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UNITED STATES DEPARTMENT OF THE INTERIOR

SURFACE WATER SUPPLY
of the **UNITED STATES**
1933

PART 4
ST. LAWRENCE RIVER BASIN

Prepared in cooperation with the States of
ILLINOIS, INDIANA, MICHIGAN, MINNESOTA, NEW YORK
OHIO, VERMONT, AND WISCONSIN

GEOLOGICAL SURVEY WATER-SUPPLY PAPER 744



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

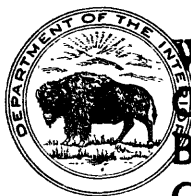
Water-Supply Paper 744

SURFACE WATER SUPPLY *of the* UNITED STATES 1933

PART 4
ST. LAWRENCE RIVER BASIN

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ILLUSTRATION

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

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3

SURFACE WATER SUPPLY OF ST. LAWRENCE RIVER BASIN, 1933

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, 1933.

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

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

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

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

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

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

In the execution of the work many private and State organizations have cooperated, either by furnishing data or by assisting in collecting data. Acknowledgments for cooperation of the first kind are made in connection with the description of each station affected; cooperation of the second kind is acknowledged on pages 10 and 11.

Measurements of stream flow have been made at about 6,680 points in the United States and also at many points in Alaska and the Hawaiian Islands. In July 1933, 2,800 gaging stations were being

¹ Only \$340,000 available for expenditure.

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, 1932, and ending September 30, 1933. At the beginning of January in most parts of the United States much of the precipitation

in the preceding 3 months is stored in the form of snow or ice, or in ponds, lakes, and swamps, or as underground water, and this stored water passes off in the streams during the spring break-up. At the end of September, on the other hand, the only stored water available for run-off is possibly a small quantity in the ground; therefore the run-off for the year beginning October 1 is practically all derived from precipitation within that year.

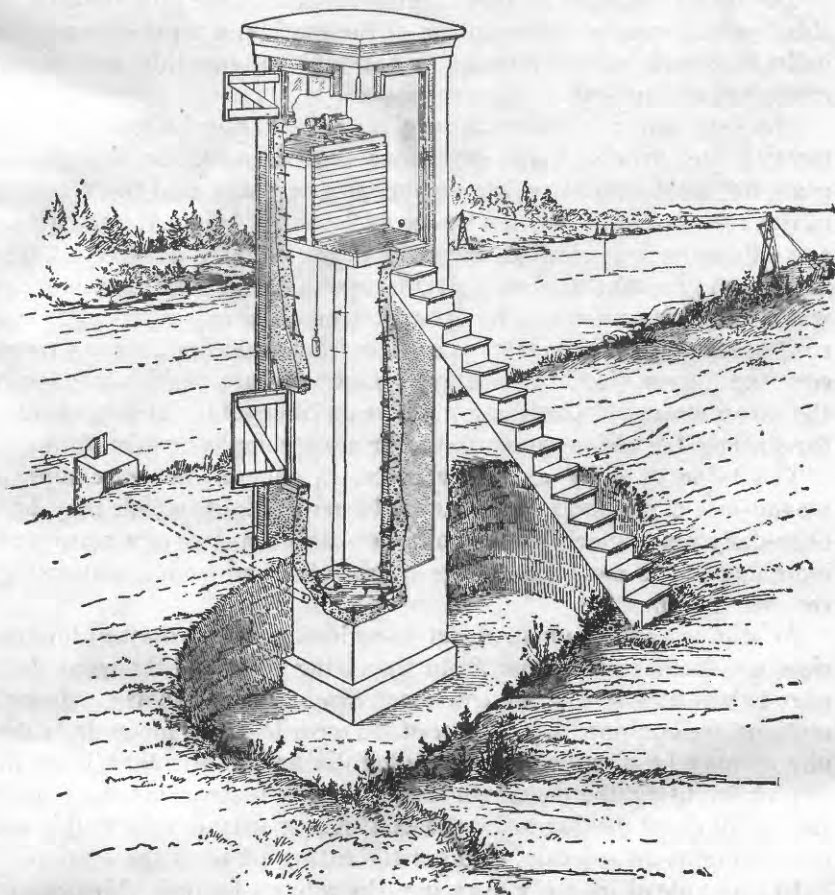


FIGURE 1.—Typical river-measurement station showing concrete well and house for water-stage recorder and staff gages, cable, and car.

The base data collected at gaging stations consist of records of stage, measurements of discharge, and general information used to supplement the gage heights and discharge measurements in determining the daily flow. The records of stage are obtained either from direct readings on a 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 out-

lined 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 discharges 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 information in regard to the location and type of gage, diversions that decrease the flow at the gage, artificial regulation from pondage or storage, and the accuracy of the records. Information under "Discharge" gives the maximum and minimum recorded discharges and the average discharge. The maximum does not necessarily represent the crest discharge unless a water-stage recorder was in operation or a nonrecording gage was read at the time of the crest. Likewise, the minimum may not represent the lowest discharge. The average discharge is the average of the mean annual discharges for the years indicated. It is given only for stations for which there are ten or more complete years of record.

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 nonrecording 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 for intervals of 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 permanence of the stage-discharge relation and (2) on the accuracy of observation of stage, measurements of flow, and interpretation of records.

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

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

The table of monthly discharge gives a general idea of the flow at the station. The table of daily discharge allows more detailed studies of the variation in flow. It should be borne in mind, however, that the observations in each succeeding year may be expected to throw new light on data previously published.

Many gaging stations on streams in the irrigated sections 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 powers, 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., 353 Broadway.
 Trenton, N.J., 228 Federal Building.
 Harrisburg, Pa., 492 Education Building.
 Charlottesville, Va., University of Virginia.
 South Charleston, W. Va., Naval Ordnance Plant.
 Asheville, N.C., 220 Post Office Building.
 Columbia, S.C., 801 National Loan & Exchange Bank Building.
 Ocala, Fla., Post Office Building.
 Montgomery, Ala., Post Office Building.
 Chattanooga, Tenn., 217 Post Office Building.
 Columbus, Ohio, Engineering Experiment Station, Ohio State University.
 Indianapolis, Ind., 319 Federal Building.
 Urbana, Ill., 302 University New Agricultural Building.
 Madison, Wis., 337N State Capitol.
 St. Paul, Minn., 808 New Post Office Building.
 Iowa City, Iowa, 402 Hydraulic Laboratory, University of Iowa.
 St. Louis, Mo., 3 Customhouse.

Rollo, Mo., Missouri Geological Survey Building, Missouri School of Mines and Metallurgy.

Topeka, Kans., 305 Federal Building.

Fort Smith, Ark., Post Office Building.

Austin, Tex., State Highway Building.

Santa Fe, N.Mex., State Capitol.

Tucson, Ariz., 210 Post Office Building.

Denver, Colo., 403 Post Office Building.

Salt Lake City, Utah, 303 Federal Building.

Idaho Falls, Idaho, 228 Federal Building.

Boise, Idaho, 429 Federal Building.

Helena, Mont., 421 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 6,680 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 Sept. 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, 1871-93).....	1888 to Dec. 31, 1893.
B 131.....	Descriptions, measurements, gage heights, and ratings.....	1893-94.
16th A, pt. 2.....	Descriptive information only.....	
B 140.....	Descriptions, measurements, gage heights, ratings, and monthly discharge (also data covering earlier years).....	1895.
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.....	Descriptions, measurements, ratings, and monthly discharge (also some long-time records).....	1897.
W 27.....	Measurements, ratings, and gage heights, eastern United States, eastern Mississippi River, and Missouri River.....	1898.
W 28.....	Measurements, ratings, and gage heights, Arkansas River and western United States.....	1898.
20th A, pt. 4.....	Monthly discharge (also for many earlier years).....	1898.
W 35 to 39.....	Descriptions, measurements, gage heights, and ratings.....	1899.
21st A, pt. 4.....	Monthly discharge.....	1899.
W 47 to 52.....	Descriptions, measurements, gage heights, and ratings.....	1900.
22d A, pt. 4.....	Monthly discharge.....	1900.
W 65, 66.....	Descriptions, measurements, gage heights, and ratings.....	1901.
W 75.....	Monthly discharge.....	1901.
W 82 to 85.....	Complete data.....	1902.
W 97 to 100.....	do.....	1903.
W 124 to 135.....	do.....	1904.
W 165 to 178.....	do.....	1905.
W 201 to 214.....	do.....	1906.
W 241 to 252.....	do.....	1907-8.
W 261 to 272.....	do.....	1909.

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

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

Report	Character of Data	Year
W 281 to 292.....	Complete data.....	1310.
W 301 to 312.....	do.....	1311.
W 321 to 332.....	do.....	1712.
W 351 to 362.....	do.....	1313.
W 381 to 394.....	do.....	1314.
W 401 to 414.....	do.....	1715.
W 431 to 444.....	do.....	1716.
W 451 to 464.....	do.....	1717.
W 471 to 484.....	do.....	1718.
W 501 to 514.....	do.....	1719-20.
W 521 to 534.....	do.....	1321.
W 541 to 554.....	do.....	1322.
W 561 to 574.....	do.....	1723.
W 581 to 594.....	do.....	1724.
W 601 to 614.....	do.....	1725.
W 621 to 634.....	do.....	1726.
W 641 to 654.....	do.....	1727.
W 661 to 674.....	do.....	1728.
W 681 to 694.....	do.....	1729.
W 696 to 709.....	do.....	1930.
W 711 to 724.....	do.....	1931.
W 726 to 739.....	do.....	1932.
W 741 to 754.....	do.....	1933.

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

The following table gives, by years and drainage basins, the numbers of the papers on surface-water supply published from 1899 to 1933. 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 from 1910 to 1920 for any station in the area covered by part 3 are published in Water-Supply Papers 283, 303, 323, 353, 383, 403, 433, 453, 473, and 503, which contain records for the Ohio River Basin for those years.

Numbers of water-supply papers containing results of stream measurements, 1899-1933

[For basins included, see pp. 7 and 8]

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

^a Rating tables and index to Water-Supply Papers 35-38 contained in Water-Supply Paper 39. Tables of 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 Mojave 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.

^h Tables of monthly discharge for 1900 in Twenty-second Annual Report, part 4.

ⁱ Wissahickon and Schuylkill Rivers to James River.

^j Scioto River.

^k Loup and Platte Rivers near Columbus, Nebr., and all tributaries below junction with Platte River.

^l Tributaries of Mississippi River from east.

^m Lake Ontario and tributaries to St. Lawrence River proper.

ⁿ Hudson Bay only.

^o New England rivers only.

^p Hudson River to Delaware River, inclusive.

^q Susquehanna River to Yackin River, inclusive.

^r Platte and Kansas Rivers.

^s The Great Basin in California, except Truckee and Carson River Basins.

^t Below junction with Gila River.

^u Rogue, Umpqua, and Siletz Rivers only.

COOPERATION

The work in the several States was done under cooperative agreements as follows: In Illinois with the Department of Purchases and Construction, Henry H. Kohn, director; the Illinois Department of Registration and Education, M. F. Walsh, director. In Indiana with the Department of Conservation, Denzil Doggett, assistant State engineer. In Michigan with the Michigan Stream Control Commission, M. D. Van Wagoner, chairman. In Minnesota with the Division of Drainage and Waters, W. S. Olson, director. In New York with the State Conservation Department, Lithgow Osborne, commissioner; State Department of Public Works, Frederick Stuart Greene, superintendent; State Water Power and Control Commission, Lithgow Osborne, chairman; State Joint Legislative Committee, Frederick J. Slater, chairman; Black River Regulating District, Edwin S. Cullings, chief engineer; Commission for the Improvement of Oswegatchie River, J. E. Fell, chairman; and City of Rochester, I. E. Matthews, city engineer. In Ohio with the Ohio Cooperative Topographic Survey, C. E. Sherman, inspector. In Vermont with Stanley C. Wilson, Governor. In Wisconsin with the Public Service Commission of Wisconsin, A. V. Guillou, chief engineer.

Assistance in collecting records was also rendered by the following municipalities, organizations, corporations, and individuals: In Michigan by the cities of Allegan, Niles, Grand Rapids, Alma, Flint, Owosso, and Dearborn, the Michigan State College, Ayres, Lewis, Norris & May, Michigan Gas & Electric Co., and Consumers Power Co.; in New York by the Federal Emergency Administration of Public Works, Northern New York Utilities, Inc., International Paper Co., Utica Gas & Electric Co., Cornell University, Malone Light & Power Co., New York & Pennsylvania Co., Associated Gas & Electric System, Rochester Gas & Electric Corporation, and Deer River Power Co.; in Vermont by the Newport Electric Light Co.; and in Wisconsin by the Wisconsin-Michigan Power Co., Wisconsin Power & Light Co., Wisconsin Public Service Corporation, and the Corps of Engineers, United States Army.

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, William Sell, E. C. Williamson, Benjamin Levy and Ruth Zander; in Indiana and Michigan by H. E. Grosbach, district engineer, assisted by W. D. Mitchell, R. L. Spencer, W. E. Hiatt, T. J. Powers, R. C. Haven, and Mrs. C. Perrin; in Minnesota (Pigeon River at International Bridge, data for which were collected by the United States Army Engineers) by C. L. Batchelder, district engineer, assisted by O. B. Johnson, R. J.

Woolery, and H. R. Smith; in New York by A. W. Harrington, district engineer, assisted by J. L. Lamson, LeRoy Engstrom, A. A. Fischback, Jr., W. B. Hanlon, W. P. Cross, Miss Agnes D. Buchanan, and Miss Bessie M. Smith; in Ohio by Lasley Lee, district engineer, assisted by J. I. Perrey, C. V. Youngquist, H. E. Cox, and H. P. Brooks; in Vermont by H. B. Kinnison, district engineer, assisted by D. M. Corbett, J. H. Foster, G. K. Wood, E. H. Curtis, G. R. Williams, and Miss T. V. Larson; and in Wisconsin by S. B. Soulé, district engineer, assisted by C. C. Yonker, R. H. Brigham, Earl Harbeck, Paul Patterson, and Mrs. Elsie Fahringer.

The manuscript was reviewed and assembled by Trigg Twichell.

GAGING-STATION RECORDS

STREAMS TRIBUTARY TO LAKE SUPERIOR

PIGEON RIVER AT INTERNATIONAL BRIDGE, MINN.

LOCATION.—Staff gage in lot 3, sec. 20, T. 64 N., R. 6 E., 100 feet upstream from International Bridge, 9.3 miles above mouth.

DRAINAGE AREA.—590 square miles (revised).

RECORDS AVAILABLE.—April 1924 to September 1933.

DISCHARGE.—Maximum during year, 4,350 second-feet Apr. 19 (gage height, 5.4 feet); minimum, 62 second-feet Oct. 13-15, 17-22 (gage height, 0.20 foot).

1924-33: Maximum, 7,050 second-feet Apr. 20, 1927 (supersedes figure previously published) and Nov. 21, 1930 (gage height, 6.50 feet); minimum, 38 second-feet, measured by current meter Feb. 5, 1926.

REMARKS.—Records furnished by United States Army Engineers July 1929 to Sept. 1933. Records good except those for periods of ice effect, Apr. 1-10, Nov. 30 to Dec. 14, 1930, Apr. 5-11, 1931, Nov. 30, 1931, to Feb. 24, 1932, Feb. 26 to Apr. 14, 1932, Nov. 19 to Dec. 9, 1932; and those during periods of log driving, Apr. 20 to June 18, July 17-23, 1930, Apr. 25 to May 15, 1931, which are poor. Some regulation from lakes above during log-driving periods.

Discharge, in second-feet, 1926-33

Day	1926-27											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	978	540	210	160	120	80	500	2,560	1,150	1,010	482	282
2.....	1,020	540	200	160	120	80	530	2,450	1,150	695	458	282
3.....	895	502	200	160	120	80	560	2,670	1,150	668	458	282
4.....	1,520	502	200	160	120	80	590	3,430	1,220	640	435	265
5.....	1,690	465	200	150	120	80	620	3,430	1,080	612	435	265
6.....	1,520	465	200	150	120	80	700	3,160	1,080	1,460	412	265
7.....	1,280	465	200	150	120	90	780	2,670	1,010	1,640	412	265
8.....	1,110	432	190	150	110	100	860	2,340	940	1,380	412	265
9.....	1,020	432	190	150	110	110	940	2,670	940	1,220	412	248
10.....	935	432	190	150	110	120	1,000	2,900	1,010	2,030	412	248
11.....	1,020	400	190	150	110	155	1,110	2,670	1,010	1,380	412	248
12.....	1,110	400	190	140	110	190	1,280	2,560	940	940	388	282
13.....	1,110	372	190	140	110	225	1,440	2,560	812	1,010	388	265
14.....	1,020	235	180	140	110	260	1,560	2,780	812	1,220	388	248
15.....	1,020	235	180	140	100	300	1,690	2,450	812	1,150	365	248
16.....	935	235	180	140	100	310	2,500	2,340	812	1,150	365	248
17.....	895	230	180	140	100	310	3,320	2,340	752	1,010	342	248
18.....	855	230	180	140	100	320	3,780	2,030	752	875	342	248
19.....	815	230	180	130	100	330	5,580	1,930	724	812	342	216
20.....	775	220	180	130	100	330	7,050	1,930	695	812	342	215
21.....	775	220	170	130	100	340	5,840	1,640	1,300	752	342	215
22.....	775	220	170	130	90	350	4,180	1,550	1,300	695	342	200
23.....	775	220	170	130	90	360	3,160	1,550	1,300	640	342	200
24.....	735	220	170	130	90	360	2,240	1,460	1,300	585	342	200
25.....	695	220	170	130	90	370	2,450	1,550	1,220	559	321	185
26.....	615	210	170	130	90	380	2,130	1,730	1,150	559	321	170
27.....	615	210	170	130	90	400	2,560	1,640	1,010	533	300	170
28.....	578	210	160	120	90	420	2,560	1,550	1,010	533	300	170
29.....	578	210	160	120	-----	440	2,670	1,460	1,010	533	300	185
30.....	578	210	160	120	-----	450	2,560	1,460	1,010	508	300	265
31.....	578	-----	160	120	-----	470	-----	1,380	-----	508	300	-----

*Discharge, in second-feet, of Pigeon River at International Bridge, Minn.,
1926-33—Continued*

Day	1927		1928							1929		
	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.	Oct.	July	Aug.	Sept.
1.....	300	170	* 800	1,930	533	940	612	695	435		62	44
2.....	300	170	* 1,800	2,340	585	812	585	723	435		62	44
3.....	388	185	* 3,000	2,780	559	752	585	695	388		62	44
4.....	411	185	5,840	2,780	482	640	559	695	388		62	48
5.....	365	185	5,020	2,340	482	640	559	667	533		62	55
6.....	342	185	4,180	2,130	452	533	559	667	533	* 168	78	55
7.....	342	185	3,860	1,930	435	695	533	640	533		88	48
8.....	300	185	3,710	1,640	507	1,220	507	585	482		88	55
9.....	300	185	3,430	1,550	452	1,640	482	533	482		88	62
10.....	265	180	3,160	1,550	482	1,550	482	533	482		78	78
11.....	248	175	3,160	1,380	452	1,340	482	559	482		78	98
12.....	215	170	2,900	1,220	482	1,040	482	533	435		78	120
13.....	215	170	2,450	1,080	812	752	458	482	435		98	120
14.....	215	170	2,030	940	1,220	640	458	482	435		98	120
15.....	215	170	1,640	752	940	533	533	507	435	145	88	98
16.....	200	170	1,150	585	752	752	559	533	482	145	78	98
17.....	200	170	875	612	1,460	752	585	559	533	145	78	78
18.....	185	170	940	612	3,710	752	533	533	533	120	70	62
19.....	185	170	810	612	2,340	752	533	482	533	120	70	55
20.....	170	170	750	585	1,880	695	533	482	533	120	62	55
21.....	170	170	875	585	1,640	695	533	482	533	98	78	55
22.....	158	170	1,010	533	1,460	695	507	482	533	88	78	55
23.....	158	170	1,010	533	1,640	812	533	533	533	88	78	55
24.....	158	170	1,080	533	2,670	752	533	533	585	78	78	55
25.....	158	170	1,220	585	2,240	695	533	507	585	78	62	55
26.....	158	* 184	1,150	585	1,680	695	533	482	585	78	62	70
27.....	145		1,300	585	1,300	695	559	482	585	70	55	98
28.....	145		1,460	559	940	640	640	458	585	70	55	145
29.....	145		1,640	585	752	585	612	458	533	62	48	145
30.....	158		1,830	585	533	585	695	458	533	62	48	145
31.....	158			533		612	667		533	62	48	

Day	1929-30							
	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1.....	120	533	98	1,270	740	812	300	185
2.....	120	1,010	116	1,460	760	651	282	185
3.....	98	752	130	1,460	770	543	282	170
4.....	120	640	155	1,370	780	444	265	170
5.....	120	482	188	1,320	790	435	265	157
6.....	98	388	244	1,460	800	383	247	157
7.....	98	300	325	1,840	810	342	230	145
8.....	98	342	640	2,290	825	300	230	120
9.....	98	300	940	1,700	840	282	157	109
10.....	120	300	1,080	1,540	860	265	78	70
11.....	120	342	1,110	1,400	870	247	62	70
12.....	132	342	1,300	1,400	880	282	48	78
13.....	145	300	1,260	1,400	1,230	351	48	78
14.....	145	300	1,010	1,400	1,010	365	48	145
15.....	132	265	1,010	1,400	810	342	48	120
16.....	120	265	752	1,400	510	282	44	88
17.....	120	265	640	1,400	270	450	40	88
18.....	120	230	667	1,350	250	540	40	98
19.....	109	230	752	1,300	247	569	40	120
20.....	109	200	770	1,260	185	569	170	157
21.....	98	* 160	710	1,210	157	530	247	157
22.....	98		440	1,160	157	510	230	157
23.....	88		510	1,100	170	462	230	145
24.....	88		430	1,050	230	460	247	157
25.....	78		400	1,000	300	460	247	157
26.....	78		450	940	875	427	230	145
27.....	78		630	890	1,110	411	230	215
28.....	78		870	840	890	382	230	300
29.....	88		810	790	706	342	215	265
30.....	109		930	740	651	342	215	230
31.....	200			740		320	200	

* Estimated.

