4,300	e 9,500	35,600	20,100	8,000	3,680	4,590	2,680	2,080
28	9,680	12,200	8,820	e 4,300	e 10,500	32,600	e 20,600	7,740	3,680	e 4,220	2,530	1,940
29	8,540	11,500	9,390	e 4,200	-------	29,700	21,000	7,480	3,680	3,860	2,530	e 2,080
30	8,000	11,500	9,680	e 4,200	-------	26,000	21,400	7,480	3,680	3,680	2,530	2,380
31	7,480	-------	9,400	e 4,100	-------	23,200	-------	6,980	-------	3,510	2,530	-------
1929–30												
1	2,230	2,380	e 900	e 1,300	e 1,100	13,200	3,170	4,980	2,840	5,600	2,380	1,180
2	2,230	2,680	e 800	e 1,400	e 1,100	10,300	3,170	4,780	3,170	5,390	2,230	1,130
3	2,230	2,380	e 800	e 1,400	e 1,100	8,820	3,000	4,980	3,170	4,980	2,080	1,180
4	2,230	2,380	e 800	e 1,400	e 1,200	6,740	3,000	5,180	3,000	4,780	1,940	1,080
5	2,230	2,380	e 900	e 1,400	e 1,200	6,270	2,840	4,590	3,340	5,600	1,940	1,030
6	2,230	2,380	e 900	e 1,400	e 1,200	6,040	2,840	4,590	4,280	7,480	1,800	1,030
7	2,080	2,380	e 900	e 1,400	e 1,300	6,040	2,680	4,590	5,180	8,540	1,800	1,130
8	2,080	2,380	e 1,000	e 1,300	e 1,400	6,040	2,530	5,180	5,820	7,480	1,800	1,080
9	2,080	2,230	e 1,000	e 1,300	e 1,500	5,600	2,530	5,180	5,390	6,040	1,800	1,080
10	2,230	e 2,230	e 1,000	e 1,300	e 2,000	5,180	2,380	5,390	5,180	5,600	1,670	1,080
11	2,230	2,230	e 1,100	e 1,300	e 2,700	5,180	2,380	5,600	5,180	5,180	1,670	1,080
12	2,380	2,380	e 1,100	e 1,300	e 3,500	4,780	2,380	6,270	4,980	4,980	1,540	1,080
13	e 2,380	2,680	e 1,200	e 1,300	e 4,500	4,590	2,380	6,500	7,230	4,780	1,540	1,030
14	2,380	3,170	e 1,200	e 1,200	e 5,500	4,400	2,380	6,740	5,670	4,400	1,540	1,030
15	2,380	4,040	e 1,300	e 1,200	e 5,200	4,220	2,380	6,980	42,400	4,400	1,540	1,030
16	2,230	3,680	e 1,300	e 1,200	e 4,800	4,040	2,680	6,740	50,000	4,040	1,540	942
17	2,080	e 3,510	e 1,300	e 1,200	e 4,500	3,860	3,170	5,820	51,200	3,860	1,540	900
18	2,080	3,340	e 1,400	e 1,100	e 5,500	3,860	3,340	6,040	35,100	3,680	1,670	900
19	2,080	3,340	e 1,400	e 1,100	e 7,000	4,220	3,510	5,390	23,700	3,510	1,670	860
20	2,230	3,170	e 1,400	e 1,100	e 8,200	4,220	3,860	5,390	15,700	3,340	1,540	1,080
21	2,380	e 2,300	e 1,300	e 1,100	9,100	4,040	3,340	4,980	13,900	3,000	1,480	1,030
22	2,080	e 1,700	e 1,300	e 1,100	10,300	4,040	5,390	4,590	12,900	3,000	1,420	1,030
23	2,380	e 1,300	e 1,300	e 1,100	15,300	4,040	6,040	4,400	13,600	2,840	1,420	985
24	2,380	e 1,200	e 1,200	e 1,100	20,600	4,220	6,040	9,980	11,200	2,840	1,420	860
25	2,080	e 1,100	e 1,200	e 1,100	22,800	4,040	6,040	9,980	9,680	2,530	1,360	900
26	2,230	e 1,500	e 1,100	e 1,100	26,000	3,860	6,040	6,980	8,540	2,530	1,360	2,530
27	e 2,150	e 2,000	e 1,100	e 1,100	25,100	3,860	5,600	5,600	8,000	2,380	1,180	7,740
28	2,080	e 2,100	e 1,100	e 1,100	21,000	3,860	5,180	4,780	6,980	2,380	1,300	3,000
29	2,230	e 1,300	e 1,200	e 1,100	-------	3,860	4,400	4,400	6,500	2,230	1,300	2,680
30	2,230	e 1,000	e 1,200	e 1,100	-------	3,680	4,590	4,220	6,270	2,080	1,300	2,080
31	2,380	-------	e 1,300	e 1,100	-------	3,510	-------	3,860	-------	2,530	1,240	-------

e Estimated.

Discharge, in second-feet, of Iowa River at Wapello, Iowa, 1927–32—Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1930-31												
1	1,670	1,240	e 1,040		3,340	e1,420	1,260	2,380	1,260	825	585	2,680
2	1,480	1,180	e 1,060		3,170	1,420	1,670	2,230	1,310	798	745	e2,400
3	1,420	1,180	e 1,100		3,510	1,360	1,670	2,080	1,160	6,270	616	1,480
4	1,360	1,180	e 1,200		3,060	1,310	1,800	1,940	1,120	4,220	616	1,120
5	1,180	1,180	e 1,600		2,530	1,360	3,170	1,800	1,310	858	616	1,080
6	1,180	1,130	e 2,000		2,680	1,310	3,680	1,800	1,800	825	585	1,030
7	1,240	1,080	e 2,500	e 800	2,530	1,310	3,860	1,670	2,680	745	585	992
8	1,800	1,080	e 3,000		2,380	1,360	3,860	1,670	2,530	745	585	955
9	1,800	1,080	e 2,600		2,230	1,360	3,680	1,670	2,380	770	585	922
10	1,800	1,130	2,080		e1,950	1,210	3,510	1,670	2,380	825	585	922
11	1,540	1,180	1,800		1,940	1,210	3,000	1,800	e2,080	745	585	890
12	1,420	1,080	1,940		1,940	1,210	2,680	1,800	1,540	798	585	858
13	1,360	1,030	1,670		e1,900	1,260	2,680	1,670	1,420	770	570	825
14	1,360	985	1,670		1,670	1,310	2,380	1,600	1,670	825	570	770
15	1,300	1,030	e 1,600		e1,750	1,160	2,080	1,540	1,420	1,120	570	655
16	1,540	1,130	e 1,000	e 750	1,800	1,160	2,380	1,480	1,360	1,420	570	655
17	1,480	1,300	e 900		1,480	1,210	2,530	1,420	1,160	1,420	570	635
18	1,480	1,360	e 800		1,480	1,160	2,530	1,420	1,080	1,310	675	635
19	e1,480	1,360	e 800		1,800	1,160	2,530	1,670	992	1,080	585	616
20	1,540	1,360	e 800		1,670	1,160	2,840	1,800	992	922	570	616
21	1,360	1,420	e 800	e 700	1,600	1,080	3,170	1,600	955	e3,340	e 570	745
22	1,300	1,300	e 800		1,540	1,120	5,820	1,540	955	1,080	570	1,800
23	1,360	2,230	e 750		1,480	1,120	4,980	1,310	922	1,030	570	3,000
24	1,360	1,940	e 750		1,480	1,080	4,220	1,310	825	890	570	2,680
25	1,360	1,540	e 800	e 750	1,360	e1,120	3,680	1,160	825	798	570	3,000
26	1,360	1,420	e 850	e 850	1,420	1,160	3,340	1,160	798	655	570	6,500
27	1,300	e1,300	e 850	e 1,000	1,420	1,160	3,170	1,080	745	585	570	6,740
28	1,130	e 800	e 840	e 1,200	1,420	1,210	2,840	1,030	720	616	570	6,740
29	1,130	e 900	e 830	e 1,500	-------	1,210	2,680	1,160	720	616	570	6,040
30	1,240	e1,000	e 820	e 3,000	-------	e1,210	2,530	1,310	858	585	570	5,180
31	1,180	-------	e 800	e 3,500	-------	1,260	-------	1,420	-------	585	570	------
1931-32												
1	4,400	1,480	26,900	15,000	e 4,600	8,000	18,000	6,500	5,820	10,600	3,170	3,510
2	3,860	1,420	27,800	15,700	e 4,300	9,980	20,100	6,270	5,820	9,680	5,600	3,680
3	3,340	1,310	24,200	16,500	e 4,100	12,200	22,400	6,500	5,820	9,100	6,740	4,040
4	3,000	1,310	17,200	16,100	e 4,000	14,200	24,200	6,980	6,040	e10,600	5,390	3,860
5	2,680	1,310	15,700	15,700	e 4,000	15,700	25,600	6,980	e 6,040	12,200	4,200	3,680
6	2,680	1,260	13,600	15,700	e 4,000	16,900	24,200	6,980	6,040	10,300	3,680	3,340
7	2,680	1,260	11,500	15,000	e 4,100	e17,000	21,900	8,000	6,740	9,100	3,340	2,840
8	2,680	1,210	9,980	12,900	e 4,400	e15,000	19,700	10,900	e 6,500	7,740	3,170	2,840
9	2,680	1,210	9,680	e 11,000	e 5,000	e10,000	19,300	8,000	6,270	6,740	2,840	2,680
10	2,230	1,160	9,100	e 9,000	6,500	e 8,600	17,600	11,200	6,270	8,820	2,840	2,530
11	2,380	1,160	9,980	8,000	8,540	e 8,200	17,200	12,200	6,500	10,300	3,000	e2,530
12	4,040	2,230	10,600	8,000	7,230	e 8,100	16,500	13,600	7,230	8,270	3,340	2,530
13	4,040	2,680	11,200	8,820	7,740	e 8,000	16,500	15,000	7,480	6,980	3,860	2,380
14	3,680	3,680	11,900	11,500	6,740	e 8,100	15,300	14,600	7,480	7,230	4,220	2,530
15	3,680	e 5,390	12,200	e 14,200	6,980	e 8,200	12,900	13,600	6,740	e 7,480	4,040	3,000
16	3,680	7,480	11,500	16,900	6,500	e 8,300	11,200	10,600	6,740	7,480	2,840	3,170
17	3,680	7,480	10,900	16,900	6,500	e 8,300	10,300	8,820	6,040	e 6,980	8,820	2,840
18	2,380	8,000	10,300	16,900	7,230	e 8,300	9,680	8,000	7,230	6,270	11,900	e2,680
19	2,230	8,540	9,680	15,700	7,480	e 8,400	9,100	7,740	12,200	5,820	8,000	2,530
20	2,080	9,680	9,100	15,300	8,000	e 8,400	8,540	9,680	11,900	4,980	5,820	2,380
21	1,940	11,500	8,820	15,000	8,540	e 8,400	8,270	9,680	11,500	4,590	4,780	2,380
22	1,800	10,300	e 8,540	13,200	8,270	8,540	8,000	8,000	12,500	4,780	4,220	2,380
23	1,800	11,500	8,270	12,500	8,000	8,540	e 7,740	7,480	13,900	4,400	3,860	2,840
24	1,800	18,000	8,270	11,900	7,480	8,540	7,480	6,500	15,700	e 4,040	3,510	2,680
25	2,080	21,900	8,000	11,200	6,980	8,540	6,980	5,500	18,000	3,680	3,340	2,530
26	2,080	24,200	8,000	10,900	6,980	12,200	7,230	6,040	22,400	3,510	3,340	2,380
27	1,800	25,500	8,000	9,680	7,230	18,900	6,980	5,820	23,200	3,510	3,680	2,230
28	1,670	24,200	8,000	9,390	7,200	17,200	6,980	5,390	15,300	3,340	3,170	2,080
29	1,670	23,200	8,000	9,100	6,740	15,700	6,500	5,180	14,200	3,170	3,170	2,080
30	1,600	24,200	8,000	e 8,000	-------	15,300	6,500	5,390	11,900	3,000	3,170	1,940
31	1,670	-------	9,980	e 6,000	-------	16,500	-------	6,040	-------	3,000	3,510	------

e Estimated.

Discharge, in second-feet, of Iowa River at Wapello, Iowa, 1927–32—Continued

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
1927–28					
October	28,800	4,400	10,500	0.841	0.97
November	4,780	3,340	3,810	.305	.34
December	4,500	1,300	2,170	.174	.20
January	3,600	2,300	2,630	.211	.24
February	28,000	2,300	11,000	.881	.95
March	23,200	6,040	10,900	.872	1.00
April	9,680	5,820	8,410	.674	.75
May	8,270	3,510	4,980	.398	.46
June	9,680	2,380	4,110	.329	.37
July	16,900	3,860	8,220	.659	.76
August	15,300	3,340	8,640	.691	.80
September	27,800	5,180	11,400	.913	1.02
The year	28,800	1,300	7,220	.579	7.86
1928–29					
October	14,600	4,040	7,170	.574	.66
November	27,800	6,980	15,500	1.24	1.38
December	18,000	7,000	11,100	.889	1.02
January	7,000	3,700	4,360	.349	.40
February	10,500	3,500	4,380	.350	.36
March	63,400	11,500	33,500	2.68	3.09
April	26,900	16,100	21,000	1.68	1.87
May	30,200	6,980	14,000	1.12	1.29
June	8,540	3,680	6,140	.491	.55
July	11,900	3,510	5,870	.470	.54
August	16,900	2,530	6,410	.514	.59
September	2,680	1,940	2,350	.188	.21
The year	63,400	1,940	11,000	.881	11.96
1929–30					
October	2,380	2,080	2,220	.178	.21
November	4,040	1,000	2,360	.189	.21
December	1,400	800	1,130	.090	.10
January	1,400	1,100	1,220	.098	.11
February	26,000	1,100	9,010	.721	.75
March	13,200	3,510	5,180	.415	.48
April	6,040	2,380	3,640	.292	.33
May	9,980	3,860	5,640	.451	.52
June	51,200	2,840	12,800	1.03	1.15
July	8,540	2,080	4,260	.341	.39
August	2,380	1,180	1,610	.129	.15
September	7,740	860	1,460	.117	.13
The year	51,200	800	4,160	.333	4.53
1930–31					
October	1,800	1,130	1,400	.112	.13
November	2,230	800	1,230	.098	.11
December	3,000	750	1,290	.103	.12
January	3,500	700	973	.779	.90
February	3,510	1,360	2,020	.162	.17
March	1,420	1,080	1,230	.098	.11
April	5,820	1,260	3,010	.241	.27
May	2,380	1,030	1,590	.127	.15
June	2,680	720	1,330	.106	.12
July	6,270	585	1,230	.098	.11
August	745	570	588	.047	.05
September	6,740	616	2,110	.169	.19
The year	6,740	570	1,490	.119	2.43
1931–32					
October	4,400	1,600	2,650	.212	.24
November	25,500	1,160	8,790	.703	.78
December	27,800	8,000	11,800	.944	1.09
January	16,900	6,000	12,600	1.01	1.16
February	8,540	4,000	6,400	.512	.55
March	18,900	8,000	11,200	.896	1.03
April	25,600	6,500	13,800	1.10	1.23
May	15,000	5,180	8,520	.682	.79
June	23,200	5,820	9,980	.798	.89
July	12,200	3,000	6,700	.536	.62
August	11,900	2,840	4,410	.353	.41
September	4,040	1,940	2,770	.222	.25
The year	27,800	1,160	8,310	.666	9.04

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, and 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 1932.

EXTREMES.—Maximum discharge during year ending Sept. 30, 1932, 12,100 second-feet Nov. 29 and Dec. 1 (gage height, 15.3 feet); minimum, 311 second-feet Aug. 10 (gage height, 3.25 feet).

1913–32: Maximum discharge, 25,200 second-feet June 15, 1930 (gage height, 22.13 feet); minimum (estimated), 20 second-feet during parts of December 1930 and January 1931.

REMARKS.—Records fair. Records furnished by Mississippi River Power Co.

Discharge, in second-feet, 1927–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1927–28												
1	465	344	295	e1,500		1,390	818	719	394	8,670	1,980	1,910
2	4,340	311	279	e1,600		1,910	870	672	360	3,620	1,210	1,640
3	1,450	327	e250	e1,300		2,190	870	672	344	2,420	3,360	1,210
4	1,640	327	e225	e1,000	e200	1,700	818	584	327	9,520	9,520	1,090
5	1,270	311	e200	e950		1,390	1,040	584	344	8,400	10,100	1,040
6	2,050	295	e200	e1,000		1,210	1,700	584	327	6,260	10,600	979
7	4,440	279	e250	e1,100	e4,500	1,150	2,260	543	327	4,240	8,670	870
8	3,620	279	e200	e1,000	4,640	979	2,260	543	360	2,490	5,660	768
9	2,190	279		e900	3,960	1,330	2,260	543	360	2,720	2,800	768
10	1,330	263		e800	2,960	1,450	2,050	503	327	3,780	2,340	719
11	1,210	295		e800	3,620	2,560	1,980	503	311	2,640	1,840	627
12	1,770	279		e700	5,150	3,700	1,840	465	360	2,560	1,580	2,640
13	1,270	248		e650	5,580	4,060	1,580	465	311	2,420	1,360	2,640
14	924	263		e600	5,260	4,150	1,510	429	311	1,910	1,150	1,700
15	768	311	e150	e600	5,470	3,620	1,510	429	311	1,640	1,040	1,840
16	719	360		e550	4,440	3,780	1,510	447	543	1,210	924	1,840
17	627	429		e550	4,060	1,640	1,390	447	1,040	1,040	979	1,840
18	543	447		e500	e3,200	1,390	1,390	543	1,090	870	818	1,910
19	503	429		e500	e2,100	1,270	1,450	2,050	768	1,580	870	1,390
20	503	394		e300	e1,200	1,150	1,450	1,910	768	1,840	768	1,150
21	503	327		e450	e900	1,090	1,390	1,700	870	3,530	1,040	1,150
22	465	295		e425	e900	979	1,390	1,210	2,490	3,780	1,210	870
23	429	311		e400	e1,000	979	1,330	924	2,720	3,040	1,210	768
24	412	344		e400	e900	924	1,330	768	2,560	1,770	3,040	719
25	394	344	e100	e375	818	924	1,210	627	4,240	1,210	2,800	719
26	377	327		e350	1,330	979	1,090	584	3,040	503	1,910	627
27	377	327		e350	1,330	1,090	979	543	1,700	924	1,210	584
28	360	311	e1,500	e300	1,270	1,040	870	465	3,280	768	870	584
29	344	327	e2,500	e250	1,210	979	818	447	8,810	672	2,420	543
30	327	311	e1,700	e200	-------	924	768	429	10,100	818	3,530	543
31	344	-------	e1,300	e200	-------	870	-------	394	-------	1,210	2,720	-------

e Estimated.

Discharge, in second-feet, of Skunk River at Coppock, Iowa, 1927–32—Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1928–29												
1	503	924	2,960	e1,300	e 450	e3,400	6,620	4,940	1,150	543	768	327
2	503	1,040	2,720	e1,100	e 450	e3,800	4,840	4,060	1,510	627	768	311
3	503	1,980	2,490	e 900	e 400	e4,200	3,880	3,360	1,770	627	719	311
4	465	2,420	2,420	e 750	e 400	e4,500	3,360	2,960	1,770	e 768	672	295
5	1,040	3,280	2,340	e 600		e4,800	3,200	2,560	1,510	1,090	719	263
6	627	3,200	e2,100			e5,000	3,200	2,340	1,330	4,840	1,390	248
7	584	2,960	e1,700			e5,200	3,040	2,120	1,330	2,420	1,450	248
8	543	2,560	e1,600	e 500		e5,300	2,800	2,050	1,210	1,090	1,090	232
9	1,450	2,260	e1,500			e5,400	2,880	1,910	1,030	924	924	627
10	768	2,120	e1,500			5,690	3,530	1,840	1,010	1,090	818	627
11	543	2,050	e1,500			5,800	3,530	1,770	979	979	979	360
12	543	2,050	e1,600			8,670	3,620	2,120	1,270	768	979	429
13	503	1,840	2,260			8,950	3,200	1,910	1,330	672	1,450	1,090
14	503	1,840	5,800		e 400	9,660	3,360	2,260	1,090	672	1,580	870
15	543	1,700	5,260	e 600		9,520	3,280	2,880	979	3,040	768	719
16	768	1,700	5,040			9,810	3,440	2,960	979	2,640	584	627
17	2,190	8,540	4,740			13,900	3,360	2,720	870	3,440	503	503
18	1,980	10,100	4,440			15,500	2,560	2,490	818	3,780	503	503
19	1,580	10,200	4,240	e 550		16,000	3,280	2,260	870	3,200	465	503
20	1,390	8,260	4,150	e 550		15,000	9,380	1,980	738	2,640	394	503
21	1,700	6,500	3,700	e 500		13,400	9,380	1,770	672	1,770	394	447
22	2,340	5,040	e2,000	e 500		11,800	6,370	1,700	677	1,580	394	447
23	2,560	4,240	e1,700	e 600		10,100	4,640	1,580	574	1,330	377	447
24	1,980	3,530	e1,600	e 550	e 600	7,610	5,470	1,510	543	1,210	360	429
25	1,700	2,960	e1,600	e 500	e1,500	7,100	9,520	1,450	543	1,150	360	385
26	1,450	2,720	e1,600		e2,000	5,690	10,700	1,450	503	2,880	360	344
27	1,270	2,490	e1,600		e2,500	4,840	8,400	1,390	503	1,840	344	344
28	1,150	2,260	e1,700	e 450	e3,000	4,150	7,480	1,330	503	1,580	327	327
29	1,090	2,340	e1,800			3,530	6,370	1,270	503	1,330	344	429
30	1,040	2,560	e1,800			3,040	5,690	1,330	429	1,090	377	412
31	979		e1,700			3,700		1,270		870	344	
1929–30												
1	327	672		e 250	e 200	1,910	672	1,270	672	1,330	217	124
2	327	543			e 225	1,700	672	1,270	677	1,040	217	114
3	412	584	e 200		e 250	1,330	672	1,330	534	870	202	95
4	447	543			e 275	979	627	1,210	543	1,090	202	95
5	394	543			e 300	1,040	627	1,090	672	1,450	188	95
6	377	465	e 250		e 350	719	584	924	2,530	1,700	188	95
7	360	465	e 300	e 300	e 400	1,270	584	1,090	3,200	1,090	217	95
8	344	447	e 300		e 450	1,150	543	1,270	2,900	1,090	188	95
9	344	429	e 350		e 500	1,090	503	1,840	2,800	924	173	95
10	360	429	e 350		e 600	979	503	1,910	2,230	924	173	e 95
11	360	429	e 400		e 850	979	503	1,910	1,840	818	167	e 85
12	1,210	503	e 400		e2,100	870	465	1,910	1,450	719	153	85
13	584	503	e 400		e2,300	818	465	1,700	1,270	672	151	85
14	503	1,330			e2,200	768	465	1,510	3,530	627	156	85
15	447	1,510		e 250	e2,100	719	503	1,330	22,200	543	151	85
16	394	1,150	e 450		e1,950	719	672	1,210	19,000	503	153	85
17	377	1,090			e1,800	719	924	1,090	14,500	465	979	83
18	327	1,090			e2,000	818	924	1,040	12,200	447	248	81
19	327	979			e2,600	870	924	1,090	10,800	412	429	75
20	377	870			3,120	979	924	1,040	7,870	412	327	68
21	394	e 700	e 400		3,880	979	924	979	3,270	394	232	68
22	412	e 500	e 400		4,440	979	1,090	924	2,580	377	188	72
23	412	e 450	e 350		3,200	924	1,770	979	2,260	360	153	72
24	412	e 450	e 350	e 200	2,560	870	2,050	2,420	1,980	344	135	70
25	377	e 450	e 300		2,800	870	1,770	1,700	1,840	327	119	162
26	344	e 500	e 300		3,280	870	1,510	1,330	1,700	327	119	924
27	344	e 550	e 250		2,640	870	1,390	1,090	1,510	327	119	279
28	327	e 500	e 250		2,190	818	1,270	924	1,390	311	119	447
29	377	e 400	e 250			768	1,150	1,040	1,330	263	122	429
30	447	e 300	e 250			768	1,150	768	1,270	248	124	263
31	e 503		e 250			719		719		232	127	

e Estimated.

Discharge, in second-feet, of Skunk River at Coppock, Iowa, 1927–32—Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1930–31												
1	188	85	a 50		a 420	140	394	377	295	114	79	1,840
2	162	81	a 70		a 400	140	503	344	232	102	79	2,880
3	145	75	a 100		a 380	140	584	327	217	153	85	1,580
4	119	75	a 150		a 360	140	768	295	202	394	83	768
5	105	75	a1,450		327	132	768	279	344	627	344	429
6	107	75	979		344	143	818	263	1,210	295	263	311
7	344	75	818		311	145	768	248	1,150	173	173	263
8	232	75	412		279	145	627	248	979	105	132	217
9	188	75	327		263	145	584	279	870	162	119	202
10	145	75	311		a 200	173	503	263	672	167	114	162
11	95	75	279		263	173	429	263	584	137	153	145
12	75	75	232		248	173	360	263	543	119	145	129
13	65	75	232	a 20	202	232	295	248	672	159	89	119
14	91	75	217		159	248	263	232	465	162	72	107
15	95	75	153		167	232	248	232	377	167	68	107
16	173	75	a 100		202	202	412	202	344	870	66	95
17	145	107	a 60		188	202	627	202	311	584	65	89
18	85	107	a 50		188	167	412	188	263	412	394	81
19	95	159	a 40		188	145	584	263	232	279	217	75
20	119	165	a 30		173	135	979	232	232	248	584	72
21	117	173	a 20		173	132	2,490	217	248	217	768	114
22	114	768	a 20		159	132	1,840	173	232	173	429	1,640
23	109	584	a 20		151	132	1,210	159	232	344	327	1,090
24	95	344	a 30		145	135	870	145	202	248	295	979
25	95	279	a 20	a 30	145	132	719	129	202	202	202	1,210
26	95	130	a 20	a 60	140	132	584	135	188	162	159	3,040
27	95	a 80	a 20	a 80	140	132	584	145	162	124	132	3,280
28	95	a 50	a 20	a 150	140	132	503	135	151	107	311	3,360
29	85	a 40	a 20	a 250	-------	145	447	145	140	91	a 272	2,880
30	79	a 40	a 20	a 300	-------	202	412	412	129	79	232	1,700
31	87	-------	a 20	a 400	-------	279	-------	344	-------	83	188	-------
1931–32												
1	1,210	503	12,100	8,540	a1,400	2,720	2,120	870	870	1,700	394	818
2	979	503	11,900	8,540	a1,200	3,200	1,980	870	870	1,510	394	818
3	768	447	10,200	7,740	a1,100	3,360	1,840	1,040	1,040	1,640	543	768
4	672	429	8,670	6,780	a1,000	3,440	1,700	1,210	2,420	2,420	503	672
5	627	412	5,260	6,740	a1,100	3,440	1,640	1,700	3,200	5,800	412	627
6	979	394	4,540	7,360	a1,200	3,440	1,510	1,330	1,910	3,120	377	584
7	1,840	377	3,700	6,980	a1,300	a3,000	1,580	2,960	2,420	2,490	377	503
8	1,640	377	3,120	6,380	a1,500	a2,000	2,720	4,150	2,560	1,580	360	503
9	1,510	360	2,880	a5,000	a1,600	a1,400	2,420	4,340	4,060	1,210	327	465
10	1,090	360	2,800	3,880	1,770	a1,100	1,980	4,060	2,420	3,620	311	465
11	1,270	360	3,700	3,200	4,150	a1,000	1,580	3,700	1,640	5,910	465	429
12	1,640	1,700	4,240	3,040	4 440	a1,000	1,450	3,280	1,390	5,150	2,420	465
13	1,390	1,210	4,340	3,970	2,880	a1,000	1,330	2,340	1,150	2,960	6 140	429
14	1,510	1,210	4,440	5,050	2,490	a1,000	1,270	1,980	1,150	1,910	5,800	584
15	1,330	3,620	4,060	5,150	2,420	a1,000	1,210	1,700	1,980	1,450	4,060	818
16	1,040	3,530	4,060	5,260	2,260	a1,200	1,150	1,580	1,510	1,210	2,260	672
17	870	3,530	4,240	5,580	2,120	a1,200	1,090	1,450	1,270	2,040	2,260	543
18	768	5,690	3,880	5,690	2,420	a1,300	1,090	1,840	3,530	924	4,740	503
19	672	4,640	3,200	5,470	3,200	a1,200	1,040	2,560	3,360	818	3,700	465
20	627	5,260	3,040	5,360	3,200	a1,100	1,040	2,190	3,530	719	3,360	503
21	584	4,940	2,960	4,440	2,560	a1,000	979	1,700	3,960	672	2,490	429
22	543	4,340	2,880	4,250	2,190	a 900	979	1,510	3,120	672	1,700	627
23	543	6,620	2,880	3,970	1,980	a 900	979	1,330	2,560	584	1,390	768
24	672	8,540	2,800	3,620	1,840	a1,100	979	1,210	1,980	584	1,210	543
25	584	8,950	2,720	3,360	2,050	1,580	979	1,090	1,640	543	1,040	465
26	543	8,950	2,720	3,200	1,980	4,540	979	2,260	7,100	503	2,960	412
27	672	9,380	2,560	2,880	1,840	4,060	979	1,450	6,020	465	2,490	394
28	870	11,600	2,420	2,880	1,980	3,280	924	979	6,860	465	1,840	360
29	672	12,100	2,260	2,880	2,420	3,040	870	924	5,580	439	1,210	344
30	627	11,800	2,640	a2,200	-------	2,560	870	870	2,640	394	979	327
31	543	-------	5,040	a1,800	-------	2,260	-------	818	-------	360	870	-------

a Estimated.