Discharge, in second-feet, of Pigeon River at International Bridge, Minn., 1926-33—
Continued

Day	1930-31								
	Oct.	Nov.	Dec.	Apr.	May	June	July	Aug.	Sept.
1.....	200	200	914	" 100	730	585	300	120	44
2.....	230	215	862		730	533	282	145	44
3.....	215	215	825		730	533	265	132	48
4.....	215	230	788		730	559	247	120	48
5.....	215	230	741		98 730	585	230	120	48
6.....	170	230	695		135 730	559	230	109	48
7.....	300	200	662		188 730	533	215	109	44
8.....	940	170	618		233 770	507	388	98	44
9.....	695	145	585		334 780	435	559	98	40
10.....	640	120	554		585 1,200	435	533	88	40
11.....	612	120	523		559 1,420	411	533	78	40
12.....	482	120	482		533 1,220	533	533	78	40
13.....	388	120	454		507 1,010	1,010	507	70	62
14.....	342	120	416		482 890	1,150	482	70	62
15.....	321	282			458 860	1,220	458	70	55
16.....	365	1,730			435 940	1,220	435	70	55
17.....	435	2,340			458 907	1,190	435	62	55
18.....	388	1,640			458 1,150	1,150	435	62	55
19.....	388	1,300			507 1,010	940	458	55	55
20.....	342	3,160			482 752	482	435	55	62
21.....	321	7,050			507 752	482	388	55	170
22.....	265	3,860	" 290		533 752	435	342	55	230
23.....	230	2,560			559 723	435	321	48	215
24.....	200	1,550			585 812	411	300	48	200
25.....	185	1,380			705 1,010	411	265	48	230
26.....	185	1,300			800 1,010	365	230	44	435
27.....	185	1,190			740 1,010	342	200	44	388
28.....	185	1,080			740 1,220	342	185	44	342
29.....	200	1,010			740 986	321	157	44	265
30.....	200	954			740 752	300	132	44	200
31.....	200				667		120	44	

Day	1931-32											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Jul.	Aug.	Sept.
1.....	200	723	444	150	120	135	127	1,880	1,300	365	230	200
2.....	170	585	370	147	120	137	127	1,830	1,220	342	230	200
3.....	157	482	321	145	120	137	107	1,830	1,190	342	230	200
4.....	170	411	286	145	120	138	125	1,640	1,150	321	230	170
5.....	215	365	258	142	118	137	125	1,550	1,080	321	265	170
6.....	280	342	237	142	118	137	162	1,550	1,010	321	265	157
7.....	350	321	222	140	118	137	300	1,640	940	342	265	157
8.....	342	265	209	140	118	135	482	1,680	875	300	247	157
9.....	300	265	197	140	116	135	640	1,680	812	300	247	157
10.....	265	265	191	137	116	135	776	1,680	752	265	247	145
11.....	230	265	185	137	116	135	901	1,600	695	265	230	145
12.....	200	265	182	135	116	135	1,010	1,380	640	265	230	120
13.....	185	300	179	135	116	135	1,020	1,340	585	482	215	98
14.....	170	300	173	135	116	135	1,510	1,300	585	435	200	98
15.....	170	342	170	132	116	132	1,260	1,220	559	389	200	78
16.....	157	342	170	132	113	132	1,550	1,220	533	389	185	78
17.....	145	533	167	130	113	132	1,640	1,780	640	342	185	78
18.....	145	875	165	130	113	132	1,930	1,640	559	300	170	78
19.....	145	1,080	165	130	113	132	2,240	1,550	612	265	170	78
20.....	132	1,300	162	130	113	132	3,020	1,220	585	482	157	78
21.....	132	1,550	160	127	111	132	3,020	1,300	559	452	157	78
22.....	132	1,420	160	127	111	130	3,300	1,260	559	389	157	78
23.....	145	1,110	157	127	111	130	3,020	1,220	533	321	145	78
24.....	200	1,010	157	125	111	130	2,240	1,080	533	321	145	78
25.....	282	940	155	125	111	130	2,130	1,080	507	321	170	78
26.....	230	907	155	125	111	130	1,930	1,080	482	300	185	78
27.....	940	875	152	125	109	130	1,730	1,110	435	300	200	78
28.....	1,190	875	152	125	116	130	1,460	1,220	411	265	215	78
29.....	1,150	640	152	122	130	130	1,460	1,260	388	230	215	78
30.....	1,000	523	150	122		127	1,730	1,380	365	230	215	78
31.....	843		150	122		127		1,340		230	200	

* Estimated.

Discharge, in second-feet, of Pigeon River at International Bridge, Minn., 1926-33—
Continued

Day	1932-33											
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept
1.....	78	200	450	230	170	145	300	3,430	695	300	170	88
2.....	78	185	440	230	170	145	388	3,020	640	300	145	88
3.....	78	185	440	230	170	145	388	2,450	1,300	300	145	88
4.....	78	200	440	230	170	145	388	2,240	1,010	300	145	78
5.....	78	200	430	230	170	158	388	1,730	812	230	120	78
6.....	78	200	430	230	170	158	482	1,300	752	230	120	78
7.....	88	200	430	230	170	158	482	1,150	695	230	120	88
8.....	88	412	420	230	170	158	533	1,080	1,220	300	120	132
9.....	88	2,030	420	230	170	158	533	940	1,010	300	120	120
10.....	78	3,710	420	230	170	158	695	1,220	875	265	120	120
11.....	78	2,670	410	230	170	158	752	1,010	752	230	120	109
12.....	78	1,380	410	230	170	158	752	1,220	752	230	120	88
13.....	62	1,080	410	230	170	132	752	1,640	752	200	120	88
14.....	62	640	410	200	170	120	812	1,640	695	230	120	78
15.....	62	612	400	200	170	120	812	1,640	695	200	120	78
16.....	70	585	400	200	170	120	812	1,080	695	200	120	120
17.....	62	533	400	200	170	120	2,340	940	640	200	120	185
18.....	62	482	400	200	170	120	3,710	1,150	640	200	120	215
19.....	62	480	390	200	170	120	4,350	1,150	585	200	109	365
20.....	62	470	388	200	158	120	3,020	695	585	170	109	458
21.....	62	470	388	200	158	120	2,560	695	640	170	109	458
22.....	62	470	342	200	158	132	3,430	812	752	170	109	458
23.....	78	470	342	200	158	132	2,670	668	752	300	109	458
24.....	98	460	300	170	158	145	2,130	812	695	435	109	412
25.....	120	460	300	170	158	145	1,830	752	752	435	109	412
26.....	132	460	300	170	158	170	1,640	752	640	388	98	458
27.....	145	460	300	170	145	185	1,300	695	533	300	98	508
28.....	170	450	265	170	145	200	1,010	695	482	230	98	458
29.....	185	450	265	170	-----	230	1,380	695	388	230	98	388
30.....	185	450	265	170	-----	248	2,670	1,010	342	230	88	300
31.....	200	-----	230	170	-----	265	-----	752	-----	200	88	-----

Month	Maximum	Minimum	Mean	Per square m ² e	Run-off in inches
1926-27					
October.....	1,690	578	930	1.58	1.82
November.....	540	-----	324	.549	.61
December.....	-----	-----	182	.308	.36
January.....	-----	-----	139	.236	.27
February.....	-----	-----	105	.178	.19
March.....	-----	-----	257	.436	.50
April.....	7,050	-----	2,220	3.76	4.20
May.....	3,430	1,380	2,220	3.76	4.34
June.....	1,300	695	1,020	1.73	1.93
July.....	2,030	508	907	1.54	1.78
August.....	482	300	371	.629	.73
September.....	282	170	236	.400	.45
The year.....	7,050	-----	746	1.26	17.18
1927-28					
October.....	411	145	228	.386	.44
November.....	-----	170	176	.298	.33
December.....	-----	-----	* 134	.227	.26
January.....	-----	-----	* 85.2	.144	.17
February.....	-----	-----	* 66.2	.112	.12
March.....	-----	-----	* 89.8	.152	.18
April.....	5,840	750	2,140	3.63	4.05
May.....	2,780	533	1,150	1.95	2.25
June.....	3,710	435	1,130	1.92	2.14
July.....	1,640	533	803	1.36	1.57
August.....	695	458	547	.927	1.07
September.....	723	458	549	.931	1.04
The year.....	-----	-----	589	.998	13.62

* Estimated.

Discharge, in second-feet, of Pigeon River at International Bridge, Minn., 1926-33—
Continued

Month	Maximum	Minimum	Mean	Per square mi ^e	Run-off in inches
1928-29					
October	585	388	505	C. 856	0.99
November			* 460	.780	.87
December			* 244	.414	.48
January			* 111	.188	.22
February			* 84.3	.143	.15
March			* 153	.259	.30
April			* 937	1.59	1.77
May			* 700	1.19	1.37
June			* 423	.717	.80
July		62	128	.217	.25
August	98	48	71.5	.121	.14
September	145	44	77.2	.131	.15
The year			325	.551	7.49
1929-30					
October	200	78	110	.186	.21
November	1,010		313	.531	.59
December			* 113	.192	.22
January			* 112	.190	.22
February			* 96.8	.164	.17
March			* 81.3	.138	.16
April	1,300	98	646	1.09	1.22
May	2,290	740	1,290	2.19	2.52
June	1,230	157	649	1.10	1.23
July	812	247	422	.715	.82
August	300	40	176	.298	.34
September	300	70	148	.251	.28
The year	2,290	40	347	.588	7.98
1930-31					
October	940	170	330	.559	.64
November	7,050	120	1,160	1.97	2.20
December	914		453	.768	.89
January			* 191	.324	.37
February			* 137	.232	.24
March			* 112	.190	.22
April	800	98	450	.763	.85
May	1,420	667	994	1.52	1.75
June	1,220	300	614	1.04	1.16
July	559	120	342	.580	.67
August	145	44	75.1	.127	.15
September	435	40	122	.207	.23
The year			407	.690	9.37
1931-32					
October	1,190	132	335	.568	.65
November	1,550	265	649	1.10	1.23
December	444	150	198	.336	.39
January	150	122	133	.225	.26
February	130	109	116	.197	.21
March	138	127	133	.225	.26
April	3,300	107	1,370	2.32	2.59
May	1,880	1,080	1,440	2.44	2.81
June	1,300	365	703	1.19	1.33
July	482	230	329	.558	.64
August	265	145	207	.351	.40
September	200	78	114	.193	.22
The year	3,300	78	476	.807	10.99
1932-33					
October	200	62	93.8	.159	.18
November	3,710	185	702	1.19	1.33
December	450	230	375	.636	.73
January	230	170	205	.347	.40
February	170	145	165	.280	.29
March	265	120	154	.261	.30
April	4,350	300	1,440	2.44	2.72
May	3,430	668	1,260	2.14	2.47
June	1,300	342	726	1.23	1.37
July	435	170	255	.432	.50
August	170	88	117	.198	.23
September	508	78	235	.398	.44
The year	4,350	62	447	.808	10.96

* Estimated.

NOTE.—Records of daily and monthly discharge for period Apr. 19, 1927, to Oct. 31, 1927 supersede those published in Water-Supply Papers 644 and 664.

Discharge Apr. 20 to June 18, July 17-23, 1930, Apr. 25 to May 15, 1931, regulated by log-driving operations. Daily and monthly discharge for these periods as given in the above tables has been corrected for this regulation in order to obtain the discharge that would have occurred if no log-driving operations had taken place.

STREAMS TRIBUTARY TO LAKE MICHIGAN

MENOMINEE RIVER AT TWIN FALLS, NEAR IRON MOUNTAIN, WIS.

LOCATION.—In sec. 12, T. 40 N., R. 31 W., at power plant of Wisconsin-Michigan Power Co., 3 miles above mouth of Pine River and $3\frac{1}{2}$ miles north of Iron Mountain.

DRAINAGE AREA.—1,790 square miles.

RECORDS AVAILABLE.—January 1914 to September 1933.

DISCHARGE.—Maximum mean daily during year, 11,200 second-feet Apr. 21; minimum, 508 second-feet Sept. 9.

1914-33: Maximum mean daily 16,700 second-feet Apr. 23, 24, 1916; minimum, 154 second-feet Aug. 9, 1925. Average, 19 years (1914-33), 1,730 second-feet.

REMARKS.—Records good. Discharge determined from power-house records. Besides regulation by power plant at which station is located, flow is regulated by a plant on Brule River about 5 miles above station, where drainage area is 58 percent of that at station. Records of daily discharge furnished by Wisconsin-Michigan Power Co.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	820	1,320	1,250	946	961	768	1,790	7,500	2,470	1,120	661	580
2.....	836	1,430	1,110	919	980	835	2,080	8,420	2,380	1,060	674	590
3.....	889	1,340	1,070	1,080	961	868	1,810	8,610	2,130	990	681	621
4.....	838	1,110	1,180	1,080	1,000	865	1,820	7,860	1,710	952	712	602
5.....	821	1,070	1,030	1,070	869	909	1,830	6,780	1,770	952	690	566
6.....	801	1,080	1,110	1,040	857	833	1,860	6,300	1,940	772	692	561
7.....	786	1,180	1,100	1,010	841	887	1,770	5,160	2,220	743	653	521
8.....	751	1,450	1,080	1,000	818	897	1,650	4,570	3,220	753	656	531
9.....	790	2,060	1,010	902	782	867	1,420	4,310	2,810	899	702	508
10.....	769	2,220	905	904	790	863	1,530	3,890	2,670	1,000	683	559
11.....	705	2,220	817	912	749	858	1,730	3,890	2,430	991	625	614
12.....	726	2,220	811	886	846	851	1,520	3,670	2,210	884	539	633
13.....	720	1,670	858	824	714	823	1,490	3,320	1,910	894	634	638
14.....	630	1,540	857	808	725	838	1,650	3,440	1,780	735	645	634
15.....	634	1,600	852	927	745	852	1,870	4,320	1,850	711	606	656
16.....	669	1,230	891	846	747	820	2,000	3,810	1,630	766	610	785
17.....	636	1,300	1,010	839	779	798	2,180	3,820	1,300	700	641	921
18.....	640	1,550	965	842	769	858	4,620	4,630	1,040	762	651	842
19.....	680	1,580	957	834	811	852	7,980	4,460	1,040	705	641	1,400
20.....	751	1,160	921	825	782	822	10,000	4,260	1,100	704	618	1,330
21.....	799	1,070	957	805	757	830	11,200	3,670	1,020	610	580	936
22.....	781	1,060	846	857	798	834	10,700	3,030	1,120	643	650	874
23.....	878	1,060	866	851	820	874	9,250	2,640	1,320	668	640	889
24.....	817	1,040	869	857	824	862	8,580	2,600	1,360	652	614	882
25.....	828	1,210	913	860	789	868	7,760	2,620	1,190	634	617	769
26.....	895	1,160	844	1,010	855	865	7,870	2,560	1,390	681	673	955
27.....	813	1,100	825	1,050	766	881	7,400	2,550	1,240	648	651	947
28.....	799	1,140	1,090	909	804	867	6,820	2,150	1,140	713	611	953
29.....	894	1,110	1,110	944	-----	865	6,100	1,880	1,260	664	614	1,020
30.....	859	1,110	1,140	853	-----	987	6,270	1,900	1,150	774	634	1,020
31.....	1,050	-----	1,130	865	-----	1,580	-----	2,440	-----	744	607	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	1,050	630	784	0.438	0.05
November.....	2,220	1,040	1,380	.771	.86
December.....	1,250	811	983	.549	.63
January.....	1,080	805	915	.511	.59
February.....	1,000	714	819	.458	.48
March.....	1,580	768	882	.493	.57
April.....	11,200	1,420	4,480	2.50	2.79
May.....	8,610	1,880	4,230	2.36	2.72
June.....	3,220	1,020	1,730	.967	1.08
July.....	1,120	610	791	.442	.51
August.....	712	539	642	.359	.41
September.....	1,400	508	778	.435	.49
The year.....	11,200	508	1,530	.855	11.63

MENOMINEE RIVER BELOW KOSS, MICH.

LOCATION.—In sec. 9, T. 34 N., R. 27 W., at the power plant of Menominee & Marinette Light & Traction Co., half a mile above mouth of Little Cedar River and 4 miles below Koss.

DRAINAGE AREA.—3,790 square miles.

RECORDS AVAILABLE.—July 1913 to September 1933.

DISCHARGE.—Maximum mean daily during year, 14,700 second-feet Apr. 23; minimum, 289 second-feet Sept. 6.

1913-33: Maximum mean daily, 23,200 second-feet Apr. 23, 25, 1916; minimum, 162 second-feet Sept. 15, 1931. Average, 20 years (1913-33), 3,190 second-feet.

REMARKS.—Records good. Discharge determined from power-house records.

Flow regulated by six dams above station, which are used for developing power.

Records of daily discharge furnished by Wisconsin Public Service Corporation.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	984	1,640	1,990	1,940	1,150	729	2,500	9,150	4,440	2,110	856	995
2.....	1,040	1,980	1,960	1,610	1,880	1,770	4,340	10,300	4,700	1,970	671	590
3.....	1,060	1,940	2,230	1,550	1,350	1,160	4,430	11,100	3,940	1,490	1,380	995
4.....	1,560	2,420	2,020	1,380	1,250	1,160	4,730	12,200	2,930	1,460	937	1,080
5.....	1,690	2,370	1,980	1,410	1,660	1,720	4,990	12,100	2,940	613	532	521
6.....	926	1,920	1,810	1,660	960	1,310	4,550	10,400	3,300	1,710	972	289
7.....	949	1,260	2,130	1,880	1,250	903	5,290	8,970	4,600	1,540	1,130	787
8.....	1,400	1,690	1,660	1,930	1,310	1,680	5,440	7,530	5,000	799	1,060	1,010
9.....	683	2,870	1,680	1,340	1,220	1,410	5,790	7,020	6,010	1,330	683	764
10.....	1,040	3,530	1,900	1,170	1,490	1,440	5,460	6,240	5,340	729	613	463
11.....	1,520	4,540	1,560	1,130	1,260	1,630	5,490	6,670	5,040	1,690	1,110	475
12.....	613	5,100	1,130	1,320	1,040	1,620	4,560	5,460	5,010	937	1,030	486
13.....	359	4,690	984	1,690	1,270	694	4,030	5,290	4,070	868	729	752
14.....	1,090	4,790	1,370	1,330	1,120	1,120	3,900	5,520	3,990	1,860	775	972
15.....	1,300	3,220	1,160	1,140	1,230	1,300	4,190	5,570	3,450	1,090	579	741
16.....	1,220	1,640	787	926	856	1,170	5,200	6,550	3,010	1,240	706	984
17.....	787	2,810	1,390	787	995	1,620	6,780	6,040	3,480	810	926	1,280
18.....	810	2,420	1,310	1,620	729	1,720	6,050	5,590	2,150	1,570	706	567
19.....	1,220	2,100	718	1,460	926	1,620	6,930	7,770	2,490	961	729	787
20.....	1,340	2,320	1,330	1,040	833	1,240	9,560	8,500	2,120	741	1,730	1,280
21.....	1,480	2,370	1,250	1,010	1,050	1,090	11,700	8,040	2,620	1,040	706	2,450
22.....	1,840	2,040	1,670	1,540	1,330	1,330	13,800	6,990	2,260	1,160	475	1,610
23.....	1,190	2,090	1,660	1,450	1,680	1,350	14,700	5,690	2,180	1,180	694	1,030
24.....	764	1,740	1,390	1,520	1,040	1,350	13,700	5,650	2,040	1,100	590	1,190
25.....	1,060	1,720	1,320	1,300	1,310	1,770	12,100	4,730	1,660	544	1,270	
26.....	1,330	2,070	1,820	1,230	1,700	1,500	11,200	4,820	1,710	718	428	1,110
27.....	1,380	1,750	1,410	1,390	1,160	1,270	10,300	4,290	2,140	810	428	1,380
28.....	1,620	1,980	1,270	1,770	891	1,320	9,860	3,890	2,600	1,150	324	2,040
29.....	1,200	1,850	1,780	1,670	-----	1,740	8,820	3,670	2,280	1,090	324	1,260
30.....	1,280	2,200	1,830	1,300	-----	1,660	8,400	3,180	1,940	718	405	1,230
31.....	1,630	-----	2,070	1,240	-----	2,010	-----	3,370	-----	521	949	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	1,840	359	1,170	0.309	0.36
November.....	5,100	1,260	2,500	.660	.74
December.....	2,230	718	1,570	.414	.48
January.....	1,940	787	1,410	.372	.43
February.....	1,880	729	1,210	.319	.33
March.....	2,010	694	1,400	.369	.43
April.....	14,700	2,500	7,290	1.92	2.14
May.....	12,200	3,180	6,850	1.81	2.09
June.....	6,010	1,710	3,330	.879	.98
July.....	2,110	521	1,180	.311	.36
August.....	1,730	324	765	.202	.23
September.....	2,450	289	1,010	.266	.30
The year.....	14,700	289	2,470	.652	8.87

PINE RIVER AT PINE RIVER POWER PLANT, NEAR FLORENCE, WIS.

LOCATION.—In sec. 28, T. 39 N., R. 18 E., at power plant of Wisconsin-Michigan Power Co. 6½ miles south of Florence.

DRAINAGE AREA.—520 square miles.

RECORDS AVAILABLE.—October 1923 to September 1933; January 1914 to September 1923 at station 4 miles upstream.

DISCHARGE.—Maximum mean daily during year, 2,070 second-feet May 19; no flow July 9, 16, 30.

1923-33: Maximum mean daily, 4,380 second-feet Apr. 9, 1929; no flow at times in 1924, 1926, 1927, 1930, 1931, 1933. Average, 10 years (1923-33), 408 second-feet.

REMARKS.—Records good for medium and low stages; fair for high stages. Discharge determined from power-house records. Flow regulated by power plant at station, but pondage is small and monthly discharge is very nearly natural flow. Records of daily discharge furnished by Wisconsin-Michigan Power Co.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	198	226	226	169	183	141	240	1,720	552	218	105	68
2	99	212	226	169	155	155	267	1,640	529	149	135	68
3	133	198	226	169	141	169	391	1,650	375	220	122	56
4	127	226	113	155	141	161	442	1,480	473	54	68	56
5	127	222	282	169	113	113	503	1,280	607	203	68	56
6	113	226	240	183	169	169	523	1,170	656	205	56	85
7	127	240	250	169	155	169	529	987	771	203	122	68
8	135	339	226	56	155	155	490	822	763	147	122	85
9	56	567	195	197	155	141	464	679	783	0	44	141
10	127	664	122	183	155	141	475	689	859	162	23	94
11	149	664	102	183	127	141	517	689	614	162	95	113
12	135	664	195	183	113	127	329	684	654	184	138	113
13	133	457	170	141	169	183	428	682	784	77	53	113
14	190	402	155	141	141	141	528	752	664	187	110	98
15	198	339	170	56	127	141	637	776	593	141	68	98
16	127	325	170	155	141	183	746	798	550	0	108	113
17	226	226	90	155	127	141	1,120	776	425	138	68	56
18	240	339	56	155	127	147	1,340	1,840	416	108	68	113
19	212	339	164	155	113	141	1,530	2,070	501	108	141	240
20	198	226	136	155	197	212	1,480	1,980	367	148	71	382
21	190	226	136	141	141	212	1,630	1,910	327	95	68	333
22	185	226	198	134	141	141	1,630	1,400	339	208	75	325
23	79	226	198	169	141	135	1,660	1,140	390	28	70	246
24	198	226	164	172	141	155	1,630	904	339	205	68	144
25	198	226	154	183	149	183	1,590	854	366	135	62	309
26	127	226	198	169	99	127	1,520	664	339	115	70	197
27	197	99	198	169	141	169	1,310	664	325	115	37	203
28	198	226	198	122	178	169	1,150	539	320	108	68	217
29	198	226	212	113	---	190	1,130	586	230	162	68	54
30	212	226	184	183	---	196	1,300	664	212	0	32	183
31	246	---	198	183	---	240	---	609	---	99	86	---

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	246	56	163	0.313	0.36
November	664	99	308	.592	.66
December	282	56	179	.344	.40
January	197	56	156	.300	.35
February	197	99	144	.277	.29
March	240	113	161	.310	.36
April	1,660	240	918	1.77	1.98
May	2,070	539	1,070	2.06	2.38
June	850	212	504	.969	1.08
July	230	0	133	.256	.30
August	141	23	80	.154	.18
September	382	54	148	.285	.32
The year	2,070	0	330	.635	8.66

PIKE RIVER AT AMBERG, WIS.

LOCATION.—Chain gage in sec. 22, T. 35 N., R. 20 E., at highway bridge 3,000 feet below Chicago, Milwaukee, St. Paul & Pacific Railroad bridge half a mile south of Amberg.

DRAINAGE AREA.—240 square miles.

RECORDS AVAILABLE.—February 1914 to September 1933.

DISCHARGE.—Maximum during year, 1,340 second-feet June 7 (gage height, 6.20 feet); minimum, 88 second-feet Aug. 26 (gage height, 1.27 feet).

1914-33: Maximum, 2,730 second-feet Apr. 10, 1922 (gage height, 7.68 feet); minimum, 26 second-feet Dec. 27, 1925 (gage height, 1.30 feet). Average, 19 years (1914-33), 236 second-feet.

REMARKS.—Records good except those for period of ice effect, Nov. 17-26, Dec. 8 to Mar. 30, which are fair.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	93	114	170	114	103	139	462	596	224	139	103	93
2	93	114	178	126	108	132	596	596	196	132	103	93
3	88	114	178	120	103	146	596	515	187	126	114	93
4	93	114	178	114	98	154	569	410	205	126	108	98
5	93	114	205	126	93	154	569	359	254	120	108	93
6	98	126	187	126	93	154	596	334	924	120	103	98
7	93	146	178	126	93	154	569	287	1,340	120	103	98
8	93	214	170	120	93	162	515	254	1,020	120	98	98
9	103	287	139	114	93	132	488	254	829	117	98	108
10	114	384	126	108	93	108	462	254	680	114	98	103
11	114	359	114	103	93	132	436	244	596	114	103	103
12	108	254	108	93	93	132	384	384	542	108	98	103
13	108	254	103	93	93	132	436	462	462	114	103	103
14	108	224	103	93	93	132	462	438	359	139	98	103
15	108	224	103	93	93	114	542	515	310	146	103	103
16	114	196	103	93	93	187	569	462	287	132	114	108
17	114	214	103	93	93	244	596	384	265	126	120	108
18	114	205	103	93	93	170	596	596	244	120	120	108
19	108	187	108	98	93	139	596	768	224	126	108	120
20	108	178	108	103	98	132	569	624	196	139	103	114
21	108	170	114	98	103	154	542	515	196	146	103	108
22	108	170	114	112	103	178	488	384	196	139	98	103
23	103	170	120	126	108	196	436	310	187	132	98	98
24	103	170	132	126	108	224	384	276	196	126	93	98
25	103	170	178	126	114	287	359	244	196	120	93	139
26	108	170	187	120	120	287	334	224	187	114	88	139
27	114	154	187	114	120	359	265	214	170	114	93	139
28	114	205	178	103	114	436	265	205	154	114	93	126
29	114	154	170	93	-----	488	265	196	154	108	93	120
30	126	170	170	93	-----	488	384	265	146	108	93	114
31	120	-----	139	93	-----	542	-----	254	-----	103	93	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	126	88	106	0.442	0.51
November	384	114	191	.796	.89
December	205	103	144	.600	.69
January	126	93	108	.450	.52
February	120	93	100	.417	.43
March	542	108	213	.888	1.02
April	596	265	478	1.99	2.22
May	768	196	381	1.59	1.83
June	1,340	146	371	1.55	1.73
July	146	103	123	.513	.59
August	120	88	101	.421	.49
September	139	93	108	.450	.50
The year	1,340	88	202	.842	11.42

PESHTIGO RIVER AT HIGH FALLS, NEAR CRIVITZ, WIS.

LOCATION.—In sec. 1, T. 32 N., R. 18 E., at High Falls power house of Wisconsin Public Service Corporation, 1 mile above Thunder River and 10 miles west of Crivitz.

DRAINAGE AREA.—585 square miles.

RECORDS AVAILABLE.—August 1912 to September 1933.

DISCHARGE.—Maximum mean daily during year, 1,470 second-feet Apr. 21; no flow Oct. 6, July 12.

1912-33: Maximum, 3,860 second-feet Apr. 11, 1922 (gage height, 7.80 feet); no flow several days during 1925, 1928, 1929, 1932, 1933. Average, 21 years (1912-33), 505 second-feet.

REMARKS.—Records fair. Discharge determined from records of power plant. Flow is regulated by storage in service reservoir at plant. Records of daily discharge furnished by Wisconsin Public Service Corporation.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	129	179	271	7	864	251	103	861	565	151	280	127
2.....	32	146	369	121	579	231	7	1,090	598	73	217	145
3.....	372	125	149	598	24	309	332	1,070	535	125	95	7
4.....	670	168	285	331	56	450	375	1,430	326	7	235	58
5.....	208	65	553	110	7	40	656	870	784	455	110	88
6.....	0	7	420	195	267	348	778	851	1,050	151	7	265
7.....	123	188	499	113	355	683	505	821	947	470	206	110
8.....	147	419	305	7	262	163	388	793	1,150	263	160	178
9.....	165	498	360	139	170	314	281	641	1,190	7	237	30
10.....	131	501	253	216	37	45	833	667	1,060	444	229	7
11.....	327	393	29	231	59	35	640	855	903	182	64	158
12.....	262	232	272	169	7	7	873	790	871	0	7	139
13.....	383	11	263	81	224	290	496	582	765	131	7	59
14.....	190	976	155	212	341	257	654	742	705	159	135	89
15.....	254	1,010	218	7	133	224	596	1,010	712	46	277	119
16.....	65	335	195	303	86	186	646	957	709	36	215	76
17.....	245	292	200	334	123	204	833	980	519	113	101	150
18.....	462	263	65	185	128	44	1,070	1,020	373	65	6	464
19.....	275	128	384	219	235	89	1,150	1,050	752	227	33	155
20.....	247	7	203	528	176	196	1,220	1,200	687	354	7	6
21.....	231	217	360	152	500	640	1,470	1,250	646	68	124	129
22.....	3	285	204	310	325	641	1,420	935	741	150	238	254
23.....	115	353	167	656	245	491	1,420	901	381	7	79	39
24.....	470	7	557	204	253	117	1,320	755	689	494	89	122
25.....	363	188	217	435	77	267	947	699	322	288	102	293
26.....	359	188	123	139	7	305	881	750	779	160	102	469
27.....	344	7	282	306	140	326	1,020	720	600	70	7	696
28.....	223	237	155	56	54	607	803	357	347	106	51	545
29.....	117	179	338	7	-----	531	841	737	391	7	139	521
30.....	64	186	232	79	-----	468	900	230	288	7	114	260
31.....	201	-----	313	17	-----	484	-----	633	-----	241	86	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	670	0	232	0.337	0.46
November.....	1,010	7	260	.444	.50
December.....	557	29	271	.453	.53
January.....	656	7	209	.337	.41
February.....	864	7	205	.339	.36
March.....	683	7	298	.509	.59
April.....	1,470	7	782	1.34	1.50
May.....	1,430	230	847	1.45	1.67
June.....	1,190	288	680	1.16	1.29
July.....	494	0	164	.239	.32
August.....	280	6	121	.278	.24
September.....	696	6	192	.328	.37
The year.....	1,470	0	355	.677	8.24

OCONTO RIVER NEAR GILLETT, WIS.

LOCATION.—Chain gage in sec. 34, T. 28 N., R. 18 E., at highway bridge 2½ miles southeast of Gillett.

DRAINAGE AREA.—678 square miles.

RECORDS AVAILABLE.—June 1906 to March 1909, January 1914 to September 1933.

DISCHARGE.—Maximum during year, 1,480 second-feet Apr. 1 (gage height, 3.25 feet); minimum, 161 second-feet Aug. 7 (gage height, 0.43 feet).

1906-9, 1914-33: Maximum, 6,470 second-feet Apr. 11, 1922, caused by failure of a dam at Pulcifer, 4 miles upstream (gage height, 9.1 feet); minimum, 95 second-feet June 3, 6, 1907 (gage height, 0.1 foot). Average, 19 years (1914-33), 621 second-feet.

REMARKS.—Records good except those for period of ice effect, Nov. 15 to Dec. 1, Dec. 5 to Mar. 31, which are fair.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	226	258	457	258	413	413	1,480	750	550	331	226	172
2.....	226	258	312	258	413	413	1,420	855	550	331	226	172
3.....	226	258	312	258	312	413	1,360	1,070	550	312	226	172
4.....	212	258	331	258	258	413	1,190	1,130	526	293	212	172
5.....	197	258	331	258	226	413	700	1,070	550	276	212	172
6.....	197	258	331	258	197	371	750	1,070	550	258	161	172
7.....	184	258	331	258	197	331	800	1,020	550	242	161	172
8.....	197	258	331	258	197	293	910	1,020	624	242	197	172
9.....	197	293	331	258	197	242	910	965	650	242	184	172
10.....	197	293	331	258	197	212	910	910	650	226	184	172
11.....	212	276	312	242	197	197	855	800	650	226	184	172
12.....	212	258	276	226	197	212	800	855	599	226	172	172
13.....	226	258	258	226	212	258	800	910	599	226	172	172
14.....	226	226	212	226	226	293	750	855	574	258	172	172
15.....	226	226	197	226	226	312	750	855	550	258	184	172
16.....	242	242	197	226	226	331	700	855	526	258	184	184
17.....	242	258	197	226	226	351	700	800	526	242	184	184
18.....	258	258	197	226	226	371	750	855	503	242	184	184
19.....	258	258	197	242	226	392	750	855	503	226	172	197
20.....	258	258	197	258	242	413	750	910	480	276	172	212
21.....	258	258	197	258	212	413	700	965	435	258	184	212
22.....	258	258	212	258	226	413	700	965	413	258	197	226
23.....	258	258	242	258	276	413	700	910	413	242	197	212
24.....	258	258	435	258	371	413	700	855	392	242	197	212
25.....	258	258	351	371	435	413	750	855	392	242	184	212
26.....	258	258	258	351	435	435	700	750	392	242	172	212
27.....	258	293	258	331	413	457	700	700	371	242	184	226
28.....	258	371	258	312	413	480	750	650	371	242	172	226
29.....	258	413	258	293	-----	503	700	599	351	226	172	212
30.....	258	457	258	276	-----	574	750	599	351	226	172	212
31.....	258	-----	258	258	-----	700	-----	550	-----	226	172	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	258	184	234	0.345	0.40
November.....	457	226	275	.406	.45
December.....	457	197	278	.410	.47
January.....	371	226	262	.386	.44
February.....	435	197	271	.400	.42
March.....	700	197	383	.565	.65
April.....	1,480	700	840	1.24	1.38
May.....	1,130	550	865	1.28	1.48
June.....	650	351	505	.745	.83
July.....	331	226	253	.373	.43
August.....	226	161	186	.274	.32
September.....	226	172	190	.280	.31
The year.....	1,480	161	379	.559	7.58

FOX RIVER AT BERLIN, WIS.

LOCATION.—Staff gage in sec. 16, T. 17 N., R. 13 E., at Government lock and dam $2\frac{1}{2}$ miles upstream from Berlin.

DRAINAGE AREA—1,430 square miles.

RECORDS AVAILABLE.—January 1898 to September 1933.

DISCHARGE.—Maximum mean daily during year, 2,600 second-feet Apr. 11; minimum, 360 second-feet Dec. 18–20.

1898–1933: Maximum mean daily, 6,620 second-feet Mar. 21, 23, 1929; minimum, 250 second-feet Feb. 1–4, 1900. Average, 35 years (1898–1933), 1,120 second-feet.

REMARKS.—Open water records good; winter records fair.

Daily-discharge records furnished by United States Army Engineers.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	535	615	440	520	800	880	1,680	1,220	1,270	645	590	535
2	535	615	480	490	800	950	1,800	1,360	1,180	705	615	510
3	560	615	510	520	740	980	1,850	1,420	1,180	705	615	510
4	590	615	610	510	640	1,030	1,980	1,420	1,100	705	590	535
5	535	615	710	500	550	940	2,100	1,420	1,060	675	590	510
6	535	615	680	490	520	830	2,310	1,460	1,060	675	560	510
7	535	615	580	520	530	765	2,380	1,460	975	675	560	535
8	535	615	450	550	480	705	2,380	1,570	940	675	560	560
9	535	675	410	490	450	650	2,380	1,850	905	705	590	535
10	535	705	450	490	450	580	2,520	2,100	865	705	590	535
11	535	705	430	510	440	520	2,600	2,240	865	705	615	590
12	560	800	420	480	440	550	2,520	2,380	800	705	615	590
13	535	800	430	460	430	580	2,450	2,520	765	705	615	645
14	560	830	440	430	430	610	2,450	2,520	735	705	590	645
15	560	800	430	420	430	645	2,380	2,450	735	705	590	645
16	590	700	410	450	430	645	2,310	2,310	705	705	590	615
17	590	600	390	450	420	645	2,170	2,520	675	705	560	590
18	590	540	360	480	410	645	2,100	2,520	645	675	590	615
19	560	500	360	480	400	560	2,040	2,380	645	675	590	645
20	560	490	360	480	380	465	1,910	2,310	535	645	590	615
21	590	480	370	440	400	590	1,850	2,170	510	675	615	615
22	590	460	370	560	400	705	1,740	2,040	510	675	590	645
23	615	450	380	650	460	735	1,620	1,980	510	715	560	615
24	615	460	430	650	510	675	1,520	1,850	510	705	560	615
25	615	430	570	680	570	735	1,420	1,740	535	675	560	615
26	615	420	550	750	600	735	1,270	1,680	560	645	560	645
27	615	410	540	780	660	765	1,180	1,570	560	615	560	645
28	615	400	540	790	770	765	1,180	1,420	560	615	590	675
29	615	410	540	710	-----	765	1,140	1,320	590	560	590	675
30	615	420	540	680	-----	905	1,100	1,360	645	535	560	675
31	615	-----	530	700	-----	1,360	-----	1,320	-----	535	-----	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	645	535	575	0.402	0.46
November	830	400	580	.406	.45
December	710	360	475	.332	.38
January	790	420	552	.386	.44
February	800	380	519	.363	.38
March	1,360	465	739	.517	.60
April	2,600	1,100	1,940	1.36	1.52
May	2,520	1,220	1,870	1.31	1.51
June	1,270	510	771	.539	.60
July	765	535	675	.472	.54
August	615	535	583	.408	.47
September	675	510	596	.417	.47
The year	2,600	360	824	.576	7.82

FOX RIVER AT RAPIDE CROCHE DAM, NEAR WRIGHTSTOWN, WIS.

LOCATION.—At Rapide Croche Dam, in sec. 4, T. 21 N., R. 19 E., 2 miles above Wrightstown.

DRAINAGE AREA.—6,150 square miles.

RECORDS AVAILABLE.—March 1896 to September 1933.

DISCHARGE.—Maximum mean daily during year, 8,900 second-feet May 19, minimum, 273 second-feet Sept. 24.

1918-33: Maximum mean daily, 20,600 second-feet Apr. 4, 1929; minimum, that of Sept. 24, 1933. Average, 37 years (1896-1933), 4,400 second-feet.

REMARKS.—Records good. Flow regulated by storage in Lake Winnebago. Daily-discharge records furnished by United States Army Engineers.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	890	546	2,820	1,560	3,510	3,300	5,600	4,480	5,910	3,210	1,300	1,070
2.....	475	861	2,040	2,460	2,660	3,320	4,610	3,120	4,920	2,520	1,240	1,080
3.....	958	598	2,220	2,410	2,390	3,220	4,210	4,150	4,540	2,540	1,130	670
4.....	541	768	2,330	2,790	2,100	2,740	5,210	5,710	3,280	3,120	1,280	551
5.....	553	1,030	2,810	2,620	1,810	3,160	5,310	4,700	4,170	3,260	1,180	1,340
6.....	725	872	2,340	2,390	1,720	2,890	4,760	3,980	4,440	3,320	1,100	874
7.....	694	876	2,770	2,060	2,330	3,840	4,340	5,030	4,350	2,940	1,520	841
8.....	869	1,030	1,900	1,960	2,650	3,880	4,140	4,590	4,630	2,580	1,360	1,090
9.....	395	1,650	2,720	2,270	2,590	3,450	3,590	5,860	4,630	1,920	1,220	889
10.....	1,110	1,470	2,310	2,300	2,610	2,800	5,970	6,690	3,990	2,520	1,330	521
11.....	823	1,420	2,120	2,290	2,440	3,320	6,280	7,660	3,590	1,840	1,220	906
12.....	916	1,650	2,910	2,980	2,590	3,160	7,100	7,150	4,110	2,050	1,370	977
13.....	725	3,130	2,380	2,650	3,190	2,900	7,070	6,250	3,780	1,920	1,110	608
14.....	637	2,610	2,590	1,890	3,220	3,180	6,940	7,890	3,400	1,920	1,140	663
15.....	770	1,380	2,500	2,500	3,060	3,150	6,710	8,100	4,200	2,060	1,130	634
16.....	224	2,270	2,500	2,360	3,210	3,700	6,030	8,310	3,810	1,640	1,350	299
17.....	782	2,990	2,290	2,320	3,100	2,720	6,590	8,780	3,700	1,990	1,310	622
18.....	746	2,310	2,440	2,790	2,750	3,050	6,620	8,160	3,200	2,020	1,190	782
19.....	869	1,870	2,760	2,410	2,270	2,550	7,000	8,900	3,590	1,920	1,080	641
20.....	653	2,470	2,470	2,330	2,850	2,210	7,260	7,930	3,760	2,130	707	481
21.....	808	2,300	3,240	2,140	2,720	2,560	6,810	8,790	3,370	1,860	1,140	616
22.....	663	2,910	2,930	3,100	3,440	4,330	5,080	8,030	3,310	1,950	1,100	484
23.....	504	2,850	2,380	2,470	3,520	4,120	5,540	8,310	3,520	1,610	1,140	365
24.....	955	2,410	2,210	2,680	3,180	4,180	5,660	8,260	3,450	1,830	1,030	273
25.....	781	2,240	2,740	2,680	3,080	4,290	3,690	6,830	2,790	2,010	1,080	739
26.....	829	2,280	2,070	2,740	2,890	4,260	3,620	5,300	3,150	1,390	897	533
27.....	721	2,020	2,900	2,420	2,830	4,380	3,930	5,180	3,390	1,100	893	753
28.....	1,000	2,550	2,290	2,550	3,040	5,120	4,250	5,490	3,450	1,650	1,190	684
29.....	746	2,870	2,680	1,970	-----	5,500	4,140	5,600	3,140	966	1,040	625
30.....	379	2,840	2,540	2,440	-----	6,090	2,900	5,260	3,080	908	1,000	659
31.....	833	-----	2,350	2,320	-----	7,000	-----	5,440	-----	1,500	1,520	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	1,110	379	728	0.118	0.14
November.....	3,130	546	1,900	.309	.34
December.....	3,240	1,900	2,500	.407	.47
January.....	3,100	1,560	2,410	.392	.45
February.....	3,520	1,720	2,780	.452	.47
March.....	7,000	2,210	3,690	.600	.69
April.....	7,260	2,900	5,370	.873	.97
May.....	8,900	3,120	6,470	1.05	1.21
June.....	5,910	2,790	3,820	.621	.69
July.....	3,320	908	2,070	.337	.39
August.....	1,520	707	1,170	.190	.22
September.....	1,340	273	709	.115	.13
The year.....	8,900	273	2,800	.455	6.17

WOLF RIVER ABOVE WEST BRANCH OF WOLF RIVER, WIS.

LOCATION.—Chain gage in E½ sec. 3, T. 28 N., R. 15 E., half a mile above West Branch of Wolf River and 3 miles upstream from Keshena. Zero of gage is 856.57 feet above mean sea level.

DRAINAGE AREA.—633 square miles.

RECORDS AVAILABLE.—March 1928 to September 1933.

DISCHARGE.—Maximum during year, 1,290 second-feet May 2 (gage height, 3.90 feet); minimum, 201 second-feet Sept. 6 (gage height, 1.36 feet).

1928-33: Maximum, 2,580 second-feet Apr. 8, 1929 (gage height, 6.10 feet); minimum, 201 second-feet Nov. 21, 1929, and Sept. 6, 1933 (gage height, 1.35 feet).