Discharge, in second-feet, of Skunk River at Coppock, Iowa, 1927–32—Continued

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
1927–28					
October	4,440	327	1,160	0.401	0.46
November	447	248	323	.112	.12
December	2,500	100	368	.127	.15
January	1,600	200	664	.230	.26
February	5,580	200	2,310	.800	.86
March	4,150	870	1,700	.588	.68
April	2,260	768	1,390	.481	.54
May	2,050	394	701	.242	.28
June	10,100	311	1,640	.567	.63
July	9,520	503	2,840	.982	1.13
August	10,600	818	2,890	1.00	1.15
September	2,640	543	1,190	.411	.46
The year	10,600	100	1,430	.495	6.72
1928–29					
October	2,560	465	1,120	.388	.47
November	10,200	924	3,520	1.22	1.36
December	5,800	1,500	2,620	.906	1.04
January	1,300	450	594	.206	.24
February	3,000	400	675	.234	.24
March	16,000	3,040	7,580	2.62	3.02
April	10,700	2,560	5,020	1.74	1.94
May	4,940	1,270	2,180	.755	.87
June	1,770	429	969	.335	.37
July	4,840	543	1,690	.585	.67
August	1,580	327	694	.240	.28
September	1,090	232	454	.157	.18
The year	16,000	232	2,270	.785	10.68
1929–30					
October	1,210	327	418	.145	.17
November	1,510	300	646	.224	.24
December	450	200	331	.115	.13
January	300	200	242	.084	.10
February	4,440	200	1,770	.611	.64
March	1,910	719	963	.333	.38
April	2,050	465	894	.309	.34
May	2,420	719	1,290	.448	.52
June	22,200	543	4,350	1.51	1.68
July	1,330	232	666	.230	.26
August	979	119	208	.072	.08
September	924	68	153	.053	.06
The year	22,200	68	982	.339	4.60
1930–31					
October	344	65	124	.043	.05
November	768	40	141	.049	.06
December	1,450	20	203	.070	.08
January	400	20	56	.019	.02
February	420	140	230	.080	.08
March	279	132	162	.056	.06
April	2,490	248	686	.237	.26
May	377	129	238	.082	.09
June	1,210	129	403	.139	.16
July	870	79	234	.081	.09
August	768	65	214	.074	.09
September	3,360	72	965	.334	.37
The year	3,360	20	303	.105	1.41
1931–32					
October	1,840	543	945	.327	.38
November	12,100	360	4,070	1.41	1.57
December	12,100	2,260	4,400	1.52	1.75
January	8,540	1,800	4,880	1.69	1.95
February	4,440	1,000	2,120	.734	.79
March	4,540	900	2,040	.706	.81
April	2,120	870	1,380	.478	.53
May	4,340	818	1,910	.661	.76
June	7,100	870	2,790	.965	1.08
July	5,910	360	1,700	.588	.68
August	5,800	311	1,850	.640	.74
September	818	327	543	.188	.21
The year	12,100	311	2,390	.827	11.25

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, Memphis datum.

DRAINAGE AREA.—4,290 square miles.

RECORDS AVAILABLE.—September to November 1913; May 1915 to September 1932.

EXTREMES.—Maximum discharge during year ending Sept. 30, 1932, 18,700 second-feet Jan. 1 (gage height, 14.6 feet); minimum, 385 second-feet Sept. 28–30 (gage height, 2.25 feet).

1913, 1915–32: Maximum discharge, 44,500 second-feet June 17, 1929 (gage height, 22.55 feet); minimum, 20 second-feet (estimated) Dec. 30, 1930.

REMARKS.—Records fair. Slight regulation at low stages. Records furnished by Mississippi River Power Co.

Discharge, in second-feet, 1927–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1927–28												
1	1,060	550	415	a 3,000	250	2,980	958	805	415	13,900	3,120	2,840
2	4,380	515	300	a 2,500	250	1,500	958	805	385	11,300	2,300	2,030
3	8,950	448	250	a 2,200	250	855	958	758	480	5,360	1,620	1,500
4	3,960	415	a 150	a 1,900	250	1,180	958	710	448	4,240	16,200	1,120
5	2,570	415	a 140	a 1,700	355	1,900	2,840	588	415	17,400	19,400	1,060
6	2,980	355	a 175	a 1,500	448	1,500	4,800	625	344	15,000	15,200	958
7	4,800	322		a 1,500	a 8,000	1,430	4,940	625	316	11,000	15,900	905
8	6,770	322		a 1,600	a 9,000	1,240	4,380	588	480	6,340	13,500	758
9	5,220	322	a 200	a 1,600	9,700	1,120	3,960	588	448	3,960	7,060	758
10	3,400	322		a 1,400	7,930	1,060	3,540	550	385	3,540	3,680	710
11	1,900	322		a 1,400	4,800	1,240	3,120	588	385	4,800	2,840	758
12	7,200	322		a 1,300	5,360	1,760	2,840	515	316	3,120	2,160	9,400
13	4,520	295	a 225	a 1,200	5,920	3,820	2,570	515	316	2,840	1,760	10,200
14	2,570	270		a 1,100	7,350	5,640	2,300	480	344	2,980	1,500	4,940
15	1,760	1,060	a 200	a 1,050	7,200	4,660	2,160	480	316	2,160	1,240	4,240
16	1,360	448		a 1,000	6,770	3,960	2,160	480	316	1,760	1,120	3,540
17	1,060	415	a 150	a 1,000	7,200	2,570	2,160	515	344	1,300	958	2,840
18	958	515		a 950	7,640	2,030	2,030	550	2,980	1,060	905	2,300
19	855	480		a 900	a 6,000	1,760	1,900	1,060	2,440	2,700	805	2,300
20	805	550	148	a 800	a 4,500	1,500	1,760	2,840	1,360	2,570	958	1,620
21	668	448	115	a 700	a 4,000	1,300	1,900	2,440	1,620	2,300	1,010	1,240
22	588	355	100	a 600	a 3,000	1,120	1,760	2,030	1,240	6,770	958	1,060
23	515	355	100	a 550	a 2,700	1,120	1,760	1,430	2,840	5,360	1,300	905
24	588	355	88	a 500	a 2,000	1,060	1,560	1,060	4,520	4,240	1,760	805
25	550	385	88	a 450	a 2,500	1,060	1,500	905	7,060	2,300	3,540	758
26	515	385	88	415	a 2,500	1,060	1,430	758	7,060	1,560	3,540	668
27	480	355	88	385	a 3,500	1,010	1,180	668	4,800	1,180	2,440	625
28	515	415	a 900	355	a 4,000	1,010	1,180	588	2,840	1,010	2,160	588
29	480	448	a 5,000	300	4,240	1,010	1,010	515	14,400	855	1,120	588
30	448	415	a 5,000	275	-------	1,010	905	515	13,500	855	2,300	588
31	385	-------	a 4,000	275	-------	1,010	-------	415	-------	3,120	3,680	-------

a Estimated.

Discharge, in second-feet, of Skunk River at Augusta, Iowa, 1927–32—Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1928–29												
1	550	1,360	3,820	a3,600		a6,300	10,300	9,400	1,620	550	1,240	355
2	515	1,560	3,680	a2,800	a700	a6,900	11,600	7,500	4,100	588	1,120	355
3	448	4,520	3,680	a2,000		a7,500	8,800	6,200	4,520	588	1,060	290
4	480	5,080	3,400	a1,400		a8,100	6,200	4,940	3,540	758	1,010	290
5	515	5,360	3,120	a1,000	a650	a8,700	5,080	4,240	2,700	1,010	805	265
6	1,010	4,800	a2,700	a900		a9,200	4,660	3,680	2,080	1,360	855	218
7	905	4,240	a2,800	a900		a9,300	4,240	3,260	2,080	5,220	1,620	265
8	805	3,680	a3,000	a950		a9,400	4,380	3,120	1,900	2,570	1,760	316
9	668	3,120	a3,800	a1,000		a9,500	4,100	2,700	1,620	1,620	1,900	415
10	2,570	2,840	a5,000	a1,000		a9,500	3,820	2,440	1,500	1,120	1,760	550
11	1,620	2,840	a6,000	a1,100		a9,600	4,520	2,160	1,360	1,120	1,620	1,120
12	958	2,570	a6,400	a1,100		9,700	4,660	2,570	1,760	1,060	1,180	588
13	1,120	2,440	a6,700			19,400	4,660	2,700	1,620	1,060	1,360	710
14	668	2,300	8,800			17,600	4,380	2,980	1,900	3,120	3,120	1,120
15	958	2,300	11,100		a600	16,400	4,100	2,980	1,560	1,760	2,160	1,010
16	1,360	2,300	10,600	a1,200		16,400	4,100	3,680	1,240	4,800	1,240	905
17	1,760	21,200	10,300			14,000	4,240	3,540	1,180	5,360	805	710
18	10,800	25,000	7,500			15,700	4,100	3,400	1,060	5,500	710	710
19	4,520	23,000	6,200			18,300	9,700	3,120	958	4,800	625	805
20	3,540	19,400	5,360			20,500	23,600	2,840	1,300	3,820	550	758
21	2,570	17,600	4,800	a1,100		20,100	26,000	2,300	1,010	3,120	480	668
22	3,260	10,200	a4,400	a1,200		18,300	21,800	2,160	758	2,440	448	550
23	6,480	7,350	a4,300	a1,400	a700	15,700	16,100	2,030	758	2,030	480	550
24	4,800	5,920	a4,200	a1,200	a2,000	12,700	9,000	1,900	710	1,760	415	415
25	3,680	5,080	a4,100	a1,000	a4,000	10,500	24,100	1,900	625	1,010	415	290
26	2,980	4,240	a4,000	a900	a4,500	9,000	23,600	1,760	588	1,430	415	448
27	2,570	3,680	a4,100	a800	a5,200	7,350	19,400	1,760	550	3,260	385	415
28	2,300	3,400	a4,300	a800	a5,800	6,200	21,100	1,620	550	2,160	385	385
29	1,760	3,260	a4,600	a750		5,360	17,600	1,500	588	2,030	385	385
30	1,620	3,120	a4,600	a750		4,520	11,000	1,500	588	1,760	355	355
31	1,430		a4,300	a700		4,380		1,560		1,500	355	
1929–30												
1	355	1,760	a750	a350		3,260	855	1,360	758	2,840	255	130
2	355	1,360	a700	a350	a250	2,700	758	1,760	710	1,900	232	100
3	316	1,180	a650			2,160	758	1,760	668	1,760	255	100
4	290	1,060	a600		a300	1,760	710	1,620	588	1,300	255	52
5	480	905	a550		a300	1,560	710	1,500	588	1,430	232	88
6	415	758		a400	a350	1,500	710	1,360	710	2,030	118	52
7	415	710			a450	1,500	625	1,240	2,300	2,440	280	52
8	385	625	a500		a600	1,760	625	1,240	3,680	2,030	333	64
9	355	625			a800	1,500	515	1,360	3,400	2,030	255	52
10	355	625		a350	a1,100	1,360	515	1,900	3,400	1,300	169	52
11	355	588			a1,400	1,240	550	2,300	2,840	1,180	189	43
12	415	588	a450		a3,500	1,180	515	2,570	2,300	1,010	232	43
13	1,620	625			a6,500	1,060	515	2,300	1,760	855	232	43
14	1,430	1,620		a300	a5,500	1,010	588	2,030	1,760	805	255	43
15	1,060	2,980	a500		a4,800	958	550	1,760	26,000	668	189	52
16	625	2,700	a650		a4,400	958	668	1,620	39,300	625	169	52
17	550	2,440	a700		a4,100	905	958	1,430	43,300	550	169	26
18	415	1,900	a700		a4,600	1,360	1,240	1,360	38,200	480	151	43
19	415	1,620	a650		a4,500	1,500	1,240	1,360	28,900	515	480	43
20	515	1,430	a600		4,380	1,430	1,180	1,240	17,400	448	300	33
21	550	1,180	a600		5,500	1,360	1,240	1,240	11,000	448	355	33
22	625		a550		5,500	1,300	1,120	1,120	5,330	415	300	33
23	588	a900	a500	a250	5,780	1,300	1,060	1,120	4,210	344	300	57
24	668		a450		4,940	1,240	1,760	1,010	3,400	316	227	30
25	625		a400		4,100	1,180	2,300	2,300	2,840	316	227	43
26	588		a400		6,200	1,060	2,160	2,570	2,840	316	185	415
27	515	a850			5,500	1,060	1,900	1,760	2,300	316	130	415
28	480				4,100	1,010	1,620	1,300	2,030	290	165	668
29	758	a800	a350			1,010	1,430	1,120	1,760	316	165	415
30	1,060	a800				958	1,360	958	2,130	290	148	515
31	1,360					855		805		265	148	

a Estimated.

Discharge in second-feet, of Skunk River at Augusta, Iowa, 1927–32—Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1930–31												
1	385	43	a 80		668	148	1,060	625	1,360	205	88	5,500
2	300	43	a 90		710	148	1,180	515	710	205	64	5,640
3	275	52	a 120		588	165	1,620	515	480	4,940	75	4,100
4	275	43	a 200		448	165	1,900	415	355	12,700	52	2,570
5	228	43	a 300		385	148	1,760	415	1,430	2,840	52	1,300
6	75	33	2,840		328	165	1,560	415	8,800	1,240	64	1,300
7	328	43	2,300		328	165	1,430	328	9,400	1,060	300	415
8	300	52	1,500		328	165	1,240	355	6,480	448	300	328
9	448	43	758		300	148	1,120	355	3,120	355	228	275
10	355	43	515		165	130	905	385	2,030	328	668	250
11	275	43	415		165	205	710	385	1,430	275	415	228
12	275	43	300		185	185	588	415	2,840	250	148	185
13	250	43	250	a 30	275	328	550	480	4,660	275	130	165
14	148	43	205		165	550	415	415	2,030	275	130	148
15	148	52	205		130	710	385	355	1,360	300	100	130
16	205	205	100		165	905	588	300	855	250	64	100
17	385	88	a 80		185	625	1,120	300	668	480	75	88
18	415	75	a 60		148	515	1,500	250	550	710	64	88
19	275	130	a 50		185	515	1,120	588	448	515	75	88
30	228	100	a 50		165	480	2,030	1,010	385	415	355	64
21	130	148	a 45		185	328	8,510	668	328	415	250	75
22	115	250	a 40		148	275	7,930	480	355	300	515	300
23	148	275	a 35		185	250	5,080	355	1,120	275	480	2,570
24	130	328	a 40		185	250	2,840	300	480	275	385	2,840
25	100	385	a 30	a 40	185	250	2,030	275	355	328	355	2,440
26	75	448	a 30	a 70	165	205	1,760	205	300	300	275	4,240
27	64	130	a 30	a 100	165	250	1,430	228	275	228	205	4,520
28	64	a 70	a 30	a 150	148	515	1,180	250	275	185	588	4,380
29	52	a 60	a 30	228	-------	625	855	275	250	115	855	3,540
30	52	a 80	a 20	300	-------	710	758	668	250	100	385	3,120
31	52	-------	a 30	625	-------	710	-------	1,010	-------	88	385	-------
1931–32												
1	2,030	855	14,200	18,700	a2,100	2,840	3,120	1,060	1,120	3,400	668	1,120
2	1,430	668	14,200	17,800	a1,800	3,400	2,840	1,010	1,060	2,300	515	1,060
3	1,060	668	14,200	15,200	a1,600	3,960	2,570	1,240	1,300	1,760	550	1,010
4	958	588	13,000	11,000	a1,500	4,240	2,440	1,900	3,120	9,250	515	958
5	758	588	10,600	9,250	a1,500	4,240	2,300	1,900	7,350	11,000	758	805
6	668	550	7,930	11,100	a1,600	4,100	2,300	2,030	6,200	13,200	550	805
7	2,570	550	5,920	11,000	a1,700	a3,800	2,160	2,300	3,120	7,780	905	668
8	3,960	550	4,520	9,700	a1,900	a3,300	2,300	8,080	3,120	4,240	1,180	625
9	3,120	515	3,960	a 7,500	a2,100	a2,800	2,840	7,930	5,920	2,570	805	550
10	2,570	480	3,680	6,480	a2,500	a2,300	2,700	6,770	7,060	7,350	480	550
11	2,440	415	5,360	5,220	4,800	a2,100	2,440	5,640	3,680	12,100	1,300	515
12	2,300	855	8,510	4,380	6,770	a2,000	2,030	4,800	2,840	12,600	4,800	515
13	3,680	2,570	7,350	4,520	5,920	a2,000	1,760	4,100	1,760	10,800	14,400	625
14	3,960	2,840	6,480	6,200	4,800	a2,100	1,760	2,980	1,560	5,500	15,600	550
15	2,700	5,360	6,060	7,640	3,540	a2,100	1,620	2,570	2,440	2,840	13,900	550
16	2,300	6,770	5,360	6,920	3,120	a2,100	1,430	2,300	2,980	2,160	11,000	1,010
17	1,620	6,340	5,360	7,350	2,980	a2,200	1,430	2,030	2,030	1,760	7,640	905
18	1,300	14,200	5,360	7,640	2,840	a2,400	1,430	1,760	1,900	1,430	6,200	710
19	1,120	11,000	4,800	7,350	3,120	2,440	1,360	2,030	4,520	1,240	8,660	625
20	1,010	10,000	4,240	7,060	3,960	2,300	1,360	2,840	4,240	1,120	8,080	550
21	905	11,600	3,960	6,480	3,400	2,300	1,360	2,440	3,680	1,010	5,920	515
22	805	8,080	3,820	5,640	3,120	2,030	1,300	2,030	4,660	905	8,680	515
23	805	14,200	3,820	5,640	2,840	1,760	1,300	1,760	3,680	1,010	2,300	515
24	758	17,600	3,680	5,080	2,570	1,900	1,300	1,560	2,980	1,010	1,760	855
25	758	16,200	3,400	4,660	2,300	2,700	1,240	1,430	2,300	758	1,760	668
26	905	15,000	3,130	4,240	2,570	5,360	1,240	1,430	2,570	668	1,500	550
27	1,060	13,900	3,120	3,960	2,570	9,400	1,300	2,030	13,200	588	1,430	515
28	1,430	11,100	3,120	3,680	2,440	7,640	1,360	2,030	12,600	588	3,680	385
29	1,430	13,400	3,120	3,680	2,300	5,360	1,300	1,560	10,600	550	2,570	385
30	1,120	14,500	3,120	a 3,200	-------	4,520	1,180	1,120	7,060	480	1,760	385
31	958	-------	6,480	a 2,700	-------	3,680	-------	1,120	-------	480	1,300	-------

a Estimated.

Discharge in second-feet, of Skunk River at Augusta, Iowa, 1927–32—Continued

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
1927–28					
October	8,950	385	2,350	0.548	0.63
November	1,060	270	419	.098	.11
December	5,000	88	632	.147	.17
January	3,000	275	1,110	.259	.30
February	9,700	250	4,420	1.03	1.11
March	5,640	855	1,790	.417	.48
April	4,940	905	2,180	.509	.57
May	2,840	415	838	.195	.22
June	14,400	316	2,440	.569	.63
July	17,400	885	4,730	1.10	1.27
August	19,400	805	4,390	1.02	1.18
September	10,200	588	2,090	.487	.54
The year	19,400	88	2,280	.531	7.21
1928–29					
October	10,800	448	2,230	.520	.60
November	25,000	1,360	6,790	1.58	1.76
December	11,100	2,700	5,210	1.21	1.40
January	3,600	700	1,220	.284	.33
February	5,800	600	1,280	.298	.31
March	20,500	4,380	11,500	2.68	3.09
April	26,000	3,820	10,700	2.49	2.78
May	9,400	1,500	3,140	.732	.84
June	4,520	550	1,540	.358	.40
July	5,500	550	2,260	.526	.61
August	3,120	355	1,000	.233	.27
September	1,120	218	541	.126	.14
The year	26,000	218	3,960	.923	12.53
1929–30					
October	1,620	290	612	.143	.16
November	2,980	588	1,170	.273	.30
December	750	350	514	.120	.14
January	400	250	302	.070	.08
February	6,500	250	3,210	.748	.78
March	3,260	855	1,390	.324	.37
April	2,300	515	1,020	.238	.27
May	2,570	805	1,560	.364	.42
June	43,300	588	8,550	1.99	2.22
July	2,840	265	962	.224	.26
August	480	118	229	.053	.06
September	668	26	126	.029	.03
The year	43,300	26	1,610	.375	5.09
1930–31					
October	448	52	211	.049	.06
November	448	33	114	.027	.03
December	2,840	20	348	.081	.09
January	625	30	720	.017	.02
February	710	148	264	.062	.06
March	905	130	353	.082	.09
April	8,510	385	1,840	.429	.48
May	1,010	205	437	.102	.12
June	9,400	250	1,780	.415	.46
July	12,700	88	989	.230	.27
August	855	52	262	.061	.07
September	5,640	64	1,700	.396	.44
The year	12,700	20	694	.162	2.19
1931–32					
October	3,960	668	1,690	.394	.45
November	17,600	415	6,730	1.57	1.75
December	14,200	3,120	6,190	1.44	1.66
January	18,700	2,700	7,520	1.75	2.02
February	6,770	1,500	2,910	.678	.73
March	9,400	1,780	3,340	.778	.90
April	3,120	1,180	1,840	.429	.48
May	8,080	1,010	2,700	.629	.73
June	13,200	1,060	4,360	1.02	1.14
July	13,200	480	3,950	.921	1.06
August	15,600	480	4,070	.949	1.09
September	1,120	385	667	.155	.17
The year	18,700	385	3,840	.895	12.18

DES MOINES RIVER NEAR JACKSON, MINN.

LOCATION.—Chain gage in sec. 28, T. 103 N., R. 35 W., 8 miles northwest of Jackson. (Present gage not referred to previous datum.)

RECORDS AVAILABLE.—August 1930 to September 1932. May 1909 to December 1913 at a site 8 miles downstream.

EXTREMES.—Maximum discharge during period, 906 second-feet Apr. 2 (gage height, 5.10 feet); maximum gage height, 6.60 feet, affected by ice; minimum discharge, 1.2 second-feet Sept. 9 (gage height, 0.72 foot).

1909–13, 1930–32: Maximum discharge, 1,690 second-feet June 29, 1909 (gage height, 10.00 feet); no flow occasionally in 1931.

REMARKS.—Records good except those for period of ice effect, Mar. 1–29, which are poor. No record Oct. 1 to Feb. 29. Discharge estimated Mar. 1. Discharge interpolated May 12, Sept. 6–8.

Discharge, in second-feet, 1932

Day	Mar.	Apr.	May	June	July	Aug.	Sept.
1	250	870	187	90	354	16	3.5
2	234	906	187	76	354	16	2.4
3	264	835	154	76	354	13	2.0
4	285	835	154	69	330	12	2.0
5	307	801	154	67	307	11	1.6
6	285	801	154	59	285	10.0	1.5
7	264	801	146	78	254	9 1	1.4
8	264	733	146	60	214	7.2	1.3
9	264	667	139	56	187	7.2	1.2
10	254	667	139	50	187	8 2	2.0
11	244	603	132	58	162	8 7	2.8
12	224	572	124	81	139	7.2	23
13	214	542	117	71	124	8 2	20
14	205	513	110	96	117	9.1	17
15	170	456	110	124	110	8 2	11
16	205	429	110	146	96	6.3	10
17	214	403	90	187	83	5 6	8.2
18	205	378	83	205	78	4 2	4.9
19	205	354	83	224	69	2.8	2.8
20	205	307	78	264	60	2.4	3.5
21	187	285	71	285	56	2.0	5.6
22	139	264	64	307	52	2.0	5.6
23	139	244	60	330	46	1.6	4.9
24	205	244	62	330	37	1.6	4.2
25	513	244	81	330	34	2.8	4.2
26	700	244	81	330	30	5 6	2.8
27	733	234	81	330	30	8 2	2.0
28	700	214	81	354	27	13	1.6
29	700	205	76	354	23	11	1.6
30	733	196	69	330	18	8 2	1.6
31	767	-------	162	-------	17	6.3	-------

Month	Maximum	Minimum	Mean	Month	Minimum	Minimum	Mean
March	767	139	332	July	354	17	137
April	906	196	495	August	16	1.6	7.57
May	187	60	112	September	23	1.2	5.21
June	354	50	181				

DES MOINES RIVER AT ELDON, IOWA

LOCATION.—Chain gage on highway bridge in Eldon, Wapello County, about 1 mile above Soap Creek.

DRAINAGE AREA.—13,300 square miles.

RECORDS AVAILABLE.—October 1930 to September 1932; comparable records at Ottumwa March 1917 to September 1927; January 1929 to September 1930.

EXTREMES.—Maximum discharge during year, 35,100 second-feet Nov. 26 (gage height, 14.99 feet); minimum, 770 second-feet Nov. 8 (gage height, 2.29 feet).

1917–27, 1929–32: Maximum discharge, 58,700 second-feet June 11, 1917 (gage height, at Ottumwa, 16.5 feet); minimum, 89 second-feet Sept. 19, 1931 (gage height, 1.13 feet).

Maximum discharge since 1850, and probably in the last century, occurred on May 31, 1903, and is estimated at 100,000 second feet.

REMARKS.—Records good except those for period of ice effect, Mar. 7–13, which are fair. Power plants above gage cause some diurnal fluctuation at low stages.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,920	1,200	14,200	27,000	3,950	16,200	13,800	4,250	7,480	7,240	1,240	2,120
2	2,510	1,200	10,900	28,600	3,500	17,800	13,800	4,100	7,020	5,800	1,290	2,250
3	1,880	950	9,040	31,400	2,920	20,000	13,300	3,950	7,240	6,600	1,510	2,380
4	1,550	1,050	7,720	31,000	2,640	22,100	13,300	3,800	11,300	6,000	1,750	2,120
5	1,450	1,050	7,240	28,600	2,920	23,600	12,000	3,800	8,480	6,800	1,510	1,990
6	1,770	1,050	6,800	23,200	3,500	25,100	10,900	3,500	8,480	4,880	2,640	1,750
7	16,200	950	6,400	17,500	4,560	25,900	11,300	7,480	8,480	4,400	3,500	1,510
8	17,200	902	5,800	14,500	4,880	25,900	12,000	6,600	9,040	3,950	1,990	1,750
9	16,200	950	5,420	10,300	4,880	25,500	11,300	6,800	9,940	8,480	1,460	1,510
10	9,940	902	5,420	8,480	5,060	20,700	9,340	6,600	8,760	24,000	1,020	1,400
11	8,220	950	7,240	7,480	10,600	10,300	8,220	6,000	9,940	12,400	2,250	1,290
12	6,000	3,060	10,600	7,240	11,600	7,720	7,480	6,200	7,020	5,060	8,760	1,510
13	6,200	3,500	14,200	12,800	9,040	7,240	7,020	5,800	7,020	4,100	14,600	1,870
14	5,420	4,100	12,800	20,000	8,220	7,020	6,600	5,060	8,760	3,950	12,000	1,290
15	3,950	12,400	9,940	20,300	6,400	7,240	6,200	4,720	8,760	3,800	7,720	1,630
16	3,060	9,040	8,760	15,700	5,600	7,240	5,600	4,400	8,220	3,950	6,000	1,630
17	2,780	11,300	7,240	14,500	6,000	7,480	5,240	4,250	7,240	3,800	15,100	1,460
18	2,250	14,000	6,800	13,300	7,960	7,720	5,060	4,400	8,220	3,500	14,200	1,630
19	2,000	14,600	6,800	11,300	10,300	7,960	4,880	3,950	8,760	2,640	14,600	1,400
20	1,770	10,300	7,240	10,600	8,760	7,960	4,720	3,500	11,600	2,780	9,340	1,510
21	1,660	14,200	7,020	10,900	7,720	9,640	4,560	3,060	14,100	2,380	5,800	2,510
22	1,770	7,480	6,400	12,000	6,800	8,220	4,560	2,920	16,000	2,250	4,400	2,780
23	1,770	13,800	6,000	13,800	6,000	7,240	6,200	2,510	18,200	2,250	3,350	2,120
24	1,660	31,800	5,600	11,300	6,200	6,800	6,000	2,640	19,200	1,750	2,780	1,630
25	1,450	33,400	5,420	9,340	6,800	7,960	6,000	2,380	18,600	1,750	2,640	1,120
26	1,770	35,100	5,420	7,720	6,800	14,000	5,420	2,380	20,000	1,460	7,240	1,240
27	3,650	34,700	5,240	7,240	6,800	11,300	5,060	2,380	23,600	1,630	8,220	1,120
28	3,500	33,400	5,240	7,240	8,480	10,600	4,720	2,510	19,600	1,400	4,560	870
29	2,250	27,800	5,240	7,240	14,100	11,600	4,400	3,500	11,600	1,180	2,510	920
30	1,660	17,500	5,240	6,400	------	12,800	4,250	5,600	9,340	1,340	2,120	870
31	1,660	------	10,900	5,800	------	14,000	------	7,240	------	1,240	1,870	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	17,200	1,450	4,390	0.330	0.38
November	35,100	902	11,400	.857	.96
December	14,200	5,240	7,690	.578	.67
January	31,400	5,800	14,600	1.10	1.27
February	14,100	2,640	6,650	.500	.54
March	25,900	6,800	13,400	1.01	1.16
April	13,800	4,250	7,770	.579	.65
May	7,480	2,380	4,400	.331	.38
June	23,600	7,020	11,400	.857	.96
July	24,000	1,180	4,610	.347	.40
August	15,100	1,020	5,420	.408	.47
September	2,780	870	1,640	.123	.14
The year	35,100	870	7,780	.585	7.98

DES MOINES RIVER AT KEOSAUQUA, IOWA

LOCATION.—Chain gage 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. No important tributary enters Des Moines River for several miles above or below.

DRAINAGE AREA.—13,900 square miles.

RECORDS AVAILABLE.—May 1930 to July 1906; April 1910 to September 1932.

EXTREMES.—Maximum discharge during year ending Sept. 30, 1932, 34,800 second-feet Nov. 25 (gage height, 11.6 feet); minimum, 760 second-feet Nov. 10 (gage height, 0.3 foot).

1903–6, 1910–32: maximum discharge, about 97,000 second-feet June 1, 1903 (gage height, 27.85 feet); minimum, 115 second-feet Sept. 20, 1931 (gage height, −0.4 foot).

Flood of June 1, 1851, reached a stage of about 24 feet (discharge, about 80,000 second-feet).

REMARKS.—Records fair. Records furnished by Mississippi River Power Co.

Discharge, in second-feet, 1927–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1927–28												
1	1,620	490	690	a 500	a 180	6,860	a 3,600	3,360	1,920	9,630	1,920	7,950
2	10,800	1,000	a 690	a 400	a 180	4,080	3,360	2,900	1,820	6,860	1,820	a 6,340
3	3,130	690	a 520	a 340	a 200	3,840	3,130	2,680	a 1,430	4,820	1,520	4,820
4	3,130	690	a 380	a 300	a 220	a 5,070	3,130	2,680	1,430	5,820	17,500	3,840
5	4,320	690	a 250	a 280	a 300	5,320	3,360	2,460	1,430	9,070	15,500	4,320
6	4,820	a 690	a 260	a 260	a 580	5,320	5,070	a 2,140	1,340	5,820	13,600	3,600
7	9,070	690	a 220	a 250	7,130	5,070	7,130	2,140	1,340	4,820	12,000	3,600
8	5,320	555	a 210	a 260	a 8,000	4,320	7,670	2,140	2,350	a 4,820	7,950	3,360
9	a 3,240	620	a 200	a 280	a 9,600	5,070	7,130	2,140	1,720	4,820	5,820	a 2,900
10	2,900	620	a 200	a 280	a 8,000	4,320	5,820	2,030	a 2,030	4,820	4,820	2,680
11	2,570	555	a 200	a 280	6,860	a 4,820	4,570	2,140	2,900	3,360	4,320	2,350
12	4,320	555	a 200	a 280	a 5,800	5,570	4,320	2,900	1,920	3,360	a 3,600	8,510
13	3,130	a 620	a 200	a 280	5,070	7,130	3,600	a 2,900	1,720	3,840	2,900	8 230
14	2,240	620	a 230	a 280	6,340	9,920	3,360	2,680	1,250	3 360	2 350	6,600
15	1,920	690	a 250	a 280	7,950	9,350	a 3,360	2,680	1,250	a 3,130	2,030	7,950
16	a 1,250	760	a 275	a 320	9,350	7,400	3,360	2,460	1,920	2,900	1,720	6,340
17	1,250	620	a 200	a 340	a 7,600	6,340	3,600	2,240	10,200	2,460	1,620	9,070
18	1,160	760	a 180	a 280	a 5,800	a 5,570	3,600	2,140	5,820	1,920	1,520	7,400
19	1,000	840	a 160	a 310	a 4,800	4,820	3,840	2,240	3,360	1,820	a 4,820	5,820
20	1,080	a 765	a 150	a 200	a 2,000	4,320	3,600	a 6,860	4,320	2,570	5,070	4,820
21	1,080	690	a 130	a 200	a 1,800	3,840	3,600	5,070	2,900	5,070	4,820	4,320
22	1,000	690	a 125	a 200	a 1,600	3,600	a 3,600	3,600	3,840	9,630	3,840	3,840
23	a 1,000	555	a 125	a 200	a 1,200	3,360	3,840	3,360	6,080	7,670	2,680	a 3,360
24	1,000	a 625	a 130	a 200	a 900	3,840	4,080	3,360	12,000	6,340	4,570	2,900
25	1,000	625	a 150	a 200	a 800	a 3,600	4,320	3,130	9,070	5,820	3,360	2,680
26	840	690	a 200	a 175	a 1,000	3,600	4,820	2,900	6,340	3,600	a 2,240	2,350
27	840	a 690	a 225	a 160	a 1,600	4,080	4,320	a 2,900	5,570	2,680	1,820	2,140
28	840	690	a 400	a 150	1,920	4,080	3,840	2,900	3,840	2,240	1,520	1,920
29	760	690	a 1,310	a 150	2,460	3,840	a 3,600	2,350	5,820	a 2,030	7,400	1,920
30	a 1,000	690	a 1,200	a 160	-------	4,080	3,600	1,920	7,400	1,820	10,800	a 1,8
31	920	-------	a 600	a 180	-------	3,840	-------	1,820	-------	2,350	8,230	-- --

a Estimated.

Discharge, in second-feet, of Des Moines River at Keosauqua, Iowa, 1927–32—Con.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1928-29												
1	1,620	2,680	6,340	a 3,800		a 7,000	18,800	22,400	5,220	2,240	1,820	a 950
2	1,620	3,360	a 6,340	a 2,500	a1,400	a 8,000	14,000	21,800	15,600	2,350	1,620	872
3	1,520	8,230	6,340	a 2,000		a 9,000	12,200	20,100	14,700	2,350	1,620	718
4	1,430	9,350	6,080	a 1,600		a 10,000	10,800	17,800	10,800	2,240	a 1,820	718
5	1,620	11,100	a 5,800	a 1,400		a 11,000	9,630	15,000	10,200	2,240	1,430	792
6	1,340	9,920	a 5,000	a 1,300		a 12,000	9,350	13,400	7,950	2,460	1,340	718
7	a 1,340	8,510	a 4,000	a 1,200		a 13,000	9,350	12,000	6,600	a 2,900	2,140	648
8	6,600	7,130	a 3,200	a 1,200		a 14,000	9,630	10,500	6,080	3,130	2,240	a 648
9	2,680	6,600	a 3,000	a 1,200		a 14,600	14,000	9,630	a 6,080	2,900	2,030	1,340
10	1,430	6,340	a 3,000	a 1,300	a1,300	a 15,200	14,000	9,070	5,820	2,680	1,820	2,460
11	1,250	6,340	a 3,100			16,200	12,600	7,950	6,860	2,460	a 2,030	1,620
12	1,080	6,600	3,600	a1,400		a 16,200	11,400	a 8,230	6,340	2,460	1,820	1,340
13	920	6,860	4,570			a 26,200	14,400	8,230	5,820	2,140	2,350	1,520
14	a 920	6,600	13,200	a 1,500		a 32,600	15,000	12,600	5,070	a 2,140	1,340	1,520
15	1,250	6,600	14,400			37,400	14,400	13,800	4,820	3,360	1,250	a1,170
16	1,920	6,340	17,200			41,100	13,700	13,800	a 4,320	6,080	1,160	1,160
17	1,820	27,600	16,900			41,800	12,800	12,600	4,080	9,070	1,080	1,160
18	4,320	31,200	13,100	a1,600		41,500	11,700	a 11,100	3,840	9,920	a 1,080	792
19	3,360	23,800	11,400			39,600	10,800	a 9,920	4,080	7,400	1,080	1,030
20	5,820	21,400	9,920		a1,200	39,300	30,400	8,790	3,600	5,570	1,030	1,340
21	6,340	13,800	a 7,000			40,700	28,300	7,950	2,900	a 4,820	1,030	1,080
22	6,860	12,200	a 5,000	a 1,800		40,400	26,900	7,130	3,360	4,320	1,430	a1,080
23	6,860	10,200	a 3,600	a 1,700		37,000	23,100	6,600	a 3,360	3,600	581	1,030
24	5,320	8,230	a 3,400		a 1,400	30,800	17,800	6,340	2,900	2,680	1,030	952
25	4,820	a 7,130	a 3,600		a 1,800	20,100	33,700	6,080	2,680	2,900	a 950	952
26	4,570	6,600	a 4,000	a1,600	a 4,000	16,200	29,000	a 6,080	2,570	2,900	872	872
27	5,320	5,820	a 5,000		a 5,000	14,400	23,100	6,080	2,460	2,350	872	581
28	a 4,820	5,570	5,570		a 6,000	12,600	26,600	5,570	2,240	a 2,350	718	792
29	3,600	5,070	5,820	a1,500		11,400	24,500	5,320	2,240	2,350	1,160	a 720
30	3,360	5,320	a 5,800			9,920	23,800	5,070	a 2,030	2,240	1,800	648
31	2,900		a 5,200	a 1,400		9,920		5,070		1,820	1,030	
1929-30												
1	648	2,570	a 400	a 450	a 400	5,320	2,140	2,900	3,130	3,360	760	308
2	648	1,820	a 400		a 450	a 6,000	1,820	3,130	3,130	2,680	620	347
3	398	1,720	a 450		a 500	a 5,400	1,620	2,900	2,900	2,460	620	328
4	581	1,720	a 500		a 600	a 2,800	1,720	2,680	2,570	2,350	690	280
5	581	1,720	a 500	a 500	a 700	2,140	1,620	2,680	2,460	2,570	620	328
6	a 718	1,340	a 550		a 800	2,460	1,520	2,680	5,570	2,570	375	280
7	718	1,620	a 600		a 1,000	2,030	1,430	2,900	8,510	2,570	690	265
8	718	1,520	a 600		a 1,200	2,240	1,340	3,840	8,790	2,240	620	328
9	581	1,250	a 650		a 1,400	2,240	1,250	4,080	6,080	2,240	555	265
10	792	1,250	a 650		a 1,600	2,460	1,430	5,070	5,070	2,460	920	265
11	1,030	1,160	a 700		a 2,100	2,460	1,430	5,070	4,570	2,460	620	265
12	1,340	1,250	a 750		a 2,800	2,240	1,160	4,570	4,320	2,030	555	242
13	a 1,080	1,430	a 800		a 6,000	2,030	1,340	5,570	4,080	1,920	490	242
14	1,030	4,320	a 1,100		a 5,200	2,030	1,160	7,130	3,840	1,720	490	280
15	792	4,820	a 1,300	a 450	a 4,800	2,030	1,250	9,630	28,300	1,520	432	280
16	952	3,360	1,430		a 4,400	2,030	1,250	9,920	26,600	1,520	432	228
17	648	3,130	1,430		a 4,100	1,820	1,620	9,920	26,600	1,430	490	242
18	648	2,900	a 1,400		a 4,000	2,240	1,920	9,920	24,800	1,160	432	228
19	718	2,460	a 800		a 3,800	2,240	1,920	9,630	15,300	1,160	432	242
20	1,080	2,140			a 6,500	2,680	2,030	7,950	11,700	760	555	220
21	1,030	1,820			6,860	2,460	1,920	6,860	10,200	1,000	555	190
22	1,030	a 1,300			6,080	3,360	1,920	6,080	8,230	920	432	220
23	1,160	a 800			4,820	3,360	3,130	5,820	6,860	760	490	205
24	792	a 550		a 400	6,860	2,900	2,900	8,230	6,080	840	400	190
25	952	a 300			7,130	2,680	3,130	8 230	5,320	840	432	328
26	952	a 800			8,230	2,680	3,600	7,130	4,570	840	490	205
27	648	a 1,800			7,130	2,680	3,600	5,570	3,360	840	432	432
28	648	a 1,500			6,340	2,460	3,360	4,570	3,840	760	432	840
29	1,920	a 400				2,460	3,130	4,080	3,360	760	432	1,820
30	3,360	a 400		a 450		2,460	2,900	3,840	3,600	620	490	1,250
31	3,840					2,030		3,600		840	375	

a Estimated.

Discharge, in second-feet, of Des Moines River at Keosauqua, Iowa, 1927–32—Con.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1930–31												
1	620	228	375	166	467	356	888	888	1,160	1,340	387	3,840
2	555	242	375	166	467	467	1,250	888	1,020	1,340	250	6,340
3	280	242	280	265	356	265	2,680	662	1,720	17,800	213	3,840
4	375	242	242	228	356	356	2,570	529	1,340	1,340	181	[a]1,800
5	220	280	490	194	409	409	2,350	529	1,520	1,340	568	555
6	242	242	1,820	194	356	490	2,140	467	12,200	1,430	1,160	490
7	490	205	1,430	194	467	594	1,820	529	9,350	1,160	1,020	280
8	620	242	1,000	265	539	140	1,520	529	5,320	1,160	776	280
9	432	232	690	228	467	356	1,160	594	5,570	1,620	856	432
10	328	220	467	142	410	662	1,340	594	4,080	1,250	1,160	205
11	280	242	467	194	490	356	1,250	594	4,820	1,080	704	205
12	280	242	467	122	409	356	1,250	662	5,070	936	250	178
13	328	272	467	122	356	467	594	732	1,920	936	213	205
14	328	258	356	142	467	1,250	529	594	2,030	1,080	213	178
15	328	242	356	194	539	1,430	467	529	1,340	856	205	328
16	1,250	375	356	228	265	1,430	808	529	1,250	1,250	205	280
17	490	328	265	308	356	968	1,160	467	634	1,250	205	242
18	328	328	410	356	467	968	1,050	467	1,020	1,150	205	205
19	280	328	356	228	409	1,050	2,030	1,520	704	936	280	150
20	280	328	142	228	356	732	5,320	888	634	1,340	328	115
21	432	1,160	308	[a]220	309	594	12,200	634	13,400	776	242	150
22	432	1,250	265	194	467	409	7,400	503	8,790	568	1,080	3,840
23	375	432	228	194	539	467	4,320	444	10,800	776	920	4,080
24	328	375	166	[a]200	594	539	3,840	444	9,630	776	760	3,360
25	328	280	308	[a]200	356	467	2,350	421	5,070	503	760	4,080
26	328	690	228	[a]200	356	539	1,820	387	3,360	856	490	11,400
27	328	180	265	142	299	539	1,250	338	2,900	568	432	9,630
28	328	280	194	194	356	1,620	1,430	289	2,140	503	280	8,510
29	280	328	194	250	-------	968	1,050	503	1,720	503	242	6,080
30	280	280	166	356	-------	888	1,050	1,920	1,520	444	205	4,570
31	280	-------	166	410	-------	1,250	-------	3,130	-------	387	205	------
1931–32												
1	3,130	1,820	16,900	29,000	[a]3,500	16,900	14,400	5,070	8,790	9,920	1,820	2,240
2	3,130	1,430	13,400	30,100	[a]2,800	18,800	14,400	4,820	8,510	7,670	1,820	2,680
3	2,680	1,430	10,800	30,800	[a]2,400	20,800	14,000	4,820	11,100	6,080	1,720	2,900
4	2,240	1,250	9,630	31,200	[a]2,200	22,800	13,800	4,570	13,400	9,070	2,240	2,460
5	1,820	1,250	8,790	30,800	[a]2,000	24,500	13,400	4,570	13,800	8,230	1,920	2,460
6	1,430	1,080	8,230	29,400	[a]2,300	25,500	12,600	4,080	12,800	8,790	1,820	2,240
7	3,130	920	7,400	[a]22,000	[a]2,800	[a]25,500	11,700	5,320	10,200	5,820	3,360	2,030
8	26,200	920	7,130	[a]17,000	[a]3,800	[a]24,000	13,200	11,400	13,800	5,320	4,080	1,820
9	19,800	840	6,340	[a]12,000	[a]5,000	[a]20,000	13,200	8,230	11,400	4,820	2,240	1,920
10	15,300	760	6,340	[a]8,000	5,820	[a]15,000	11,400	8,790	11,100	25,200	1,820	1,620
11	9,350	1,000	7,950	[a]8,000	9,070	[a]10,000	10,200	7,400	9,350	23,500	1,250	1,430
12	11,100	2,030	10,500	8,510	12,600	[a]8,700	9,350	7,130	8,230	9,350	6,600	1,430
13	7,400	5,070	14,000	10,800	10,500	[a]8,200	8,510	7,400	8,510	5,320	25,200	1,620
14	8,230	4,820	14,400	19,100	9,920	[a]8,000	[a]7,800	6,600	11,080	5,070	14,400	2,240
15	5,820	15,000	12,200	22,800	8,230	[a]8,000	7,130	5,820	9,630	4,570	14,700	2,240
16	4,320	13,200	10,500	[a]19,000	7,400	8,510	6,860	5,320	10,500	4,320	9,920	2,030
17	3,840	10,500	9,350	[a]16,000	6,600	8,790	6,340	5,070	9,070	4,570	9,630	1,820
18	3,360	16,600	7,950	14,700	7,950	8,790	6,080	4,820	9,630	4,320	20,800	1,820
19	2,460	15,900	7,400	12,200	10,800	9,350	5,820	4,820	9,920	4,080	18,800	1,820
20	2,240	15,600	7,130	11,700	10,500	9,630	5,570	4,320	12,200	2,680	15,000	2,030
21	2,350	12,200	8,510	11,700	9,350	10,200	5,570	3,840	13,800	2,460	8,510	1,920
22	1,820	12,000	7,670	12,600	8,510	10,800	5,320	3,600	16,900	2,680	6,600	2,900
23	1,820	19,800	7,130	13,400	7,670	9,630	6,340	3,360	18,800	2,460	4,820	2,900
24	1,720	32,200	6,600	[a]12,500	7,130	9,070	7,670	2,900	21,100	2,350	3,840	1,820
25	2,030	34,800	6,340	[a]11,000	7,950	9,630	7,130	2,900	21,400	2,240	3,130	1,820
26	1,720	33,700	6,340	9,630	7,950	16,200	7,130	2,900	21,800	2,030	3,360	1,620
27	4,570	34,100	6,080	8,790	7,950	14,000	6,340	2,460	23,500	2,030	11,100	1,340
28	4,820	33,700	6,080	8,230	8,510	14,000	5,820	2,680	23,800	1,820	7,950	1,430
29	3,840	30,800	6,080	8,510	12,000	12,200	5,570	3,360	17,500	1,720	4,570	1,080
30	2,460	22,800	6,340	[a]7,500	-------	13,200	5,070	4,570	11,700	1,620	2,680	1,080
31	2,460	-------	22,000	[a]5,500	-------	13,800	-------	7,130	-------	1,430	2,460	------

[a] Estimated.

Discharge, in second-feet, of Des Moines River at Keosauqua, Iowa, 1927–32—Con.

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
1927–28					
October	10,800	760	2,530	0.182	0.21
November	1,000	490	672	.048	.05
December	1,310	125	331	.024	.03
January	500	150	257	.018	.02
February	9,600	180	3,770	.272	.29
March	9,920	3,360	5,050	.364	.42
April	7,670	3,130	4,210	.303	.34
May	6,860	1,820	2,810	.202	.23
June	12,000	1,250	3,810	.274	.31
July	9,630	1,820	4,500	.324	.37
August	19,500	1,520	5,490	.395	.46
September	9,070	1,820	4,590	.330	.37
The year	19,500	125	3,160	.227	3.10
1928–29					
October	6,860	920	3,180	.229	.26
November	31,200	2,680	9,880	.711	.79
December	17,200	3,000	6,790	.489	.56
January	3,800	1,200	1,620	.117	.13
February	6,000	1,200	1,710	.123	.13
March	41,800	7,000	22,200	1.60	1.85
April	33,700	9,350	17,500	1.26	1.41
May	22,400	5,070	10,500	.756	.87
June	15,600	2,030	5,490	.395	.44
July	9,920	1,820	3,500	.252	.29
August	2,350	581	1,380	.099	.11
September	2,460	581	1,040	.075	.08
The year	41,800	581	7,100	.511	6.92
1929–30					
October	3,840	398	1,030	.074	.09
November	4,820	300	1,770	.128	.14
December	1,430	400	645	.046	.05
January	500	400	445	.032	.04
February	8,230	400	3,780	.272	.28
March	6,000	1,820	2,720	.196	.23
April	3,600	1,160	2,020	.145	.16
May	9,920	2,680	5,680	.409	.47
June	28,300	2,460	8,460	.609	.68
July	3,360	620	1,620	.117	.13
August	920	375	531	.038	.04
September	1,820	190	371	.027	.03
The year	28,300	190	2,400	.173	2.34
1930–31					
October	1,250	220	389	.028	.03
November	1,250	180	352	.025	.03
December	1,820	142	429	.031	.04
January	410	122	217	.016	.02
February	539	265	417	.030	.03
March	1,620	140	690	.050	.06
April	12,200	467	2,300	.165	.18
May	3,130	289	716	.052	.06
June	13,400	634	4,070	.293	.33
July	17,800	387	1,530	.110	.13
August	1,080	181	484	.035	.04
September	11,400	115	2,530	.182	.20
The year	17,800	115	1,170	.084	1.15
1931–32					
October	26,200	1,430	5,370	.386	.44
November	34,800	760	12,600	.906	1.01
December	22,000	6,080	9,210	.663	.76
January	31,200	5,500	15,900	1.14	1.31
February	12,600	2,000	7,010	.504	.54
March	25,500	8,000	14,000	1.01	1.16
April	14,400	5,070	8,920	.642	.72
May	11,400	2,460	5,160	.371	.43
June	23,800	8,230	13,400	.964	1.08
July	25,200	1,430	5,860	.422	.49
August	25,200	1,250	7,040	.506	.58
September	2,900	1,080	1,960	.141	.16
The year	34,800	760	8,880	.639	8.68

HERON LAKE OUTLET NEAR HERON LAKE, MINN.

LOCATION.—Staff gage on line between secs. 15 and 22, T. 104 N., R. 37 W 3 miles east of Heron Lake.
DRAINAGE AREA.—492 square miles.
RECORDS AVAILABLE.—August 1930 to September 1932.
EXTREMES.—Maximum discharge during year, about 500 second-feet durin estimated period, Apr. 1–8; no flow during long periods.
1930–32: Maximum discharge, that of April 1932; no flow for several period during 1931 and 1932.
REMARKS.—Records fair. No record Feb. 28 to Mar. 31.

Discharge, in second-feet, 1931–32

Day	Apr.	May	June	July	Aug.	Day	Apr.	May	June	July	Aug
1		e 87	34	23	0.1	16	216	36	29	7.9	0.
2		85	34	23	.6	17	e 197	31	29	e 6.6	.
3		85	33	e 22	.5	18	178	34	27	5.3	.
4		80	34	e 22	.5	19	166	30	e 26	2.7	.
5	450	76	e 32	22	.6	20	155	28	26	1.1	.
6		64	31	19	.5	21	144	28	26	.7	0
7		60	32	16	e .4	22	133	e 30	26	.3	0
8		e 55	31	16	.3	23	133	31	26	.4	0
9	326	50	29	14	.2	24	e 123	35	25	e .3	0
10	e 291	45	31	e 14	.2	25	113	38	25	.2	0
11	256	42	31	14	.3	26	108	39	e 25	.1	0
12	256	42	e 31	14	.1	27	90	40	25	.1	0
13	256	40	31	14	.1	28	80	38	23	0	0
14	256	40	32	12	e .2	29	90	e 36	25	.1	0
15	256	e 38	31	11	.3	30	e 88	34	25	.1	0
						31	------	34	------	e .1	0

Month	Maximum	Minimum	Mean	Month	Maximum	Minimum	Mean
April	------	80	250	July	23	0	9.1
May	87	28	46.2	August	.6	0	.1
June	34	23	28.8				

e Interpolated.

NOTE.— No flow during periods Oct. 1 to Feb. 27, Sept. 1–30.

TUTTLE LAKE NEAR CEYLON, MINN.

LOCATION.—Staff gage above dam at outlet of Tuttle Lake, 7 miles southeast of Ceylon. Zero of gage is 2.0 feet below crest of dam at outlet.

RECORDS AVAILABLE.—July 1930 to September 1932.

EXTREMES.—Maximum stage during period, 3.66 feet Apr. 8; minimum, 1.84 feet Sept. 29, 30.

1930–32: Maximum stage, that of Apr. 8, 1932; minimum, 0.00 several times in September 1931.

REMARKS.—Owing to placing flash boards and fish screen on crest of dam, there was no fixed relation between the pool stage and discharge over the dam during the year.

Discharge measurements of Tuttle Lake outlet, 1932

Date	Gage height above dam	Gage height below dam	Discharge
	Feet	*Feet*	*Sec.-ft.*
Apr. 13	3.28	2.99	112
May 13	3.18	1.78	27.1
July 13	2.63	1.61	24.4
Aug. 11	2.10	.50	[a].04

[a] Estimated leakage through dam.

Gage height, in feet, 1932

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	-------	3.20	3.16	2.74	2.18	2.10	16	3.40	3.16	3.12	2.52	2.26	1.98
2	-------	3.16	3.16	2.70	2.16	2.10	17	3.38	3.04	3.12	2.48	2.24	1.96
3	-------	3.18	3.16	2.70	2.16	2.10	18	3.34	3.00	3.10	2.46	2.20	1.96
4	-------	3.22	3.14	2.68	2.16	2.10	19	3.30	2.92	3.10	2.40	2.18	1.96
5	-------	3.14	3.12	2.64	2.14	2.10	20	3.26	3.00	3.14	2.40	2.14	1.94
6	-------	3.20	3.12	2.64	2.12	2.10	21	3.26	2.90	3.14	2.38	2.10	1.94
7	-------	3.18	3.18	2.66	2.10	2.06	22	3.20	2.90	3.10	2.36	2.10	1.92
8	3.66	3.20	3.18	2.62	2.10	1.98	23	3.20	2.84	3.00	2.34	2.10	1.92
9	3.62	3.20	3.10	2.56	2.10	2.06	24	3.28	3.00	2.92	2.32	2.10	1.92
10	3.60	3.20	3.10	2.60	2.08	2.04	25	3.24	3.10	2.94	2.26	2.10	1.90
11	3.58	3.20	3.10	2.60	2.06	2.02	26	3.22	3.14	2.94	2.26	2.08	1.88
12	3.52	3.18	3.10	2.60	2.06	2.04	27	3.20	3.16	2.90	2.24	2.08	1.88
13	3.50	3.18	3.14	2.62	2.04	2.02	28	3.20	3.14	2.96	2.22	2.08	1.86
14	3.46	3.00	3.14	2.56	2.14	2.00	29	3.20	3.14	2.84	2.20	2.18	1.84
15	3.44	3.14	3.12	2.54	2.16	1.98	30	3.20	3.14	2.74	2.18	2.10	1.84
							31	-------	3.10	-------	2.20	2.10	------

NOTE.—No record Oct. 1 to Apr. 7.

FOX RIVER AT WAYLAND, MO.

LOCATION.—In NW¼ sec. 31, T. 65 N., R. 6 W., at bridge on State higl way 4, three quarters of a mile west of Wayland.

DRAINAGE AREA.—400 square miles.

RECORDS AVAILABLE.—October 1929 to September 1932; February 1922 to September 1929 at site 2 miles upstream.

EXTREMES.—Maximum discharge during year, 6,440 second-feet Nov. 24 (gage height, 16.85 feet); minimum discharge, 5 second-feet July 30, Sept. 29, 30; minimum gage height, 2.18 feet July 30.

1929–32: Maximum discharge, 9,940 second-feet June 7, 1931 (gage height, 18.35 feet); no flow Sept. 10, 13, 23, 1930.

Maximum stage known, about 21.8 feet during May 1908; estimated discharge, 24,000 second-feet.

REMARKS.—Records fair except those for periods of ice effect, Jan. 10, Jan. 30 to Feb. 8, which are poor.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	30	67	251	3,360	68	55	122	49	12	57	2,000	25
2	23	64	208	5,210	57	80	104	42	38	38	1,490	20
3	18	50	163	833	47	98	92	36	86	39	626	a 20
4	14	47	156	370	47	86	74	38	1,040	55	170	21
5	12	33	156	580	47	86	68	32	695	170	104	23
6	12	36	156	2,060	47	86	64	24	149	310	80	18
7	25	34	136	1,300	47	78	64	59	104	110	350	16
8	1,160	29	122	475	57	64	92	454	80	80	156	14
9	1,160	28	110	215	86	47	110	475	1,040	80	86	13
10	208	25	310	200	104	49	66	232	270	142	61	12
11	215	26	1,160	163	2,390	a 46	55	122	98	475	1,040	11
12	787	603	1,750	242	741	44	49	86	53	330	672	11
13	1,320	1,220	626	290	330	42	43	57	41	104	1,490	12
14	764	475	496	626	200	48	39	48	496	50	1,300	11
15	672	2,200	391	391	a 160	32	37	a 38	412	32	1,110	10
16	270	2,270	290	224	116	38	38	28	251	22	948	10
17	136	810	251	192	270	58	40	25	122	17	1,630	a 10
18	98	3,050	270	290	215	80	51	21	538	16	1,730	a 16
19	70	3,110	290	251	178	92	45	17	270	a 14	2,310	14
20	57	902	232	200	98	86	42	16	178	11	412	12
21	46	1,270	200	a 204	92	92	46	14	70	10	135	18
22	40	1,600	178	208	86	53	122	13	53	9	116	13
23	42	1,870	156	192	80	73	129	10	34	10	86	10
24	47	6,440	149	178	68	170	122	10	a 27	9	64	9
25	34	4,550	129	110	64	810	79	9	21	8	59	8
26	92	787	104	116	64	1,660	208	9	18	9	53	7
27	68	475	86	122	64	1,040	116	9	a 60	8	67	9
28	391	192	86	129	61	433	86	8	764	6	110	10
29	232	330	92	116	58	330	65	8	433	6	59	5
30	110	290	178	104	-------	200	56	8	129	5	39	5
31	75	-------	1,840	92	-------	163	-------	11	-------	7	28	------

Month	Maximum	Minimum	Mean	Per square mile	R in-off in inches
October	1,320	12	265	0.662	0.76
November	6,440	25	1,100	2.75	3.07
December	1,840	86	346	.865	1.00
January	5,210	92	614	1.54	1.78
February	2,390	47	205	.512	.55
March	1,660	32	204	.510	.59
April	208	37	77.5	.194	.22
May	475	8	64.8	.162	.19
June	1,040	12	253	.632	.71
July	475	5	72.2	.180	.21
August	2,310	28	605	1.51	1.74
September	25	5	13.1	.033	.04
The year	6,440	5	318	.795	10.86

a Estimated.

WYACONDA RIVER NEAR CANTON, MO.