REMARKS.—Records excellent except those for periods of ice effect, Nov. 25, 26, Dec. 6 to Apr. 11, which are fair.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept
1.....	290	321	404	337	337	337	676	1,240	590	354	215	215
2.....	290	321	387	337	370	337	769	1,290	550	321	244	230
3.....	290	321.	370	337	354	337	722	1,180	550	290	274	230
4.....	290	337	475	337	337	337	632	1,130	550	290	259	215
5.....	290	337	404	337	337	337	722	1,080	590	274	244	215
6.....	290	354	387	337	305	337	870	1,020	676	274	244	201
7.....	290	337	387	337	305	337	818	970	676	274	244	215
8.....	290	439	370	337	290	337	676	920	676	259	230	244
9.....	290	590	337	337	274	274	920	870	632	244	230	290
10.....	305	632	305	337	274	244	818	722	632	244	230	244
11.....	305	590	290	305	274	244	818	632	632	244	230	244
12.....	305	512	274	274	274	274	870	632	590	244	230	244
13.....	305	439	274	274	274	305	920	870	550	244	230	244
14.....	305	337	274	274	274	321	920	970	550	259	230	230
15.....	321	370	274	305	274	337	818	970	512	274	230	230
16.....	321	387	215	305	274	354	870	920	550	274	244	244
17.....	305	512	244	305	274	370	970	970	550	259	259	274
18.....	305	512	259	305	274	370	1,080	1,020	512	244	259	259
19.....	305	475	274	290	274	337	1,130	970	512	244	244	290
20.....	305	404	274	274	274	305	1,180	920	475	274	244	259
21.....	305	370	274	274	274	305	1,180	818	475	321	230	274
22.....	305	370	274	337	290	305	1,180	769	512	305	230	259
23.....	290	370	274	370	305	305	1,130	769	512	305	230	259
24.....	305	354	274	370	305	305	1,080	769	475	274	230	259
25.....	305	337	337	370	305	321	1,080	722	457	274	230	259
26.....	321	321	370	370	305	337	1,020	676	439	259	215	337
27.....	337	305	370	337	321	354	970	676	422	244	230	337
28.....	337	321	370	321	337	387	920	632	404	259	230	337
29.....	321	387	337	321	-----	457	870	632	387	244	215	337
30.....	321	387	337	305	-----	512	1,020	676	354	230	215	305
31.....	321	-----	337	305	-----	590	-----	632	-----	215	215	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	337	290	305	0.482	0.56
November.....	632	305	402	.635	.71
December.....	475	215	324	.512	.59
January.....	370	274	321	.507	.58
February.....	370	274	299	.472	.49
March.....	590	244	342	.540	.62
April.....	1,180	632	922	1.46	1.63
May.....	1,290	632	873	1.38	1.59
June.....	676	354	533	.842	.94
July.....	354	215	268	.423	.49
August.....	274	215	235	.371	.43
September.....	337	201	259	.409	.46
The year.....	1,290	201	423	.668	9.09

WOLF RIVER AT KESHENA FALLS, WIS.

LOCATION.—Water-stage recorder in E½ sec. 22, T. 28 N., R. 15 E., 500 feet below Keshena Falls.

DRAINAGE AREA. 812 square miles.

RECORDS AVAILABLE.—March 1928 to September 1933. May 1907 to March 1909; February 1911 to March 1928 at station 1½ miles downstream, at Keshena.

DISCHARGE.—Maximum during year, 1,660 second-feet May 2 (gage height, 7.04 feet); minimum, 223 second-feet Jan. 12.

1911–33: Maximum, 4,390 second-feet Apr. 10, 1922; minimum, 275 second-feet Sept. 26, 1908. Average, 22 years (1911–33), 803 second-feet.

REMARKS.—Records good except those estimated Nov. 25 to Dec. 9, and those for period of ice effect, Dec. 10 to Apr. 2, which are fair.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	376	402	518	420	465	555	1,130	1,460	801	481	321	281
2.....	376	402	496	386	420	600	1,130	1,660	764	454	311	276
3.....	351	402	474	386	420	600	1,130	1,660	764	454	326	281
4.....	376	402	009	369	386	600	1,080	1,460	729	428	336	281
5.....	376	402	518	369	420	600	1,080	1,280	729	402	336	286
6.....	376	402	496	352	420	600	1,380	1,230	729	376	331	286
7.....	376	428	496	335	403	646	1,180	1,140	801	376	331	291
8.....	351	454	474	335	394	692	980	1,090	801	351	326	291
9.....	351	597	437	335	352	555	1,180	1,040	801	346	321	326
10.....	376	764	335	327	344	600	1,080	958	764	336	316	336
11.....	402	764	335	327	303	600	1,080	878	764	331	316	336
12.....	402	764	335	223	335	600	1,130	801	764	321	311	331
13.....	402	661	335	396	386	600	1,080	878	729	316	311	326
14.....	402	597	295	352	369	600	1,080	1,180	729	311	311	321
15.....	402	537	295	352	510	510	1,030	1,230	694	326	311	316
16.....	402	537	295	369	510	510	1,080	1,180	661	331	311	306
17.....	402	537	295	386	510	692	1,180	1,140	694	336	351	321
18.....	402	508	295	369	555	555	1,380	1,180	661	336	351	336
19.....	402	566	319	420	600	646	1,380	1,230	661	336	351	346
20.....	402	537	335	412	600	739	1,480	1,180	661	331	346	351
21.....	402	537	420	465	600	510	1,480	1,090	628	376	341	351
22.....	376	537	403	465	600	510	1,380	1,040	597	402	331	351
23.....	376	481	386	510	646	465	1,280	958	597	402	321	346
24.....	376	481	420	465	646	510	1,280	1,000	597	402	316	341
25.....	376	432	555	465	646	510	1,180	1,000	597	376	306	341
26.....	376	411	646	465	646	510	1,140	958	566	376	301	351
27.....	376	391	646	420	510	600	1,090	917	566	376	301	402
28.....	402	411	600	412	555	600	1,040	838	537	351	296	402
29.....	402	496	555	394	-----	646	1,000	838	508	346	296	402
30.....	402	496	465	378	-----	786	1,040	801	508	336	291	402
31.....	402	-----	420	378	-----	931	-----	801	-----	326	281	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	402	351	386	0.475	0.55
November.....	764	391	511	.629	.70
December.....	646	295	436	.537	.62
January.....	510	223	368	.478	.55
February.....	646	303	484	.596	.62
March.....	931	465	603	.743	.86
April.....	1,480	980	1,170	1.44	1.61
May.....	1,660	801	1,100	1.35	1.56
June.....	801	508	680	.837	.93
July.....	481	311	366	.451	.52
August.....	351	281	320	.394	.45
September.....	402	276	330	.406	.45
The year.....	1,660	223	564	.695	9.42

WOLF RIVER AT NEW LONDON, WIS.

LOCATION.—Staff gage in sec. 12, T. 22 N., R. 14 E., at New London, three-quarters of a mile below Embarrass River.

DRAINAGE AREA.—2,240 square miles.

RECORDS AVAILABLE.—October 1913 to September 1933.

DISCHARGE.—Maximum during year, 5,320 second-feet Apr. 5, 6 (gage height, 7.9 feet); minimum, 261 second-feet Sept. 6 (gage height, -0.4 foot).

1913-33: Maximum, 15,500 second-feet Apr. 13, 1922 (gage height, 11.4 feet); minimum, that of Sept. 6, 1933. Average, 20 years (1913-33), 1,840 second-feet.

Maximum stage known, 11.6 feet Apr. 16, 1888, reported by United States Engineer Corps.

REMARKS.—Records good except those for period of ice effect, Nov. 19 to Mar. 28, which are fair.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	560	779	812	844	970	1,140	3,360	2,290	1,710	906	479	437
2.....	520	637	812	812	1,140	1,070	4,200	2,470	1,670	875	394	394
3.....	520	745	812	745	1,100	1,070	4,710	2,710	1,670	844	479	350
4.....	350	779	812	710	1,100	1,070	5,160	2,900	1,570	812	560	350
5.....	394	779	779	674	1,000	1,070	5,320	3,030	1,530	779	520	350
6.....	479	710	745	745	844	1,070	5,320	3,160	1,670	674	520	261
7.....	560	674	710	710	812	1,030	5,160	3,160	1,670	599	520	306
8.....	599	674	637	710	812	1,000	4,850	3,360	1,710	710	479	394
9.....	560	812	599	745	745	938	4,440	3,490	1,760	710	394	350
10.....	479	938	599	637	745	875	4,440	3,490	1,860	710	520	394
11.....	520	1,100	599	599	710	812	4,710	3,490	1,810	599	560	394
12.....	560	1,310	599	560	674	812	4,710	3,420	1,570	479	479	394
13.....	599	1,310	560	637	637	875	4,570	3,360	1,480	637	437	306
14.....	637	1,310	520	637	637	906	4,444	3,230	1,480	710	394	520
15.....	637	1,180	520	674	637	875	4,200	3,100	1,480	710	437	479
16.....	674	875	520	637	637	906	3,990	2,970	1,480	637	437	479
17.....	710	745	560	599	674	1,220	3,720	2,900	1,440	599	394	437
18.....	599	745	520	599	674	1,260	3,420	2,840	1,350	580	437	437
19.....	637	745	520	637	674	1,310	3,290	2,840	1,220	394	394	437
20.....	674	745	520	637	637	1,360	3,100	2,840	1,220	599	437	350
21.....	674	745	479	637	599	1,480	2,970	2,840	1,220	710	437	437
22.....	674	745	520	812	599	1,310	2,840	2,710	1,140	779	479	520
23.....	674	745	520	1,000	674	1,220	2,770	2,650	1,070	745	350	560
24.....	674	745	560	1,070	745	1,220	2,710	2,590	1,030	674	437	560
25.....	637	812	745	1,180	970	1,260	2,650	2,350	1,000	637	437	479
26.....	637	779	970	1,260	1,070	1,260	2,590	2,130	1,000	520	437	437
27.....	710	745	1,030	1,220	1,100	1,260	2,530	2,130	938	637	394	350
28.....	710	745	1,030	1,180	1,140	1,310	2,470	2,020	938	674	394	560
29.....	745	745	970	1,100	-----	1,310	2,290	1,860	970	599	394	599
30.....	812	779	844	970	-----	1,350	2,290	1,810	906	560	306	560
31.....	875	-----	875	970	-----	1,710	-----	1,710	-----	560	394	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	875	350	616	0.275	0.32
November.....	1,310	637	839	.375	.42
December.....	1,030	479	687	.307	.36
January.....	1,260	560	805	.359	.41
February.....	1,140	599	813	.363	.38
March.....	1,710	812	1,140	.509	.59
April.....	5,320	2,290	3,770	1.68	1.87
May.....	3,490	1,710	2,770	1.24	1.43
June.....	1,860	906	1,390	.62	.69
July.....	906	394	664	.293	.34
August.....	560	306	443	.197	.23
September.....	599	261	429	.192	.21
The year.....	5,320	261	1,200	.535	7.24

EMBARRASS RIVER NEAR EMBARRASS, WIS.

LOCATION.—Chain gage on line between T. 26 N., R. 14 E., and T. 26 N., R. 15 E., 4 miles upstream from Embarrass.

DRAINAGE AREA.—395 square miles.

RECORDS AVAILABLE.—June 1919 to September 1933.

DISCHARGE.—Maximum during year, 1,450 second-feet Mar. 31 (gage height, 5.65 feet); minimum, 32 second-feet Nov. 25–30, Dec. 1.

1919–33: Maximum, 6,760 second-feet Apr. 10, 1922 (gage height, 11.5 feet); minimum, 23 second-feet Aug. 3, 6, 7, 1931. Average, 14 years (1919–33), 299 second-feet.

REMARKS.—Records excellent except those for period of ice effect, Nov. 17 to Mar. 25, which are fair.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	66	88	32	101	209	475	1,210	650	355	81	60	55
2.....	56	91	40	114	192	475	1,150	1,090	280	79	58	49
3.....	58	91	66	114	175	475	855	1,090	262	73	56	46
4.....	79	101	209	106	175	454	605	910	317	98	51	44
5.....	75	96	77	88	175	434	517	700	355	126	42	46
6.....	64	93	66	88	175	394	855	560	434	104	51	46
7.....	66	98	66	88	159	317	910	434	605	88	53	44
8.....	66	131	114	88	143	244	700	414	560	86	55	42
9.....	68	209	114	88	143	209	605	517	517	73	53	44
10.....	88	374	114	88	143	175	700	517	374	68	51	44
11.....	93	374	114	88	143	159	750	454	355	77	53	46
12.....	88	262	109	88	143	143	650	434	336	75	51	46
13.....	88	199	84	88	143	143	605	582	317	84	51	47
14.....	209	165	66	88	143	143	517	700	298	98	49	47
15.....	109	156	47	88	143	143	517	650	280	86	46	46
16.....	111	143	56	86	143	143	475	605	280	75	47	51
17.....	98	143	66	84	143	159	454	560	226	70	49	60
18.....	109	143	77	86	143	175	496	560	226	86	47	58
19.....	104	143	88	88	143	209	475	475	209	109	51	68
20.....	93	143	114	88	175	280	496	434	195	111	66	77
21.....	81	128	114	88	209	280	475	434	165	104	56	88
22.....	106	114	114	355	244	244	475	434	159	91	60	84
23.....	111	88	114	434	280	209	434	394	137	84	58	73
24.....	98	66	128	355	394	175	394	374	134	75	60	58
25.....	79	32	143	317	434	143	355	434	134	93	62	62
26.....	88	32	143	244	454	137	355	434	165	93	73	96
27.....	88	32	143	143	475	137	317	374	126	68	64	84
28.....	86	32	143	143	475	126	317	317	104	75	62	79
29.....	91	32	128	143	-----	226	298	298	106	91	56	77
30.....	86	32	114	143	-----	454	496	355	96	86	53	79
31.....	93	-----	101	143	-----	1,090	-----	336	-----	68	55	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	209	56	90.2	0.228	0.26
November.....	374	32	128	.324	.36
December.....	209	32	100	.253	.29
January.....	434	84	140	.354	.41
February.....	475	143	218	.552	.57
March.....	1,090	126	276	.699	.81
April.....	1,210	298	582	1.47	1.64
May.....	1,090	298	533	1.35	1.56
June.....	605	96	270	.684	.76
July.....	126	68	86.3	.219	.25
August.....	73	42	54.8	.139	.16
September.....	96	42	59.5	.151	.17
The year.....	1,210	32	211	.534	7.24

LITTLE WOLF RIVER AT ROYALTON, WIS.

LOCATION.—Staff gage in sec. 1, T. 22 N., R. 13 E., at Royalton.

DRAINAGE AREA.—485 square miles.

RECORDS AVAILABLE.—January 1914 to September 1933.

DISCHARGE.—Maximum during year, 2,610 second-feet Apr. 2 (gage height, 4.45 feet); minimum, 69 second-feet Dec. 13 (measured).

1914-33: Maximum, 5,780 second-feet Apr. 10-11, 1922 (gage height, 6.92 feet); minimum, that of Dec. 13, 1933. Average, 19 year^s (1914-33), 457 second-feet.

REMARKS.—Records fair except those for period of ice effect, Nov. 19-28, 30, Dec. 1, Dec. 6 to Mar. 12, Mar. 18-28, which are poor. Slight diurnal fluctuation caused by power plant about 5 miles upstream.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	122	180	273	180	253	631	2,160	522	379	154	132	102
2.....	116	198	293	180	253	574	2,560	840	379	147	132	111
3.....	108	208	293	180	253	425	2,460	995	402	147	122	111
4.....	116	198	314	180	234	379	2,160	956	402	173	122	102
5.....	108	198	253	180	215	379	1,750	917	379	164	141	102
6.....	100	208	253	180	180	425	1,150	840	425	147	132	111
7.....	108	223	253	180	147	425	1,150	765	402	147	141	111
8.....	116	253	245	170	116	379	1,150	917	379	147	122	116
9.....	122	335	215	160	102	293	840	917	379	147	116	122
10.....	134	402	180	147	89	293	840	878	335	164	116	132
11.....	128	473	89	147	89	293	802	878	357	164	132	122
12.....	134	425	82	147	89	293	765	995	293	154	122	132
13.....	134	293	72	147	89	234	765	1,070	273	132	122	147
14.....	128	253	72	147	89	425	663	1,070	253	147	116	154
15.....	134	273	75	144	89	379	631	917	253	141	111	141
16.....	128	253	79	141	89	357	574	917	245	111	102	132
17.....	140	293	89	116	102	335	522	917	253	122	116	141
18.....	134	293	89	116	116	314	548	840	253	132	132	141
19.....	128	293	89	116	180	293	522	840	245	122	132	122
20.....	149	293	89	116	253	273	522	917	234	111	116	122
21.....	156	293	102	132	293	253	522	840	234	164	122	116
22.....	146	293	116	425	379	253	473	765	223	253	102	116
23.....	146	293	164	449	425	335	425	695	208	234	94	111
24.....	156	293	253	425	522	379	379	522	187	187	102	147
25.....	173	293	335	379	840	425	402	574	223	147	111	147
26.....	187	293	379	293	695	379	473	522	164	141	94	132
27.....	180	293	425	180	695	335	425	473	141	122	116	122
28.....	173	273	425	180	695	335	402	402	141	116	102	147
29.....	173	253	293	180	-----	335	379	425	147	111	122	141
30.....	164	273	215	215	-----	574	379	379	147	116	132	147
31.....	173	-----	198	253	-----	1,290	-----	425	-----	122	-----	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	187	100	139	0.287	0.33
November.....	473	180	280	.577	.64
December.....	425	72	203	.417	.48
January.....	449	116	200	.412	.48
February.....	840	89	270	.557	.58
March.....	1,230	234	395	.814	.94
April.....	2,560	379	893	1.84	2.05
May.....	1,070	379	772	1.59	1.53
June.....	425	141	278	.573	.64
July.....	253	111	147	.307	.35
August.....	141	94	119	.245	.28
September.....	154	102	127	.267	.29
The year.....	2,560	72	318	.657	8.89

WAUPACA RIVER NEAR WAUPACA, WIS.

LOCATION.—Chain gage near north line of sec. 1, T. 21 N., R. 12 E., at highway bridge 4 miles below Waupaca.

DRAINAGE AREA.—305 square miles.

RECORDS AVAILABLE.—October 1917 to September 1933. June 1916 to October 1917 at station 1 mile below present site.

DISCHARGE.—Maximum during year, 1,440 second-feet Apr. 2 (gage height, 4.80 feet); minimum, 94 second-feet Oct. 30, Jan. 12, 20.

1916-33: Maximum, 2,600 second-feet Mar. 17, 1919 (gage height, 5.6 feet); minimum (estimated), 35 second-feet Jan. 22, 28, 1926. Average, 17 years (1916-33), 254 second-feet.

REMARKS.—Records fair except those for periods of ice effect, Nov. 19 to Dec. 2 Dec. 8 to Mar. 6, Mar. 9-13, 20-25, which are poor. Slight diurnal fluctuations,

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	135	143	195	120	370	162	1,180	247	195	162	162	162
2.....	135	220	183	162	420	195	1,440	338	183	162	183	162
3.....	143	143	127	207	172	207	960	291	183	162	152	172
4.....	152	162	152	195	127	207	559	261	195	162	172	114
5.....	143	162	183	162	172	207	420	261	220	162	135	152
6.....	135	152	183	183	183	220	673	220	220	162	143	172
7.....	135	143	195	195	120	247	559	247	207	108	162	103
8.....	127	195	207	162	114	233	356	338	183	152	162	127
9.....	143	247	195	183	114	322	306	420	195	127	172	135
10.....	143	195	207	172	127	291	488	338	195	127	135	135
11.....	162	195	172	195	127	233	523	261	172	162	152	143
12.....	127	162	172	94	120	220	338	276	162	172	152	172
13.....	143	172	162	162	114	233	322	322	162	135	152	220
14.....	143	135	162	172	135	207	276	233	183	162	114	195
15.....	152	172	183	172	114	220	261	261	183	162	152	172
16.....	152	233	127	172	120	220	261	247	183	135	114	183
17.....	127	322	207	172	114	233	233	247	162	162	135	143
18.....	152	291	195	143	120	207	276	233	143	183	162	135
19.....	183	322	172	233	135	354	261	233	172	172	162	183
20.....	162	291	195	94	108	354	233	276	162	172	162	183
21.....	120	291	162	220	143	454	261	247	162	195	135	183
22.....	172	276	195	354	143	488	261	247	207	233	172	135
23.....	135	276	220	488	135	354	195	220	152	183	162	152
24.....	172	261	195	488	322	261	247	195	143	162	162	143
25.....	172	261	403	261	354	354	233	207	172	162	152	152
26.....	172	261	403	306	338	220	220	220	152	162	162	207
27.....	162	261	291	291	207	220	195	220	127	195	172	207
28.....	162	247	220	233	220	233	207	220	143	162	114	195
29.....	143	233	233	183	-----	207	195	207	162	172	162	172
30.....	94	207	207	195	-----	220	247	207	162	135	143	108
31.....	183	-----	172	195	-----	918	-----	195	-----	127	143	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	183	94	148	0.485	0.56
November.....	322	135	221	.725	.81
December.....	403	127	202	.662	.76
January.....	488	94	212	.695	.80
February.....	420	108	178	.584	.61
March.....	918	162	281	.921	1.06
April.....	1,440	195	406	1.33	1.48
May.....	420	195	256	.839	.97
June.....	220	127	175	.574	.64
July.....	233	108	161	.528	.61
August.....	183	114	152	.498	.57
September.....	220	103	161	.528	.59
The year.....	1,440	94	213	.698	9.46

MILWAUKEE RIVER NEAR MILWAUKEE, WIS.

LOCATION.—Chain gage in sec. 5, T. 7 N., R. 22 E., at Port Washington highway bridge near the north limits of Milwaukee.

DRAINAGE AREA.—661 square miles.

RECORDS AVAILABLE.—April 1914 to September 1933.

DISCHARGE.—Maximum during year, 6,060 second-feet Apr. 2 (gage height, 4.38 feet); minimum, 15 second-feet Oct. 2-3.

1914-33: Maximum, 15,100 second-feet Mar. 20, 1918 (gage height, 9.00 feet); minimum, 11 second-feet Sept. 6, 1932. Average, 19 years (1914-33), 442 second-feet.