LOCATION.—Chain gage in SE¼SW¼ sec. 33, T. 62 N., R. 6 W., three quarters of a mile below Sugar Creek and 3 miles southwest of Canton.
DRAINAGE AREA.—447 square miles.
RECORDS AVAILABLE.—February 1922 to September 1932 (discontinued).
EXTREMES.—Maximum discharge during year, 4,930 second-feet Aug. 15 (gage height, 15.04 feet); minimum, 1.6 second-feet July 24 (gage height, 0.52 foot).
1922–32: Maximum discharge, 16,000 second-feet Nov. 18, 1928 (gage height, 26.7 feet); minimum, 0.2 second-foot Sept. 22–24, 1930 (gage height, .0.40 foot).
REMARKS.—Records good except those for period of ice effect, Mar. 8–15, which are fair.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	22	61	186	4,140	50	58	84	43	18	18	2,480	25
2	16	51	136	3,920	43	106	72	38	43	9	3,200	18
3	12	41	97	1,380	43	146	64	34	196	8	2,000	18
4	9	34	94	386	37	118	54	32	700	58	458	30
5	10	28	118	294	35	99	48	30	700	48	146	21
6	9	24	109	2,840	46	68	45	30	204	339	75	14
7	36	22	94	1,920	58	62	43	30	109	186	217	12
8	670	18	74	458	75	48	52	339	250	68	362	10
9	250	18	67	239	92	26	95	316	533	35	126	10
10	136	16	136	176	106	20	62	206	196	30	66	10
11	107	18	1,450	272	272	15	50	102	79	339	48	9
12	458	1,030	1,920	146	1,420	15	43	64	54	109	670	9
13	283	1,380	760	166	434	15	37	46	37	62	1,030	74
14	2,040	533	434	508	196	15	31	38	30	38	2,360	27
15	670	2,200	386	386	146	26	30	31	48	25	4,830	12
16	261	1,590	250	261	126	52	30	27	196	18	4,060	8
17	104	700	196	283	176	64	30	21	84	11	3,120	6
18	65	3,120	196	386	316	77	30	17	54	8	3,650	820
19	44	3,000	176	283	186	77	50	17	64	6	3,440	94
20	31	970	166	176	126	87	40	15	362	3.6	940	57
21	28	1,660	156	166	89	84	45	13	261	3.0	410	31
22	23	1,170	146	228	87	48	70	12	62	2.7	146	22
23	22	2,760	136	272	84	87	186	9	40	2.0	89	14
24	28	3,480	126	186	72	146	99	8	26	1.6	65	14
25	44	3,440	109	136	66	2,280	75	8	18	3.6	51	10
26	51	1,920	100	126	62	1,800	64	11	14	13	67	9
27	53	410	78	166	64	910	89	13	19	70	83	12
28	339	239	69	166	62	434	95	14	26	35	86	8
29	136	228	71	136	62	250	50	9	14	14	57	7
30	88	217	83	72	-------	166	43	8	24	8	39	6
31	69	-------	670	38	-------	109	-------	10	-------	4.8	30	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	2,040	9	197	0.441	0.51
November	3,480	16	1,010	2.26	2.52
December	1,920	67	284	.635	.73
January	4,140	38	655	1.47	1.70
February	1,420	35	160	.358	.39
March	2,280	15	242	.541	.62
April	186	30	60.2	.135	.15
May	339	8	51.3	.115	.13
June	700	14	152	.340	.38
July	339	1.6	50.5	.113	.13
August	4,830	30	1,110	2.48	2.86
September	820	6	47.2	.106	.12
The year	4,830	1.6	336	.752	10.24

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 1932.

EXTREMES.—Maximum discharge during year, 7,100 second-feet Aug. 15 (gage height, 21.50 feet); minimum discharge, 4.8 second-feet July 24, 25; minimum gage height, 1,86 feet Oct. 6.

1922–32: Maximum discharge, 16,000 second-feet Nov. 18, 1928 (gage height, 30.0 feet); minimum discharge, 1 second-foot July 9, 1922; minimum gage height, 0.50 foot Aug. 10, 1926.

REMARKS.—Records fair. Discharge estimated Feb. 17. Stage-discharge relation affected by ice Mar. 8–14.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	33	78	221	7,020	122	55	101	33	39	18	3,790	16
2	26	69	146	850	67	98	84	48	92	13	3,300	45
3	22	64	114	510	75	130	71	37	354	10	652	40
4	19	64	130	259	75	104	59	36	718	23	174	28
5	17	45	138	1,950	75	98	50	36	610	104	71	19
6	16	41	146	4,310	80	84	50	36	354	652	84	16
7	59	38	95	1,290	122	76	52	34	98	297	610	14
8	972	35	84	373	130	48	164	450	570	57	297	13
9	492	32	95	392	138	39	87	373	740	36	108	12
10	139	32	164	354	155	31	61	164	183	674	57	12
11	162	30	2,480	335	1,620	31	50	101	71	411	41	12
12	876	1,330	1,020	240	1,400	31	44	64	50	130	630	12
13	1,870	972	784	373	392	31	30	48	31	44	828	14
14	2,220	416	550	550	202	31	33	36	39	22	4,260	12
15	852	3,230	373	373	155	48	34	27	112	15	6,700	12
16	226	924	316	221	122	101	36	24	335	11	3,090	11
17	118	608	240	297	300	95	41	22	31	7	3,790	8
18	88	5,520	240	259	297	90	55	18	41	7	4,860	278
19	78	1,160	221	259	221	84	71	18	55	8	1,070	29
20	74	1,330	212	164	130	104	46	16	392	6	430	29
21	48	1,310	164	240	122	61	174	13	192	6	164	20
22	43	828	146	354	114	43	784	12	48	5	80	11
23	45	5,700	138	278	104	95	316	11	30	5	56	10
24	52	6,780	130	174	81	183	155	9	16	4.8	40	10
25	207	2,020	111	94	74	2,650	114	10	15	4.8	33	11
26	94	652	87	109	71	1,890	146	12	14	146	38	11
27	74	335	76	130	71	740	146	11	146	34	45	12
28	302	297	76	155	66	392	87	9	111	59	42	11
29	162	114	74	138	59	278	69	8	46	30	33	10
30	78	259	130	94	-------	183	31	9	36	11	25	7
31	78	-------	2,910	174	-------	138	-------	27	-------	8	2	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	2,220	16	308	0.681	0.79
November	6,780	30	1,140	2.52	2.81
December	2,910	74	381	.843	.97
January	7,020	94	720	1.59	1.83
February	1,620	59	229	.507	.55
March	2,650	31	260	.575	.66
April	784	30	108	.239	.27
May	450	8	56.5	.125	.14
June	740	14	186	.412	.45
July	674	4.8	92.2	.204	.24
August	6,700	21	1,140	2.52	2.90
September	278	7	24.8	.055	.06
The year	7,020	4.8	389	.861	11.68

NORTH FABIUS RIVER AT TAYLOR, MO.

LOCATION.—Chain gage in NE¼ SE¼ 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.

DRAINAGE AREA.—930 square miles.

RECORDS AVAILABLE.—April 1930 to September 1932.

EXTREMES.—Maximum discharge during year, 11,600 second-feet Aug. 19 (gage height, 14.36 feet); minimum, 9 second-feet July 24 (gage height, 2.08 feet).

1930–32: Maximum discharge, that of Aug. 19, 1932; minimum, 4.5 second-feet Sept. 13, 1930.

Maximum stage known, 23.5 feet Nov. 19, 1928 (discharge, about 24,000 second-feet).

REMARKS.—Records good.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	98	164	545	7,000	292	194	257	164	70	60	4,420	92
2	72	136	495	7,720	310	186	233	143	95	53	6,880	72
3	60	110	445	3,590	310	233	217	116	422	40	2,720	63
4	43	98	355	1,580	301	292	194	104	1,180	38	760	61
5	38	77	355	1,260	296	233	157	92	1,100	310	520	60
6	164	68	332	5,280	202	179	143	104	545	470	233	56
7	470	60	310	2,980	202	150	130	126	332	960	678	46
8	1,340	54	301	2,300	209	157	68	650	890	595	1,100	43
9	1,100	49	265	678	225	233	355	825	1,100	202	960	43
10	890	46	520	355	217	225	217	545	650	332	622	43
11	678	60	1,340	595	495	179	164	378	332	705	233	43
12	520	760	2,890	495	2,980	136	143	229	190	495	241	40
13	1,420	3,060	1,740	422	1,580	116	110	154	133	209	3,140	81
14	4,130	1,260	1,420	960	825	81	86	126	70	130	5,180	56
15	2,720	4,700	960	545	445	98	81	107	123	77	7,000	43
16	890	4,320	705	650	355	157	77	84	378	40	8,720	40
17	495	2,380	622	622	545	150	72	70	190	35	8,990	36
18	332	7,240	545	595	650	209	68	58	650	28	10,600	332
19	202	6,880	520	545	622	241	63	60	422	21	9,970	825
20	164	3,140	470	495	445	233	213	54	960	19	2,890	355
21	143	2,980	470	495	400	241	265	51	595	16	825	150
22	113	3,140	422	470	332	249	960	48	378	16	445	77
23	98	4,320	400	650	292	249	1,420	45	182	11	355	53
24	81	8,330	378	470	265	257	705	42	101	9	274	46
25	77	9,550	355	378	249	3,410	400	42	45	11	249	40
26	445	4,130	310	378	241	2,720	422	45	42	825	595	38
27	164	1,660	283	355	241	1,740	495	51	61	422	194	202
28	470	725	265	355	225	1,580	292	48	70	310	194	110
29	400	705	265	378	217	545	209	51	65	164	186	46
30	288	622	292	310	------	422	179	48	89	86	179	35
31	217	------	2,640	310	------	355	------	54	------	760	136	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	4,130	38	591	0.635	0.73
November	9,550	46	2,360	2.54	2.83
December	2,890	265	684	.735	.85
January	7,720	310	1,390	1.49	1.72
February	2,980	202	482	.518	.56
March	3,410	81	498	.535	.62
April	1,420	63	280	.301	.34
May	825	42	152	.163	.19
June	1,180	42	382	.411	.46
July	960	9	240	.258	.30
August	10,600	136	2,560	2.75	3.17
September	825	35	108	.116	.13
The year	10,600	9	813	.874	11.90

MIDDLE FABIUS RIVER NEAR BARING, MO.

LOCATION.—Chain gage 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 673.1 feet above mean sea level.

DRAINAGE AREA.—156 square miles.

RECORDS AVAILABLE.—April 1930 to September 1932.

EXTREMES.—Maximum discharge recorded during year, 4,340 second-feet Nov. 24 (gage height, 18.90 feet); minimum discharge, 0.4 second-foot Oct. 5; minimum gage height, 1.96 feet July 18.

1930–32: Maximum discharge recorded, 4,840 second-feet Apr. 21, 1931 (gage height, 19.70 feet); no flow on many days during 1930 and 1931.

Maximum stage known, about 27 feet, date unknown.

REMARKS.—Records fair but fragmentary, as gage was not read on many days.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						37			112	1.7	800	8
2	0.6			1,120	27							8
3	.6		68						490		134	8
4			72	106							29	
5	.4		72		24	42				215		
6				1,570	26		30		60	77		3.6
7		3.1	52				189	64	25			
8	322				41		68		680			
9			52	86	48			128	106	11		
10	18		228		52			52	42			2.4
11			962	64	560	21			20	12	202	
12	101		962			21						1.7
13	1,010				68				13		163	
14	575			228				18				
15	112				48	45			38	2.0	3,440	
16	48	877					19	12	12	2.0		2.7
17	26					52		12				2.0
18				176	163				6	1.1		
19	14	800				56	44				406	32
20	8			77	56		41		77			
21			77	86		37	710	9	12	1.2		
22					52		605			1.2	38	
23	3.2		72	77			145				29	
24		4,340										2.0
25		1,700					280	77	1.7	1.2	20	
26	18						134	20		1.7	23	1.2
27	18	176		60	41		56		8	1.7	41	1.7
28		176	52	60				4.8				
29				60	37				2.4		16	
30	15	280					48		2.4	1.2		
31	14		1,300									

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.

DRAINAGE AREA.—72 square miles.

RECORDS AVAILABLE.—April 1930 to September 1932.

EXTREMES.—Maximum discharge recorded during period of record, 1,700 second-feet Apr. 21, 1931 (gage height, 11.44 feet); no flow on many days during 1930 and 1931.

Maximum stage known, 13.9 feet, date unknown.

REMARKS.—Records fair but fragmentary, as gage was not read on many days

Discharge, in second-feet, 1930–32

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1930							1930						
1		12		16			16	20	4.5	362	0		
2		141	0.3				17		3.9	287			
3		74	.2	3.6		0	18			18			0
4			.2		0		19		6	10	0		
5		11	.2				20		5	17			
6		9	.8			0	21		14	15	0	0	
7		8	.2	.1			22		9				0
8		7		0		0	23		8	6	0	0	
9		10	.1	0	0		24		5	5	0		
10	3.6	10	0	0	0	0	25			2.7	0		
11			0				26		10	40	0		
12		7	0	0			27		5	6			0
13		12	0			0	28		3.9	1.3	0		
14		8	0		0		29	3.9	2.2	2.0	0	0	0
15		6	306			0	30	4.8	1.3	23			0
							31		.8				

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1930-31												
1		0	0.8				157		890	0.2	0.1	14
2					0			19	86	.2		
3			.8	0						157	.6	10
4	0					0	141		28			
5		0	6				74	12	558	52	.1	3.0
6	0	0		0	0		40		1,220			
7							26	9	1,300	7		
8	.2	0		0	.2		22		760	5	.1	
9				0				11		4.2		
10	0		.8	0			23		99	3.6	12	
11					0			12		2.7		
12			2.4	0					660		.6	
13	0						16	22	610	2.4		
14		0			0	46		16				
15							9	12	34		.1	
16	0		.3				8	9		.6		3.2
17	0	0		0	.1				10			
18	0					36	42		8		0	
19			.2		0			72		10	.2	8
20	0	.1		.1		36	448	127	5	92	4.5	
21					0	21	1,000	52			1.3	
22	0	0	0				1,220	32	2.9	5		49
23					0	12	206			3.9		574
24				0			69	12	2.0	2.4		
25					.1		69	12		1.9		189
26				.1		10		9	.2			113
27	0				0	12			.2			
28					0		69	7		1.3		9
29		0		0				8		.8		4.6
30						80		388		.2		2.6
31			0	0		141		845				

Discharge, in second-feet, of North Fork of South Fabius River at Edina, Mo., 1930–32—Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1931–32												
1				940						3.2	1,370	2.3
2						10				3.2	1,480	
3	0.2	8						12	40		173	
4			26	54			5		189			
5		7		224	6							
6	0			660				9	30		24	
7	25	7	22	610				20		32		.4
8	635				14				64	12		
9									120			
10	27	5	72						23			
11	296		242	25	508		6			6		
12	460	484			49	4.5		14				
13	590	326		56			3.3				346	
14	800	165						9	4.6		1,140	
15	296			25	24						1,300	
16				40			3.0	6	22		1,390	.4
17	25	336	42								1,070	.4
18		845							11	3.2	1,390	
19			38	54		14		6		2.9	1,140	
20	42	336		38					74			
21		388					173					7
22	9		30	86			508		14	2.0		3.4
23		660				11	113	4.0	9		7	
24	9	800			14			3.8	6			
25				10		532	36					
26	8									508		
27	38	52	15		11		28				6	
28			16	32		49	22			9		
29									3.2	7	5	.1
30							18		3.4			.2
31			544					7				

SALT RIVER NEAR SHELBINA, MO.

LOCATION.—In SW¼NW¼ sec. 17, T. 57 N., R. 10 W., at bridge on State highway 15, 3 miles north of Shelbina. Zero of gage is about 663.4 feet above mean sea level.

DRAINAGE AREA.—481 square miles.

RECORDS AVAILABLE.—April 1930 to September 1932.

EXTREMES.—Maximum discharge recorded during year, 5,920 second-feet Aug. 18, 1931 (gage height, 16.32 feet); minimum, 1.7 second-feet July 19, 23.

1930-32: Maximum discharge recorded, 6,940 second feet June 8, 1931 (gage height, 17.88 feet); minimum, 0.1 second-foot Aug. 2, 1930.

REMARKS.—Records fair but fragmentary, as gage was not read on many days.

Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	19		268		68							22
2				3,460	68	62	54		234		2,190	
3	4					94		43		9	4,060	16
4		33	114	742				41	1,030		3,840	
5			123	778	49			38			1,840	
6				1,840	49		33	36	217		268	4.8
7		21	114					94		285		
8	1,100										1,350	4.8
9	390			285	71		77	530	850	56		3.2
10		10	285								191	3.2
11				179	114							
12	1,320	425	1,540			36				51	1,250	1.9
13	1,610			168	814				31		2,190	408
14	1,540	1,070	1,210						17		4,330	82
15	1,990		814	390				43			3,670	29
16		1,610		234	147		28	33		6	4,660	18
17		1,320	268			54		28	43		5,120	8
18		1,800		425	565						5,800	
19	77	3,560	211		320	74			994	1.7	5,860	355
20					157				1,100		4,600	285
21		1,880	179	168			118			2.1		
22						77	1,760		635			60
23		1,920		285	101	144				1.7		20
24	28					137					76	20
25		3,940		132	77					2.5	60	
26				118				14		635		
27	670						137		101		60	
28		408	90			234		7	98			27
29					65						50	16
30		302	1,070				65		36	59	34	4.8
31	77							9				

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 615.2 feet above mean sea level.

DRAINAGE AREA.—626 square miles.

RECORDS AVAILABLE.—April 1930 to September 1932.

EXTREMES.—Maximum discharge during year, 6,560 second-feet Aug. 20 (gage height, 15.22 feet); minimum, 2.3 second-feet July 24, 25 (gage height, 1.92 feet).

1930–32: Maximum discharge, 9,280 second-feet June 8, 1931 (gage height, 18.50 feet); minimum, 0.2 second-foot Nov. 4–6, 8, 13, 1930.

Maximum stage known, about 21.8 feet, date unknown.

REMARKS.—Records good. Stage-discharge relation affected by ice, Mar. 10–12.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	38	75	284	2,050	45	41	72	57	6	31	202	19
2	25	43	242	3,260	45	41	57	48	7	19	2,100	16
3	19	29	183	3,460	34	34	41	32	1,180	13	3,580	13
4	15	26	137	1,610	34	114	32	36	1,760	18	4,390	6
5	10	25	124	456	20	66	28	25	1,140	146	2,980	6
6	7	19	124	1,900	14	51	28	21	632	632	488	6
7	54	19	117	2,660	34	38	28	16	232	488	306	6
8	456	14	110	2,710	20	19	25	328	128	183	1,050	6
9	1,520	14	110	1,560	20	19	89	1,420	183	89	1,370	4.5
10	872	14	164	352	60	19	72	632	456	48	328	4.5
11	284	14	916	242	328	19	57	400	202	21	146	6
12	488	66	1,710	164	1,140	19	38	222	89	18	428	4.5
13	1,900	1,470	1,800	164	1,560	19	28	114	43	36	3,080	1,370
14	1,710	1,660	1,370	306	632	19	21	72	28	18	3,430	456
15	2,050	788	1,370	428	263	19	21	43	16	12	6,430	110
16	2,200	1,470	668	328	192	16	19	32	202	8	5,190	38
17	788	1,850	376	263	232	38	15	19	105	7	5,420	38
18	352	1,760	284	306	632	25	57	19	110	7	5,720	29
19	110	3,140	242	456	456	57	63	15	1,660	4.0	6,490	45
20	75	3,650	222	284	263	72	78	15	1,470	4.0	6,560	284
21	45	2,300	212	212	183	89	106	13	1,900	2.6	5,040	252
22	34	2,250	192	146	128	96	1,560	10	1,090	2.6	1,770	121
23	20	2,400	183	376	124	78	2,000	10	328	2.6	352	51
24	20	2,820	164	284	114	106	1,230	10	328	2.3	183	24
25	14	3,780	146	222	89	263	222	7	85	2.3	124	14
26	14	4,040	110	146	78	1,000	202	7	28	1,420	106	8
27	1,140	2,710	92	146	66	1,000	183	13	106	1,140	72	8
28	488	708	92	146	57	376	124	8	232	1,050	66	174
29	284	352	60	183	43	212	82	8	114	41	110	34
30	183	328	60	110	-------	146	63	8	43	89	72	14
31	103	-------	60	45	-------	106	-------	6	-------	51	32	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	2,200	7	494	0.789	0.91
November	4,040	14	1,260	2.01	2.24
December	1,800	60	385	.615	.71
January	3,460	45	806	1.29	1.49
February	1,560	14	238	.380	.41
March	1,000	16	136	.217	.25
April	2,000	15	221	.353	.39
May	1,420	6	118	.188	.22
June	1,900	6	463	.740	.83
July	1,420	2.3	181	.289	.33
August	6,560	32	2,180	3.48	4.01
September	1,370	4.5	106	.169	.19
The year	6,560	2.3	551	.880	11.98

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 1932.

EXTREMES.—Maximum discharge during year, 23,500 second-feet Aug. 15 (gage height, 18.70 feet); minimum, 9 second-feet July 25 (gage height, 1.60 feet).

1922–32: Maximum discharge, 58,700 second-feet June 21, 1928 (gage height, 28.8 feet); minimum, 5 second-feet Aug. 21, 24, Sept. 4, 6, Nov. 14, 1930.

REMARKS.—Records good.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	354	260	721	7,620	456	260	306	297	23	540	9,480	132
2	225	182	630	11,400	430	269	251	242	35	306	1,350	104
3	148	125	540	7,620	292	260	190	207	456	165	2,480	91
4	97	111	456	5,480	265	269	157	182	2,830	140	3,780	73
5	62	85	354	2,980	256	278	148	157	6,320	140	4,180	57
6	53	67	278	7,350	220	330	132	140	3,670	111	3,140	62
7	73	53	242	7,480	220	354	118	132	2,090	1,140	1,350	57
8	67	43	234	5,250	265	297	97	118	2,730	1,710	721	48
9	942	27	251	4,080	379	288	85	125	1,570	942	814	39
10	1,860	35	242	1,940	354	269	97	1,940	773	484	3,400	35
11	1,350	35	288	878	1,570	216	91	1,280	1,140	306	1,210	31
12	690	31	1,640	690	4,920	207	125	752	630	207	2,730	27
13	752	27	2,570	630	3,880	182	140	570	354	140	3,400	878
14	3,140	27	2,730	540	2,650	148	104	330	234	97	19,800	3,490
15	3,400	1,710	2,320	1,010	1,710	111	97	242	225	85	23,000	2,170
16	2,730	1,280	2,320	2,090	1,070	132	91	190	148	73	14,200	942
17	2,480	1,790	1,570	1,640	1,010	125	91	140	125	53	8,740	511
18	1,420	2,020	1,010	1,570	2,090	125	67	111	878	43	7,080	330
19	721	2,020	721	1,210	2,020	157	85	91	330	35	6,940	207
20	190	3,780	570	1,210	1,570	182	79	73	2,020	27	7,210	157
21	242	4,280	484	942	1,070	173	269	57	1,730	20	6,690	111
22	173	5,820	430	690	783	242	783	57	2,320	15	5,360	190
23	125	9,040	570	600	570	379	2,090	43	1,710	12	2,170	330
24	97	6,690	511	660	456	430	2,810	39	878	12	878	207
25	73	4,920	430	814	404	430	2,170	35	456	9	456	125
26	67	5,250	354	783	354	456	2,240	31	260	3,060	1,570	91
27	79	5,030	306	600	330	1,210	1,010	27	330	4,800	354	104
28	216	3,320	269	570	288	1,490	690	23	2,090	4,080	260	91
29	878	1,490	216	600	269	942	511	23	1,640	2,890	182	73
30	690	814	242	570	-------	570	379	23	1,010	1,280	190	288
31	430	-------	511	570	-------	404	-------	20	-------	288	182	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	3,400	53	769	0.310	0.36
November	9,040	27	2,010	.810	.90
December	2,730	216	775	.312	.36
January	11,400	540	2,580	1.04	1.20
February	4,920	220	1,040	.419	.45
March	1,490	111	361	.146	.17
April	2,810	67	517	.208	.23
May	1,940	20	248	.100	.12
June	6,320	23	1,300	.524	.58
July	4,800	9	749	.302	.35
August	23,000	182	4,620	1.86	2.14
September	3,490	27	368	.148	.17
The year	23,000	9	1,280	.516	7.03

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.

DRAINAGE AREA.—70 square miles.

RECORDS AVAILABLE.—April 1930 to September 1932.

EXTREMES.—Maximum recorded discharge during period of record, 2,020 second-feet June 30, 1930 (gage height, 11.34 feet); no flow on many days during 1930 and 1931.

Maximum stage known, about 13 feet, date unknown.

REMARKS.—Records fair, but fragmentary, as gage was not read on many days.

Discharge, in second-feet, 1930–32

Day	Apr.	June	July	Aug.	Sept.	Day	Apr.	June	July	Aug.	Sept.
1930						1930					
1			809			16		0.3		0.2	12
2			29	0	0	17					
3			7			18				.1	
4				0	0	19			0.5		
5				0		20		.2			.7
6				0		21			.4		
7			.7	0		22					.7
8	1.9				0	23		.2		.3	
9		0.2		0	0	24					
10					0	25		258		.2	
11				0	0	26		166	.4		
12		.1	.4			27					
13		.2			1.2	28		94			
14			.3	0		29			.3		
15	1.3				34	30		1,510		0	.1
						31					

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1930–31												
1	0.1	0.1	53						1.3	0	0.1	4.1
2		0	12	0.1	0	1.3		1.9				
3		0	5				24		1.1	0	0	
4	.1						47	1.5	1.1			
5		0			0				1.3			4.1
6		0	11				8	1.9	.8		0	
7	117			0	.5		7					
8		.1	2.8	0	1.2			.8	2.6		0	.7
9			2.4					1.1	2.2			
10	4.1	.2	2.0				14		7		223	
11	2.2						31			0	33	
12				0		65		1.9	7			
13			.6				4.9		476		4.1	
14		.2			1.0	112		1.1				0
15	.4		.4					1.9	19		1.7	147
16								1.3	8			
17				.1	.6				2.2	0	.7	5
18	.2				.8		2.2	1.5		0	30	
19						7		61			223	1.4
20	.2		.2	.2	.4			499	.8	1.9	7	
21						5		60			8	
22		.3	.1					106	.4		4.6	
23	.2					2.8						7
24					4.9		5		.2			
25	0					2.6	3.8	11		2.9	1.7	19
26				.1	1.5						1.7	
27	.2					40	16		.3			
28					1.5	453		1.9			50	8
29				.1			16	1.9	0		7	2.4
30			.1			269	2.9					
31				.1		52				.3	1.4	

Discharge, in second-feet, of Crooked Creek, near Shelbina, Mo., 1930–32—Contd.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1931-32												
1	1.2					1.2	1.4		0.4			
2	.8			66		2.0		0.8			1.4	0.6
3	.9				2.8				146			.5
4		0.8	1.8	20		1.6						
5			2.4				.8			51		
6	.4			569	1.4				29	32	1.0	
7	977	.5						.8		12		
8	64		1.2				.8		34			
9	17	.7	2.8	11				25			430	.3
10		.7	72		2.0			9			18	
11			188	6	125	.9				.6		
12		3.6	90		59						51	.4
13	499			9							1,150	315
14	177	8						.9	.8			
15	29		51	12			.5					8
16		1.8	24		13	.9				.2		
17					38				.7			
18		97	11	15					17	.1	103	
19	1.6		9									.8
20		13		9	8			.5		.1	1.2	
21		8				2.4	20	.4	18			
22	.8		6	6			36					
23		361	6			8	21		1.8	11		.1
24	.5	61			3.2	6						
25		78					5	.3			.8	
26	6			5	2.8			.4		1,460	.9	
27	200						1.6			200	.8	
28		8	1.8					.4				8
29						2.8	1.4					
30		5							.4	2.0	.5	
31	2.4		665									

ELK FORK OF SALT RIVER NEAR PARIS, MO.

LOCATION.—Chain gage in SE¼SE¼ sec. 22, T. 54 N., R. 10 W., at bridge on State highway 15, 2½ miles south of Paris.

DRAINAGE AREA.—262 square miles.

RECORDS AVAILABLE.—April 1930 to September 1932.

EXTREMES.—Maximum discharge recorded during year ending Sept. 30, 1932, 7,820 second-feet Aug. 14 (gage height, 10.46 feet); minimum, 0.8 second-foot July 23 (gage height, 1.48 feet).

1930–32: Maximum discharge recorded, 10,100 second-feet June 12, 1930 (gage height, 12.50 feet); no flow on many days during 1930 and 1931.

Maximum known stage, 19.1 feet, date unknown.

REMARKS.—Records fair but fragmentary, as gage was not read on many days.

Discharge, in second-feet, 1930–32

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1930							1930						
1		13		570	0		16	13	6	4.2	1.0	0	6
2		13	4.2	52	0		17	13	5	3.6	.5		9
3	28	13	3.6	22			18	15		4.2	.4		10
4	25		3.6		0		19	15	4.8	4.2	.3		8
5	22	15	3.6		0	0.1	20		4.2	4.2		3.0	6
6		18	3.6		0	.1	21	13	4.2	4.2	.4	3.6	
7	20	10	3.0	4.2	0		22	10	3.6		.4	4.2	
8	11	9		4.2	0		23	10	5	3.6	.4	4.2	3.0
9		8	2.5	3.0	0		24	10	5	4.2	.4		3.0
10	15	9	2.5	2.0	.1	.1	25	8		5	.4		1.0
11	13		3.0	1.5	0	.1	26	26	3.6	52	.4		
12	13	9	3.0	1.0	0		27		3.6	56	.4		.1
13		9	3.0		0	.1	28	7	4.2	28	.4		
14	13	10	2.5	.5	0		29	8	4.2		.4	5	
15	13	5		.5	0	3.0	30	11	3.6	1,150	.3	5	.1
							31		3.6		0		

Discharge, in second-feet, of Elk Fork of Salt River near Paris, Mo., 1930–32—Con.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1930–31												
1	0.1	0.5						9	34		0	260
2			48			4.2		8	28			187
3				0.8	2.5		37				0	
4	0		22		2.0		31		15	2.2		
5		.2						3.0			.2	25
6			10				10		11			
7	37				10	4.2	8					
8	37	.4		.8					7		.1	8
9			6		14	4.2		3.0				
10	34	.4		.8	28		15		331	.5	468	
11	18						28	3.0	4,370			
12									9,580			1.5
13			3.9			56	11		6,390			
14				.8	5	131			200			
15	3.6	.4					9	2.5		.5	2.5	
16			.8				8	2.5	71			.5
17	2.5			.8	4.8		5				3.0	.5
18	2.5		2.2		5		5	2.5		.4	48	
19								138				.5
20		1.0	.8	1.2			4.2	895	24	97		
21	.4				7	10	4.8	174		348	6	
22		3.0					10	300			5	.5
23					7					28		15
24		3.0		.8	7		13	6,390	12			
25	.4					5	20	5,320		4.2		
26								810				65
27			.8			8	20		6	4.2		
28					4.8	570		94				
29		6		2.0				45		.2	2.0	11
30						196		28	2.2			7
31			.4	2.0		146				1.5	2.0	
1931–32												
1	8			2,420							18	
2		1.6	9	475	14		7	10	7			
3	4.0					9			608			21
4			8						852	4.6		
5			8	852	9	9						
6				1,330	9		7	9	275		3.2	
7	7	1.4		253		9		9	505			3.8
8			5						40			
9	6			40			7	7			15	
10	6		46		14							
11					1,420						330	
12	14	3.2	28	24	1,060	12					5,840	
13	210				55				5		4,900	368
14		4.6						8			7,820	280
15			33	35	55		7		22		2,520	55
16		4.6	20		50	17		5			275	
17	20		20		297			4.6	3.8		308	
18			12	35	210						60	
19			12					2.4		1		19
20					24				6		20	
21	4.6	6					55	2.4				
22												
23	4.0	570	11	35	24		140			.8		
24	4.0	319						1.8				3.0
25							35					
26			6			7		1.8		685		2.2
27					22		70	1.8	570			
28	4.0	12	6	26				1.8		130		
29					22							
30							17					
31	1.6		2,720			7					6	

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 1932.

EXTREMES.—Maximum discharge recorded during period of record, 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 fair but fragmentary, as gage was not read on on mary days.

Discharge, in second-feet, 1930–32

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1930							1930						
1	4.7	1.0	------	24	0	0	16	1.6	0.2	0	0.1	0	------
2	------	3.1	0	4.4	------	0	17	1.8	.3	------	.1	------	2.6
3	------	2.3	0	------	------	------	18	1.4	------	------	------	0	------
4	3.2	------	0	------	0	0	19	1.4	.2	------	.1	0	.3
5	2.7	1.2	0	.3	0	0	20	------	.2	0	------	------	.2
6	------	.5	------	------	------	0	21	.8	.2	0	0	0	------
7	2.1	.5	0	.2	0	0	22	1.0	.2	------	------	0	.2
8	2.1	.5	------	------	0	0	23	.8	.1	------	------	0	.2
9	1.9	1.2	0	.2	0	0	24	.7	.1	0	------	------	------
10	1.5	.8	------	------	------	0	25	.5	------	0	------	------	------
11	1.8	------	0	.2	0	------	26	.5	.1	5	0	0	.1
12	1.1	.8	------	------	0	------	27	------	.1	1.4	------	0	.1
13	------	.7	0	------	0	.3	28	.8	.1	.8	------	------	------
14	1.1	.3	0	.1	0	------	29	.8	.1	------	0	0	------
15	1.2	.3	------	.1	------	1.0	30	1.2	.1	24	0	0	.1
							31	------	.1	------	------	------	------

Discharge, in second-feet of Davis Creek near Mexico, Mo., 1930–32—Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1930–31												
1	0	0.1	18				16	1.0	6	0.2	0	112
2				0.1	0	0.1	9	.3	3.8	.2		
3	0	.1	1.4	0		.1	6		3.4			
4	0	.1	.7		0		4.2	.3	2.3	.2		9
5			.7		0			.3			0	7
6	0	.1		0		.1	2.6	.3	1.8	.2	0	
7	3.1			0	.1		2.6			.2	6	
8		0	.2	0			2.3	.3	1.1	.1	.8	.4
9	4.4		.2	0	.1	.2	2.1	.3	1.0			.4
10		0		0	.1	.2	3.3		1.0	.1		
11	.3		.2			1.9	3.3	.3	2.1	.1	8	.3
12		0		0		38		1.9	406			.1
13	.2	0	.2	0	.5		2.1	1.4	118		.6	
14	.2				.2	118	1.9	.7		.1	.6	
15	.2	0	.2	0			1.4	.5	7	.1	.4	.2
16	.3			0	.3		.8	.3	4.7	.1		.2
17			.1	0	.5	4.2	.5		3.1	.1		
18	.2	.1				2.6	.5	822	2.1	.1	49	.2
19		.1	.1		.8	1.9		2,200	1.8		118	
20		.2	.1	.1	.5	1.4		1,160	.8	.6	25	
21	.1				.3	1.4	.5	67		.2	3.8	.1
22	.1	.1	.1	0			.3	956	.7	.2	1.1	195
23	.1			0	.2	2.6	.5		.6			230
24	.1	.1	.1	0		2.3	.5		.4		72	10
25	.1	.1			.2	.7		848	.4	.2	3.1	7
26		.1				.5	1.4	72	.5		.7	4.1
27	.1			0	.2	42	2.1	28	.4	.1		
28	.1	.1		0	.2	770	2.1	14		0	45	
29	.1	.1	.1	0			1.6	7	.3	.1	8	.3
30	.1		.1			32	1.0	18	.2	.1		.2
31	.1		.1	0		22				0	3.8	
1931–32												
1			3.4		2.6	4.4			0.1		0	.2
2	0.2		3.4	45		7	1.4			0.2		
3	.2	0.2	3.1			10			1.0			.1
4						14			36		0	
5		.2	2.3							32	0	
6	.1				22				5	8	0	.1
7			1.6				1.3					
8	29								.5			
9		.2						0.5		.2	0	.1
10			67		19	1.1						
11		.4		14	97	1.1	.7			.1	0	
12	12		20							.1	0	.1
13	218	.4									460	1.0
14		47		16			.4					
15			12		20	1.6				0	5	.2
16	1.6	11				2.8	7				2.1	.2
17	.7	6	4.4		129							
18		5	.1			3.4			.1		4.7	
19					30					0	1.1	
20		4.7		16			1.6		.3	0	.5	.3
21			9			6	28					
22	.1			18		7	30	.1	.2		.2	
23	.1	102	13	29	11	17	9	.1		0	.2	
24	.1				10						.2	.1
25		26				13		.1		0		
26	.2			18			3.4	.1		28	5	.1
27	.2								294	.2		
28		22		23				.1		.1		.1
29			1.8			2.8					.1	
30	.2		7				1.6		.5	.1		.1
31	.2		900					.1			.2	

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 1932.
EXTREMES.—Maximum discharge during year, 13,900 second-feet Aug. 13 (gage height, 20.20 feet); minimum, 2.2 second-feet July 22 (gage height, 1.30 feet).
1922–32: Maximum discharge, about 52,600 second-feet May 18, 1929 (gage height, 25.75 feet at old location); minimum, 0.3 second-foot Aug. 2–9, 1930.
REMARKS.—Records good.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	23	15	200	5,040	166	128	92	128	20	50	4,160	870
2	20	16	158	3,920	158	120	92	112	54	40	2,360	350
3	16	11	142	955	166	128	86	98	65	46	337	166
4	15	10	120	600	237	150	77	92	1,390	48	142	112
5	11	10	98	2,180	209	150	72	86	289	71	98	78
6	12	10	89	3,620	714	142	69	86	62	268	71	66
7	23	9	82	1,290	1,540	135	74	79	92	142	66	55
8	1,000	10	74	562	1,140	135	67	75	98	48	112	44
9	376	9	92	430	714	142	65	66	75	57	86	42
10	128	11	135	300	600	135	60	64	53	38	1,690	36
11	84	37	714	237	830	98	58	62	48	30	312	34
12	72	87	600	228	1,850	92	56	59	42	22	5,440	29
13	4,880	82	460	218	790	98	54	53	36	20	10,100	1,240
14	1,900	2,020	562	183	376	89	56	48	31	18	3,700	562
15	528	638	402	1,340	300	87	52	46	71	11	2,420	158
16	247	337	247	1,190	257	82	58	40	98	8	1,490	105
17	142	209	192	3,270	1,900	84	79	50	64	8	1,340	562
17	98	209	166	1,000	955	87	105	35	42	5	752	183
19	74	228	135	638	430	89	98	30	30	3.4	337	98
20	67	870	142	402	350	87	92	31	289	3.8	228	68
21	54	1,040	150	324	257	92	1,690	28	150	3.0	183	50
22	52	324	1,960	289	237	98	1,960	25	128	2.2	150	44
23	41	1,000	714	350	200	105	676	23	78	62	128	36
24	35	2,600	350	870	192	174	402	25	55	16	105	30
25	31	830	247	376	174	200	300	20	40	7	98	25
26	26	376	183	350	166	192	228	28	27	2,300	3,200	24
27	25	257	158	790	150	158	183	30	25	337	955	22
28	18	237	142	528	135	142	150	28	402	92	257	21
29	16	257	120	376	128	135	135	22	135	73	158	20
30	19	237	3,200	300	-------	120	120	20	86	38	120	18
31	18	-------	4,320	337	-------	98	-------	19	-------	27	98	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	4,880	11	324	0.359	0.41
November	2,600	9	400	.443	.49
December	4,320	74	528	.585	.67
January	5,040	183	1,050	1.16	1.34
February	1,900	128	528	.585	.63
March	200	82	122	.135	.16
April	1,960	52	244	.270	.30
May	128	19	51.9	.057	.07
June	1,390	20	136	.151	.17
July	2,300	2.2	126	.140	.16
August	10,100	66	1,310	1.45	1.67
September	1,240	18	172	.190	.21
The year	10,100	2.2	417	.462	6.28

DES PLAINES RIVER AT LEMONT, ILL.

LOCATION.—Staff gage in NW¼ sec. 20, T. 37 N., R. 11 E., at Stephens Street highway 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 1932.

EXTREMES.—Maximum discharge during year, 2,500 second-feet Mar. 30 (gage height, 5.19 feet); no flow Aug. 26, 27.

1915–32: Maximum discharge, 5,520 second-feet Mar. 18, 1919; no flow for various dates, 1919, 1925, 1932.

REMARKS.—Records fair. During high water, part of flow spills into Chicago Sanitary Canal 7 miles above gage. This overflow, in second-feet, during the year (not included in the table of daily and monthly discharge) was as follows:

Jan. 15	5	Jan. 17	10	Mar. 29	265	Mar. 31	165
Jan. 16	35	Mar. 28	65	Mar. 30	335	Apr. 1	20

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	24	82	527	468	500	384	2,170	212	124	64	104	34
2	34	57	484	492	468	614	1,900	175	109	37	130	37
3	30	41	444	855	429	1,090	1,780	147	120	48	75	44
4	38	41	407	975	399	1,470	1,380	181	94	44	52	52
5	45	38	399	975	384	1,470	1,230	165	109	44	44	48
6	38	34	399	1,030	377	1,470	1,090	155	253	28	25	60
7	45	30	369	1,170	355	1,380	855	266	424	145	11	44
8	61	30	348	1,170	334	1,230	745	432	635	135	3.0	28
9	49	27	327	1,170	320	1,030	657	624	540	296	16	18
10	45	41	299	1,030	327	855	604	734	415	335	52	23
11	110	74	334	855	657	635	511	646	296	288	52	20
12	145	110	690	800	1,230	500	482	624	208	212	48	6.0
13	150	150	800	1,030	1,560	437	425	521	161	166	23	11
14	166	150	975	1,170	1,660	460	364	424	120	124	11	25
15	178	150	915	1,660	1,300	355	314	374	114	109	9.0	25
16	166	130	800	2,170	1,030	341	330	303	104	140	4.0	25
17	145	150	657	2,170	800	341	322	253	94	130	3.0	18
18	106	140	604	2,030	657	313	283	219	44	94	3.0	16
19	87	130	593	1,660	518	327	253	184	89	75	3.0	23
20	82	140	604	1,380	429	377	226	161	67	71	6.0	11
21	74	171	593	1,230	452	306	246	178	79	44	1.2	14
22	65	492	545	1,090	468	208	212	150	71	99	6.0	28
23	57	1,030	500	1,030	444	271	246	124	84	89	12	12
24	45	1,170	476	1,030	407	258	239	150	90	28	1.2	9.0
25	45	1,170	460	975	355	285	239	119	84	12	.2	11
26	53	1,030	429	855	320	582	226	135	60	18	0	14
27	69	855	407	800	362	1,170	212	161	84	71	0	28
28	74	712	384	734	377	1,780	187	155	84	166	172	23
29	82	624	369	690	348	2,330	219	172	90	178	201	12
30	91	582	369	800	------	2,330	232	184	48	140	84	11
31	101	------	414	855	------	2,330	------	178	------	84	48	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	178	24	80.6	0.114	0.13
November	1,170	27	319	.452	.50
December	975	299	514	.729	.84
January	2,170	468	1,110	----------	----------
February	1,660	320	595	.844	.91
March	2,330	208	869	----------	----------
April	2,170	187	606	----------	----------
May	734	119	274	.389	.45
June	635	20	156	.221	.25
July	335	12	113	.160	.18
August	201	0	38.7	.055	.06
September	60	6.0	24.3	.034	.04
The year	2,330	0	392	----------	----------

DES PLAINES RIVER AT JOLIET, ILL.

LOCATION.—Water-stage recorder in NE¼ sec. 9, T. 35 N., R. 10 E., at Jackson Street Bridge, Joliet. Zero of gage is 524.31 feet above mean sea level.

RECORDS AVAILABLE.—December 1914 to February 1932 (discontinued because of construction of Illinois waterway).

EXTREMES.—Maximum daily discharge during period, 10,600 second-feet Jan. 15; minimum daily discharge, 6,930 second-feet Oct. 24.

1914–32: Maximum daily discharge, 18,400 second-feet Mar. 18, 1919; minimum daily discharge occurred in August 1927 during period of no record.

REMARKS.—Records good. Discharge estimated Jan 7–12, Feb. 14. Discharge includes flow of Chicago Sanitary Canal. Diversion averaging about 310 second-feet made to Illinois Michigan Canal just above gage.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Day	Oct.	Nov.	Dec.	Jan.	Feb.
1	8,480	7,820	8,670	9,620	7,450	16	8,260	8,040	8,230	10,100	9,380
2	8,260	7,600	8,000	8,900	8,010	17	8,260	7,330	8,450	9,890	8,900
3	8,260	7,160	8,230	9,380	7,800	18	8,040	8,040	8,570	8,900	8,670
4	8,260	7,160	7,590	9,380	8,010	19	7,820	8,040	8,250	8,420	8,040
5	8,260	7,380	7,800	9,620	7,590	20	7,820	8,260	8,670	7,920	8,450
6	8,040	7,600	7,590	9,350	7,800	21	7,820	8,260	7,270	7,970	------
7	8,260	7,380	7,800	9,090	8,010	22	7,820	10,100	8,880	7,690	------
8	8,040	7,600	7,670	9,440	7,800	23	7,600	9,860	8,670	7,490	------
9	8,260	7,380	7,570	9,400	7,590	24	6,930	9,860	9,140	7,650	------
10	8,260	7,600	8,230	9,320	8,010	25	7,600	9,620	9,140	7,390	------
11	8,920	8,040	7,830	8,600	9,280	26	7,820	9,620	8,900	7,260	------
12	8,260	8,920	7,950	7,900	8,670	27	7,600	9,380	9,140	7,380	------
13	8,260	8,040	8,020	7,950	8,900	28	7,600	8,900	8,400	7,260	------
14	8,480	8,040	8,670	7,960	9,140	29	7,600	8,670	7,590	7,310	------
15	8,260	8,040	8,670	10,600	9,140	30	7,820	8,450	8,480	7,910	------
						31	7,820	------	8,890	7,540	------

Month	Maximum	Minimum	Mean	Month	Maximum	Minimum	Mean
October	8,920	6,930	8,030	January	10,600	7,260	8,540
November	10,100	7,160	8,270	Feb. 1–20	9,380	7,450	8,330
December	9,140	7,270	8,290				

ILLINOIS RIVER AT MORRIS, ILL.

LOCATION.—Chain gage in NE¼ sec. 9, T. 33 N., R. 7 E., at highway bridge in Morris, 10 miles below mouth of Kankakee River. Zero of gage is 478.97 feet above mean sea level.

RECORDS AVAILABLE.—October 1919 to September 1932; January 1903 to December 1904 at station near Minooka.

EXTREMES.—Maximum discharge during year, 27,800 second-feet Nov. 23 (gage height, 13.2 feet); minimum, 7,750 second-feet Sept. 5 (gage height, 4.7 feet).

1919–32: Maximum discharge, 60,600 second-feet Apr. 12, 1922 (gage height, 20.1 feet); minimum, 5,120 second-feet Aug. 21, 1929 (gage height, 3.9 feet).

Maximum stage known, 26.2 feet in 1831.

REMARKS.—Records good. Discharge estimated for period of ice effect, Mar. 13–17. Discharge includes flow of Chicago Sanitary Canal. Gage-height record furnished by United States Weather Bureau.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9,420	9,640	15,100	14,800	13,600	10,500	19,000	11,900	9,820	9,990	9,310	9,820
2	9,420	9,640	14,400	17,200	13,400	11,700	18,700	11,900	10,500	9,990	10,500	8,040
3	9,420	9,640	13,100	16,400	13,400	16,100	17,700	11,900	10,900	9,990	11,000	9,480
4	9,420	9,200	13,400	16,100	13,400	16,400	16,400	11,200	10,700	11,200	11,000	8,830
5	9,420	9,000	13,400	15,400	12,200	15,600	16,100	11,400	10,300	11,000	11,000	7,750
6	9,200	9,000	13,100	16,400	12,400	15,600	15,400	11,400	12,200	10,500	11,200	9,650
7	9,200	9,200	12,900	17,400	12,200	15,600	14,800	11,900	12,400	10,700	11,000	9,310
8	9,000	9,200	12,600	16,400	12,200	13,600	13,800	13,800	12,200	11,000	10,700	9,310
9	9,420	9,420	12,600	16,100	11,700	13,600	13,600	14,600	11,600	11,000	9,650	9,310
10	9,420	9,420	12,600	15,600	11,700	12,400	12,900	14,100	11,200	10,900	10,200	9,480
11	12,200	9,420	13,100	14,600	13,100	11,400	12,200	13,600	10,700	10,700	10,900	9,480
12	14,100	10,500	16,100	13,800	22,000	11,200	12,200	13,100	10,300	9,650	10,500	9,480
13	13,400	12,600	16,900	14,600	22,000	11,000	12,200	12,900	10,300	9,480	10,200	9,990
14	13,100	12,900	16,700	17,200	20,900	10,800	11,400	12,600	10,200	9,310	10,500	9,650
15	13,100	13,400	16,400	20,100	19,500	10,500	11,200	12,200	10,200	10,700	10,300	9,480
16	13,100	13,800	16,100	24,700	18,000	10,500	11,200	11,700	10,200	10,700	9,650	9,650
17	13,100	13,600	15,600	23,300	16,900	10,500	11,200	10,900	10,500	10,500	8,990	9,820
18	12,600	12,900	15,100	23,100	16,100	10,500	11,200	10,700	10,900	10,200	9,310	9,650
19	11,900	13,100	14,600	21,400	15,600	10,800	11,200	9,650	10,700	10,200	9,650	9,310
20	11,000	13,400	14,100	20,400	14,100	10,800	10,800	10,700	10,500	9,480	9,480	9,310
21	10,800	17,700	13,800	19,800	13,600	11,000	10,500	10,700	10,300	9,150	9,480	9,310
22	10,300	17,200	13,100	18,700	13,400	10,800	10,500	10,300	10,300	10,200	9,310	9,310
23	10,300	27,800	13,600	18,500	12,900	11,400	10,300	10,300	9,820	11,000	9,310	9,650
24	10,100	24,700	13,600	18,200	11,000	11,000	10,300	10,500	9,820	10,300	9,310	9,650
25	9,860	22,200	13,600	18,000	10,500	12,600	11,200	9,990	9,820	9,480	9,310	9,650
26	9,860	20,100	13,600	17,200	11,700	16,900	11,000	11,200	9,990	9,150	9,310	9,650
27	9,640	18,200	13,600	16,900	11,400	21,700	11,700	10,700	11,000	11,000	8,990	9,650
28	9,420	17,200	13,600	16,400	11,400	21,700	11,700	10,300	9,990	9,820	9,650	9,820
29	9,420	18,200	13,400	16,100	11,200	21,700	12,200	10,300	9,820	9,480	9,990	9,650
30	9,420	15,600	12,900	15,800	-------	21,200	11,900	10,700	9,650	9,310	9,150	9,650
31	9,640	-------	12,200	15,100	-------	20,100	-------	10,500	-------	9,650	9,150	-------

Month	Maximum	Minimum	Mean	Month	Maximum	Minimum	Mean
October	14,100	9,000	10,600	May	14,600	9,650	11,500
November	27,800	9,000	13,900	June	12,400	9,650	10,600
December	16,900	12,200	14,000	July	11,200	9,150	10,200
January	24,700	13,800	17,600	August	11,200	8,990	9,940
February	22,000	10,500	14,200	September	9,900	7,750	9,430
March	21,700	10,500	13,800				
April	19,000	10,300	12,800	The year	27,800	7,750	12,400

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 428.92 feet above mean sea level.

RECORDS AVAILABLE.—March 1910 to September 1932; March 1903 to July 1906 for station 3½ miles downstream.

EXTREMES.—Maximum discharge, 30,300 second-feet Jan. 22 (gage heigl t, 17.73 feet); minimum, 10,000 second-feet July 26 (gage height, 9.50 feet).

1910–32: Maximum discharge, 58,300 second-feet Oct. 9, 1926 (gage height, 25.05 feet); minimum discharge, about 7,250 second-feet Dec. 11, 1916, to Jan. 10, 1917.

Maximum stage known, 26.6 feet in 1844.

REMARKS.—Records good. Discharge estimated for period of ice effect, Mar. 11–16. Discharge determined on basis of slope as obtained by use of an auxiliary staff gage on highway bridge at Pekin, 9.3 miles downstream. Gage-height record furnished by Engineer Corps, United States Army.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10,800	12,900	27,200	20,300	26,000	19,800	25,800	14,700	12,700	11,100	10,100	10,600
2	11,000	12,600	26,600	20,700	24,100	19,500	25,200	15,000	12,600	11,000	10,400	10,800
3	10,800	12,600	25,100	20,000	23,600	19,300	26,300	13,800	12,400	11,000	11,800	10,600
4	10,700	12,700	25,400	20,400	26,200	19,500	25,700	15,000	12,500	11,200	12,700	10,300
5	11,000	12,400	24,600	20,500	23,000	20,200	26,400	14,800	12,500	11,700	12,800	10,300
6	10,800	12,100	23,400	18,800	22,800	20,500	25,800	14,600	12,200	11,900	12,800	10,300
7	11,000	11,300	23,400	20,300	22,300	20,600	25,900	14,600	12,200	11,200	12,900	10,300
8	11,200	11,800	22,800	22,000	21,300	21,100	25,200	13,300	13,200	12,000	12,500	10,300
9	11,000	11,500	22,300	22,300	20,600	19,200	24,300	15,000	13,100	12,000	12,000	10,300
10	10,700	11,800	21,300	22,500	20,500	17,800	23,400	16,300	13,100	12,100	12,300	10,400
11	11,300	12,000	19,800	21,900	17,900	17,800	23,300	16,700	13,400	12,200	12,600	10,500
12	13,300	11,500	20,600	21,400	20,900	17,900	22,200	17,300	13,300	12,000	12,400	10,200
13	15,100	12,200	21,700	21,200	22,600	18,200	20,900	16,700	13,100	12,000	12,000	10,400
14	15,900	12,400	21,400	22,800	24,600	17,600	21,500	16,300	13,000	12,100	12,000	10,400
15	16,500	12,700	22,300	22,800	25,100	17,500	19,800	16,700	12,900	11,600	11,800	10,400
16	16,700	13,600	22,300	24,600	25,200	17,800	19,200	16,500	12,400	11,900	11,800	10,600
17	16,600	13,100	22,300	25,200	26,000	17,500	19,000	17,000	12,400	11,800	11,600	10,100
18	16,200	15,100	22,500	28,400	26,000	17,900	18,100	16,100	12,100	11,500	11,800	10,200
19	16,200	15,200	21,700	28,800	26,300	17,200	17,500	15,200	12,300	11,400	11,200	10,400
20	15,800	15,200	23,000	29,800	24,600	17,600	17,600	15,100	12,100	11,000	11,200	10,600
21	15,800	14,900	22,200	29,900	24,700	17,600	17,700	15,000	12,200	10,700	11,100	10,700
22	15,100	17,100	21,900	30,300	23,800	16,500	16,600	14,400	12,100	10,700	11,000	10,600
23	15,200	17,600	21,400	30,000	24,100	16,000	17,300	13,800	11,800	10,700	10,800	10,500
24	15,400	20,100	20,400	29,000	22,800	16,300	16,500	13,400	11,800	10,200	10,800	10,300
25	14,500	24,900	21,100	29,400	21,400	15,800	15,900	13,500	11,500	10,100	10,600	10,500
26	14,100	28,600	20,100	28,000	21,400	16,300	15,900	12,900	11,500	10,000	10,700	10,400
27	12,700	28,900	20,000	28,500	21,200	17,400	15,300	13,100	11,400	10,700	10,900	10,400
28	13,500	28,000	20,500	27,700	20,100	19,000	15,300	13,900	11,400	10,500	10,900	10,200
29	13,400	28,800	20,300	27,300	19,000	21,100	15,200	12,800	10,900	10,700	10,600	10,300
30	13,300	26,500	18,100	26,600	-------	21,700	14,400	12,700	11,500	10,400	10,500	10,200
31	13,300	-------	20,600	27,100	-------	25,100	-------	12,600	-------	10,300	10,500	-------

Month	Maximum	Minimum	Mean	Month	Maximum	Minimum	Mean
October	16,700	10,700	13,500	May	17,300	12,600	14,800
November	28,900	11,300	16,300	June	13,400	10,900	12,300
December	27,200	18,100	22,100	July	12,200	10,000	11,200
January	30,300	18,800	24,800	August	13,000	10,100	11,600
February	26,300	17,900	23,000	September	10,800	10,100	10,400
March	25,100	15,800	18,600				
April	26,400	14,400	20,400	The year	30,300	10,000	16,600

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 420.33 feet above mean sea level.

RECORDS AVAILABLE.—October 1920 to September 1932.

EXTREMES.—Maximum discharge during year, 36,000 second-feet Jan. 26 (gage height, 15.0 feet); minimum 10,500 second-feet Sept. 12 (gage height, 7.8 feet).

1920–32: Maximum discharge, 105,000 second-feet Oct. 9, 1926; maximum gage height, 26.25 feet Oct. 12, 1926; minimum discharge, 9,550 second-feet Dec. 31, 1930, Jan. 1, 1931 (gage height, 7.5 feet).

Maximum discharge known, about 115,000 second-feet Apr. 4, 1904.

REMARKS.—Records good. Discharge estimated Nov. 22. Gage-height record furnished by United States Weather Bureau.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	13,100	14,700	28,200	25,600	33,700	27,800	24,900	19,600	16,800	14,400	12,100	11,800
2	12,800	14,700	28,600	26,000	33,400	27,400	25,300	19,200	16,800	14,400	13,100	11,800
3	12,800	14,400	28,600	26,300	33,000	27,100	26,000	19,200	17,800	14,400	13,400	11,400
4	12,400	14,400	28,600	26,300	32,200	26,300	26,700	18,800	18,800	14,400	13,400	11,400
5	12,400	14,100	28,600	26,300	31,900	26,000	27,100	18,800	18,200	15,100	13,100	11,400
6	12,100	14,100	27,800	26,300	31,500	25,600	27,400	18,800	17,800	15,800	12,800	11,400
7	12,100	13,700	27,800	27,100	30,800	24,900	27,400	18,800	17,500	16,400	13,100	11,100
8	12,100	13,700	27,400	27,400	30,400	24,900	27,800	18,800	17,500	16,800	13,400	10,800
9	12,100	13,400	27,100	27,400	30,000	24,200	27,800	19,900	17,500	16,400	13,700	10,800
10	12,100	13,100	26,700	27,800	29,700	23,100	27,800	20,600	17,500	16,400	14,100	10,800
11	12,100	13,100	26,300	27,800	29,700	22,700	27,400	21,000	17,500	16,800	13,700	10,800
12	12,100	13,100	26,300	27,400	30,800	23,100	27,400	21,000	17,100	16,400	15,400	10,500
13	12,400	13,100	26,000	27,400	30,800	23,100	27,100	21,000	16,800	16,400	17,500	11,100
14	12,800	13,700	26,000	27,400	31,100	23,100	26,700	21,000	16,800	15,800	17,800	11,400
15	13,700	13,700	25,600	28,600	31,100	23,100	26,300	21,000	16,800	15,400	17,800	11,100
16	14,400	14,100	25,600	29,300	31,100	23,100	25,600	20,600	16,800	15,100	18,200	11,100
17	14,700	14,100	25,600	29,700	31,100	22,700	25,600	20,600	16,800	14,700	17,800	11,100
18	15,100	14,400	26,600	30,400	31,500	22,700	25,300	20,200	16,400	14,400	17,500	11,100
19	15,400	14,700	25,600	31,100	31,900	22,400	24,500	20,200	16,400	14,100	17,100	11,100
20	15,800	15,800	25,600	31,900	31,900	22,400	23,800	19,900	16,400	13,700	16,400	11,100
21	15,800	16,400	25,600	33,000	31,900	22,400	23,500	19,600	16,100	13,400	15,800	10,800
22	15,800	18,800	25,600	33,700	31,900	22,400	23,100	19,200	16,100	13,100	15,100	10,800
23	15,800	21,300	26,000	34,500	31,500	22,000	22,400	18,800	15,800	12,800	14,400	10,800
24	15,800	23,800	25,600	35,200	31,100	22,000	22,000	18,500	15,400	12,800	14,100	10,800
25	15,800	24,900	25,300	35,600	30,800	22,000	21,700	18,200	15,400	12,400	13,700	10,800
26	15,800	25,600	24,900	36,000	30,000	22,400	21,300	17,800	15,100	12,800	13,400	10,800
27	15,800	26,300	24,500	35,600	29,700	22,700	21,000	17,500	14,700	13,700	12,800	10,800
28	15,400	26,700	24,500	35,600	28,900	23,500	20,600	17,100	14,700	12,800	12,400	10,800
29	15,100	27,400	24,200	35,200	28,200	23,800	20,200	17,100	14,400	12,100	12,400	10,800
30	15,100	27,800	24,200	35,200	------	23,800	19,900	17,100	14,400	11,800	12,100	10,800
31	14,700	------	24,200	34,500	------	24,200	------	16,800	------	11,800	11,800	------

Month	Maximum	Minimum	Mean	Month	Maximum	Minimum	Mean
October	15,800	12,100	14,000	May	21,000	16,800	19,200
November	27,800	13,100	17,300	June	18,800	14,400	16,500
December	28,600	24,200	26,200	July	16,800	11,800	14,400
January	36,000	25,600	30,400	August	18,200	11,800	14,500
February	33,700	28,200	31,100	September	11,800	10,500	11,000
March	27,800	22,000	23,800				
April	27,800	19,900	24,800	The year	36,000	10,500	20,200

SPRING CREEK AT JOLIET, ILL.