REMARKS.—Records good except those for periods of ice effect, Nov. 24, Dec. 7-22, Jan. 11, 12, 20, 21, Feb. 5-24, Mar. 9-11, which are poor.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	20	107	67	234	273	1,340	5,440	632	357	279	130	54
2.....	15	130	73	299	387	199	6,060	734	299	674	92	38
3.....	15	73	107	149	895	234	3,790	950	260	511	115	35
4.....	41	73	107	107	632	234	2,110	1,480	234	537	61	41
5.....	67	73	86	115	299	234	1,340	1,070	260	450	73	46
6.....	56	73	67	122	177	247	1,340	2,480	840	378	73	56
7.....	41	56	36	107	130	177	1,200	1,940	2,020	230	92	51
8.....	33	86	29	683	92	177	1,010	2,890	1,780	223	328	25
9.....	33	130	29	149	61	76	950	2,480	1,860	178	149	41
10.....	122	130	29	107	41	61	1,070	2,110	1,340	149	92	41
11.....	130	122	25	111	29	76	2,020	1,560	950	119	92	149
12.....	73	177	25	111	25	130	2,200	1,480	632	96	115	73
13.....	107	107	22	107	22	122	1,700	1,340	387	96	46	73
14.....	67	107	22	130	29	177	1,340	1,200	357	174	51	86
15.....	122	36	22	115	41	149	1,010	442	273	349	92	86
16.....	25	41	22	107	61	41	840	840	273	119	92	56
17.....	86	100	22	86	92	122	734	840	234	144	61	92
18.....	86	100	23	73	130	149	683	734	234	172	61	73
19.....	56	92	30	200	154	130	840	840	247	154	64	86
20.....	56	107	46	36	206	260	613	3,550	177	135	83	67
21.....	56	107	70	76	266	130	520	1,940	149	115	76	46
22.....	56	46	122	177	299	149	467	1,630	149	149	96	56
23.....	86	56	168	177	537	107	387	950	130	130	64	56
24.....	56	61	260	467	537	149	342	734	130	371	21	33
25.....	200	56	520	450	546	122	299	520	130	80	67	41
26.....	122	56	575	434	632	122	234	734	73	473	51	56
27.....	122	46	632	314	485	149	260	895	73	170	51	61
28.....	168	25	403	734	434	200	234	787	149	92	36	56
29.....	107	122	296	632	-----	357	234	632	149	61	51	73
30.....	73	86	234	130	-----	1,940	299	520	139	61	51	92
31.....	56	-----	485	234	-----	3,320	-----	467	-----	61	48	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	200	15	75.9	0.115	0.13
November.....	177	25	86	.130	.14
December.....	632	22	150	.227	.26
January.....	734	36	225	.340	.39
February.....	895	22	268	.405	.42
March.....	3,320	41	361	.546	.63
April.....	6,060	234	1,320	2.00	2.23
May.....	3,550	442	1,270	1.92	2.21
June.....	2,020	73	476	.720	.80
July.....	604	61	216	.327	.38
August.....	328	21	83	.125	.14
September.....	149	25	61.3	.093	.10
The year.....	6,060	21	382	.578	7.83

CEDAR CREEK NEAR CEDARBURG, WIS.

LOCATION.—Chain gage on south line of sec. 14, T. 10 N., R. 21 E., at bridge on State trunk highway 60, 2 miles north of Cedarburg.

DRAINAGE AREA.—122 square miles.

RECORDS AVAILABLE.—August 1930 to September 1933.

DISCHARGE.—Maximum during year, 1,420 second-feet Apr. 1 (gage height, 8.94 feet); minimum, 2.6 second-feet Oct. 3.

1930-33: Maximum, that of Apr. 1, 1933; minimum, 0.8 second-foot Aug. 22, 1931 (gage height, 4.70 feet).

REMARKS.—Records good for high stages, fair for medium stages, and poor for low stages and for periods of ice effect, Nov. 11-13, Nov. 19 to Dec. 2, Dec. 9 to Mar. 13, Mar. 20-28.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.4	9.3	6.8	21	42	87	1,420	146	97	105	6.1	6.1
2	3.0	9.3	6.8	21	42	77	702	243	85	230	6.1	6.1
3	2.6	9.3	8.0	21	42	63	363	316	77	230	12	6.1
4	6.8	8.0	16	21	31	50	243	230	66	285	12	5.4
5	6.1	8.0	9.3	21	20	39	203	146	89	243	24	4.1
6	6.1	8.0	16	21	13	26	216	316	93	155	11	4.8
7	6.1	11	21	21	13	26	230	396	70	89	13	5.4
8	6.8	24	13	20	13	26	203	396	66	52	11	5.4
9	6.8	26	8.0	17	11	26	190	579	52	39	18	4.1
10	13	26	6.1	16	13	26	216	430	45	36	24	3.4
11	16	26	6.8	16	20	26	331	271	39	26	18	8.0
12	16	25	6.1	16	26	26	271	216	29	21	13	8.0
13	13	21	5.1	14	26	31	190	203	29	21	9.3	13
14	11	18	4.4	14	26	39	160	178	26	24	8.0	11
15	6.8	16	4.1	13	26	52	151	141	26	32	8.0	8.0
16	6.8	16	3.7	13	26	45	127	155	25	45	6.8	9.3
17	6.1	18	3.4	13	31	32	118	178	22	59	6.8	8.0
18	6.1	13	3.4	13	32	32	123	146	22	36	6.8	6.8
19	5.4	12	3.4	13	32	26	127	165	20	29	6.8	5.4
20	6.1	9.9	3.4	13	32	25	118	396	12	18	6.1	5.4
21	6.1	6.8	3.4	13	34	20	105	1,120	11	13	7.4	4.8
22	5.4	5.4	4.8	24	40	13	101	579	11	12	7.4	4.8
23	8.0	5.1	6.1	59	97	13	85	300	11	12	6.5	4.8
24	11	5.1	42	118	132	16	81	203	9.9	12	6.5	4.8
25	12	5.1	59	130	153	16	73	141	11	11	5.8	4.8
26	18	5.1	42	77	178	26	70	285	54	11	6.5	5.4
27	18	5.1	34	56	165	42	66	347	87	8.0	5.8	6.1
28	18	5.1	34	50	118	68	59	285	78	6.8	6.5	4.8
29	18	5.1	26	42	-----	105	56	216	68	8.0	5.8	4.8
30	11	5.1	24	36	-----	413	110	151	75	5.4	5.8	4.8
31	11	-----	21	34	-----	465	-----	141	-----	5.4	5.8	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	18	2.6	9.37	0.077	0.09
November	26	5.1	12.2	.100	.11
December	59	3.4	14.6	.120	.14
January	130	13	31.5	.258	.30
February	178	11	51.2	.420	.44
March	465	13	63.8	.523	.60
April	1,420	56	217	1.78	1.99
May	1,120	141	291	2.39	2.76
June	97	9.9	46.9	.384	.43
July	285	5.4	60.6	.497	.57
August	24	5.8	9.57	.078	.09
September	13	3.4	6.12	.050	.06
The year	1,420	2.6	67.9	.557	7.58

LITTLE CALUMET RIVER AT HARVEY, ILL.

LOCATION.—Staff gage in NW¼ sec. 9, T. 36 N., R. 14 E., at Illinois Central Railroad bridge at Harvey.

DRAINAGE AREA.—570 square miles.

RECORDS AVAILABLE.—October 1916 to September 1933.

DISCHARGE.—Maximum during year, 2,470 second-feet Apr. 2 (gage height, 8.49 feet); minimum, 8.8 second-feet Oct. 9 (gage height, 2.79 feet).

1916-33: Maximum, 3,750 second-feet Mar. 18, 1919 (gage height, 10.28 feet); minimum, 3.9 second-feet July 24, 1932 (gage height, 2.71 feet).

Maximum stage known, 13.4 feet Mar. 6, 1908. Average, 17 years (1916-33), 259 second-feet.

REMARKS.—Records good above and fair below 15 second-feet except those for periods of ice effect, Dec. 8-22, which are fair, and Feb. 9-23, which are poor. Most of flow from upper 330 square miles of drainage area is diverted to Lake Michigan above gage. Gage-height records furnished by Sanitary District of Chicago.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14	23	19	141	799	215	2,160	152	71	79	33	17
2	14	16	19	171	889	189	2,470	189	54	664	34	17
3	12	16	23	116	500	162	1,440	202	36	335	134	17
4	30	14	37	92	302	139	754	215	32	139	59	17
5	52	14	37	85	286	126	664	202	29	79	36	17
6	26	16	39	81	242	122	622	1,080	28	52	24	17
7	14	18	100	77	189	114	580	709	27	37	19	17
8	11	41	89	70	150	110	424	1,280	28	41	17	17
9	11	136	58	67	110	90	352	1,380	28	47	17	17
10	50	126	39	61	90	76	302	983	27	50	17	17
11	64	94	26	54	90	69	500	889	26	46	17	17
12	30	70	26	42	88	66	622	1,330	26	41	17	17
13	30	52	24	46	98	77	388	936	26	32	17	17
14	23	44	23	40	94	424	302	664	24	27	17	17
15	16	39	21	38	90	352	302	443	24	25	17	17
16	15	41	21	41	88	228	286	352	24	26		17
17	14	44	23	42	90	176	1,130	286	25	27		19
18	14	41	23	48	90	202	1,030	242	26	27		22
19	14	37	23	754	100	335	664	215	28	27		21
20	12	30	23	664	139	709	424	176	28	26		21
21	14	33	24	406	202	844	335	166	27	26		21
22	14	28	26	352	256	540	286	169	27	26	17	20
23	23	30	303	709	709	443	228	134	27	29		21
24	24	26	940	242	889	335	189	112	24	36		24
25	23	23	1,130	228	622	302	166	102	24	34		25
26	60	19	754	228	500	388	148	94	24	31		98
27	44	19	481	242	335	622	130	104	24	31		166
28	37	21	335	256	256	443	106	106	24	31		162
29	24	21	256	242	-----	318	100	108	29	29	17	92
30	26	19	202	215	-----	256	106	106	66	28	17	50
31	21	-----	174	215	-----	271	-----	89	-----	28	17	-----

Month	Maximum	Minimum	Mean	Month	Maximum	Minimum	Mean
October	64	11	25.0	May	1,380	89	426
November	136	14	38.4	June	71	24	30.4
December	1,130	19	172	July	664	25	69.5
January	754	38	196	August	134	17	24.1
February	889	88	296	September	166	17	34.5
March	844	66	282				
April	2,470	100	574	The year	2,470	11	180

ST. JOSEPH RIVER AT MOTTVILLE, MICH.

LOCATION.—Float gage in NE¼ sec. 6, T. 8 S., R. 12 W., at hydroelectric plant of Michigan Gas & Electric Co., at Mottville, 5 miles below mouth of Fawn River. Zero of gage is 759.5 feet above mean sea level.

RECORDS AVAILABLE.—December 1923 to September 1933.

DISCHARGE.—Maximum during year, 4,700 second-feet Dec. 27 (gage height, 2.40 feet); minimum, 276 second-feet Sept. 9 (gage height, -0.98 foot).

1924-33: Maximum, 8,250 second-feet Apr. 20, 1926 (gage height, 4.4 feet); minimum, 20 second-feet Sept. 7, 1930; minimum gage height, -1.90 feet July 26, 27, 1931.

REMARKS.—Records good except those for July and August, which are fair.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	712	1,210	1,090	2,230	1,970	2,790	2,370	2,370	1,840	1,450	580	712
2.....	580	1,090	975	2,510	1,970	2,370	2,510	1,840	1,580	920	760	712
3.....	760	1,210	1,030	2,790	1,970	2,370	3,500	2,510	1,840	1,520	1,210	622
4.....	712	1,990	865	2,790	1,710	2,230	3,350	2,370	1,330	1,640	712	548
5.....	812	1,150	1,090	2,650	1,450	2,100	3,500	2,510	1,640	1,970	920	760
6.....	712	665	1,210	2,370	1,330	2,100	3,800	2,790	1,710	1,580	712	760
7.....	712	1,330	1,330	2,230	1,390	2,100	3,650	2,790	1,710	1,390	865	712
8.....	712	1,330	1,390	1,970	1,450	1,840	3,800	3,210	1,640	1,520	920	622
9.....	564	1,390	1,580	2,230	1,840	1,580	3,650	3,210	1,450	1,210	760	485
10.....	975	975	1,580	1,970	1,640	1,580	3,800	3,500	1,390	1,520	760	355
11.....	1,210	1,090	1,450	1,640	1,640	1,450	3,800	3,800	1,090	1,580	865	580
12.....	1,030	1,330	1,580	1,840	1,210	1,450	3,800	3,650	1,270	1,390	760	712
13.....	1,150	1,270	1,580	1,840	1,210	1,710	3,210	3,350	1,390	1,150	712	812
14.....	975	1,710	1,270	1,840	1,390	1,710	3,350	3,650	1,270	865	760	665
15.....	920	1,580	1,150	1,580	1,330	1,710	3,070	3,500	1,090	865	760	712
16.....	580	1,450	1,330	1,640	1,330	1,580	2,930	3,350	1,090	920	812	712
17.....	975	1,390	1,210	1,520	1,330	1,840	3,070	3,210	1,270	760	865	485
18.....	920	1,030	812	1,640	1,270	1,970	3,210	3,070	712	812	865	712
19.....	865	1,210	1,090	1,710	1,270	1,840	3,210	3,210	812	865	760	622
20.....	920	1,710	865	2,100	1,520	1,840	3,210	2,930	920	975	665	920
21.....	712	1,150	1,210	2,230	1,640	2,370	3,070	2,930	1,090	865	812	975
22.....	665	1,270	975	2,230	1,840	2,370	3,070	2,790	975	920	812	812
23.....	712	1,210	1,520	2,930	1,840	2,370	2,930	2,370	920	524	812	760
24.....	865	760	1,840	2,930	1,970	2,370	2,790	2,510	760	760	760	493
25.....	975	1,330	3,210	2,100	2,370	2,100	2,230	2,230	665	812	812	1,030
26.....	1,030	1,450	2,100	2,230	2,370	1,970	2,510	2,100	975	920	712	920
27.....	1,150	865	4,100	2,370	2,650	2,230	2,230	2,100	865	812	548	1,150
28.....	1,210	1,330	3,650	2,230	2,650	2,230	2,100	1,840	865	812	760	1,090
29.....	1,210	1,090	3,650	2,100	-----	2,230	1,970	1,970	760	975	865	1,210
30.....	920	1,030	3,500	2,100	-----	2,370	2,100	1,840	975	812	760	1,030
31.....	1,270	-----	3,500	2,100	-----	2,510	-----	1,640	-----	760	580	-----

Month	Maximum	Minimum	Mean	Month	Maximum	Minimum	Mean
October.....	1,270	564	888	May.....	3,800	1,640	2,750
November.....	1,710	665	1,230	June.....	1,840	665	1,200
December.....	4,100	812	1,730	July.....	1,970	524	1,090
January.....	2,930	1,520	2,150	August.....	1,210	548	782
February.....	2,650	1,210	1,700	September.....	1,210	355	756
March.....	2,790	1,450	2,040	The year.....	4,100	355	1,610
April.....	3,800	1,970	3,060				

ST. JOSEPH RIVER AT NILES, MICH.

LOCATION.—Water-stage recorder in sec. 26, T. 7 S., R. 17 W., at Niles, 1 mile above Dowagiac Creek. Zero of gage is 634.91 feet above mean sea level.

DRAINAGE AREA.—3,620 square miles.

RECORDS AVAILABLE.—October 1930 to September 1933.

DISCHARGE.—Maximum during year, 10,000 second-feet Apr. 18 (gage height, 7.53 feet); minimum not determined.

1930-33: Maximum, that of Apr. 18, 1933; minimum, 244 second-feet Aug. 30, 1931.

REMARKS.—Records good except those for July, August, and estimated periods, which are fair. Gage-height record furnished by city of Niles.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1-----	1,260	2,200	2,060	6,040	3,400	4,850	6,580	4,850	3,000	2,130	1,130	1,640
2-----	1,420	2,320	2,130	4,520	3,640	4,520	7,480	5,020		3,020	1,190	
3-----	1,460	2,280	2,200	5,870	3,400	4,040	7,480	4,850		3,320		
4-----	1,770	2,060	1,920	5,020	3,100	4,040	7,300	5,360		3,180		
5-----	1,420	2,420	2,200	5,020	2,500	3,560	6,940	5,020		2,880		
6-----	1,680	1,800	2,420	4,850	2,130	3,720	7,300	5,530	2,650	2,950	2,200	
7-----	1,140	1,920	2,650	4,360	2,400	3,320	8,240	6,040		1,920		
8-----	791	2,200	3,320	4,360	2,500	3,320	6,760	6,760		2,200		
9-----	748	2,280	3,250	4,200	2,450	2,800	7,860	2,350				
10-----	794	2,420	3,720	4,360	2,400	2,580	8,240	1,800				
11-----	977	1,990	2,500	3,430	2,400	2,200	8,500	8,240	1,780	1,500		
12-----	1,090	2,060	2,400	3,400	2,350	2,350		8,620	2,060			
13-----	1,090	1,690	2,300	3,180	2,350	2,720		8,240	1,780			
14-----	1,020	2,420	2,200	3,250	2,300	4,710		6,220	1,850			
15-----	922	2,720	2,100	2,950	2,300	7,120		6,580	1,770			
16-----	986	2,350	2,100	3,100	2,400	4,850	6,220	7,300	1,520	1,250	1,200	
17-----	1,540	2,420	2,050	3,020	2,500	6,760	7,120	6,940	1,640			
18-----	1,920	2,280	2,000	2,950	2,580	6,760	9,600	6,760	1,350			
19-----	1,770	2,130	2,000	3,880	3,320	6,400	8,810	6,400	1,460			
20-----	1,780	2,350	2,000	4,680	2,880	5,870	7,480		1,180			
21-----	1,630	2,350	2,100	4,520	3,400	4,200	6,760	5,750	1,320	1,610		
22-----	1,550	2,060	2,300	4,520	3,480	3,720	6,220		1,580	1,280		
23-----	1,670	2,280	3,720	4,360	3,960	4,680	5,870		1,480	1,170		
24-----	1,780	1,850	6,580	5,020	4,200	5,190	5,020		1,230	1,680		
25-----	1,920	1,920	8,810	5,020	4,360	5,530	5,020		1,280	1,260		
26-----	2,280	2,720	8,430	3,880	5,530	5,020	4,200	4,250	1,600	1,430	1,200	
27-----	2,200	1,960	7,860	4,040	4,850	5,700	4,850		1,500	1,380		
28-----	2,650	2,130	7,670	3,880	5,020	6,040	4,360		1,420			
29-----	2,130	2,200	7,300	3,460		5,360	4,040		1,490			
30-----	2,090	1,920	6,580	3,320		5,700	3,800		2,720			
31-----	2,130		6,580	3,480		5,700						

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October-----	2,650	748	1,540	0.425	0.49
November-----	2,720	1,690	2,190	.605	.68
December-----	8,810	1,920	3,690	1.02	1.18
January-----	6,040	2,950	4,120	1.14	1.31
February-----	5,530	2,130	3,150	.870	.91
March-----	7,120	2,200	4,620	1.28	1.45
April-----	9,600	3,800	6,820	1.88	2.10
May-----	8,620		6,040	1.67	1.92
June-----		1,180	1,970	.544	.61
July-----	3,320		1,750	.483	.56
August-----			1,260	.348	.40
September-----			1,200	.331	.37
The year-----	9,600		3,200	.884	12.01

* Estimated.

ELKHART RIVER AT GOSHEN, IND.

LOCATION.—Water-stage recorder in sec. 8, T. 36 N., R. 6 E., at River Avenue Bridge, in Goshen, Elkhart County.

DRAINAGE AREA.—530 square miles.

RECORDS AVAILABLE.—April 1931 to September 1933. Records September 1924 to September 1927 published by the Indiana Department of Conservation.

DISCHARGE.—Maximum during year, 3,060 second-feet Apr. 1st (gage height, 7.05 feet); minimum, 88 second-feet Oct. 4 (gage height, 1.68 feet).

1931-33: Maximum, that of Apr. 18, 1933; minimum, 58 second-feet June 19, 1932; minimum gage height, 1.27 feet May 25, 30, 1932.

REMARKS.—Records good below and poor above 750 second-feet October to June. Records poor July to September. Some regulation at three hydroelectric plants above gage.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	231	428	432	1,100	595	692	1,340	840	550	278	219	192
2	208	478	432	940	640	665	1,040	965	505	390	229	183
3	227	417	456	1,020	618	640	1,460	990	518	432	279	190
4	178	412	469	965	577	618	1,310	890	518	335	280	153
5	277	380	478	990	418	618	1,220	865	440	296	267	185
6	280	392	474	940	447	595	1,310	1,070	482	291	246	204
7	267	400	724	915	500	586	1,040	1,100	505	265	228	158
8	263	400	940	890	393	582	1,520	1,190	448	284	225	170
9	267	420	740	865	* 375	523	1,400	1,710	432	328	229	178
10	254	469	595	840	* 375	408	1,310	1,640	356	329	239	140
11	351	469	550	765	* 375	384	1,250	1,520	348	284	250	140
12	348	424	* 530	690	* 375	436	1,190	1,710	344	274	266	188
13	340	364	* 510	665	* 375	510	1,130	1,580	344	278	222	233
14	319	396	* 490	665	* 375	1,830	1,070	1,520	333	264	224	228
15	330	360	* 450	618	* 375	2,180	1,160	1,400	302	224	209	225
16	322	408	* 430	618	* 375	1,190	1,070	1,370	291	243	218	206
17	316	412	* 450	618	* 400	990	1,540	1,370	294	233	216	237
18	312	360	* 450	595	428	965	2,900	1,370	294	240	224	211
19	312	424	* 450	665	464	1,040	2,200	1,250	288	244	225	192
20	316	440	* 450	740	595	1,130	1,580	1,220	274	237	200	187
21	305	404	* 460	665	715	1,920	1,400	1,130	262	232	215	180
22	277	424	* 470	550	690	1,710	1,310	1,040	265	225	192	196
23	257	424	822	665	815	1,370	1,190	990	242	213	215	201
24	257	432	2,200	665	840	1,260	1,130	915	248	249	203	191
25	244	474	2,340	618	915	1,220	1,100	865	236	246	202	181
26	360	487	1,580	618	965	1,220	1,020	815	255	230	201	238
27	572	500	1,220	618	815	1,340	965	715	244	231	194	344
28	459	464	1,070	618	715	1,370	890	665	263	229	180	344
29	448	417	990	595	-----	1,190	840	640	298	223	182	291
30	326	420	965	568	-----	1,100	790	618	327	216	186	274
31	368	-----	1,100	564	-----	1,130	-----	568	-----	205	182	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	572	178	309	0.583	0.67
November	500	360	423	.798	.89
December	2,340	430	765	1.44	1.66
January	1,100	550	737	1.39	1.60
February	965	375	555	1.05	1.09
March	2,180	384	1,010	1.91	2.20
April	2,900	790	1,330	2.50	2.79
May	1,710	568	1,110	2.09	2.41
June	550	236	350	.660	.74
July	432	205	267	.504	.58
August	280	180	221	.417	.48
September	344	140	208	.392	.44
The year	2,900	140	607	1.14	15.55

* Estimated because of ice effect.

KALAMAZOO RIVER NEAR ALBION, MICH.

LOCATION.—Chain gage on line between secs. 29 and 32, T. 2 S., R. 4 W., 3 miles west of Albion. Zero of gage is 919.44 feet above mean sea level.

DRAINAGE AREA.—246 square miles.

RECORDS AVAILABLE.—October 1930 to July 1931, October 1932 to July 1933 (discontinued).

DISCHARGE.—1930-31, 1932-33: Maximum, 475 second-feet Dec. 27, 1932; maximum gage height, 3.88 feet Feb. 8, 1933 (affected by backwater); minimum, 37 second-feet June 27, 1933 (gage height, 1.38 feet).