LOCATION.—Staff gage in SE¼ sec. 10, T. 35 N., R. 10 E., at Benton Street Bridge, in Joliet, half a mile above mouth.
DRAINAGE AREA.—19.7 square miles.
RECORDS AVAILABLE.—July 1925 to September 1932.
EXTREMES.—Maximum discharge during year, 325 second-feet Nov. 22 (gage height, 2.96 feet); minimum, 1.6 second-feet Sept. 9.
1925–32: Maximum discharge, 1,070 second-feet June 11, 1926 (gage height, 6.5 feet); minimum, 1.6 second-feet Aug. 3, 7, 1931, Sept. 9, 1932.
REMARKS.—Records fair.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.8	3.6	24	34	3.8	23	30	6.1	2.9	5.8	4.8	2.2
2	2.7	3.2	23	32	3.3	91	26	5.4	4.0	6.8	4.8	1.7
3	2.8	2.7	22	31	3.5	65	22	4.8	3.5	14	4.5	2.0
4	2.5	2.8	19	31	17	60	19	5.4	2.7	10	5.1	2.0
5	2.5	2.8	11	56	17	86	15	5.4	4.2	8.5	5.1	2.0
6	2.1	2.8	8.0	60	11	65	14	11	6.8	7.2	5.4	1.9
7	2.8	2.8	5.1	37	12	48	12	24	5.4	13		1.9
8	2.5	2.8	3.5	23	8.5	31	9.5	97	4.2	10	4.7	1.9
9	2.7	2.8	26	21	8.0	19	7.6	80	3.8	7.6		1.6
10	4.1	2.7	103	18	9.5	16	6.8	75	3.1	6.4	4.0	1.9
11	15	4.6	70	15	70	14	6.8	49	2.9	7.6		2.2
12	12	13	51	14	86	13	6.8	26	3.1	8.5		3.3
13	12	15	45	19	56	11	6.1	18	2.5	8.5		2.7
14	10	23	40	38	42	10	5.4	15	2.7	7.2		2.5
15	7.5	23	35	65	33	9.0	5.8	12	2.7	8.0		2.0
16	5.9	22	31	60	22	9.5	5.4	11	2.3	10	3.2	2.0
17	5.4	24	23	49	19	8.5	4.8	9.0	2.3	14		2.0
18	5.1	22	17	41	16	11	4.8	8.0	4.0	11		2.0
19	4.6	23	15	24	14	12	4.2	5.8	3.3	8.0		2.7
20	4.1	26	18	26	18	9.5	4.2	3.3	2.7	9.0		3.5
21	3.6	24	16	22	17	8.5	5.4	3.3	2.5	9.0		3.1
22	3.6	306	15	31	14	10	5.1	4.8	2.9	8.0		2.3
23	3.4	203	14	26	12	9.0	4.8	4.5	2.5	6.8	2.5	2.5
24	3.2	115	12	22	12	9.5	5.8	4.0	2.2	6.4	2.5	2.2
25	3.2	80	11	19	11	18	7.2	4.2	2.5	6.1	2.2	1.9
26	2.8	56	10	20	9.5	56	6.8	4.0	6.4	5.8	2.3	2.5
27	3.2	46	9.0	20	9.5	70	6.4	3.8	6.4	5.4	2.3	3.8
28	3.4	31	6.4	22	9.5	51	5.4	3.8	6.4	5.1	22	3.3
29	5.6	24	5.1	18	9.0	44	9.5	4.0	6.1	4.8	2.0	2.9
30	4.8	25	7.2	3.8	-------	37	7.6	3.1	5.1	5.1	2.0	3.3
31	4.4	-------	9.0	3.8	-------	33	-------	3.1	-------	5.1	5.1	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	15	2.1	4.85	0.246	0.28
November	306	2.7	37.8	1.92	2.14
December	103	3.5	22.7	1.15	1.33
January	65	3.8	29.1	1.48	1.71
February	86	3.3	19.8	1.01	1.09
March	91	8.5	30.9	1.57	1.81
April	30	4.2	9.34	.474	.53
May	97	3.1	16.6	.843	.97
June	6.8	2.2	3.74	.190	.21
July	14	4.8	8.02	.407	.47
August	22	2.0	4.16	.211	.24
September	3.8	1.6	2.39	.121	.14
The year	306	1.6	15.8	.802	10.92

KANKAKEE RIVER AT DAVIS, IND.

LOCATION.—Chain gage in sec. 13, T. 34 N., R. 3 W., at highway bridge on United States route 30, 4 miles east of Hanna, Knox County.
DRAINAGE AREA.—510 square miles.
RECORDS AVAILABLE.—April 1931 to September 1932.
EXTREMES.—Maximum discharge during year, 1,020 second-feet Mar. 27 (gage height, 7.98 feet); minimum, 228 second-feet Aug. 25, Sept. 9–25 (gage height, 3.4 feet).
REMARKS.—Records good.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	271	378	546	495	563	461	816	412	331	315	256	242
2	271	427	529	546	546	512	798	412	347	347	285	242
3	271	394	529	529	529	529	780	395	347	363	480	242
4	257	394	529	529	512	512	744	412	363	379	429	256
5	257	362	597	529	512	495	690	412	347	379	363	242
6	257	362	546	580	512	495	600	429	331	363	331	242
7	271	346	546	580	495	478	582	514	331	600	315	242
8	285	346	495	563	495	478	565	514	331	582	300	242
9	271	362	512	529	495	461	548	480	315	565	285	228
10	285	362	563	512	495	461	531	446	315	565	285	228
11	495	378	631	512	580	444	531	429	300	480	285	228
12	580	512	716	512	804	444	514	412	300	429	270	228
13	478	804	682	580	716	427	497	395	315	395	270	228
14	461	699	631	614	495	427	497	395	315	379	270	228
15	427	786	597	631	495	427	480	395	331	363	256	228
16	410	804	580	648	495	444	480	379	331	363	256	228
17	394	804	563	648	495	444	463	363	315	363	256	228
18	378	804	563	631	563	461	463	363	315	347	256	228
19	362	822	546	631	546	461	446	363	300	331	256	282
20	362	912	546	614	529	461	429	347	300	315	242	228
21	346	1,020	529	631	529	444	463	347	300	315	242	228
22	346	912	546	750	529	461	463	347	300	300	242	228
23	330	840	546	750	512	461	463	347	285	300	242	228
24	330	750	546	733	512	478	446	347	315	300	242	228
25	330	733	529	733	495	495	446	347	285	285	228	228
26	330	665	512	716	495	1,020	429	363	347	285	242	242
27	330	665	495	648	478	1,020	429	395	363	285	242	256
28	315	614	495	631	478	1,020	412	363	363	285	256	256
29	315	597	495	631	461	984	412	363	315	270	270	242
30	330	563	495	614	------	948	429	363	315	270	256	242
31	330	------	495	597	------	894	------	347	------	270	242	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	580	257	344	0.675	0.78
November	1,020	346	614	1.20	1.34
December	716	495	553	1.08	1.25
January	750	495	608	1.19	1.37
February	804	461	530	1.04	1.12
March	1,020	427	566	1.11	1.28
April	816	412	528	1.04	1.16
May	514	347	393	.771	.89
June	363	285	322	.631	.70
July	600	270	367	.720	.83
August	480	228	279	.547	.63
September	256	228	235	.461	.51
The year	1,020	228	445	.873	11.86

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 1932.

EXTREMES.—Maximum discharge during year, 3,490 second-feet Apr. 1 (gage height, 7.90 feet); minimum, 522 second-feet Aug. 24, Sept. 10, 12, 15–22, 24–26; minimum gage height, 1.48 feet Sept. 18, 19.

1930–32: Maximum discharge, 3,870 second-feet Apr. 21, 22, 1930 (gage height, 8.00 feet); minimum discharge, that of 1932.

REMARKS.—Records good except those estimated for period of ice effect, Mar. 10–15, which are fair.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	701	950	1,930	1,700	2,030	1,600	3,490	1,400	965	1,000	710	594
2	671	990	1,880	1,740	1,930	1,650	3,430	1,350	965	925	742	569
3	671	1,030	1,780	1,830	1,930	1,830	3,370	1,350	1,000	847	742	569
4	671	990	1,780	1,830	1,830	1,880	3,310	1,350	1,040	965	925	569
5	642	950	1,830	1,780	1,880	1,880	3,130	1,350	1,000	1,000	925	594
6	642	950	1,830	1,830	1,830	1,880	2,840	1,350	1,000	1,080	925	569
7	671	950	1,830	1,930	1,780	1,780	2,560	1,350	965	1,120	847	594
8	701	910	1,830	1,980	1,740	1,740	2,300	1,440	965	1,120	811	569
9	701	910	1,780	1,980	1,700	1,650	2,100	1,530	885	1,440	742	569
10	765	872	1,740	1,930	1,700	1,600	2,000	1,530	885	1,760	742	522
11	872	872	1,830	1,830	1,830	1,600	1,950	1,480	847	1,800	742	545
12	1,030	1,030	2,130	1,740	2,280	1,550	1,900	1,350	847	1,850	710	522
13	1,240	1,380	2,130	1,830	2,430	1,550	1,850	1,350	847	1,800	679	545
14	1,380	1,650	2,230	1,930	2,530	1,500	1,760	1,300	847	1,480	679	545
15	1,380	1,930	2,280	2,080	2,580	1,500	1,710	1,260	885	1,300	649	522
16	1,290	1,930	2,130	2,280	2,630	1,470	1,620	1,260	925	1,120	649	522
17	1,200	1,930	2,080	2,430	2,580	1,470	1,580	1,220	885	1,080	621	522
18	1,160	1,930	1,980	2,530	2,380	1,470	1,530	1,170	885	1,000	621	522
19	1,110	1,930	1,880	2,630	2,230	1,470	1,530	1,080	811	965	594	522
20	1,070	2,030	1,830	2,630	2,030	1,470	1,480	1,080	811	925	569	522
21	1,030	2,480	1,780	2,630	1,980	1,520	1,480	1,080	776	847	594	522
22	990	2,680	1,830	2,630	1,830	1,470	1,480	1,080	776	811	569	522
23	990	2,730	1,830	2,630	1,830	1,560	1,480	1,000	742	811	569	545
24	950	2,840	1,830	2,730	1,740	1,560	1,480	1,000	742	776	522	522
25	910	2,840	1,830	2,840	1,740	1,560	1,480	1,000	649	776	545	522
26	910	2,630	1,780	2,780	1,650	2,330	1,530	1,000	710	776	545	522
27	910	2,480	1,740	2,730	1,650	2,950	1,480	1,000	847	776	545	545
28	910	2,330	1,740	2,680	1,650	3,190	1,440	1,000	1,080	776	594	569
29	910	2,180	1,700	2,530	1,600	3,310	1,350	1,000	1,170	742	594	594
30	910	2,080	1,650	2,430	-------	3,370	1,400	1,000	1,120	710	621	569
31	910	-------	1,650	2,180	-------	3,430	-------	965	-------	710	594	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	1,380	642	932	0.530	0.61
November	2,840	872	1,710	.972	1.08
December	2,280	1,650	1,870	1.06	1.22
January	2,840	1,700	2,230	1.27	1.46
February	2,630	1,700	1,990	1.13	1.22
March	3,430	1,470	1,900	1.08	1.25
April	3,490	1,350	2,000	1.14	1.27
May	1,530	965	1,220	.693	.80
June	1,170	649	896	.509	.57
July	1,850	710	1,070	.608	.70
August	925	522	675	.384	.44
September	594	522	548	.311	.35
The year	3,490	522	1,420	.807	10.97

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 1932.

EXTREMES.—Maximum discharge during year, 4,000 second-feet Mar. 29, 31 (gage height, 4.04 feet); minimum, 498 second-feet Sept 25, 26 (gage height, 1.85 feet).

1905–6, 1915–32: Maximum discharge, 12,600 second-feet Jan. 22, 1916; minimum, 306 second-feet Sept. 1, 16, 17, 1919 (gage height, 1.37 feet).

REMARKS.—Records fair. Discharge estimated because of ice effect Mar. 8–15. Discharge interpolated Mar. 5.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	799	1,020	2,330	2,030	2,480	1,800	4,000	1,880	928	1,160	815	617
2	777	1,070	2,330	2,180	2,330	2,330	3,750	1,880	928	1,100	928	617
3	755	1,070	2,180	2,030	2,330	2,480	3,750	1,880	1,040	1,040	928	639
4	755	1,070	2,180	2,030	2,180	2,330	3,510	1,800	1,100	1,100	985	617
5	733	1,070	2,030	2,030	2,180	2,330	3,510	1,880	1,040	1,100	1,040	606
6	744	1,020	2,030	2,330	2,030	2,330	3,290	1,880	1,040	1,160	1,040	650
7	843	1,020	2,030	2,330	2,030	2,180	3,070	1,880	985	1,280	1,100	639
8	843	1,020	2,030	2,330	2,030	2,030	2,850	1,800	985	1,220	985	628
9	843	958	2,180	2,330	2,030	2,030	2,480	1,800	928	1,280	985	617
10	843	958	2,030	2,330	1,880	2,030	2,330	1,660	928	1,520	928	606
11	2,180	958	2,330	2,180	2,330	1,880	2,330	1,520	928	1,590	870	595
12	1,730	1,660	2,660	2,180	3,290	1,880	2,180	1,400	870	1,730	870	595
13	1,800	1,800	2,480	2,480	3,290	1,800	2,180	1,340	870	1,730	815	595
14	1,730	2,030	2,660	2,660	3,290	1,800	2,030	1,280	870	1,730	760	595
15	1,730	2,330	2,660	2,660	3,070	1,730	2,030	1,160	870	1,520	738	573
16	1,660	2,330	2,660	2,850	3,070	1,730	1,880	1,160	985	1,340	716	551
17	1,520	2,330	2,480	2,850	3,070	1,730	1,800	1,160	985	1,220	716	540
18	1,450	2,330	2,480	3,070	2,850	1,660	1,800	1,100	928	1,220	683	530
19	1,320	2,480	2,330	3,070	2,850	1,730	1,730	1,040	928	1,100	672	530
20	1,320	2,660	2,180	3,070	2,480	1,660	1,730	1,040	928	1,040	661	540
21	1,260	3,070	2,180	3,070	2,480	1,730	1,730	1,040	870	1,040	661	573
22	1,190	3,070	2,180	3,290	2,330	1,660	1,800	985	870	985	639	540
23	1,190	3,070	2,180	3,290	2,180	1,730	1,800	985	870	928	639	519
24	1,130	3,070	2,180	3,290	2,030	1,730	1,880	928	815	928	606	508
25	1,070	3,290	2,180	3,290	2,030	2,030	2,030	985	815	928	606	498
26	1,070	3,290	2,030	3,070	2,030	3,070	2,030	985	870	928	606	498
27	1,020	3,070	2,030	3,290	1,880	3,510	1,880	985	870	985	628	573
28	1,020	3,070	2,030	3,070	1,880	4,000	1,880	985	1,100	928	650	584
29	1,020	2,660	2,030	3,070	1,880	4,000	1,880	985	1,220	870	672	573
30	1,020	2,480	1,880	2,850	-------	4,000	1,880	985	1,280	870	683	562
31	1,020	-------	1,880	2,660	-------	4,000	-------	928	-------	815	683	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	2,180	733	1,170	0.500	0.58
November	3,290	958	2,040	.872	.97
December	2,660	1,880	2,230	.953	1.10
January	3,290	2,030	2,690	1.15	1.33
February	3,290	1,880	2,410	1.03	1.11
March	4,000	1,660	2,290	.979	1.13
April	4,000	1,730	2,370	1.01	1.13
May	1,880	928	1,330	.568	.65
June	1,280	815	955	.408	.46
July	1,730	815	1,170	.500	.58
August	1,100	606	784	.335	.39
September	650	498	577	.247	.28
The year	4,000	498	1,670	.714	9.71

KANKAKEE RIVER AT CUSTER PARK, ILL.

LOCATION.—Chain gage in NW¼ sec. 19, T. 32 N., R. 10 E., at Wabash Railroad bridge in Custer Park, a quarter of a mile above Horse Creek. Zero of gage is 531.27 feet above mean sea level.

DRAINAGE AREA.—4,870 square miles.

RECORDS AVAILABLE.—November 1914 to September 1932.

EXTREMES.—Maximum discharge during year, 10,200 second-feet Mar. 28 (gage height, 9.51 feet); minimum, 610 second-feet Sept. 23 (gage height, 5.42 feet).

1914–32: Maximum discharge, 31,200 second-feet Apr. 11, 1922 (gage height, 15.05 feet); minimum, 250 second-feet Nov. 15, 1914 (gage height, 4.09 feet).

REMARKS.—Records poor. Discharge estimated for periods of ice effect, Jan. 31 to Feb. 1, Mar. 7–17. Small amount of regulation above. Discharge estimated Mar. 6.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	940	1,200	3,700	3,060	4,200	2,480	7,480	3,700	1,100	1,320	1,100	750
2	890	1,200	3,260	3,700	3,950	2,860	7,140	3,260	1,100	1,370	1,150	710
3	890	1,200	3,060	4,450	3,700	3,950	6,470	3,060	1,100	1,370	1,370	710
4	890	1,200	2,860	4,200	3,480	4,450	6,150	2,860	1,260	1,480	1,590	710
5	840	1,200	2,860	3,950	3,260	4,450	5,550	2,480	1,320	1,480	1,920	710
6	840	1,200	2,860	3,950	3,060	4,450	4,950	2,480	1,320	1,480	1,700	710
7	795	1,150	2,860	4,700	3,060	4,200	4,450	2,480	1,260	1,480	1,480	750
8	1,040	1,200	2,860	4,450	3,060	4,200	4,200	2,660	1,200	1,590	1,370	750
9	1,040	1,150	2,860	4,200	3,060	3,950	3,700	2,480	1,150	1,590	1,260	750
10	1,200	1,150	2,860	3,950	3,260	3,700	3,480	2,480	1,100	1,590	1,260	710
11	1,920	1,040	3,060	3,700	4,200	3,480	3,260	2,320	1,100	1,700	1,260	750
12	3,060	1,480	4,200	3,260	8,500	3,260	3,060	2,170	1,100	1,810	1,100	710
13	3,060	2,660	4,950	3,700	9,520	3,060	2,860	2,040	1,040	1,810	990	710
14	3,060	2,860	4,950	5,250	9,520	2,860	2,860	1,810	1,040	1,810	940	710
15	3,260	3,060	4,700	6,470	8,160	2,660	2,660	1,590	1,040	1,810	890	710
16	3,700	3,260	4,450	7,820	6,800	2,480	2,660	1,480	1,150	1,700	840	710
17	3,260	3,260	4,200	8,500	6,150	2,480	2,480	1,480	1,370	1,590	795	670
18	2,660	3,260	3,700	9,180	5,850	2,320	2,320	1,370	1,480	1,480	795	670
19	2,170	3,260	3,480	9,520	5,250	2,320	2,320	1,370	1,370	1,370	840	670
20	1,920	3,260	3,260	9,180	4,700	2,170	2,320	1,320	1,370	1,320	795	710
21	1,810	4,700	3,260	8,500	4,200	2,320	2,320	1,260	1,320	1,200	795	710
22	1,700	5,850	3,060	8,160	3,700	2,320	2,480	1,200	1,260	1,150	795	670
23	1,590	6,150	3,260	7,480	3,480	2,480	2,480	1,150	1,200	1,150	795	670
24	1,480	6,150	3,260	7,480	3,260	2,860	2,660	1,150	1,100	1,150	840	710
25	1,480	6,150	3,260	7,480	3,060	4,450	2,860	1,150	1,040	1,150	795	710
26	1,320	5,850	3,260	7,140	2,860	8,160	3,480	1,150	1,040	1,100	795	710
27	1,260	5,250	3,260	6,470	2,660	9,860	4,450	1,150	1,100	1,150	795	710
28	1,260	4,950	3,060	6,150	2,660	10,200	4,450	1,100	1,150	1,320	710	710
29	1,260	3,950	2,860	5,850	2,480	9,520	4,200	1,100	1,260	1,260	750	710
30	1,260	4,200	2,660	5,550	------	8,500	3,950	1,100	1,320	1,100	710	710
31	1,200	------	2,660	4,950	------	8,160	------	1,100	------	1,100	750	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	3,700	795	1,710	0.315	0.36
November	6,150	1,040	3,080	.632	.71
December	4,950	2,660	3,380	.694	.80
January	9,520	3,060	5,880	1.21	1.40
February	9,520	2,480	4,520	.928	1.00
March	10,200	2,170	4,340	.891	1.03
April	7,480	2,320	3,790	.778	.87
May	3,700	1,100	1,850	.380	.44
June	1,480	1,040	1,190	.244	.27
July	1,810	1,100	1,420	.292	.34
August	1,920	710	1,030	.211	.24
September	750	670	710	.146	.16
The year	10,200	670	2,740	.563	7.62

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 1932.

EXTREMES.—Maximum discharge during year, 5,680 second-feet Jan. 19 (gage height, 7.18 feet); minimum, 13 second-feet Sept. 7 (gage height, 0.67 foot).

1923–32: Maximum discharge, 21,400 second-feet Oct. 5, 1926 (gage height, 16.1 feet); minimum, 12 second-feet Sept. 4, 1925 (gage height, 0.60 foot).

Maximum stage known, approximately 19.6 feet in spring of 1913.

REMARKS.—Records good. Discharge estimated Mar. 9–16 because of ice effect.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	190	220	1,600	1,520	1,600	970	2,820	1,170	202	144	115	29
2	153	225	1,440	2,000	1,600	1,300	2,420	1,040	189	135	310	32
3	141	216	1,370	2,430	1,600	1,680	2,030	855	230	135	1,040	34
4	129	207	1,370	2,170	1,440	1,760	1,770	795	315	148	855	34
5	117	199	1,300	1,920	1,370	2,000	1,460	795	420	153	445	29
6	106	212	1,230	1,920	1,300	1,840	1,240	765	420	162	470	20
7	98	212	1,160	2,080	1,230	1,760	1,170	765	395	216	495	14
8	125	194	1,160	2,170	1,370	1,680	1,040	765	310	234	345	15
9	190	182	1,300	2,260	1,520	1,600	975	855	270	220	198	21
10	220	165	1,440	2,430	1,600	1,440	915	795	212	207	220	27
11	238	178	1,680	2,080	3,270	1,370	855	708	176	184	189	32
12	675	455	2,000	1,300	4,360	1,300	795	652	158	153	166	37
13	1,370	648	2,170	1,370	5,140	1,230	765	625	153	123	148	32
14	1,600	790	2,260	2,170	5,010	1,100	708	545	180	107	131	29
15	1,920	850	2,000	3,620	4,230	1,040	680	520	370	95	115	29
16	2,000	970	1,920	4,100	3,270	970	652	470	495	84	99	32
17	1,840	1,040	1,680	4,620	2,820	910	625	420	598	67	78	39
18	1,760	1,040	1,520	5,270	2,620	790	570	395	570	60	44	47
19	1,370	970	1,300	5,680	2,260	790	545	370	520	55	44	42
20	970	1,300	1,230	5,140	1,920	790	545	345	420	50	44	37
21	538	2,000	1,160	4,230	1,760	850	520	320	345	50	44	32
22	482	2,720	1,160	3,620	1,520	970	495	315	266	50	44	29
23	375	2,820	1,160	3,160	1,370	1,100	470	305	212	44	44	30
24	295	2,820	1,160	3,270	1,300	1,520	445	295	184	44	50	37
25	281	2,620	1,160	3,380	1,230	2,340	652	285	166	39	50	44
26	266	2,430	1,160	3,160	1,160	3,980	1,380	261	153	47	50	55
27	243	2,260	1,160	2,930	1,100	5,010	1,690	248	248	67	50	57
28	234	1,920	1,100	2,720	1,100	4,620	1,610	238	189	103	50	52
29	225	1,840	1,100	2,520	1,040	4,100	1,530	230	180	81	50	47
30	216	1,760	1,160	2,260	------	3,740	1,310	230	158	74	50	42
31	207	------	1,370	1,920	------	3,160	------	216	------	81	37	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	2,000	98	599	0.283	0.33
November	2,820	165	1,120	.528	.59
December	2,260	1,100	1,420	.670	.77
January	5,680	1,300	2,880	1.36	1.57
February	5,140	1,040	2,110	.995	1.07
March	5,010	790	1,860	.877	1.01
April	2,820	445	1,090	.514	.57
May	1,170	216	535	.252	.29
June	598	153	290	.137	.15
July	234	39	110	.052	.06
August	1,040	37	196	.092	.11
September	57	14	34.5	.016	.02
The year	5,680	14	1,020	.481	6.54

FOX RIVER AT ALGONQUIN, ILL.

LOCATION.—Staff gage in NW¼ sec. 34, T. 43 N., R. 8 E., at Chicago Street Bridge, in Algonquin, 300 feet above Crystal Lake outlet. Zero of gage is 729.31 feet above mean sea level (revised).

DRAINAGE AREA.—1,340 square miles.

RECORDS AVAILABLE.—October 1915 to September 1932.

EXTREMES.—Maximum discharge during year, 1,880 second-feet Apr. 2 (gage height, 2.47 feet); minimum, 81 second-feet Sept. 27–30 (gage-height, 0.82 foot).

1915–32: Maximum discharge, 7,120 second-feet Mar. 31, 1916 (gage height, 5.3 feet); minimum, 47 second-feet Sept. 4–6, 11–13, 1931 (gage height, 0.74 foot).

REMARKS.—Records good. Discharge occasionally regulated at dam 16 miles above gage.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	100	192	1,200	755	810	640	1,880	261	276	110	126	120
2	120	198	1,200	755	810	700	1,880	276	269	110	120	120
3	110	198	1,060	700	755	755	1,880	219	239	100	126	115
4	110	198	1,060	660	755	755	1,800	292	232	120	126	115
5	120	178	930	700	700	810	1,720	276	276	126	105	110
6	120	166	870	810	680	755	1,650	300	309	126	115	105
7	120	148	755	870	680	755	1,580	419	317	292	110	105
8	142	148	660	870	670	755	1,650	473	292	309	110	110
9	142	154	650	930	680	700	1,500	530	276	325	120	110
10	148	166	640	995	700	700	1,420	560	254	325	120	110
11	269	192	690	1,060	755	700	1,200	620	232	300	120	110
12	246	205	810	1,060	700	680	1,060	700	212	309	120	110
13	212	232	930	1,060	670	670	1,060	640	205	325	126	110
14	226	261	930	1,060	670	660	870	560	198	309	120	105
15	212	276	930	1,200	660	650	670	500	192	276	120	100
16	219	292	930	1,580	700	650	630	393	178	276	120	95
17	219	325	930	1,500	700	650	520	437	205	261	120	95
18	198	600	930	1,420	755	660	437	419	205	246	115	95
19	160	700	930	1,420	755	650	359	359	205	246	110	95
20	154	810	930	1,420	755	640	325	342	192	246	110	90
21	115	995	930	1,420	755	500	292	359	185	246	110	90
22	154	1,280	870	1,420	755	350	276	500	178	284	100	90
23	178	1,350	870	1,500	755	359	292	359	166	239	100	90
24	192	1,350	810	1,420	755	393	292	254	142	198	100	90
25	185	1,420	810	755	755	590	342	239	120	166	95	90
26	154	1,500	810	810	755	755	292	205	120	148	100	90
27	131	1,500	810	870	755	1,280	284	232	120	178	110	81
28	142	1,500	810	1,350	700	1,350	276	254	131	172	105	81
29	126	1,420	810	1,060	660	1,500	276	254	120	166	95	81
30	160	1,350	810	870	-------	1,500	185	246	110	142	95	81
31	205	-------	870	810	-------	1,800	-------	276	-------	142	90	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	269	100	164	0.122	0.14
November	1,500	148	643	.480	.54
December	1,200	640	877	.654	.75
January	1,580	660	1,070	.798	.92
February	810	660	724	.540	.58
March	1,800	350	784	.585	.67
April	1,880	185	897	.669	.75
May	700	205	379	.283	.33
June	317	110	205	.153	.17
July	325	100	220	.164	.19
August	126	90	112	.084	.10
September	120	81	99.6	.074	.08
The year	1,880	81	514	.384	5.22

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 1932.

EXTREMES.—Maximum mean daily discharge during year, 7,630 second-feet Mar. 27; minimum, 182 second-feet Aug. 24.

1925–32: Maximum mean daily discharge, 14,300 second-feet Apr. 1, 1929; minimum, 151 second-feet Aug. 17, 1931.

REMARKS.—Records fair. Daily discharge computed from electrical output of power plant and flow over dam. Records collected by North Counties Hydroelectric Co., under the general supervision of the United States Geological Survey in connection with a Federal Power Commission project.