REMARKS.—Records fair except those for periods of ice effect, Dec. 10-22, Feb. 5-22, which are poor. Flow regulated by power plant at Altion. Gage-height record furnished by city of Albion.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
1	65	92	136	275	160	275	125	260	162	260
2	55	127	188	306	155	290	275	338	101	
3	54	157	138	162	167	202	290	338	90	
4	134	99	216	183	172	275	338	290	83	
5	245	97	275	230	160	275	354	290	74	
6	185	95	275	216	150	172	338	322	80	
7	165	157	290	108	150	138	371	354	71	
8	65	230	371	145	145	143	422	290	138	
9	94	116	322	245	145	162	338	338	101	
10	116	245	300	155	140	245	338	371	116	
11	120	94	275	129	135	275	322	354	138	
12	143	216	250	245	135	44	275	322	64	
13	216	138	225	138	140	76	290	338	78	
14	120	178	200	160	140	290	322	290	90	
15	127	183	200	78	145	230	275	290	97	
16	90	216	200	83	150	290	322	338	88	
17	83	94	200	170	150	116	290	306	97	
18	77	101	200	172	150	170	290	260	83	
19	65	92	200	216	150	275	260	216	95	
20	53	87	200	260	150	275	245	275	94	
21	60	202	250	245	155	275	290	290	97	
22	90	230	350	230	155	322	275	306	94	
23	83	116	405	202	157	245	216	290	120	
24	90	138	354	306	188	275	230	275	63	
25	97	90	440	275	188	306	275	245	63	
26	290	95	440	275	290	230	105	260	43	
27	143	110	458	260	245	178	140	275	44	
28	103	97	458	275	290	157	116	230	105	
29	95	108	275	68		97	188	245	172	
30	94	120	322	160		110	188	216	175	
31	68		290	136		105		167		

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	290	53	112	0.455	0.52
November	245	87	137	.557	.62
December	458	136	281	1.14	1.31
January	306	68	197	.801	.92
February	290	135	166	.675	.70
March	322	44	210	.854	.98
April	422	105	270	1.10	1.23
May	371	167	290	1.14	1.31
June	175	43	97.2	.395	.44

KALAMAZOO RIVER AT COMSTOCK, MICH.

LOCATION.—Staff gage in NE¼ sec. 19, T. 2 S., R. 10 W., 95 feet below highway bridge at Comstock.

DRAINAGE AREA.—1,010 square miles.

RECORDS AVAILABLE.—April to August 1931, October 1932 to August 1933 (discontinued).

DISCHARGE.—1930, 1932-33: Maximum, 2,050 second-feet May 9, 1933; maximum gage height, 3.10 feet Feb. 10, 1933 (affected by backwater); minimum, 272 second-feet May 4, 1931 (gage height, 0.56 foot).

REMARKS.—Records fair except those for periods of ice effect, Dec. 12-21, Feb. 6-21, which are poor. Flow regulated by power plants upstream.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
1	350	750	638	1,150	910	1,410	1,320	950	750	950	530
2	350	750	600	870	1,030	1,320	1,500	1,030	675	1,320	638
3	350	830	600	1,070	910	1,230	1,590	1,070	675	1,320	750
4	377	712	712	1,030	910	1,070	1,680	1,070	712	1,230	-----
5	404	712	712	1,030	1,070	1,030	1,770	1,150	712	1,150	-----
6	530	675	712	950	1,050	950	1,950	1,410	712	1,070	-----
7	530	675	675	950	1,050	950	1,950	1,410	712	910	-----
8	530	675	901	950	1,000	910	1,950	1,500	638	950	-----
9	565	675	950	870	975	870	1,770	2,050	675	870	-----
10	565	870	1,070	950	925	870	1,770	1,860	638	830	-----
11	565	870	870	910	950	750	1,680	1,950	600	750	-----
12	565	870	775	712	950	750	1,590	1,950	600	712	-----
13	530	870	675	750	975	712	1,500	1,950	565	638	-----
14	565	830	600	870	975	712	1,410	1,770	530	638	-----
15	565	830	575	830	1,000	790	1,320	1,590	497	675	-----
16	530	830	575	638	1,000	870	1,230	1,410	530	675	-----
17	530	830	575	790	1,000	830	1,230	1,410	530	638	-----
18	530	790	575	830	1,000	790	1,320	1,230	530	638	-----
19	434	750	575	990	1,000	830	1,320	1,320	530	600	-----
20	434	675	600	1,070	1,000	870	1,230	1,230	497	530	-----
21	434	712	700	1,230	1,000	870	1,150	1,230	464	600	-----
22	404	675	870	1,230	1,030	950	1,150	1,150	534	675	-----
23	497	600	1,070	1,320	1,230	1,030	1,030	1,070	404	638	-----
24	497	675	1,150	1,320	1,070	1,030	1,030	1,070	434	638	-----
25	497	638	1,590	1,320	1,150	1,030	990	1,030	434	675	-----
26	565	638	1,680	1,230	1,410	1,030	950	950	464	675	-----
27	638	600	1,770	1,150	1,320	990	910	950	434	675	-----
28	750	565	1,860	1,150	1,410	1,070	870	950	434	600	-----
29	750	600	1,770	990	-----	1,150	830	870	434	600	-----
30	750	600	1,680	950	-----	1,230	790	870	1,150	600	-----
31	790	-----	1,410	910	-----	1,070	-----	830	-----	600	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	790	350	528	0.523	0.60
November	870	565	726	.719	.80
December	1,860	575	952	.943	1.09
January	1,320	638	1,000	.990	1.14
February	1,410	910	1,050	1.04	1.08
March	1,410	712	967	.957	1.10
April	1,950	790	1,360	1.35	1.51
May	2,050	830	1,300	1.29	1.49
June	1,150	404	580	.574	.64
July	1,320	530	776	.768	.89

KALAMAZOO RIVER AT CALKINS BRIDGE, NEAR ALLEGAN, MICH.

LOCATION.—Water-stage recorder in sec. 15, T. 2 N., R. 14 W., at Calkins Bridge, 6 miles northwest of Allegan and 1 mile above Swan Creek. Gage heights refer to mean sea level datum.

DRAINAGE AREA.—1,540 square miles.

RECORDS AVAILABLE.—April 1929 to September 1933.

DISCHARGE.—Maximum during year, 3,180 second-feet Apr. 29 (gage height, 603.48 feet); minimum, 212 second-feet Sept. 5 (gage height, 595.75 feet). 1929-33: Maximum, 3,580 second-feet Jan. 8, 1930 (gage height, 603.82 feet); minimum, 164 second-feet Aug. 23, 1931 (gage height, 595.25 feet).

REMARKS.—Records good except those for estimated periods, which are fair. Flow regulated by power plant in Allegan.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Jul.	Aug.	Sept.
1	656	1,250	1,050	1,960		1,940	1,840	2,610	1,230	1,420	655	1,210
2	570	1,250	1,060	1,740		1,950	2,310	2,290	1,250	1,470	505	1,090
3	696	1,250	1,070	1,600	a1,500	1,880	2,310	2,080	1,150	1,600	621	351
4	600	1,250	977	1,680		1,830	2,270	1,930	1,020	1,750	1,140	251
5	968	1,240	1,080	1,600		1,720	2,290	1,860	1,250	1,650	1,090	230
6		810	1,130	1,150	1,540	1,640	2,380	2,030	1,620	1,550	835	377
7		817	1,140	1,250	1,510	1,570	2,600	2,310	1,590	1,220	1,010	353
8		720	1,130	1,370	1,490	1,540	2,640	2,280	1,340	1,220	869	354
9		891	1,240		1,460	1,410	2,560	2,450	1,200	1,230	805	362
10		845	1,330		1,320	b1,350	2,460	2,760	1,010	1,120	860	330
11	1,020	1,290		b1,310		b1,320	2,480	2,750	985	1,000	783	356
12	962	1,480	a1,150	1,410		b1,300	2,440	2,680	992	1,040	696	335
13	945	1,380		1,270	a1,250	1,270	2,360	2,660	913	684	595	674
14	935	1,380		1,160		1,310	2,210	2,590	780	760	803	530
15	902	1,350		1,240		1,440	2,170	2,510	b850	810	617	628
16	898	1,350		1,280		1,360	2,120	2,350	778	680	581	656
17	881	1,370		1,170		1,420	2,100	2,210	744	765	732	718
18	868	1,330	a1,000	1,240	a1,200	1,430	2,120	2,140	801	825	651	748
19	890	1,260		1,450		1,310	2,120	2,030	787	715	558	696
20	821	b1,200		1,680		1,450	2,130	2,140	739	639	517	685
21	755	1,240		b1,790		1,380	2,190	2,150	766	697	636	673
22	740	1,180				1,510	2,270	2,040	724	647	612	701
23	760	1,140	a1,300			1,540	2,360	1,870	688	560	649	615
24	872	1,060			a1,700	1,510	2,450	1,770	645	797	589	560
25	890	1,140				1,640	2,490	1,670	428	689	603	929
26	975	1,060	1,580			1,660	2,590	1,650	768	755	536	835
27	1,270	b1,020	1,710	a1,750	b1,910	1,710	2,630	1,560	663	727	490	1,320
28	1,180	b1,000	1,770		1,980	1,750	2,710	1,470	644	683	608	1,490
29	1,290	988	1,810			1,800	2,890	1,340	581	718	618	1,230
30	1,250	1,030	1,810			1,810	2,820	1,410	1,000	375	855	1,140
31	1,210		1,860			1,860		1,300		663	1,320	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	1,290	570	900	0.574	0.67
November	1,480	986	1,220	.772	.88
December	1,860		1,260	.818	.94
January			1,560	1.07	1.16
February			1,440	.935	.97
March	1,950	1,270	1,570	1.07	1.18
April	2,890	1,840	2,380	1.55	1.73
May	2,760	1,300	2,090	1.38	1.57
June	1,620	428	931	.605	.68
July	1,750	376	952	.618	.71
August	1,320	490	724	.470	.54
September	1,490	230	681	.442	.49
The year	2,890	230	1,310	.851	11.52

a Estimated.

b Partly estimated.

BATTLE CREEK AT BATTLE CREEK, MICH.

LOCATION.—Staff gage in sec. 5, T. 2 S., R. 7 W., 350 feet above Verona Street Bridge, in Battle Creek.

DRAINAGE AREA.—241 square miles.

RECORDS AVAILABLE.—October 1930 to July 1931; October 1932 to August 1933.

DISCHARGE.—Maximum during periods of record, 695 second-feet May 12, 1933 (gage height, 1.78 feet); minimum not determined (published figure of 1 second-foot probably in error).

REMARKS.—Records fair except those for estimated periods, which are poor. No record Aug. 6 to Sept. 30.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
1.....	70	77	118	* 225	176	459	196	201	162	122	43
2.....	70	77	118	201	176	459	* 250	222	152	148	43
3.....	67	77	118	201	176	459	* 350	201	148	191	102
4.....	70	77	118	* 225	181	428	660	191	148	181	102
5.....	70	80	118	* 225	181	* 410	590	282	135	191	102
6.....	73	84	122	* 200	181	* 390	555	345	126	162	-----
7.....	73	84	122	* 175	176	* 370	625	* 400	122	135	-----
8.....	70	87	130	* 150	176	* 350	625	522	113	113	-----
9.....	70	91	139	* 125	176	* 330	625	590	109	98	-----
10.....	70	95	148	* 110	176	* 300	* 575	625	105	87	-----
11.....	70	95	* 150	102	176	* 250	* 525	660	95	80	-----
12.....	70	95	* 140	102	157	176	* 475	695	87	80	-----
13.....	73	98	* 130	130	157	176	* 450	625	80	73	-----
14.....	73	98	* 120	143	167	172	428	555	80	61	-----
15.....	73	98	* 110	148	172	167	392	555	77	67	-----
16.....	73	102	* 100	167	176	162	398	522	80	67	-----
17.....	70	102	* 95	152	176	162	416	416	84	67	-----
18.....	67	102	91	143	176	157	392	410	73	67	-----
19.....	70	102	91	162	176	152	380	404	73	67	-----
20.....	70	109	95	176	176	157	374	404	61	61	-----
21.....	70	109	95	176	191	157	374	392	61	64	-----
22.....	70	113	* 100	176	191	167	368	356	67	55	-----
23.....	70	113	* 110	172	186	162	368	322	67	49	-----
24.....	70	118	* 140	167	191	162	356	304	67	49	-----
25.....	70	118	310	181	322	162	339	282	58	49	-----
26.....	70	109	310	176	428	172	254	243	52	55	-----
27.....	77	109	* 300	176	459	181	243	201	52	52	-----
28.....	80	113	* 275	181	459	201	201	196	55	49	-----
29.....	80	113	* 275	181	-----	201	196	191	49	46	-----
30.....	80	118	* 300	181	-----	310	206	181	126	52	-----
31.....	77	-----	* 250	181	-----	201	-----	181	-----	41	-----

Month	Maximum	Minimum	Mean	Per square rile	Run-off in inches
October.....	80	67	71.8	0.298	0.34
November.....	118	77	101	.418	.47
December.....	310	91	156	.647	.75
January.....	225	102	168	.897	.80
February.....	459	157	211	.876	.91
March.....	459	152	250	1.34	1.20
April.....	660	196	406	1.69	1.89
May.....	695	181	377	1.52	1.75
June.....	162	49	92.1	.382	.48
July.....	191	41	86.4	.358	.41

* Estimated.

GRAND RIVER AT GRAND RAPIDS, MICH.

LOCATION.—Water-stage recorder at municipal sewage pumping plant near west limits of Grand Rapids, Kent County. Zero of gage is 589.01 feet above mean sea level.

DRAINAGE AREA.—4,900 square miles.

RECORDS AVAILABLE.—October 1930 to September 1933; March 1901 to September 1918 at Fulton Street Bridge, in Grand Rapids.

DISCHARGE.—Maximum during year, 11,500 second-feet Apr. 11 (gage height, 7.13 feet); minimum, 757 second-feet Aug. 18 (gage height, -4.38 feet).

1930-33: Maximum, that of Apr. 11, 1933; minimum not determined.

A stage of 19.3 feet occurred at the Fulton Street gage on Mar. 27, 1904 (discharge not determined).

REMARKS.—Records October to June good; July to September fair. Gage-height record furnished by city of Grand Rapids. Flow slightly regulated by power plants upstream. The city of Grand Rapids diverts about 30 second-feet from river above gage, most of which is returned to river 1 mile downstream.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Jul.	Aug.	Sept.
1	1,030	2,550	1,940	4,730	3,520	7,540	7,190	4,100	3,360	1,570	1,030	813
2	1,030	2,410	1,940	3,680	4,280	6,970	7,900	6,200	3,200	2,140	1,010	828
3	1,030	2,480	1,880	3,440	4,190	6,310	8,650	7,190	2,970	2,140	1,100	912
4	1,110	2,620	1,940	3,840	4,010	5,600	9,590	7,080	2,690	2,140	1,030	930
5	1,280	2,690	2,000	4,460	3,120	5,300	10,200	6,970	2,760	2,000	1,380	912
6	1,510	2,620	2,200	4,550	3,000	4,820	10,800	7,080	2,760	2,570	1,510	894
7	1,690	2,340	2,340	4,190	2,900	4,550	11,100	7,300	2,690	1,880	1,340	912
8	1,630	2,200	2,620	3,840	2,800	4,190	10,800	7,660	2,550	1,810	1,840	912
9	1,140	2,690	3,120	3,760	2,750	4,010	10,600	8,140	2,480	1,570	1,290	912
10	1,190	3,040	2,480	3,360	2,700	3,120	10,800	8,650	2,340	1,570	1,400	912
11	1,940	3,120	2,400	3,280	2,650	2,830	11,500	9,170	2,140	1,340	1,370	930
12	1,880	3,360	2,350	2,830	2,600	3,120	11,300	9,310	2,000	1,260	1,290	1,050
13	2,000	3,360	2,300	2,410	2,550	3,520	10,300	9,170	1,810	1,280	1,260	1,160
14	2,070	3,120	2,250	2,550	2,500	3,440	9,590	8,650	1,630	1,190	1,160	1,140
15	2,000	3,120	2,200	2,410	2,500	3,760	8,650	7,900	1,630	1,270	1,070	1,030
16	1,940	2,900	2,200	2,760	2,500	3,920	7,660	7,660	1,570	1,180	1,010	1,100
17	1,810	2,760	2,150	2,900	2,500	3,840	7,190	7,420	1,510	1,180	855	1,120
18	1,750	2,620	2,150	2,900	2,500	3,920	7,420	6,860	1,570	1,180	832	1,100
19	1,630	2,550	2,100	2,830	2,600	3,840	7,780	6,530	1,400	1,180	1,010	1,030
20	1,510	2,480	2,100	3,200	2,700	3,680	8,140	6,860	1,320	1,180	1,120	1,100
21	1,400	2,340	2,200	4,180	2,900	3,360	8,390	8,390	1,340	1,180	1,050	1,190
22	1,460	2,340	2,400	4,910	3,200	3,760	7,900	9,040	1,260	1,180	949	1,050
23	1,460	2,200	2,760	5,100	3,760	4,100	7,080	8,260	1,320	1,140	968	1,100
24	1,460	2,200	3,490	5,100	4,550	4,370	6,310	7,190	1,240	1,220	968	1,030
25	1,510	2,200	6,200	5,000	6,100	4,550	5,700	6,100	1,190	1,280	949	1,050
26	1,570	2,140	8,260	4,910	7,660	4,820	5,000	5,300	1,240	1,340	968	1,360
27	1,810	2,070	8,260	4,820	8,260	5,100	4,550	4,730	1,260	1,140	988	1,400
28	2,270	1,880	8,140	4,550	8,020	5,300	4,280	4,280	1,290	1,010	930	1,260
29	2,480	2,000	7,660	4,190	-----	6,100	4,010	3,840	1,400	980	860	1,400
30	2,690	1,940	6,970	3,920	-----	6,750	3,840	3,920	1,510	1,050	930	1,380
31	2,620	-----	6,100	3,360	-----	6,970	-----	3,680	-----	1,180	894	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	2,690	1,030	1,670	0.341	0.39
November	3,360	1,940	2,540	.518	.58
December	8,260	1,880	3,450	.704	.81
January	5,100	2,410	3,810	.778	.90
February	8,260	2,500	3,690	.753	.78
March	7,540	2,830	4,630	.945	1.09
April	11,500	3,840	8,140	1.66	1.85
May	9,310	3,680	6,920	1.41	1.63
June	3,360	1,190	1,910	.390	.44
July	2,550	988	1,420	.280	.32
August	1,510	832	1,090	.222	.25
September	1,400	813	1,060	.216	.24
The year	11,500	813	3,360	.686	9.28

CEDAR RIVER AT EAST LANSING, MICH.

LOCATION.—Water-stage recorder in sec. 18, T. 4 N., R. 1 W., 4 miles above mouth at East Lansing. Zero of gage is 824.96 feet above mean sea level.

RECORDS AVAILABLE.—March 1931 to September 1933. August 1902 to December 1903, at a site three-quarters of a mile downstream.

DISCHARGE.—Maximum during year, 2,310 second-feet Apr. 2 (gage height, 7.11 feet); minimum, 5.6 second-feet July 26 (gage height, 1.93 feet).

1902-3, 1931-33: Maximum mean daily, 2,700 second-feet Apr. 15, 1903 (gage height, 10.07 feet, old datum); minimum, 3 second-feet July 31, 1931.

Maximum stage known, about 14.5 feet during flood of 1921 (discharge not determined).

REMARKS.—Records good except those estimated, which are fair. Gage-height record furnished by Michigan State College.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	50	288	116	215	208	395	855	188	136		22	
2.....	46	322	118	223	258	334	2,080	273	116		29	
3.....	44	276	127	273	247	276	2,000	288	102		39	
4.....	55	229	149	244	202	251	1,380	258	124			
5.....	109	208	162	233	102	229	996	233	121			
6.....	155	195	168	219	136	219	857	326	104	a 50		
7.....	130	178	293	215	149	208	940	412	94		a 40	
8.....	107	181	382	215	91	208	884	403	86			
9.....	89	212	318	205	107	191	724	500	72			30
10.....	94	326	155	191	a 115	109	608	724	64		32	
11.....	175	318	a 110	181	a 120	143	518	698	58		26	
12.....	251	273	a 100	129	a 120	133	490	569	52		35	
13.....	212	226	a 90	146	a 120	165	442	477	49		38	
14.....	168	202	a 85	146	a 120	412	391	395	44		36	
15.....	143	185	a 80	124	a 120	518	459	330	44		30	a 25
16.....	124	172	a 75	130	a 120	420	513	318	46	a 30	31	
17.....	113	162	a 75	130	a 120	334	536	420	49		39	
18.....	104	168	a 75	140	a 125	291	912	403	47		26	
19.....	96	172	a 75	487	a 125	273	940	307	44		14	
20.....	91	172	74	698	a 125	307	750	412	41			22
21.....	86	165	74	647	a 130	500	579	584	39	18		22
22.....	82	152	74	579	a 135	490	450	541		13		25
23.....	79	146	181	598	a 140	412	338	395		9.2		23
24.....	82	152	511	574	a 150	338	280	280		7.6		24
25.....	84	172	1,020	482	a 300	322	244	226		6.1	a 25	19
26.....	118	185	968	408	a 450	291	219	181	a 35	6.1		31
27.....	208	158	776	366	a 500	370	198	175		15		36
28.....	240	137	588	303	482	518	181	178		22		31
29.....	236	127	450	208		500	165	172		22		30
30.....	202	118	346	205		416	155	165		21		30
31.....	185		326	208		382		158		21		

Month	Maximum	Minimum	Mean	Per square rile	Run-off in inches
October.....	251	44	128	0.361	0.42
November.....	326	118	199	.561	.63
December.....	1,020	74	263	.741	.85
January.....	698	124	294	.828	.95
February.....	500	91	183	.515	.54
March.....	518	109	321	.904	1.04
April.....	2,080	155	669	1.88	2.10
May.....	724	158	354	.997	1.15
June.....	136		61.6	.174	.19
July.....		6.1	31.0	.087	.10
August.....			30.2	.085	.10
September.....			25.8	.073	.08
The year.....	2,080	6.1	213	.600	8.15

• Estimated.

THORNAPPLE RIVER NEAR CALEDONIA, MICH.

LOCATION.—Staff gage in sec. 22, T. 5 N., R. 10 W., in tailrace of LaBarge power plant, $2\frac{1}{2}$ miles northeast of Caledonia. Gage heights are referred to mean sea level datum.

DRAINAGE AREA.—733 square miles.

RECORDS AVAILABLE.—October 1930 to September 1933.