Discharge, in second-feet, 1930–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1930-31												
1	349	417	853	364	586	445	1,750	460	927	894	244	490
2	304	392	644	305	515	393	1,540	491	745	792	200	586
3	320	332	738	349	610	536	1,450	414	677	897	200	302
4	304	389	762	392	578	540	1,380	403	606	814	184	268
5	304	431	538	393	562	462	1,230	432	460	515	167	244
6	332	432	610	348	514	463	1,200	443	1,060	514	167	282
7	415	392	540	404	602	463	1,190	494	1,960	514	153	200
8	931	351	538	402	562	202	1,090	419	2,240	475	224	183
9	1,030	331	559	393	564	622	996	418	1,980	477	244	184
10	743	331	580	365	582	559	1,010	393	1,750	394	184	182
11	652	321	515	365	522	465	973	436	1,380	365	184	201
12	483	331	482	334	517	437	811	699	1,170	364	167	183
13	444	413	494	303	515	395	699	714	1,100	305	199	166
14	532	390	517	350	405	383	562	602	850	284	302	184
15	555	350	408	305	336	492	602	580	809	320	202	184
16	557	348	351	282	514	580	515	538	762	305	184	184
17	564	559	225	349	494	806	775	448	784	285	151	184
18	536	538	454	363	517	947	649	447	564	321	183	184
19	516	534	574	324	445	889	445	694	491	349	223	183
20	378	557	445	245	478	874	489	1,320	558	334	184	200
21	487	818	414	332	540	1,150	828	1,270	480	268	166	183
22	538	629	321	364	478	1,010	988	979	694	363	164	183
23	492	534	412	321	463	992	961	947	2,630	269	184	244
24	491	441	390	378	514	1,010	697	724	3,400	267	201	183
25	463	644	390	492	514	964	709	610	2,610	302	166	515
26	473	492	444	538	494	896	606	709	2,000	245	166	515
27	390	270	332	580	437	964	538	713	1,750	224	153	351
28	487	319	472	909	477	1,540	647	540	1,360	183	268	244
29	512	616	334	831	------	2,230	606	515	1,080	182	166	266
30	432	1,180	226	762	------	1,930	514	624	1,050	200	223	282
31	473	------	303	649	------	1,830	------	871	------	222	166	------

Discharge, in second-feet, of Fox River at Dayton, Ill., 1930–32—Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1931–32												
1	244	336	2,260	2,220	1,290	1,500	5,450	721	492	432	402	360
2	223	320	2,080	2,400	1,930	2,200	5,320	586	663	285	513	319
3	223	431	1,940	2,240	1,980	3,540	4,960	642	853	407	432	222
4	200	491	2,080	1,980	1,720	3,140	4,760	868	629	597	440	244
5	200	444	2,060	1,940	1,270	2,900	4,590	714	538	540	376	200
6	183	378	1,990	2,120	1,770	2,540	4,100	667	1,450	443	350	183
7	348	332	1,870	2,320	1,700	1,820	4,070	950	2,410	512	243	198
8	282	331	1,780	2,000	1,660	1,300	3,770	1,820	1,810	1,010	30[illegible]	242
9	222	361	1,580	1,770	1,560	1,660	3,470	1,930	1,300	992	20[illegible]	281
10	321	331	1,530	1,660	1,800	1,570	3,190	1,830	1,010	786	40[illegible]	266
11	4,520	403	2,220	1,990	2,960	1,810	3,200	1,580	844	696	268	222
12	2,190	1,520	2,870	1,940	5,160	1,860	2,920	1,470	764	647	264	223
13	1,760	1,510	2,740	2,610	3,250	1,680	2,700	1,400	535	602	318	200
14	1,880	1,150	2,420	3,100	2,400	1,480	2,300	1,400	599	492	283	319
15	1,390	1,170	2,300	5,300	2,210	1,670	1,880	1,270	1,100	487	244	265
16	1,040	1,060	2,230	4,260	2,330	1,820	1,510	1,000	938	473	203	242
17	853	1,110	1,920	3,930	2,270	1,800	1,280	1,080	578	475	203	222
18	759	1,390	2,020	3,680	1,990	1,530	1,230	892	887	404	223	266
19	557	1,450	2,020	3,010	1,920	1,490	1,090	818	608	374	222	199
20	509	1,910	1,910	2,840	1,760	1,340	974	865	512	458	242	222
21	534	3,360	1,930	2,670	1,810	1,130	898	739	512	362	193	320
22	512	4,870	1,950	2,870	1,850	880	947	630	512	347	242	200
23	491	6,330	1,870	2,770	1,820	1,550	836	559	389	330	222	223
24	492	4,500	1,860	2,620	1,550	1,430	929	644	389	427	183	242
25	478	3,900	1,850	2,320	1,460	1,570	927	709	364	433	222	199
26	405	3,360	1,830	2,080	1,450	4,420	1,050	732	284	305	193	200
27	444	2,960	1,830	2,080	1,480	7,630	950	750	427	319	184	183
28	511	2,780	1,700	2,520	1,450	7,160	895	667	562	347	22[illegible]	243
29	489	2,580	1,740	2,320	1,480	6,260	892	536	429	320	280	243
30	473	2,330	1,640	1,860	-------	6,020	847	489	412	300	303	222
31	477	-------	1,740	898	-------	5,820	-------	534	-------	318	265	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
1930–31					
October	1,030	304	500	0.195	0.22
November	1,180	270	469	.182	.20
December	853	225	480	.187	.22
January	909	245	422	.164	.19
February	610	336	512	.199	.21
March	2,230	202	822	.320	.37
April	1,750	445	882	.343	.38
May	1,320	393	624	.243	.28
June	3,400	460	1,260	.490	.55
July	897	182	395	.154	.18
August	302	151	193	.075	.09
September	586	166	258	.101	.11
The year	3,400	151	567	.221	3.00
1931–32					
October	4,520	183	749	.291	.34
November	6,330	320	1,780	.693	.77
December	2,870	1,530	1,990	.774	.89
January	5,300	898	2,530	.984	1.13
February	5,160	1,270	1,980	.770	.83
March	7,630	880	2,660	1.04	1.20
April	5,450	836	2,400	.934	1.04
May	1,930	489	951	.370	.43
June	2,410	284	760	.296	.33
July	1,010	285	481	.187	.22
August	513	182	279	.109	.13
September	360	183	239	.093	.10
The year	7,630	182	1,400	.545	7.41

NOTE.—Records for year ending Sept. 30, 1931, supersede those published in Water-Supply Paper 715.

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, La Salle 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 1932.

EXTREMES.—Maximum discharge during year, 5,400 second-feet Nov. 23, 1931 (gage height, 6.77 feet); minimum, 9.5 second-feet Sept. 23–27 (gage height, 1.29 feet).

1931–32: Maximum discharge, that of Nov. 23, 1931; minimum, 5.5 second-feet Sept. 12–14, 1931 (gage height, 1.21 feet).

Highest stage known, about 16 feet during an ice jam.

REMARKS.—Records good. Discharge estimated Mar. 7–15 because of ice effect.

Discharge, in second-feet, 1931–32

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1931						1931					
1	------	427	125	94	42	16	472	6[illegible]2	79	30	9.0
2	------	505	128	92	34	17	401	505	70	21	24
3	------	472	188	42	25	18	342	280	60	15	110
4	------	394	1,650	45	36	19	440	540	50	92	235
5	------	330	1,550	34	34	20	1,980	420	86	38	135
6	------	725	970	18	19	21	1,650	103	121	18	94
7	------	2,200	650	18	16	22	1,550	45	362	15	77
8	90	2,680	540	13	14	23	1,350	420	330	18	66
9	123	1,870	310	15	13	24	1,060	762	268	18	79
10	168	1,760	225	19	10	25	800	612	180	240	132
11	375	1,350	154	21	7.0	26	650	440	84	268	103
12	650	1,250	146	81	6.0	27	540	268	100	114	88
13	762	970	125	75	5.5	28	440	215	77	92	81
14	725	762	114	73	6.0	29	388	184	52	92	70
15	575	688	103	47	7.0	30	225	143	38	70	*52
						31	414	-------	28	47	------

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1931–32												
1	47	70	970	2,200	688	505	1,150	650	176	103	42	75
2	38	66	800	2,200	840	650	1,100	612	235	88	3,720	86
3	30	60	725	1,980	840	800	925	650	414	130	1,980	47
4	32	55	725	1,650	762	880	762	800	356	1,150	1,450	30
5	32	50	840	1,350	650	880	762	840	205	840	1,250	22
6	30	47	800	1,760	688	800	688	840	540	725	970	16
7	38	47	762	1,980	688	650	650	1,550	650	575	688	14
8	32	42	650	1,650	650	540	612	3,980	356	414	408	13
9	34	42	612	1,450	575	575	540	2,440	274	310	316	14
10	27	40	612	1,250	650	725	540	1,870	198	274	250	14
11	1,870	42	1,150	1,020	1,870	880	505	1,450	154	196	505	11
12	650	304	1,870	925	1,870	800	505	1,250	125	149	304	15
13	472	925	1,550	1,450	2,680	688	472	1,020	178	121	316	60
14	725	925	1,450	1,760	2,200	612	472	840	114	105	235	30
15	540	925	1,250	3,200	1,760	612	440	688	114	92	168	22
16	274	925	1,150	2,810	1,550	575	434	612	178	77	138	16
17	540	800	1,060	2,560	1,350	505	472	505	112	66	121	13
18	394	688	1,020	2,440	1,250	472	472	440	375	52	105	14
19	304	575	925	2,200	1,060	440	472	414	304	45	90	13
20	152	725	840	1,870	880	440	505	382	250	36	79	12
21	157	2,940	762	1,760	840	394	505	356	184	30	68	12
22	130	3,720	762	1,650	800	388	540	304	154	28	58	12
23	128	4,820	762	1,450	725	394	505	280	138	22	47	10
24	121	3,070	725	1,550	650	414	540	256	114	19	42	9.5
25	108	2,560	688	1,350	612	800	650	298	103	18	36	9.5
26	98	1,870	612	1,350	612	1,980	650	286	98	16	32	9.5
27	90	1,550	575	1,250	575	2,200	650	292	262	22	38	10
28	84	1,450	540	1,150	575	2,200	612	245	157	16	42	12
29	77	1,250	540	1,150	540	1,980	612	210	138	13	32	11
30	77	1,100	540	970	-------	1,760	650	196	125	11	28	10
31	75	-------	612	688	-------	1,350	-------	180	-------	12	27	------

Discharge, in second-feet, of Vermilion River at Lowell, Ill., 1931–32—Continued

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
1931					
May 8–31	1,980	90	674	0.548	0.49
June	2,680	45	731	.594	.66
July	1,650	28	289	.235	.27
August	268	13	60.5	.049	.06
September	235	5.5	54.3	.044	.05
1931–32					
October	1,870	27	239	.194	.22
November	4,820	40	1,060	.862	.96
December	1,870	540	867	.705	.81
January	3,200	688	1,680	1.37	1.58
February	2,680	540	1,010	.821	.89
March	2,200	388	867	.705	.81
April	1,150	434	613	.498	.56
May	3,980	180	798	.649	.75
June	650	98	222	.180	.20
July	1,150	11	186	.151	.17
August	3,720	27	438	.356	.41
September	86	9.5	21.4	.017	.02
The year	4,820	9.5	667	.542	7.38

MACKINAW RIVER NEAR GREEN VALLEY, ILL.

LOCATION.—Chain gage in sec. 15, T. 23, N., R. 5 W., at Chicago & Northwestern Railway bridge 3 miles north of Green Valley.

DRAINAGE AREA.—1,100 square miles.

RECORDS AVAILABLE.—March 1921 to September 1932.

EXTREMES.—Maximum discharge during year, 3,450 second-feet Nov. 23 (gage height, 7.32 feet); minimum, 24 second-feet Sept. 23–25 (gage height, 0.48 foot).

1921–32: Maximum discharge, 21,800 second-feet May 19, 1927 (gage height, 14.2 feet); minimum, 24 second-feet Sept. 23–25, 1932.

REMARKS.—Records good. Discharge estimated Mar. 10–14 because of ice effect.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	78	55	641	886	529	427	686	297	19[illegible]	88	50	31
2	70	55	595	1,260	565	459	641	283	19[illegible]	81	44	30
3	67	53	529	1,200	641	529	601	283	20[illegible]	74	43	30
4	64	53	493	986	601	565	529	339	20[illegible]	77	88	29
5	60	50	529	886	529	565	493	353	20[illegible]	222	128	28
6	59	50	529	1,090	529	529	459	311	252	565	95	27
7	60	48	493	1,310	529	493	459	601	19[illegible]	397	76	27
8	59	47	459	1,260	529	427	459	1,040	18[illegible]	297	57	26
9	63	45	459	1,040	529	382	427	2,320	169	211	51	26
10	59	45	459	886	493	367	397	1,150	158	180	48	26
11	65	47	529	786	686	367	397	886	148	158	50	25
12	218	70	786	736	1,610	367	382	686	138	148	48	29
13	161	400	936	786	1,490	367	367	565	128	128	55	31
14	123	268	886	836	1,260	382	353	529	120	109	45	29
15	142	205	786	1,260	1,040	427	339	459	257	98	44	27
16	132	194	736	1,550	836	427	339	427	325	88	43	26
17	142	183	686	1,670	886	459	353	397	297	81	41	25
18	123	183	641	1,670	836	397	339	353	211	74	40	26
19	108	194	601	1,610	736	367	311	325	190	66	36	27
20	91	205	565	1,430	641	367	311	311	169	60	36	25
21	79	960	529	1,260	601	353	311	297	169	57	34	25
22	73	1,660	529	1,150	601	339	297	283	15[illegible]	54	34	24
23	67	3,350	493	1,090	565	325	297	257	13[illegible]	51	33	24
24	71	2,640	493	986	529	367	297	245	11[illegible]	48	32	24
25	67	1,870	493	986	493	686	339	233	10[illegible]	48	32	24
26	64	1,490	427	936	493	1,200	367	233	111	50	32	24
27	64	1,200	427	886	493	1,490	339	245	107	45	31	30
28	63	986	427	836	459	1,310	311	245	111	44	31	43
29	60	886	397	786	459	1,150	283	211	10[illegible]	43	31	50
30	59	736	397	736	-------	986	297	200	9[illegible]	41	31	33
31	57	-------	427	601	-------	886	-------	190	-------	38	31	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	218	57	86.1	0.078	0.09
November	3,350	45	608	.553	.62
December	936	397	560	.509	.59
January	1,670	601	1,080	.982	1.13
February	1,610	459	696	.633	.68
March	1,490	325	573	.521	.60
April	686	283	393	.357	.40
May	2,320	190	469	.426	.49
June	325	98	170	.155	.17
July	565	38	120	.109	.13
August	128	31	47.4	.043	.05
September	50	24	28.4	.026	.03
The year	3,350	24	402	.365	4.98

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 1932.

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. Pumpage record furnished by city of Bloomington. Rainfall record (mean of 3 gages within basin) furnished by the State Water Survey.

Monthly discharge and rainfall, 1930–32

Month	Discharge from spillway (million gallons)	Pumpage (million gallons)	Gain or loss in storage (million gallons)	Corrected for storage				Rainfall in inches
				Run-off in million gallons	Discharge per square mile		Run-off in inches	
					Million gallons a day	Second-feet		
1930-31								
October 10-31	0	49.20	−80.1	[a] −30.90	[a] −0.0230	[a] −0.036	[a] −0.03	0.14
November	0	68.89	−55.3	13.59	.0743	.115	.13	2.53
December	0	75.51	−77.9	−2.39	−.00126	−.0019	−.002	.35
January	0	75.57	−78.2	−2.63	−.00139	−.0022	−.003	[b] .24
February	0	63.80	−54.8	8.90	.00521	.0081	.008	[b] .90
March	0	70.80	−27.5	43.30	.0230	.036	.04	[b] 2.81
April	0	71.77	−30.0	41.77	.0228	.035	.04	[b] 3.14
May	0	73.36	+570.1	643.46	.341	.528	.61	5.58
June	0	77.37	+300.2	377.57	.207	.320	.36	2.46
July	99.67	84.78	−21.9	162.55	.0859	.133	.15	4.27
August	0	86.06	−47.3	38.76	.0205	.032	.04	3.40
September	0	78.17	+67.5	145.67	.0797	.123	.14	5.38
The period	99.67	875.28	+464.7	1,439.65				31.20
1931-32								
October	0	81.33	−28.7	52.63	.0279	.043	.05	2.03
November	400.1	71.77	+61.5	533.37	.292	.452	.50	4.21
December	189.8	74.47	−14.2	250.07	.132	.204	.24	1.63
January	326.0	75.94	−5.1	396.84	.210	.325	.37	2.43
February	53.57	77.46	+1.7	132.73	.0751	.116	.13	.88
March	101.5	80.31	+17.6	199.41	.105	.162	.19	2.08
April	224.6	79.49	−5.3	298.79	.163	.252	.28	1.82
May	225.7	85.68	−12.3	299.08	.158	.244	.28	1.96
June	39.90	75.96	−16.9	98.96	.0541	.084	.09	2.28
July	0	84.62	−109.8	−25.18	−.0133	−.021	−.02	2.59
August	0	80.61	−116.1	−35.49	−.0187	−.029	−.03	2.97
September	0	75.45	−111.4	−35.95	−.0197	−.030	−.03	2.87
The year	1,561.17	943.09	−339.0	2,165.26	.0970	.150	2.05	27.75

[a] Negative values indicate the amount by which the evaporation from the reservoir surface exceeded the inflow.

[b] Average of only 2 stations.

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 1932.

EXTREMES.—Maximum discharge during year, 7,980 second-feet Nov. 22 (gage height, 15.86 feet); minimum, 17 second-feet Sept. 12.

1914–32: Maximum discharge, 28,900 second-feet Aug. 22, 1924 (gage height, 30.5 feet); minimum, 3.8 second-feet July 31, Aug. 27–29, 1914 (gage height, 1.35 feet).

REMARKS.—Records good except those estimated because of ice, Feb. 3, 4, Mar. 9–19, which are fair.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	95	126	762	2,280	543	670	1,320	440	543	194	119	92
2	91	107	626	1,920	810	860	1,210	361	716	172	155	94
3	72	83	626	1,540	626	960	1,110	543	1,380	289	222	73
4	56	79	910	1,320	670	910	960	810	1,060	1,760	255	86
5	40	72	626	1,380	716	860	910	762	762	3,460	197	55
6	56	68	584	1,700	810	810	860	626	1,110	5,660	146	35
7	210	64	543	1,870	810	482	810	670	1,060	2,590	127	30
8	122	79	502	1,430	810	380	810	2,520	1,060	960	96	30
9	60	60	522	1,260	860	342	762	1,600	1,060	670	82	26
10	138	64	584	1,160	1,010	670	716	1,540	670	716	184	23
11	337	91	860	1,110	2,590	522	670	1,260	522	1,160	124	22
12	138	584	860	810	4,040	380	626	960	440	1,010	306	24
13	584	501	910	1,060	3,180	342	584	762	361	626	584	502
14	860	378	960	1,060	2,040	324	584	670	361	482	1,650	860
15	337	358	860	3,530	1,540	324	543	584	324	361	626	400
16	243	337	762	2,400	1,430	380	543	584	584	306	1,210	306
17	182	358	762	2,160	1,320	400	716	522	482	289	1,480	222
18	146	358	716	1,760	1,160	420	670	502	502	255	910	197
19	111	316	716	1,540	1,060	461	584	461	626	206	584	342
20	95	1,870	670	1,430	1,010	670	522	440	626	194	380	222
21	83	1,430	670	1,320	910	626	522	400	524	184	272	152
22	72	6,620	670	1,260	910	502	522	380	311	172	206	102
23	87	5,500	670	1,210	860	626	543	361	306	152	166	53
24	170	4,860	626	1,060	810	626	543	342	238	149	146	32
25	158	2,590	626	1,010	762	1,210	584	716	222	135	124	28
26	214	1,980	584	1,010	762	2,400	543	910	238	138	122	24
27	206	1,260	584	1,060	762	3,530	522	810	374	141	132	39
28	142	1,110	584	1,010	716	2,920	461	1,760	342	135	135	30
29	150	910	543	960	716	2,220	461	762	440	138	112	23
30	186	860	543	860	-------	1,700	482	522	279	116	112	41
31	158	-------	810	461	-------	1,430	-------	482	-------	99	78	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	860	40	181	0.113	0.13
November	6,620	60	1,100	.688	.77
December	960	502	686	.429	.49
January	3,530	461	1,420	.888	1.02
February	4,040	543	1,180	.738	.80
March	3,530	324	934	.584	.67
April	1,320	461	690	.431	.48
May	2,520	342	776	.485	.56
June	1,380	222	586	.366	.41
July	5,660	99	739	.462	.53
August	1,650	78	356	.222	.26
September	860	22	139	.087	.10
The year	6,620	22	731	.457	6.22

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 1932.

EXTREMES.—Maximum discharge during year, 1,530 second-feet Jan. 19 (gage height, 10.22 feet); minimum, 2.8 second-feet Sept. 9–12 (gage height, 1.93 feet).

1908–12, 1914–32: Maximum discharge, 15,400 second-feet Oct. 4, 1926 (gage height, 18.4 feet); minimum, 1 second-foot July 31 to Aug. 3, 1914, Aug. 6–10, 13, 27, 28, Sept. 6, 11–14, 21–23, 1930.

REMARKS.—Records good except those below 10 second-feet, which are fair, and those estimated, which are poor. Stage-discharge relation affected by ice Mar. 6–14.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	90	a 51	213	233	402	223	293	a 154	46	30	19	3.9
2	74	48	203	504	388	233	253	a 145	52	28	15	3.8
3	68	45	193	a 675	388	273	a 243	136	52	a 28	23	3.6
4	a 66	42	173	544	388	293	233	145	110	29	13	a 3.4
5	64	39	173	434	374	283	213	145	a 154	103	17	3.3
6	60	38	a 213	402	374	a 273	203	136	96	82	15	3.2
7	54	37	154	468	a 402	a 253	193	145	73	243	a 12	3.2
8	51	a 36	145	584	450	a 243	193	a 145	61	154	7.7	3.0
9	51	35	145	504	450	a 223	183	136	55	82	6.9	2.8
10	48	37	183	a 418	486	a 213	a 173	127	70	a 66	12	2.8
11	a 63	45	233	362	564	a 193	173	127	58	49	8.1	a 2.8
12	78	51	273	326	675	a 173	163	118	a 49	38	6.2	2.8
13	94	45	a 338	362	895	a 154	154	110	40	32	6.9	55
14	102	82	402	486	a 805	a 145	145	103	38	27	a 6.4	43
15	90	a 110	362	628	700	183	136	a 100	34	23	6.0	18
16	136	86	315	725	564	203	127	96	64	19	5.7	9.7
17	163	82	304	a 965	504	203	a 127	89	61	a 18	6.2	6.9
18	a 132	118	283	1,350	450	183	127	82	52	16	6.2	a 6.3
19	102	118	263	1,530	402	173	118	76	a 62	13	5.7	5.7
20	90	203	a 243	1,470	362	a 163	118	76	73	11	4.9	12
21	78	213	223	1,190	a 338	154	118	70	89	10	a 4.9	6.5
22	74	a 293	213	865	315	203	110	a 68	64	8.5	4.9	5.7
23	68	388	213	750	304	243	110	67	52	7.7	4.7	5.5
24	60	338	203	a 700	283	263	a 118	64	40	a 7.3	4.4	5.2
25	a 49	273	193	675	273	304	136	61	31	6.9	4.2	a 7.2
26	38	283	183	650	263	374	154	58	a 25	10	3.9	9.3
27	32	293	a 173	584	263	a 486	213	55	82	13	3.8	6.9
28	39	253	163	524	a 243	434	193	55	82	16	a 3.7	5.7
29	51	a 233	163	468	233	388	173	a 52	49	11	3.6	5.5
30	57	223	163	418	------	350	163	49	43	9.3	3.4	5.2
31	60	------	163	a 418	------	326	------	46	------	a 9.0	3.3	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	163	32	73.6	0.134	0.15
November	388	35	138	.251	.28
December	402	145	221	.402	.46
January	1,530	233	652	1.19	1.37
February	895	233	432	.785	.85
March	486	145	252	.458	.53
April	293	110	169	.307	.34
May	154	46	97.9	.178	.21
June	154	25	61.9	.113	.13
July	243	6.9	38.7	.070	.08
August	23	3.3	7.76	.014	.02
September	55	2.8	8.60	.016	.02
The year	1,530	2.8	179	.325	4.44

a Estimated or interpolated.

SANGAMON RIVER AT RIVERTON, ILL.

LOCATION.—Chain gage in SW¼ sec. 9, T. 16 N., R. 4 W., at Wabash Railway bridge in Riverton, 5 miles below mouth of South Fork. Zero of gage is 503.15 feet above mean sea level.

DRAINAGE AREA.—2,560 square miles.

RECORDS AVAILABLE.—February 1908 to December 1912; August 1914 to September 1932.

EXTREMES.—Maximum discharge during year not determined; minimum, 25 second-feet Sept. 17 (gage height, 7.47 feet).

1908–12; 1914–32: Maximum discharge, 30,200 second-feet Oct. 4, 1926 (gage height, 32.0 feet); minimim, 3.0 second-feet Oct. 3–15, 1914 (gage height, 6.9 feet).

REMARKS.—Records good. Discharge estimated because of ice Mar. 6–15. Some regulation of low-water flow and seasonal storage by municipal reservoir at Decatur. No record Oct. 13 to Jan. 22.

Discharge, in second-feet, 1931–32

Day	Oct.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	172		1,450	914	882	580	182	824	60	149
2	152		1,380	914	1,140	522	192	625	80	84
3	142		1,340	914	790	550	222	510	79	67
4	108		1,310	850	760	610	298	464	75	56
5	103		1,380	850	700	580	444	673	70	42
6	96		1,450	820	640	580	496	1,220	54	36
7	79		1,720	790	580	580	550	1,060	52	34
8	74	1,120	1,920	760	550	610	730	910	48	32
9	87		2,020	700	550	640	640	824	43	31
10	101		2,020	670	550	700	550	772	43	32
11	118		2,070	640	522	670	368	649	63	31
12	172		2,120	640	550	610	298	556	105	29
13			2,220	640	522	550	254	419	149	70
14			2,320	640	470	470	212	331	464	43
15			2,620	640	444	444	298	258	533	34
16			2,820	640	444	392	760	217	697	30
17			2,820	640	444	368	730	187	798	26
18			2,520	640	470	344	670	158	1,300	27
19			2,020	610	444	320	700	130	1,220	34
20			1,760	610	418	320	670	112	1,030	40
21			1,720	580	418	298	700	94	852	36
22			1,450	610	392	276	580	84	746	33
23		3,030	1,310	640	392	276	496	74	602	30
24		2,870	1,200	670	418	254	368	62	441	29
25		2,670	1,200	760	444	232	298	62	268	28
26		2,420	1,170	850	550	212	243	89	187	29
27		2,170	1,140	914	580	202	670	130	227	32
28		2,020	1,070	978	550	182	1,600	107	217	36
29		1,840	914	978	550	182	1,760	70	149	45
30		1,720		914	580	172	1,190	54	101	60
31		1,600		914		162		46	77	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October 1–12	172	74	117	0.046	0.02
January 23–31	3,030	1,600	2,260	.883	.30
February	2,820	914	1,740	.680	.73
March	978	580	753	.294	.34
April	1,140	392	558	.218	.24
May	700	162	416	.163	.19
June	1,760	182	572	.224	.25
July	1,220	46	380	.149	.17
August	1,300	43	349	.136	.16
September	149	26	42.8	.017	.02

SANGAMON RIVER NEAR OAKFORD, ILL.

LOCATION.—Chain gage in sec. 6, T. 19 N., R. 7 W., at highway bridge 3 miles northeast of Oakford and 1¼ miles above Crane Creek. Zero of gage is 458.88 feet above mean sea level.

DRAINAGE AREA.—5,000 square miles.

RECORDS AVAILABLE.—October 1909 to March 1912; August 1914 to June 1919; March 1921 to August 1922; October 1928 to September 1932.

EXTREMES.—Maximum discharge during year, 6,430 second-feet Jan. 20 (gage height, 7.90 feet); minimum, 164 second-feet Sept. 30 (gage height 0.74 foot). 1909–12, 1914–19, 1921–22, 1929–32: Maximum discharge (revised), 37,600 second-feet Apr. 14, 1922 (gage height, 19.84 feet); minimum, 85 second-feet Aug. 30, 31, Nov. 27, Dec. 2, 1914.

REMARKS.—Records good except those estimated for period of ice effect, Mar. 6–17, which are fair. Gage-height record furnished by Sanitary District of Chicago.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	770	372	1,660	1,900	3,030	2,060	2,140	1,200	485	1,900	315	353
2	770	372	1,580	2,760	2,940	2,060	1,980	1,280	540	1,500	270	402
3	715	350	1,420	3,210	2,850	2,060	1,900	1,280	570	1,280	348	402
4	632	330	1,420	3,120	2,850	2,060	1,820	1,280	818	1,060	300	326
5	578	330	1,420	2,940	2,850	1,820	1,660	1,350	990	1,200	275	300
6	550	330	1,500	2,940	2,940	1,740	1,660	1,350	1,200	1,820	266	266
7	522	310	1,420	3,210	3,210	1,660	1,580	1,350	1,420	2,060	275	243
8	495	310	1,500	3,300	3,500	1,580	1,500	1,420	1,740	1,900	243	230
9	495	310	1,420	3,120	3,600	1,580	1,420	1,500	1,580	1,660	234	221
10	470	310	1,280	2,940	3,600	1,500	1,420	1,500	1,280	1,420	225	205
11	470	310	1,200	2,850	3,700	1,500	1,350	1,500	1,130	1,350	285	201
12	522	330	1,500	2,760	3,800	1,500	1,280	1,420	885	1,280	261	205
13	550	470	1,980	2,670	4,000	1,500	1,280	1,280	752	1,060	402	256
14	660	632	1,980	2,760	4,100	1,500	1,200	1,200	720	885	630	315
15	890	605	1,980	3,030	4,300	1,500	1,130	1,130	785	720	690	305
16	830	632	1,980	3,300	4,410	1,500	1,130	1,060	1,580	630	1,130	248
17	830	578	1,980	3,800	4,410	1,500	1,200	990	1,580	540	1,420	213
18	830	578	1,900	5,400	4,410	1,500	1,130	885	1,350	485	2,060	225
19	830	715	1,820	6,190	4,100	1,500	1,130	850	1,280	430	2,580	280
20	770	830	1,660	6,310	3,800	1,500	1,130	818	1,350	402	2,060	256
21	715	1,800	1,580	6,070	3,400	1,420	1,060	752	1,420	402	1,740	238
22	495	3,670	1,580	5,840	3,120	1,500	1,060	752	1,280	353	1,500	217
23	660	3,120	1,580	5,620	2,850	1,500	1,060	690	1,130	326	1,280	197
24	605	2,940	1,580	5,400	2,670	1,580	1,060	660	990	315	1,130	185
25	495	2,580	1,580	4,960	2,490	1,660	1,060	630	818	295	818	178
26	470	2,490	1,500	4,740	2,490	1,980	1,130	630	720	512	660	185
27	445	2,230	1,420	4,410	2,140	2,320	1,200	570	1,060	375	600	185
28	495	2,060	1,350	4,200	2,230	2,400	1,280	570	1,420	326	512	174
29	470	1,900	1,350	4,100	2,060	2,490	1,280	512	2,140	331	485	171
30	395	1,820	1,350	3,800	-------	2,320	1,280	512	2,320	310	458	164
31	395	-------	1,280	3,300	-------	2,140	-------	485	-------	270	375	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	890	395	607	0.121	0.14
November	3,670	310	1,120	.224	.25
December	1,980	1,200	1,570	.314	.36
January	6,310	1,900	3,900	.780	.90
February	4,410	2,060	3,310	.662	.71
March	2,490	1,420	1,760	.352	.41
April	2,140	1,060	1,350	.270	.30
May	1,500	485	1,010	.202	.23
June	2,320	485	1,180	.236	.26
July	2,060	270	884	.177	.20
August	2,580	225	769	.154	.18
September	402	164	245	.049	.05
The year	6,310	164	1,470	.294	3.99

SOUTH FORK OF SANGAMON RIVER AT KINCAID, ILL.