DISCHARGE.—Maximum mean daily during year, 2,090 second-feet Apr. 6 and May 10 (gage height, 682.6 feet); minimum, 284 second-feet Feb. 8 (gage height, 680.3 feet).

1930-33: Maximum mean daily, 2,240 second-feet Mar. 30, 31, 1932 (gage height, 682.7 feet); minimum, 138 second-feet Aug. 11, 1931.

REMARKS.—Records fair. Flow regulated by storage at LaBarge power plant. Gage-height record furnished by Consumers Power Co.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Jul.	Aug.	Sept.
1-----	362	362	362	705	497	1,440	1,440	765	450	405	362	362
2-----	362	362	362	650	546	1,330	1,810	1,130	497	405	362	362
3-----	362	362	362	597	546	1,040	1,810	1,230	450	450	362	362
4-----	362	362	362	597	546	825	1,950	1,130	405	450	405	362
5-----	362	362	362	497	362	705	1,950	1,130	450	405	362	362
6-----	362	362	362	497	450	650	2,090	1,330	450	405	362	362
7-----	362	362	405	450	405	597	1,950	1,440	450	362	362	362
8-----	362	362	497	497	284	546	1,810	1,440	405	362	362	362
9-----	362	405	497	450	362	497	1,560	1,810	405	362	362	362
10-----	362	450	405	450	362	362	1,680	2,090	362	362	362	362
11-----	362	450	450	405	362	450	1,950	1,950	362	362	362	362
12-----	362	497	450	362	450	450	1,810	1,810	362	362	362	362
13-----	362	450	362	405	362	497	1,440	1,680	362	362	362	362
14-----	362	450	362	405	405	597	1,330	1,440	405	362	362	362
15-----	362	405	362	405	362	597	1,230	1,230	362	362	362	362
16-----	362	362	362	362	362	597	1,040	1,230	362	362	362	362
17-----	362	362	362	362	362	650	960	1,130	362	362	362	362
18-----	362	405	362	405	362	597	1,230	960	362	362	362	362
19-----	362	362	362	497	405	597	1,230	960	362	362	362	362
20-----	362	362	362	597	405	546	1,130	1,560	362	362	362	362
21-----	362	362	362	825	450	497	1,040	2,090	362	362	362	362
22-----	362	362	362	1,040	497	705	890	1,810	362	362	362	362
23-----	362	362	497	1,130	597	705	825	1,560	362	362	362	362
24-----	362	362	650	1,040	825	705	705	1,440	362	362	362	362
25-----	362	362	1,230	1,040	1,230	825	650	1,130	362	362	362	362
26-----	362	362	1,440	890	1,560	890	597	960	362	362	362	362
27-----	362	362	1,560	765	1,560	960	546	890	362	362	362	362
28-----	405	362	1,440	705	1,560	1,040	497	705	362	362	362	362
29-----	405	362	1,230	597	-----	1,230	497	597	405	362	362	362
30-----	405	362	960	497	-----	1,230	497	597	322	362	362	362
31-----	405	-----	825	497	-----	1,230	-----	546	-----	362	362	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October-----	405	362	368	0.477	0.55
November-----	497	362	353	.496	.55
December-----	1,560	362	591	.765	.88
January-----	1,130	362	601	.778	.90
February-----	1,560	284	588	.761	.79
March-----	1,440	362	761	.985	1.14
April-----	2,090	497	1,270	1.64	1.83
May-----	2,090	546	1,280	1.66	1.91
June-----	497	322	387	.501	.56
July-----	450	362	373	.483	.56
August-----	405	362	363	.470	.54
September-----	362	362	362	.468	.52
The year-----	2,090	284	611	.790	10.73

MUSKOGON RIVER AT NEWAYGO, MICH.

LOCATION.—Staff gage in sec. 24, T. 12 N., R. 13 W., in tailrace of power plant operated by Consumers Power Co. at Newaygo.

DRAINAGE AREA.—2,350 square miles.

RECORDS AVAILABLE.—October 1930 to September 1933. June 1971 to December 1906 at a site above Newaygo.

DISCHARGE.—Maximum mean daily during year, 8,000 second-feet May 3 (gage height, 50.7 feet); minimum, 615 second-feet July 16, Aug. 12, 20, 26, 27, Sept. 2-4 (gage height, 46.6 feet).

1901-6, 1930-33: Maximum mean daily, that of May 3, 1933; minimum, 495 second-feet Feb. 27, Mar. 22, Apr. 1, Aug. 8, Sept. 13, 1931.

REMARKS.—Records fair. Flow regulated at Croton Dam, 18 miles upstream, and by power plant at Newaygo. Gage-height record furnished by Consumers Power Co.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1-----	960	1,770	960	1,520	1,910	2,060	1,640	3,840	2,390	1,040	815	885
2-----	815	1,770	960	1,220	2,060	2,390	1,770	5,500	2,220	1,040	815	615
3-----	885	1,770	1,040	1,770	2,060	2,570	1,910	8,000	1,910	1,040	1,040	615
4-----	885	1,770	1,120	1,910	1,640	2,570	1,770	7,750	1,770	1,040	960	615
5-----	885	1,770	1,120	2,570	1,220	2,060	1,770	6,250	1,910	1,310	960	815
6-----	960	1,410	1,040	1,770	1,770	2,960	2,570	5,260	1,910	1,310	680	885
7-----	885	1,410	1,520	1,770	1,910	3,390	2,960	3,840	1,770	1,220	745	885
8-----	885	1,770	1,770	1,310	2,060	3,170	2,960	3,610	2,910	1,120	815	885
9-----	885	2,060	1,770	1,770	2,060	3,170	2,960	3,840	1,770	1,120	815	680
10-----	960	2,220	1,640	1,910	2,390	2,760	2,760	3,840	1,520	1,120	745	680
11-----	1,040	2,390	1,120	1,910	1,770	2,960	7,000	3,840	1,220	1,120	815	1,220
12-----	1,310	1,910	1,040	1,910	1,220	2,960	7,250	3,840	1,640	1,040	615	885
13-----	1,640	1,220	960	1,910	1,640	3,170	4,780	3,840	1,640	1,040	680	885
14-----	1,640	1,640	960	1,770	1,640	2,960	6,500	2,960	1,640	1,040	885	680
15-----	960	1,640	960	1,120	1,770	2,060	5,020	2,760	1,520	1,040	815	815
16-----	1,220	1,410	1,040	960	1,640	1,770	3,610	3,840	1,220	615	815	680
17-----	1,310	1,770	960	960	1,640	1,770	5,020	3,610	885	815	815	680
18-----	1,520	1,770	1,040	960	1,120	1,410	7,250	2,760	960	1,040	815	815
19-----	1,640	1,640	1,040	960	1,120	1,220	7,000	2,220	1,220	960	680	1,220
20-----	1,770	1,410	960	1,520	1,640	1,520	7,250	1,910	1,310	1,040	615	1,040
21-----	1,770	1,640	1,040	1,770	1,410	1,520	6,750	1,910	885	1,040	815	1,220
22-----	1,410	2,060	1,040	1,120	1,640	1,640	6,500	2,390	885	1,040	815	1,120
23-----	960	1,910	1,410	1,410	1,520	1,410	5,260	2,390	885	1,040	815	1,040
24-----	1,220	1,310	1,770	1,640	1,640	1,520	2,960	2,390	885	1,040	885	1,040
25-----	1,310	1,120	1,640	1,640	1,520	1,520	4,300	2,390	960	1,040	885	1,120
26-----	1,520	1,040	1,640	1,910	1,220	1,120	5,020	2,390	885	1,040	615	1,220
27-----	1,640	1,040	2,960	2,220	1,770	1,770	4,300	1,640	960	1,040	615	1,040
28-----	1,640	1,120	2,760	1,770	1,770	2,570	3,840	1,910	960	1,040	815	1,120
29-----	1,770	960	2,760	1,220	-----	2,960	3,170	1,770	960	1,040	885	1,310
30-----	1,410	960	2,570	1,770	-----	2,760	2,060	1,910	1,910	1,040	885	1,410
31-----	1,520	-----	2,570	1,910	-----	2,390	-----	2,220	-----	1,040	885	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October-----	1,770	815	1,270	0.540	0.62
November-----	2,390	960	1,590	.677	.76
December-----	2,960	960	1,460	.621	.72
January-----	2,570	960	1,610	.685	.79
February-----	2,390	1,120	1,670	.711	.74
March-----	3,390	1,120	2,260	.962	1.11
April-----	7,250	1,640	4,260	1.81	2.02
May-----	8,000	1,640	3,440	1.46	1.66
June-----	2,390	885	1,390	.591	.66
July-----	1,310	615	1,050	.447	.52
August-----	1,040	615	802	.341	.39
September-----	1,410	615	937	.399	.45
The year-----	8,000	615	1,810	.770	10.46

STREAMS TRIBUTARY TO LAKE HURON

SHIAWASSEE RIVER AT OWOSSO, MICH.

LOCATION.—Water-stage recorder in sec. 13, T. 7 N., R. 2 E., 90 feet upstream from Shiawassee Street Bridge, in Owosso. Zero of gage is 713.28 feet above mean sea level.

DRAINAGE AREA.—538 square miles.

RECORDS AVAILABLE.—March 1931 to September 1933.

DISCHARGE.—Maximum during year, 1,400 second-feet Apr. 1 (gage height, 7.30 feet); minimum, 8.4 second-feet July 29 (gage height, 2.74 feet).

1931-33: Maximum, 1,630 second-feet May 12, 1932 (gage height, 6.51 feet); minimum, 3.2 second-feet July 27, 1931.

Maximum stage known, 726 feet above mean sea level during an ice jam in 1918.

REMARKS.—Records good except those for estimated periods, which are poor. Flow regulated by power plant at Shiawassee town. Gage-height record furnished by city of Owosso.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	84	335	171	^b 515	426	485	1,030	370	254	41	23	} ^c 35
2.....	71	268	176	^b 546	398	440	1,130	384	247	41	37	
3.....	83	317	132	^b 643	384	412	970	412	211	66	36	
4.....	106	307	190	562	356	398	930	398	187	57	54	
5.....	174	299	199	470	^a 300	370	892	398	157	74	36	
6.....	90	286	215	426	^a 275	370	911	485	145	37	48	27
7.....	118	261	382	384	^a 250	356	930	470	138	^b 39	52	27
8.....	127	222	398	370	^a 225	370	836	485	137	^b 37	57	29
9.....	90	246	320	370	^a 200	356	800	500	118	^b 37	30	34
10.....	139	332	^a 300	356	^a 180	^a 300	728	546	107	^b 37	35	19
11.....	201	222	^a 280	343	^a 180	^a 275	677	562	91	^b 37	35	35
12.....	221	309	^a 270	^a 320	^a 190	^a 275	660	562	92	55	39	29
13.....	229	317	^a 260	^a 300	^a 190	^a 300	594	500	90	60	43	^b 29
14.....	168	296	^a 250	^a 280	^a 200	^a 325	578	455	66	15	60	^b 35
15.....	168	288	^a 240	^a 260	^a 200	356	594	426	76	27	29	^b 46
16.....	152	274	^a 230	^a 240	^a 210	398	^b 594	412	80	39	46	61
17.....	126	215	^a 220	^a 220	^a 220	398	^b 677	412	80	44	27	63
18.....	136	224	^a 210	^b 195	^a 230	370	^b 555	455	102	35	35	53
19.....	172	222	^a 200	550	^a 250	356	^b 818	440	40	36	32	46
20.....	165	223	^a 200	594	^a 325	356	^b 828	426	64	34	32	46
21.....	141	200	^a 250	578	^a 375	426	764	426	54	30	38	57
22.....	146	225	^a 500	594	^a 425	440	^b 677	485	52	31	31	38
23.....	157	181	^b 677	660	^a 500	440	^b 643	470	39	17		34
24.....	131	193	^b 855	610	^a 600	412	^b 546	412	37	36		24
25.....	135	206	^b 782	578	^a 750	412	^b 485	356	39	22		50
26.....	159	212	^b 782	532	^a 800	398	^b 426	317	47	33	} ^c 35	58
27.....	189	212	694	400	694	455	^b 370	281	54	39		71
28.....	235	213	610	470	546	532	335	266	53	32		59
29.....	233	227	532	370	-----	500	330	256	39	25		^b 100
30.....	278	206	485	356	-----	485	332	256	55	22		129
31.....	316	-----	^b 485	412	-----	515	-----	252	-----	32	-----	-----

Month	Maximum	Minimum	Mean	Per square mil. ^a	Run-off in inches
October.....	316	71	159	0.296	0.34
November.....	335	181	255	.474	.53
December.....	355	132	371	.690	.80
January.....	660	195	439	.816	.94
February.....	800	180	353	.656	.68
March.....	532	275	396	.736	.85
April.....	1,130	330	696	1.29	1.44
May.....	562	252	415	.771	.89
June.....	254	87	98.4	.183	.20
July.....	74	15	37.6	.070	.08
August.....	60	23	37.7	.070	.08
September.....	129	19	45.5	.085	.09
The year.....	1,130	15	275	.511	6.92

^a Estimated because of ice effect.

^b Partly estimated.

^c Estimated.

FLINT RIVER AT GENESEE, MICH.

LOCATION.—Wire gage installed Oct. 19, 1932, in sec. 10, T. 8 N., R. 7 E., at new highway bridge at Genesee; prior to that date gage was at highway bridge 500 feet downstream. Zero of present gage is 695.84 feet above mean sea level; zero of former gage, 695.32 feet above mean sea level.

DRAINAGE AREA.—593 square miles.

RECORDS AVAILABLE.—March 1931 to September 1933.

DISCHARGE.—Maximum during year, 2,530 second-feet Apr. 4 (gage height, 20.64 feet); minimum, 50 second-feet Sept. 5-10.

1931-33: Maximum, that of Apr. 4, 1933; minimum, 19 second-feet Aug. 22-24, 26, 1931.

REMARKS.—Records fair except those for periods of ice effect, Dec. 9-24, Jan. 2-6, 12-17, Feb. 4-24, 27, 28, Mar. 9-13, which are poor. Diversions below station for municipal use at Flint. Gage-height record furnished by city of Flint.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	133	623	250	597	186	1,180	1,740	378	271	77	56	52
2.....	124	651	240	550	572	900	1,780	468	260	89	52	52
3.....	124	680	240	500	740	710	2,080	623	230	83	56	52
4.....	142	710	250	500	500	623	2,480	740	210	83	67	52
5.....	217	710	269	475	350	500	2,440	740	200	77	72	50
6.....	315	740	348	450	325	433	2,120	740	180	77	67	50
7.....	504	800	623	455	300	411	1,900	740	171	77	67	50
8.....	460	800	860	455	275	411	1,580	710	162	77	63	50
9.....	439	830	600	390	250	375	1,500	710	152	72	63	50
10.....	460	860	525	369	225	325	1,350	710	134	72	59	50
11.....	504	960	475	369	235	325	1,180	651	126	67	59	52
12.....	570	1,040	450	300	240	350	1,100	623	117	67	59	52
13.....	570	1,070	425	275	245	375	960	568	110	67	72	52
14.....	548	1,000	400	275	250	390	830	517	102	67	96	56
15.....	548	800	375	275	250	390	830	492	102	72	96	56
16.....	526	710	350	250	250	390	770	445	102	67	89	56
17.....	482	651	325	240	250	348	740	400	110	67	83	56
18.....	418	547	325	231	275	369	1,580	445	102	63	72	56
19.....	348	477	300	547	300	328	1,500	334	96	59	63	52
20.....	288	455	275	900	350	328	1,660	334	96	59	67	52
21.....	240	433	300	1,070	400	455	1,700	378	89	59	67	56
22.....	231	390	325	800	450	523	1,500	445	89	59	63	59
23.....	222	369	450	900	525	572	1,180	378	89	63	59	56
24.....	222	348	800	1,000	650	523	900	313	77	63	56	56
25.....	213	328	1,000	900	1,180	523	710	271	77	67	52	72
26.....	348	328	1,070	830	1,280	500	568	250	77	63	52	126
27.....	455	328	1,320	770	1,150	572	492	250	77	63	56	134
28.....	623	328	1,540	680	1,100	572	422	271	72	59	56	143
29.....	651	328	1,350	572	-----	572	400	262	72	59	56	134
30.....	438	328	1,180	547	-----	572	356	313	77	56	52	143
31.....	523	-----	1,000	269	-----	651	-----	262	-----	56	52	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	651	124	383	0.646	0.74
November.....	1,070	328	621	1.05	1.17
December.....	1,540	240	588	.992	1.14
January.....	1,070	231	540	.911	1.05
February.....	1,280	186	468	.789	.82
March.....	1,180	325	500	.843	.97
April.....	2,480	356	1,280	2.16	2.41
May.....	740	250	478	.806	.93
June.....	271	72	128	.216	.24
July.....	89	56	67.9	.114	.13
August.....	96	52	64.6	.109	.13
September.....	143	50	67.6	.114	.13
The year.....	2,480	50	431	.727	9.86

Estimated.

FLINT RIVER NEAR FLINT, MICH.

LOCATION.—Water-stage recorder in SW¼ sec. 4, T. 7 N., R. 6 E., at sewage treatment plant 2 miles below Flint. Zero of gage is 678.80 feet above mean sea level.

DRAINAGE AREA.—927 square miles.

RECORDS AVAILABLE.—August 1932 to September 1933. September 1903 to March 1904 at site 5 miles upstream, at Flint.

DISCHARGE.—1932-33: Maximum during period, 5,350 second-feet Apr. 1, 1933 (gage height, 9.05 feet); minimum, 24 second-feet Sept. 22, 1933 (gage height, 2.40 feet).

REMARKS.—Records good except those for periods of ice effect, Dec. 11-21, Feb. 6-13, and for period May to September, which are fair. Some regulation at storage dams upstream. The city of Flint diverts water for municipal and industrial use above the gage, the sewage from the city is included in the flow at the gage. Gage-height record furnished by the city of Flint.

Discharge, in second-feet, 1932-33

Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.
1932			1932			1932		
1		281	11		920	21	120	228
2		246	12		685	22	124	246
3		452	13		735	23	116	113
4		2,040	14		567	24	106	204
5		1,590	15		602	25	102	225
6		1,470	16		397	26	95	180
7		1,370	17		472	27	106	192
8		1,340	18	124	270	28	98	184
9		1,180	19	113	362	29	205	234
10		948	20	124	222	30	171	246
						31	234	

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1932-33												
1	116	865	439	827	892	1,610	3,400	685	548	196	116	140
2	116	1,090	370	760	948	1,180	4,080	685	567	120	106	155
3	120	892	411	735	810	948	3,380	865	567	175	163	63
4	196	1,030	490	785	760	810	3,380	920	462	175	102	72
5	255	975	462	735	391	760	3,270	1,000	379	136	91	81
6	334	948	556	710	450	810	3,270	1,090	374	102	88	84
7	379	785	975	760	400	735	2,940	1,120	374	109	98	81
8	379	865	1,120	685	375	710	2,160	1,060	311	109	102	91
9	365	838	892	685	350	605	1,950	1,000	246	88	106	120
10	488	1,090	591	645	325	365	1,790	1,000	426	95	109	69
11	920	1,210	580	500	300	338	1,680	892	159	91	262	95
12	892	1,120	550	392	310	360	1,580	865	202	88	197	109
13	735	1,240	525	342	310	500	1,280	920	283	78	124	106
14	810	1,210	500	456	304	660	1,240	838	147	78	296	136
15	735	1,000	460	383	334	685	1,240	865	298	81	356	88
16	645	810	410	467	334	660	1,180	735	167	72	259	75
17	660	810	380	481	329	596	1,410	620	329	78	314	63
18	495	865	370	439	338	509	3,100	576	298	78	285	46
19	425	785	360	1,240	355	548	2,340	576	225	75	143	162
20	402	685	340	1,440	874	660	2,030	591	188	75	128	289
21	320	685	300	1,280	755	975	2,070	605	136	78	136	95
22	251	505	284	1,280	591	892	1,910	600	66	81	136	41
23	255	505	600	1,610	785	865	1,540	696	183	75	116	39
24	320	543	1,240	1,370	975	838	1,280	586	208	95	48	33
25	240	519	1,950	1,280	1,580	865	1,090	486	128	95	52	683
26	409	505	1,910	1,280	1,610	810	865	425	116	88	54	618
27	439	495	1,720	1,150	1,440	1,000	735	467	102	88	41	397
28	576	495	1,680	1,030	1,540	1,090	685	538	37	95	57	316
29	596	425	1,580	660	-----	975	685	543	37	88	69	156
30	581	509	1,400	660	-----	920	514	562	113	81	95	315
31	660	-----	1,210	735	-----	1,160	-----	576	-----	98	101	-----

Discharge, in second-feet, of Flint River near Flint, Mich., 1932-33—Continued

Month	Maximum	Minimum	Mean	Per square mi. ^a	Run-off in inches
1932					
August 18-31.....	234	95	212	0.229	0.12
September.....	2,040	113	607	.655	.73
1932-33					
October.....	920	116	455	.491	.57
November.....	1,240	425	810	.874	.98
December.....	1,950	284	795	.858	.99
January.....	1,610	342	832	.897	1.03
February.....	1,610	300	670	.723	.75
March.....	1,610	338	788	.850	.98
April.....	4,080	514	1,940	2.09	2.33
May.....	1,120	425	738	.796	.92
June.....	567	37	256	.276	.31
July.....	196	72	98.7	.107	.12
August.....	356	41	143	.154	.18
September.....	683	33	161	.174	.19
The year.....	4,080	33	638	.688	9.35

FARMERS CREEK NEAR LAPEER, MICH.

LOCATION.—Staff gage at footbridge at Michigan Home and Training School, 2 miles west of Lapeer. Zero of gage is 806.48 feet above mean sea level.

DRAINAGE AREA.—57 square miles.

RECORDS AVAILABLE.—March to September 1933.

DISCHARGE.—Maximum during period, 186 second-feet Apr. 3 (gage height, 16.91 feet); minimum, 2.7 second-feet Sept. 10 (gage height, 14.44 feet).

REMARKS.—Records good.