LOCATION.—Chain gage in NE¼ sec. 14, T. 13 N., R. 3 W., at highway bridge 100 feet below railway bridge, 1 mile southeast of Kincaid, and 6 miles below mouth of Bear Creek.

DRAINAGE AREA.—510 square miles.

RECORDS AVAILABLE.—May 1917 to September 1930; August 1931 to September 1932.

EXTREMES.—Maximum discharge during year not determined; minimum, 0.3 second-foot Oct. 7 (gage height, 2.98 feet).

1917–32: Maximum discharge, 11,800 second-feet Mar. 15, 1922 (gage height, 26.6 feet); no flow Aug. 29, Oct. 6–23, 1922.

REMARKS.—Records fair October to June; good July to September. Estimated values poor. Stage-discharge relation affected by ice Mar. 9–17.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.8	a 1.0	47	386	193	a 185	a 97	a 66	a 14	169	3.1	9.6
2	1.5	1.0	69	a 850	a 206	177	a 97	62	a 326	76	1.4	8.6
3	1.1	1.0	59	a 760	220	177	a 88	a 56	a 986	50	1.5	8.2
4	a .9	.8	66	a 590	a 850	a 220	80	86	a 946	44	.8	7.6
5	.7	1.3	53	a 420	a 791	a 220	a 71	105	a 386	153	.8	7.2
6	.6	1.0	a 40	250	a 732	a 185	62	90	a 260	452	.8	4.9
7	.3	.9	a 26	240	a 673	153	a 62	153	a 177	538	4.8	3.9
8	.5	a .8	13	a 220	614	a 120	a 61	202	105	494	1.4	3.1
9	1.0	.8	24	a 211	a 670	a 86	a 61	260	86	480	.8	3.0
10	.9	.8	24	a 202	726	a 80	a 60	185	90	350	.5	2.6
11	a 1.0	.9	36	a 193	630	a 72	a 60	137	44	145	.9	2.6
12	1.2	1.3	28	a 185	a 1,200	a 69	a 59	105	26	80	18	2.4
13	a 5.5	90	a 57	a 193	a 1,780	a 69	59	86	21	39	271	2.2
14	34	250	86	240	a 1,870	a 69	53	66	a 20	34	694	1.9
15	304	a 523	153	326	1,300	a 69	47	56	a 125	22	886	2.1
16	399	260	113	a 507	1,200	a 69	a 48	47	230	18	1,130	1.9
17	271	185	86	a 687	1,200	a 69	a 48	44	466	15	1,390	1.8
18	a 176	90	66	868	966	83	a 49	36	425	9.6	1,120	1.7
19	80	72	a 44	886	678	a 97	50	32	260	9.4	646	1.5
20	19	220	a 29	832	a 584	a 90	a 52	28	374	9.0	624	1.4
21	11	583	a 34	778	a 491	a 90	53	26	230	7.6	562	1.4
22	7.2	a 523	39	742	a 398	105	44	26	161	5.0	192	1.5
23	5.6	282	50	a 1,420	304	137	a 44	26	105	6.2	97	1.4
24	a 4.5	193	44	a 1,050	282	145	a 44	20	240	2.8	60	1.3
25	3.4	97	a 38	646	260	169	53	16	39	2.3	40	1.4
26	2.1	76	a 32	a 584	230	a 161	72	18	26	3.1	36	1.5
27	1.5	56	a 25	523	a 218	a 153	a 76	17	62	1.5	56	1.5
28	1.2	44	19	523	a 205	145	66	16	240	1.7	38	1.4
29	1.5	a 44	a 17	425	193	a 132	a 62	a 15	338	6.2	25	1.5
30	1.3	44	69	362	------	a 118	a 69	14	a 254	2.5	17	1.5
31	1.1	------	145	a 278	------	105	------	13	------	1.7	12	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	399	0.3	43.2	0.085	0.10
November	583	.8	121	.237	.26
December	153	13	52.6	.103	.12
January	1,420	185	528	1.04	1.20
February	1,870	193	678	1.33	1.43
March	220	69	123	.241	.28
April	97	44	61.6	.121	.14
May	260	13	68.0	.133	.15
June	986	14	235	.461	.51
July	538	1.5	104	.204	.24
August	1,390	.5	256	.502	.58
September	9.6	1.3	3.09	.0061	.007
The year	1,870	.3	188	.369	5.02

a Estimated.

LA MOINE RIVER AT RIPLEY, ILL.[1]

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 431.31 feet above mean sea level.

DRAINAGE AREA.—1,310 square miles.

RECORDS AVAILABLE.—March 1921 to September 1932.

EXTREMES.—Maximum discharge during year, 5,880 second-feet Aug. 13 (gage height, 18.68 feet); minimum, 23 second-feet Nov. 9 (gage height, 2.67 feet).

1921–32: Maximum discharge, 12,500 second-feet July 25, 1924 (gage height, 25.0 feet); minimum, 8.9 second-feet Sept. 11, 12, 1930.

Maximum known stage, 26.0 feet, date unknown.

REMARKS.—Records good. Discharge estimated because of ice effect, Feb. 2, 3, Mar. 9–14.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	50	58	357	2,790	402	335	471	117	275	58	1,290	117
2	44	47	335	2,710	315	357	425	112	402	50	3,110	128
3	39	44	315	1,840	335	315	379	117	2,350	47	3,250	98
4	36	40	295	1,140	402	357	335	145	2,000	172	1,560	133
5	34	38	315	1,170	425	960	295	238	1,620	602	315	98
6	31	34	295	1,810	448	870	275	315	1,230	1,230	229	88
7	37	33	275	1,970	448	379	275	256	574	1,380	780	80
8	47	32	295	1,500	471	275	275	870	660	448	1,140	76
9	39	23	256	1,140	402	238	275	1,380	900	195	750	72
10	47	26	275	840	357	220	256	630	660	602	220	72
11	54	32	750	720	2,350	203	229	357	256	780	1,710	68
12	44	37	900	690	2,550	195	195	238	165	930	4,480	68
13	133	402	810	630	2,040	187	187	187	133	496	5,650	448
14	98	780	602	780	1,320	195	180	145	128	203	5,160	238
15	448	574	660	2,000	780	220	172	122	315	139	5,280	128
16	212	496	546	1,740	720	238	172	107	1,320	107	5,090	84
17	102	471	471	1,710	690	275	172	102	496	88	2,210	64
18	72	402	425	1,470	660	295	172	98	256	76	1,040	72
19	58	357	402	1,050	546	275	172	93	145	72	1,440	122
20	47	295	379	900	471	256	165	84	357	61	720	139
21	41	295	1,050	780	402	256	158	80	335	54	496	98
22	40	3,550	840	750	402	238	158	76	180	50	357	80
23	44	4,960	720	720	402	275	158	72	107	47	295	68
24	44	3,900	546	660	402	602	152	68	84	44	357	64
25	44	2,750	425	602	379	1,710	152	229	80	39	212	61
26	47	2,140	335	546	357	1,970	145	139	76	1,020	195	58
27	117	1,940	295	448	335	2,040	145	165	180	1,710	256	72
28	80	900	295	496	315	1,680	139	117	72	521	357	76
29	72	546	275	574	315	1,080	133	88	61	152	203	76
30	68	425	471	471	------	720	128	68	64	203	145	58
31	68	------	1,470	357	------	602	------	68	------	229	128	------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	448	31	75.4	0.058	0.07
November	4,960	23	854	.652	.73
December	1,470	256	506	.386	.44
January	2,790	357	1,130	.863	.99
February	2,550	315	670	.511	.55
March	2,040	187	575	.439	.51
April	471	128	218	.166	.19
May	1,380	68	222	.169	.19
June	2,350	61	516	.394	.44
July	1,710	39	381	.291	.34
August	5,650	128	1,590	1.21	1.40
September	448	58	103	.079	.09
The year	5,650	23	571	.436	5.94

[1] Formerly published as Crooked Creek at Ripley, Ill.

MACOUPIN CREEK NEAR KANE, ILL.

LOCATION.—Chain gage in SE¼ sec. 11, T. 9 N., R. 12 W., at highway bridge 3½ miles northwest of Kane. Zero of gage is 427.12 feet above mean sea level.

DRAINAGE AREA.—875 square miles.

RECORDS AVAILABLE.—October 1928 to September 1932; March 1921 to September 1928 at Chicago & Alton Railroad bridge 2 miles upstream.

EXTREMES.—Maximum discharge during year, 5,400 second-feet Aug. 26 (gage height, 16.84 feet); minimum, 1.3 second-feet July 25 (gage height, 2.63 feet).

1921–32: Maximum discharge, 22,200 second-feet Oct. 4, 1926; maximum gage height at former gage, 24.6 feet Mar. 15, 1922; minimum discharge, 1 second-foot Sept. 29, Oct. 3, 5, 15, 1922.

REMARKS.—Records good. Discharge estimated because of ice effect Mar. 8–13. Gage-height record furnished to Dec. 31, 1931, by Sanitary District of Chicago.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.0	3.3	100	2,750	190	123	78	100	18	84	336	84
2	2.6	3.6	100	2,030	203	147	73	84	45	52	1,700	84
3	2.6	3.0	95	830	216	153	63	68	153	43	494	56
4	2.2	2.6	90	406	427	153	60	61	850	38	135	37
5	1.9	2.2	90	406	1,010	153	58	63	304	230	63	30
6	2.2	2.2	90	1,280	1,010	165	56	68	117	73	36	25
7	2.2	2.4	78	890	980	117	56	68	73	53	32	19
8	2.0	2.2	78	448	860	95	58	68	165	31	21	17
9	14	2.4	84	304	650	84	55	63	353	28	14	16
10	14	2.2	100	230	471	73	49	63	190	19	11	14
11	8.8	5.5	244	216	471	73	48	63	78	14	44	13
12	7.1	100	259	203	1,190	73	46	49	48	11	259	112
13	360	162	203	230	920	78	43	36	31	9.5	1,190	60
14	935	1,230	177	569	336	78	38	32	20	8.5	950	23
15	435	760	141	471	274	95	38	29	35	3.5	596	27
16	146	450	112	304	259	95	51	23	153	3.5	177	19
17	64	139	106	3,020	320	100	78	18	320	1.8	569	15
18	36	139	95	2,750	320	100	78	14	120	3.5	2,030	13
19	23	125	90	1,420	274	106	68	11	90	2.3	1,190	16
20	15	760	84	596	216	117	58	10	78	1.9	165	16
21	14	2,060	135	448	203	106	129	11	117	1.8	95	11
22	11	1,500	117	406	203	112	190	8.0	84	1.9	63	9.0
23	9.7	336	244	1,250	190	135	153	6.0	84	1.5	46	7.5
24	8.3	274	165	1,530	190	153	117	5.5	44	1.5	35	6.5
25	7.9	203	123	860	177	165	100	5.5	20	1.4	28	7.0
26	7.9	147	100	494	165	153	90	5.0	19	31	4,600	7.0
27	5.5	123	90	544	147	141	73	4.4	90	28	2,270	7.0
28	5.5	123	84	519	135	123	59	4.4	950	9.0	448	7.0
29	4.8	117	73	406	129	100	59	3.5	448	4.7	190	6.0
30	4.2	106	1,360	244	-------	90	78	2.6	153	2.6	100	6.0
31	3.6	-------	2,710	165	-------	78	-------	7.5	-------	1.8	68	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	935	1.9	69.6	0.080	0.09
November	2,060	2.2	296	.338	.38
December	2,710	73	246	.281	.32
January	3,020	165	846	.967	1.11
February	1,190	129	418	.478	.52
March	165	73	114	.130	.15
April	190	38	73.3	.084	.09
May	100	2.6	34.0	.039	.04
June	950	18	175	.200	.22
July	230	1.4	25.7	.029	.03
August	4,600	11	579	.662	.76
September	112	6.0	25.7	.029	.03
The year	4,600	1.4	242	.277	3.74

KASKASKIA RIVER AT VANDALIA, ILL.

LOCATION.—Chain gage in SE¼ sec. 16, T. 6 N., R. 1 E., at Gallatin Street Bridge, Vandalia, 3½ miles above Hickory Creek. Zero of gage is 455.30 feet above mean sea level.

DRAINAGE AREA.—1,980 miles.

RECORDS AVAILABLE.—February 1908 to December 1912; August 1914 to September 1932.

EXTREMES.—Maximum discharge during year, 5,550 second-feet Jan. 24 (gage height, 15.42 feet); minimum, 18 second-feet Sept. 30 (gage height, 0.01 foot).

1908–12, 1914–32: Maximum discharge, 20,000 second-feet Oct. 4, 1926; maximum stage, 23.0 feet June 5, 1917; minimum discharge, 3.5 second-feet Aug. 22, 1911.

REMARKS.—Records good except those for October to December, which are fair. Discharge estimated Jan. 17 and for period of ice effect, Mar. 13–16.

Discharge, in second-feet, 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	147	114	992	4,470	1,430	606	534	340	79	404	134	84
2	127	108	962	4,270	1,470	932	534	320	90	452	172	64
3	96	108	962	2,430	1,510	1,150	534	280	1,060	548	202	55
4	90	102	932	1,400	1,780	992	512	260	3,190	692	102	45
5	90	96	872	1,290	3,370	1,150	490	260	3,150	1,360	84	39
6	84	96	844	1,150	3,110	844	468	300	2,760	1,940	84	36
7	79	102	816	1,150	2,890	788	446	320	1,860	1,200	74	35
8	90	108	760	1,290	2,720	734	424	340	1,360	794	64	33
9	79	114	708	1,330	2,510	682	424	490	1,200	644	58	32
10	64	114	1,260	1,330	2,300	630	402	446	983	620	52	30
11	79	120	2,550	1,470	2,340	606	380	380	821	548	172	30
12	84	127	3,600	1,510	4,420	558	360	340	740	476	875	30
13	84	127	3,110	1,620	4,620	558	340	320	596	404	1,590	31
14	992	127	1,980	2,470	4,620	558	340	280	452	317	2,380	30
15	2,510	134	1,470	2,220	4,220	558	320	280	1,070	244	3,940	30
16	1,820	140	932	2,510	3,840	558	320	260	875	191	2,260	30
17	1,400	280	734	3,650	3,460	582	300	250	692	172	1,200	30
18	1,060	582	656	4,870	3,190	582	320	240	620	164	500	35
19	788	630	606	4,570	2,930	582	340	211	740	155	244	35
20	558	992	558	3,600	2,510	582	320	202	692	134	212	36
21	512	1,860	708	3,550	2,100	582	320	185	644	120	182	34
22	424	2,300	682	4,720	1,940	606	320	185	620	114	172	33
23	340	2,380	682	5,500	1,740	656	320	177	596	102	155	32
24	280	1,940	682	5,550	1,620	656	320	162	500	96	120	29
25	230	1,660	656	5,170	1,430	630	320	147	359	96	102	25
26	220	1,360	656	4,220	1,150	606	320	134	452	96	120	25
27	211	1,260	606	3,460	1,020	606	360	120	524	90	140	23
28	185	1,060	534	2,930	962	606	360	102	500	90	148	22
29	194	1,090	512	2,340	816	582	320	96	500	84	155	21
30	194	1,020	490	1,940	-------	558	320	90	476	79	134	19
31	140	-------	3,650	1,550	-------	558	-------	84	-------	102	102	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	2,510	64	427	0.216	0.25
November	2,380	96	675	.341	.38
December	3,650	490	1,130	.571	.66
January	5,550	1,150	2,890	1.46	1.68
February	4,620	816	2,480	1.25	1.35
March	1,150	558	673	.340	.39
April	534	300	380	.192	.21
May	490	84	245	.124	.14
June	3,190	79	940	.475	.53
July	1,940	79	404	.204	.24
August	3,940	52	514	.260	.30
September	84	19	34.4	.017	.02
The year	5,550	19	896	.453	6.15

CENTRALIA RESERVOIR CREEK NEAR CENTRALIA, ILL.

LOCATION.—Water-stage recorder at bridge over outlet of Centralia Reservoir in the NW¼NE¼ sec. 5, T. 1 N., R. 2 E., 1 mile above confluence with Crooked Creek and 7½ miles northeast of Centralia, Marion County.

DRAINAGE AREA.—7 square miles.

RECORDS AVAILABLE.—March to September 1932.

REMARKS.—Flow regulated by storage in Centralia Reservoir (area of reservoir at level of crest of spillway, 261 acres). Discharge corrected for storage but not for evaporation. Pumpage record furnished by city of Centralia. Rainfall record (mean of 3 gages within basin) furnished by the State Water Survey.

Monthly discharge and rainfall, 1932

Month	Discharge from spillway (million gallons)	Pumpage (million gallons)	Gain or loss in storage (million gallons)	Corrected for storage				Rainfall in inches
				Run-off in million gallons [a]	Discharge per square mile		Run-off in inches [a]	
					Million gallons a day [a]	Second-feet [a]		
March	0	42.403	−26.0	+16.4	+0.0756	+0.117	+0.13	2.05
April	0	38.516	−31.5	+7.02	+.0334	+.052	+.06	2.11
May	0	42.2625	−64.5	−22.2	−.102	−.158	−.18	1.66
June	0	40.282	−63.9	−23.6	−.112	−.173	−.19	2.35
July	0	42.906	−82.4	−39.5	−.182	−.282	−.33	3.16
August	0	41.1585	−48.8	−7.64	−.0351	−.054	−.06	5.54
September	0	39.8855	−64.5	−24.6	−.117	−.18	−.20	3.08

[a] Negative values indicate the amount by which the evaporation and seepage from the reservoir surface exceeded the inflow.

BIG MUDDY RIVER AT PLUMFIELD, ILL.

LOCATION.—Chain gage installed July 13, 1932, in southwest corner of sec. 20, T. 7 S., R. 2 E., at State highway bridge on route 149 at Plumfield, 2.6 miles below mouth of Middle Fork. Prior to July 13, 1932, gage half a mile upstream was used.

DRAINAGE AREA.—753 square miles.

RECORDS AVAILABLE.—August 1914 to September 1932; June 1908 to December 1921 at Chicago, Burlington & Quincy Railroad bridge 2.4 miles upstream.

EXTREMES.—Maximum discharge during year, 7,410 second-feet June 20 (gage height, 22.41 feet at old station); minimum, 2.6 second-feet June 24 (gage height, 1.07 feet at old station).

1914–32: Maximum discharge, 16,300 second-feet Feb. 1, 1916 (gage height, 30.2 feet at old station); no flow Aug. 18–26, 1914.

REMARKS.—Records good.

Discharge, in second-feet, 1931-32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.4	5.6	1,200	3,800	2,100	96	563	629	36	44	3.6	46
2	5.6	5.1	1,220	5,700	1,480	96	713	657	26	52	3.2	31
3	5.3	4.7	1,120	6,240	1,030	a 140	498	485	18	34	4.5	212
4	4.0	3.2	783	6,330	755	186	225	205	14	22	39	661
5	3.4	3.2	657	5,970	615	300	142	118	a 55	21	48	991
6	11	3.3	769	5,540	472	300	110	96	96	14	23	1,150
7	8.2	4.5	685	4,980	a 350	235	89	65	110	26	24	1,120
8	8.5	3.6	433	4,430	235	168	602	54	59	134	16	717
9	42	2.9	245	3,940	186	118	713	46	36	89	20	222
10	118	2.9	195	3,310	177	77	699	38	23	54	19	55
11	324	3.4	348	2,280	195	71	643	40	16	459	13	33
12	142	2.9	741	1,550	372	59	498	44	12	420	11	24
13	a100	235	a1,060	a1,520	563	52	195	38	9.2	415	35	21
14	56	289	1,390	1,480	a 400	42	110	34	8.5	355	119	15
15	103	159	1,570	1,730	300	42	83	30	8.5	159	112	12
16	360	54	1,800	2,460	267	44	65	28	8.0	66	127	9.8
17	267	a 52	2,100	3,940	245	755	56	26	7.6	33	143	8.0
18	110	205	2,100	5,790	408	1,150	44	21	6.6	20	242	6.2
19	56	576	1,670	7,230	384	1,370	40	17	5.4	11	319	6.0
20	36	1,320	1,270	7,410	289	1,520	36	15	5.8	8.6	391	6.6
21	24	1,520	867	6,960	225	1,530	a 260	13	4.0	7.3	297	7.8
22	19	1,620	867	6,510	300	1,390	485	11	3.4	6.4	105	7.2
23	16	a1,760	910	5,880	360	1,170	769	9.4	3.2	5.3	61	5.7
24	12	1,890	a 736	5,620	300	853	797	8.0	2.6	4.6	33	4.7
25	10	1,890	563	5,970	256	498	783	6.6	3.2	3.7	22	4.0
26	9.7	1,800	372	6,330	195	a 340	925	7.6	3.2	25	12	
27	8.7	1,570	235	5,620	150	186	825	13	9.4	6.6	37	24
28	a 16	1,250	168	5,220	134	150	420	11	7.1	7.7	41	33
29	12	1,100	126	4,430	110	126	186	a120	7.6	6.2	51	40
30	7.3	1,170	1,320	3,310	-------	110	372	77	4.4	4.5	91	26
31	6.4	-------	1,890	2,960	-------	278	-------	49	-------	3.9	78	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	360	3.4	61.5	0.082	0.09
November	1,890	2.9	617	.819	.91
December	2,100	126	949	1.26	1.45
January	7,410	1,480	4,660	6.19	7.14
February	2,100	110	443	.588	.63
March	1,530	42	434	.576	.66
April	925	36	398	.529	.59
May	657	6.6	97.1	.129	.15
June	110	2.6	20.4	.027	.03
July	459	3.2	80.5	.107	.12
August	391	3.2	82.4	.109	.13
September	1,150	4.0	184	.244	.27
The year	7,410	2.6	674	.895	12.17

a Estimated.

BIG MUDDY RIVER AT MURPHYSBORO, ILL.

LOCATION.—Chain gage in SE¼ sec. 8, T. 9 S., R. 2W., on Illinois Central Railroad bridge across mouth of Lewis Creek at Murphysboro, Jackson County. Zero of gage is 336.00 feet above mean sea level.

DRAINAGE AREA.—2,170 square miles (includes Lewis Creek).

RECORDS AVAILABLE.—December 1916 to September 1932.

EXTREMES.—Maximum discharge during year, 12,300 second-feet Jan. 26 (gage height, 25.97 feet); minimum, 16 second-feet Oct. 4.

1917–32: Maximum discharge not determined; minimum discharge, 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 fair. Stage-discharge relation at present location of gage affected by backwater from Mississippi River whenever gage height on United States Weather Bureau gage at Chester, Ill., exceeds about 15.3 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 1931–32

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	23	98	3,380	6,630	7,880	412	645	1,020	143	190	51	272
2	20	66	3,340	7,440	6,800	335	824	1,020	153	184	48	321
3	20	45	1,850	a7,000	5,020	307	959	994	130	168	43	1,790
4	16	35	1,790	9,550	3,180	321	992	921	107	161	31	3,380
5	18	24	2,410	10,300	3,840	520	a940	720	105	146	24	3,570
6	a613	22	2,360	9,500	2,970	645	a640	441	81	90	20	3,130
7	526	20	1,410	10,200	1,890	536	a335	298	63	152	19	2,670
8	158	18	1,300	11,500	976	503	a900	206	61	112	31	2,220
9	81	17	1,350	8,230	698	441	1,690	176	123	121	42	1,670
10	48	20	813	a8,500	389	352	2,060	143	143	412	503	1,010
11	84	19	441	8,730	538	298	1,400	127	152	943	736	518
12	384	19	921	8,230	795	233	1,390	103	127	1,230	902	236
13	362	342	2,300	5,940	1,010	199	1,110	92	77	1,110	4,200	146
14	362	1,040	3,350	6,450	983	176	638	84	54	856	5,390	114
15	248	1,140	4,290	6,640	862	161	514	96	40	689	5,560	92
16	522	984	3,350	4,560	696	152	209	78	42	491	6,400	90
17	536	617	2,940	3,200	1,010	1,720	204	75	52	272	5,790	96
18	472	781	3,170	5,540	1,600	3,350	206	64	64	152	3,550	75
19	346	984	3,090	8,790	1,470	3,620	272	58	59	96	4,500	58
20	233	2,640	1,960	12,000	1,230	4,340	233	51	55	66	3,400	45
21	152	4,050	3,200	11,600	930	3,850	236	45	46	46	2,180	39
22	105	4,880	3,660	11,500	1,240	3,640	307	39	39	34	1,320	34
23	79	4,900	3,320	11,700	1,410	3,260	584	33	46	28	802	36
24	63	4,500	1,840	12,000	1,170	2,930	1,080	29	39	23	412	37
25	46	3,970	1,800	12,200	911	2,490	1,610	27	86	19	217	32
26	38	4,050	1,430	12,300	810	1,600	1,560	24	179	18	298	71
27	71	3,350	1,010	11,900	657	1,060	1,540	32	255	27	1,010	434
28	176	2,900	a757	11,300	520	729	1,400	56	206	152	920	631
29	256	2,420	504	10,800	472	503	1,200	88	269	252	892	665
30	225	3,310	2,770	10,800	-------	412	930	84	274	135	764	472
31	161	-------	4,560	7,980	-------	389	-------	84	-------	84	441	-------

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	613	16	208	0.096	0.11
November	4,900	17	1,580	.728	.81
December	4,560	441	2,280	1.05	1.21
January	12,300	3,200	9,130	4.21	4.85
February	7,880	389	1,790	.825	.89
March	4,340	152	1,270	.585	.67
April	2,060	204	887	.409	.46
May	1,020	24	236	.109	.13
June	274	39	109	.050	.06
July	1,230	18	273	.126	.15
August	6,400	19	1,630	.751	.87
September	3,570	32	798	.368	.41
The year	12,300	16	1,690	.779	10.62

a Estimated.

MISCELLANEOUS DISCHARGE MEASUREMENTS

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 Hudson Bay and upper Mississippi River drainage basins during the year ended Sept. 30, 1932

Date	Stream	Tributary to—	Locality	Gage height	Discharge
				Feet	*Sec.-ft.*
Nov. 7	Red River	Hudson Bay	Oslo, Minn	−1.74	218
Apr. 28	do	do	do	1.32	1,360
May 31	do	do	do	−.50	600
Oct. 26	Red Lake River	Red River	In sec. 28, T. 152 N., R. 36 W., at outlet of Red Lakes, Minn.	1,172.63	70.6
May 27	do	do	do	1,171.69	2.69
Aug. 2	do	do	do	1,172.66	18.2
Apr. 22	Middle Fork of Two Rivers.	do	Near Bronson, Minn	3.02	117
Nov. 10	Mississippi River	Gulf of Mexico	Hastings, Minn	[a] 8.70	2,180
20	do	do	do	[a] 10.22	3,560
Sept. 15	do	do	do	[a] 7.2	1,840
Oct. 27	Minnesota River	Mississippi River	Mendota, Minn	1.56	278
Nov. 27	do	do	do	1.66	578
Dec. 4	do	do	do	1.44	472
11	do	do	do	1.36	446
Feb. 27	do	do	do	[b] 1.51	444
Mar. 16	do	do	do	[b] 4.10	2,640
Apr. 30	do	do	do	4.66	2,710
June 14	do	do	do	3.68	2,290
July 8	do	do	do	2.08	939
Aug. 18	do	do	do	1.16	356
Sept. 28	do	do	do	1.07	283
June 23	Beef River	do	Accola Farm, near Alma, Wis	2.75	206
July 22	do	do	do	2.92	167
Sept. 10	do	do	do	2.56	137
June 24	Zumbro River	do	Bridge on State highway 3 near Kellogg, Minn.		325
Sept. 7	do	do	do	3.42	222
June 24	Whitewater River	do	Bridge on State highway 3 at Weaver, Minn.	3.52	102
July 22	do	do	do	3.12	73.3
Sept. 7	do	do	do	3.24	74.2
June 23	Trempealeau River	do	Delta Farm, near Trempealeau, Wis.	3.75	282
July 22	do	do	do	3.82	289
Sept. 10	do	do	do	3.32	219
Feb. 24	Coon Creek	do	Bridge on State highway 3 near Stoddard, Wis.		63.3
July 20	Bad Axe River	do	Bridge 2 miles above mouth, near Victory, Wis.	2.93	70.3
Sept. 10	do	do	do	2.85	61.5
June 22	Upper Iowa River	do	Near New Albin, Iowa	3.68	800
July 21	do	do	do	2.31	364
Sept. 10	do	do	On road between Eitzen and Waukon, Iowa.		174
Oct. 2	Illinois & Michigan Canal.	Diverts from Des Plaines River.	Jackson Street Bridge, in Joliet, Ill.		328
Jan. 5	do	do	do		264
Feb. 4	do	do	do		226

[a] Tail gage. [b] Affected by ice.

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