Discharge, in second-feet, 1933

Day	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....		93	41	30	10	5.6	8.0
2.....		111	42	27	11	8.0	6.6
3.....		186	68	23	11	11	5.9
4.....		186	72	24	10	10	4.8
5.....		147	64	25	10	8.8	4.2
6.....		120	68	25	10	10	4.8
7.....		106	68	24	10	8.8	5.2
8.....		102	68	22	9.6	7.3	5.6
9.....		88	68	20	11	8.0	4.5
10.....		84	64	17	7.0	7.6	2.7
11.....		80	64	18	9.6	5.6	3.3
12.....		72	64	15	9.6	12	3.3
13.....		68	60	14	9.2	14	3.3
14.....		68	60	14	9.6	16	3.3
15.....		64	48	20	10	20	3.9
16.....		64	43	15	9.6	20	4.5
17.....		64	39	4.5	9.2	19	4.5
18.....		111	37	14	8.8	16	3.9
19.....		166	35	16	8.8	13	3.3
20.....		176	34	14	7.3	9.6	3.9
21.....		138	34	14	8.4	8.4	4.2
22.....		111	31	13	8.8	7.0	3.9
23.....		88	28	12	9.6	6.2	3.3
24.....		68	27	12	10	5.9	3.3
25.....		56	25	12	8.0	5.6	11
26.....	52	48	22	11	7.3	6.6	12
27.....	52	44	27	7.3	8.0	6.6	14
28.....	56	39	29	9.2	7.3	6.6	14
29.....	56	35	30	10	6.2	6.6	14
30.....	56	34	31	9.6	7.3	6.2	14
31.....			31		7.0	6.6	

Month	Maximum	Minimum	Mean	Per square mi. ^e	Run-off in inches
April.....	186	34	93.9	1.65	1.84
May.....	72	22	45.9	.805	.93
June.....	30	4.5	16.4	.288	.32
July.....	11	6.2	9.01	.158	.18
August.....	20	5.6	9.76	.171	.20
September.....	14	2.7	6.11	.107	.12

TITTABAWASSEE RIVER AT FREELAND, MICH.

LOCATION.—Chain gage on line between secs. 16 and 21, T. 13 N., R. 3 E., at highway bridge at Freeland, Saginaw County.

DRAINAGE AREA. 2,530 square miles.

RECORDS AVAILABLE.—August 1903 to December 1909, January 1912 to September 1933.

DISCHARGE.—Maximum during year ending Sept. 30, 1931, 2,210 second-feet May 22 (gage height, 3.11 feet); minimum, 222 second-feet July 28, Aug. 1, 25, 26 (gage height, 0.46 feet).

Maximum during year ending Sept. 30, 1932, 8,080 second-feet Feb. 13 (gage height, 9.21 feet); minimum, 339 second-feet Oct. 14, 15, Sept. 27.

Maximum during year ending Sept. 30, 1933, 24,500 second-feet May 3 (gage height, 15.02 feet); minimum, 282 second-feet Aug. 2.

Average, 21 years (1912-33), 1,840 second-feet.

REMARKS.—Records Oct. 1, 1932, to Sept. 30, 1933, good; others fair except those for periods of ice effect, Nov. 29 to Dec. 4, Dec. 25, 26, 30, 31, 1930, Jan. 1-5, 15, 16, 22-24, Feb. 14, 15, Dec. 8, 9, 1931, Feb. 2-6, 24, Mar. 7-13, Dec. 9-23, 1932, Jan. 2-4, Feb. 6-22, 1933, which are poor. Gage-height record Oct. 1, 1930, to Nov. 23, 1932, furnished by Ayres, Lewis, Norris & May, consulting engineers, Ann Arbor, Mich.

Discharge, in second-feet, 1930-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1930-31												
1.....	565	565	730	600	405	1,460	1,970	728	630	435	222	304
2.....	532	532	840	650	405	1,250	1,740	728	662	435	249	333
3.....	500	500	820	700	598	970	1,600	630	630	429	363	333
4.....	500	435	790	700	630	795	1,530	565	630	468	333	276
5.....	429	435	760	700	532	970	1,250	532	630	555	304	276
6.....	399	435	728	695	435	1,250	900	500	662	570	333	304
7.....	369	468	662	662	405	1,250	1,040	468	1,040	435	304	304
8.....	500	468	630	865	532	1,110	1,670	532	630	417	333	333
9.....	1,040	500	695	695	405	1,040	1,600	695	630	435	363	333
10.....	1,040	468	760	429	435	970	1,530	900	795	498	695	304
11.....	1,040	435	830	399	598	865	1,530	1,180	630	272	695	304
12.....	830	435	830	399	435	1,250	1,460	1,890	598	405	630	333
13.....	630	411	1,110	500	345	1,600	1,040	1,180	565	369	565	363
14.....	500	435	1,180	500	450	1,180	1,180	1,740	565	399	532	695
15.....	369	435	1,180	500	500	1,110	1,250	865	598	363	500	1,040
16.....	369	532	1,180	500	532	970	1,040	900	598	363	393	1,740
17.....	630	500	1,110	500	565	1,180	900	865	500	570	304	2,130
18.....	865	500	1,110	468	1,320	1,110	830	830	468	570	276	1,740
19.....	830	1,180	970	429	1,460	900	760	795	435	381	363	1,390
20.....	760	1,320	900	282	1,180	598	662	795	435	351	598	1,040
21.....	695	1,390	695	310	1,110	1,040	630	900	435	345	304	695
22.....	630	1,040	630	350	1,040	1,320	695	2,210	375	279	276	1,040
23.....	598	1,040	532	425	900	1,390	900	1,530	369	310	249	1,180
24.....	500	865	468	500	760	1,600	970	1,180	399	310	304	1,390
25.....	435	728	460	662	970	1,970	970	865	423	374	222	900
26.....	468	662	470	598	1,110	1,970	900	900	423	374	222	900
27.....	500	630	500	532	1,460	1,890	900	795	565	249	363	865
28.....	565	630	532	662	1,600	1,810	830	728	500	222	363	695
29.....	565	640	532	630	-----	1,970	795	662	435	276	276	695
30.....	532	660	550	598	-----	2,050	795	630	435	276	304	695
31.....	565	-----	575	598	-----	2,050	-----	630	-----	374	304	-----

Discharge, in second-feet, of Tittabawassee River at Freeland, Mich., 1930-33—Cont.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1931-32												
1.....	662	1,110	1,390	1,460	1,600	2,370	3,010	830	1,250	662	970	760
2.....	630	900	1,390	1,810	1,600	2,450	2,530	662	970	865	369	760
3.....	630	760	1,320	1,460	1,700	2,290	2,530	760	970	830	468	728
4.....	630	468	1,180	1,530	1,700	1,970	2,370	900	1,040	760	598	795
5.....	565	468	795	1,600	1,600	1,600	3,170	970	1,600	830	695	728
6.....	532	435	728	2,130	1,600	1,810	3,010	695	2,530	970	728	695
7.....	500	435	468	3,880	1,460	1,700	3,610	728	2,610	900	630	760
8.....	500	435	625	4,060	1,530	1,600	3,880	970	2,370	830	532	1,110
9.....	532	435	800	3,610	1,530	1,500	3,790	1,320	970	728	468	1,040
10.....	532	435	1,180	2,770	1,180	1,400	3,520	3,880	970	695	900	728
11.....	468	435	1,460	1,810	1,600	1,250	3,170	5,850	830	662	630	565
12.....	423	468	1,810	1,670	6,650	1,100	3,520	6,350	728	630	565	399
13.....	399	760	1,740	1,890	8,080	950	3,170	4,780	630	532	565	468
14.....	339	1,110	1,600	4,510	5,150	830	1,970	4,240	630	532	865	662
15.....	339	1,320	1,460	5,450	3,430	1,320	1,740	3,250	695	565	630	900
16.....	399	1,460	1,530	5,350	3,010	1,040	1,740	2,690	760	2,850	598	760
17.....	435	1,810	1,320	4,240	2,770	865	1,530	1,740	865	1,970	830	630
18.....	405	1,670	1,320	4,420	3,250	795	1,180	1,460	970	1,460	900	468
19.....	405	2,130	1,250	4,510	2,610	695	1,040	1,320	760	532	970	728
20.....	375	2,210	1,530	4,060	1,810	565	1,040	1,180	695	565	970	339
21.....	381	2,210	1,890	3,610	1,670	411	1,110	1,180	662	630	760	399
22.....	381	2,210	2,290	3,520	728	970	1,040	970	630	662	695	369
23.....	411	2,210	1,810	3,520	1,250	1,250	970	795	695	598	830	369
24.....	411	2,370	1,970	2,690	1,300	1,670	970	1,180	429	532	728	468
25.....	532	2,450	2,290	2,450	1,320	1,970	900	1,320	468	500	630	468
26.....	1,180	2,210	1,890	2,370	1,320	2,210	970	1,320	468	598	565	500
27.....	1,180	1,890	1,810	2,290	1,320	2,850	1,040	1,600	423	565	468	369
28.....	1,250	1,670	1,530	2,290	1,250	3,610	1,040	2,530	468	532	468	399
29.....	1,390	1,460	1,390	1,970	1,180	4,780	1,040	2,290	468	500	468	630
30.....	1,460	1,390	1,320	1,810	1,180	4,240	970	1,970	970	728	865	865
31.....	1,320	---	1,250	1,600	---	3,250	---	1,600	---	532	760	---
1932-33												
1.....	532	1,890	630	1,600	1,600	2,210	5,250	3,010	1,110	970	327	399
2.....	532	1,670	468	2,000	3,880	2,210	6,380	10,600	1,740	1,180	282	423
3.....	399	1,600	865	2,000	4,060	2,210	6,940	24,000	1,600	760	387	435
4.....	532	1,740	598	1,750	3,250	2,370	5,550	14,400	1,320	630	345	435
5.....	1,670	1,390	830	1,670	2,050	1,320	4,510	10,100	900	598	393	357
6.....	1,810	1,040	1,110	1,110	1,350	1,180	5,850	7,180	1,180	598	393	435
7.....	1,740	970	1,460	1,040	1,300	1,390	8,750	6,050	1,040	598	393	435
8.....	1,040	1,390	1,320	630	1,250	1,320	8,330	4,960	1,110	598	423	435
9.....	598	1,670	775	630	1,200	1,180	5,050	4,060	1,040	532	423	423
10.....	630	1,740	750	598	1,200	1,740	4,330	4,420	970	468	429	500
11.....	2,130	1,740	775	865	1,200	1,460	4,870	4,240	795	500	411	500
12.....	1,600	1,670	775	1,180	1,250	1,250	5,950	3,520	760	532	695	435
13.....	1,530	1,530	775	1,670	1,250	1,180	6,270	3,880	830	532	565	468
14.....	1,460	1,460	850	1,600	1,250	2,290	4,870	3,430	830	468	381	468
15.....	1,390	1,390	840	970	1,250	1,600	4,690	3,090	900	500	369	468
16.....	1,390	1,390	800	532	1,250	1,460	4,240	3,250	795	429	375	500
17.....	1,890	1,040	775	697	1,250	1,390	4,330	2,930	728	429	662	500
18.....	1,740	1,040	850	1,040	1,200	1,600	9,340	2,770	695	417	468	435
19.....	1,250	918	825	1,180	1,200	1,390	14,700	2,530	630	405	393	411
20.....	1,040	795	825	1,320	1,200	1,180	12,000	2,210	598	429	399	500
21.....	532	695	975	1,460	1,300	1,460	7,670	1,890	565	435	423	630
22.....	365	760	1,150	1,180	1,400	1,810	4,960	1,740	500	728	393	630
23.....	598	1,460	1,400	1,180	1,670	1,670	4,240	1,810	532	500	468	795
24.....	598	1,110	1,970	1,810	3,250	1,390	3,430	1,970	565	423	500	662
25.....	1,040	532	3,430	1,810	3,090	1,530	2,770	2,050	500	435	411	728
26.....	1,320	598	4,420	1,810	2,930	2,210	2,930	1,670	500	429	399	1,530
27.....	1,600	411	3,790	1,320	2,850	3,090	2,450	1,810	500	435	411	1,390
28.....	2,050	662	3,430	970	2,930	3,340	2,130	1,600	468	429	411	1,390
29.....	1,740	728	3,250	970	---	3,790	1,890	1,180	565	468	399	970
30.....	1,180	662	3,090	970	---	3,850	1,530	1,180	728	381	468	695
31.....	1,390	---	2,610	1,390	---	3,430	---	1,110	---	357	429	---

Discharge, in second-feet, of Tittabawassee River at Freeland, Mich., 1937-33—Cont.

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
1930-31					
October.....	1,040	369	605	0.239	0.28
November.....	1,390	411	642	.254	.28
December.....	1,180	460	766	.303	.35
January.....	865	282	550	.217	.25
February.....	1,600	345	754	.298	.31
March.....	2,050	598	1,320	.522	.60
April.....	1,970	630	1,130	.447	.50
May.....	2,210	468	914	.361	.42
June.....	1,040	369	556	.220	.25
July.....	565	222	375	.148	.17
August.....	695	222	372	.147	.17
September.....	2,130	276	764	.302	.34
The year.....	2,210	222	728	.288	3.92
1931-32					
October.....	1,460	339	632	.250	.29
November.....	2,450	435	1,310	.518	.58
December.....	2,290	468	1,430	.565	.65
January.....	5,450	1,460	2,910	1.15	1.33
February.....	8,080	728	2,250	.889	.96
March.....	4,780	411	1,780	.704	.81
April.....	3,880	900	2,050	.810	.90
May.....	6,350	662	1,980	.783	.90
June.....	2,610	423	951	.376	.42
July.....	2,850	500	798	.315	.36
August.....	970	369	681	.269	.31
September.....	1,110	339	629	.249	.28
The year.....	8,080	339	1,450	.573	7.79
1932-33					
October.....	2,050	399	1,200	.474	.55
November.....	1,890	411	1,190	.470	.52
December.....	4,420	468	1,500	.593	.68
January.....	2,000	532	1,260	.498	.57
February.....	4,060	1,200	1,890	.747	.78
March.....	3,880	1,180	1,920	.759	.88
April.....	14,700	1,530	5,540	2.19	2.44
May.....	24,000	1,110	4,470	1.76	2.03
June.....	1,740	468	833	.329	.37
July.....	1,180	357	535	.211	.24
August.....	695	282	427	.169	.19
September.....	1,890	357	646	.255	.28
The year.....	24,000	282	1,780	.704	9.53

CHIPPEWA RIVER NEAR MOUNT PLEASANT, MICH.

LOCATION.—Chain gage on line between secs. 7 and 8, T. 14 N., P. 3 W., 4 miles northeast of Mount Pleasant.

DRAINAGE AREA.—416 square miles (revised).

RECORDS AVAILABLE.—October 1930 to July 1931, October 1932 to September 1933.

DISCHARGE.—Maximum during year, 3,150 second-feet May 3 (gage height, 9.92 feet); minimum, 54 second-feet Oct. 2 (gage height, 2.90 feet).

1930-31, 1932-33: Maximum, that of May 3, 1933; minimum, that of Oct. 2, 1932.

REMARKS.—Records good below and fair above 700 second-feet, except those for periods of ice effect, Dec. 9-22, Feb. 8-22, which are poor.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	116	236	208	665	358	1,020	900	630	295	181	143	129
2	54	236	194	820	820	630	940	2,270	265	181	138	143
3	120	250	181	860	560	342	940	2,980	280	181	143	82
4	107	236	222	860	374	295	780	3,100	280	109	194	107
5	122	222	208	665	310	280	630	2,160	265	176	168	236
6	133	222	194	490	310	280	630	1,450	280	181	158	133
7	194	222	222	456	295	265	860	1,120	236	176	163	133
8	113	208	236	525	280	250	820	780	222	107	111	222
9	131	208	400	326	265	250	700	780	194	111	120	120
10	160	358	250	326	250	250	665	820	194	133	120	96
11	208	374	200	208	260	250	940	700	176	100	120	181
12	236	326	200	236	270	295	1,120	700	176	100	120	138
13	176	295	200	208	270	295	1,020	740	168	153	163	143
14	194	310	200	181	270	222	860	665	111	116	153	260
15	168	250	200	222	270	265	780	525	150	148	124	133
16	165	265	190	310	270	326	665	490	176	129	143	85
17	148	236	190	265	280	208	630	456	163	173	124	194
18	145	222	200	265	290	222	1,600	423	143	155	120	88
19	145	222	200	250	300	236	1,750	406	150	105	116	116
20	145	194	190	265	325	250	1,700	390	155	122	148	124
21	138	208	200	326	350	250	1,250	423	178	77	158	120
22	141	236	275	236	450	342	940	390	208	127	158	129
23	129	194	390	358	820	280	700	342	168	160	138	222
24	138	176	456	295	1,020	250	665	326	88	171	129	194
25	145	194	900	295	1,120	423	595	295	138	155	153	194
26	181	194	1,750	265	1,250	310	525	250	103	160	96	250
27	310	150	1,650	265	1,200	342	490	310	94	194	133	222
28	295	208	1,500	295	1,120	595	456	374	94	208	138	222
29	295	178	1,250	265	-----	525	456	310	101	138	129	178
30	222	236	900	295	-----	490	456	265	194	138	129	173
31	222	-----	423	236	-----	595	-----	326	-----	143	138	-----

Month	Maximum	Minimum	Mean	Per square miles	Run-off in inches
October	310	54	168	0.404	0.47
November	374	150	236	.567	.63
December	1,750	181	451	1.08	1.24
January	860	181	372	.894	1.08
February	1,250	250	498	1.20	1.25
March	1,020	208	349	.839	.97
April	1,750	456	849	2.04	2.28
May	3,100	250	811	1.95	2.25
June	295	88	182	.437	.49
July	208	77	145	.349	.40
August	194	96	138	.332	.38
September	250	85	159	.382	.43
The year	3,100	54	362	.870	11.82

PINE RIVER AT ALMA, MICH.

LOCATION.—Staff gage in sec. 34, T. 12 N., R. 3 W., 70 feet below highway bridge in Alma.

DRAINAGE AREA.—288 square miles (revised).

RECORDS AVAILABLE.—October 1930 to September 1933.

DISCHARGE.—Maximum during year, 1,060 second-feet May 2 (gage height, 6.18 feet); minimum, 34 second-feet Sept. 15-17 (gage height, 0.34 foot).

1930-33: Maximum, that of May 2, 1933; minimum, 30 second-feet July 29, 1931.

REMARKS.—Records fair except those for estimated periods, which are poor. Gage-height record furnished by city of Alma.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	43	161	114	231	175	480	514	413	217	88	49	42
2.....	43	175	114	189	429	397	568	1,060	175	94	46	42
3.....	43	161	114	147	365	304	643	864	161	177	73	44
4.....	48	154	114	120	161	161	605	801	147	114	73	51
5.....	57	154	126	147	161	245	550	720	147	170	73	51
6.....	57	147	126	175	160	217	497	780	140	94	73	51
7.....	60	140	161	175	155	203	605	624	161	90	73	49
8.....	72	147	132	154	150	189	514	605	133	84	73	49
9.....	66	154	161	154	145	161	497	463	126	81	73	46
10.....	60	161	94	161	145	334	497	605	120	81	73	46
11.....	85	217	160	154	150	120	497	568	114	80	71	44
12.....	126	217	160	217	150	175	514	497	100	77	66	51
13.....	107	203	90	91	150	170	514	568	93	77	61	54
14.....	94	203	185	91	150	165	532	514	89	74	54	39
15.....	93	182	185	120	150	180	532	463	91	67	54	34
16.....	85	161	185	120	145	160	463	446	91	73	85	34
17.....	80	147	185	161	140	165	397	381	90	68	76	34
18.....	74	114	185	161	140	175	605	319	94	66	68	39
19.....	72	80	185	161	170	189	586	289	100	66	68	120
20.....	67	91	188	245	180	203	662	274	94	66	61	71
21.....	60	84	90	203	170	203	643	274	89	66	58	71
22.....	57	85	107	203	170	217	550	274	86	66	56	66
23.....	93	82	161	203	175	203	446	259	85	68	54	66
24.....	100	84	231	203	231	203	334	217	85	66	51	58
25.....	107	84	480	203	397	231	289	189	85	66	51	58
26.....	114	85	446	203	381	259	231	182	84	66	51	94
27.....	140	107	497	175	381	289	245	175	84	63	49	107
28.....	217	107	497	161	413	334	259	189	84	58	39	94
29.....	231	114	463	126	-----	397	217	231	85	54	39	86
30.....	175	114	365	120	-----	413	161	175	88	49	39	78
31.....	168	-----	217	114	-----	446	-----	175	-----	49	42	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	231	43	93.4	0.324	0.37
November.....	217	80	137	.476	.53
December.....	497	85	185	.642	.74
January.....	245	91	164	.569	.66
February.....	429	140	210	.729	.76
March.....	480	120	245	.851	.98
April.....	662	161	472	1.64	1.83
May.....	1,060	175	439	1.52	1.75
June.....	217	84	111	.385	.43
July.....	114	49	74.8	.259	.30
August.....	85	39	60.4	.209	.24
September.....	120	34	59.0	.205	.23
The year.....	1,060	34	187	.653	8.82

• Estimated.

STREAMS TRIBUTARY TO LAKE ERIE

BLACK RIVER NEAR PORT HURON, MICH.

LOCATION.—Chain gage in sec. 2, T. 6 N., R. 16 E., at highway bridge 6 miles west of Port Huron.

RECORDS AVAILABLE.—April to June 1931, October 1932 to August 1933 (discontinued).

DISCHARGE.—Maximum during periods, 6,740 second-feet Apr. 2, 1933 (gage height, 18.94 feet); minimum, 4 second-feet June 22, 1931 (gage height, 4.48 feet).

REMARKS.—Records good except those estimated, Apr. 19, 26, May 3, 10, 17, 24, 1931, Feb. 25, 1933, which are fair.

Discharge, in second-feet, 1931-33

Day	Apr.	May	June	Aug.	Day	Apr.	May	June	Aug.
1931					1931				
1-----		42	101	-----	16-----		64	12	-----
2-----		42	27	-----	17-----	54	60	7	-----
3-----		43	27	-----	18-----	37	55	7	-----
4-----		44	30	• 14	19-----	34	55	6	-----
5-----		42	39	-----	20-----	30	58	7	-----
6-----		37	27	-----	21-----				-----
7-----		42	42	-----	22-----	30	53	6	-----
8-----		64	44	-----	23-----	64	55	4	-----
9-----		64	39	-----	24-----	67	55	6	-----
10-----		67	53	-----	25-----	55	55	6	-----
11-----				-----	26-----	37	55	6	-----
12-----		70	44	-----	27-----	52	190	7	-----
13-----		115	37	-----	28-----	67	47	27	-----
14-----		85	23	-----	29-----	50	13	25	-----
15-----		76	37	-----	30-----	55	12	27	-----
		67	22	-----	31-----	47	13	32	-----
				-----			101		-----

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
1932-33											
1-----	38	515	143	633	440	2,550	2,900	1,490	152	26	13.
2-----	34	961	139	440	515	1,950	6,470	1,760	122	28	13.
3-----	34	713	135	593	673	1,180	6,020	1,310	111	30	-----
4-----	32	836	152	404	554	593	4,780	1,260	96	26	-----
5-----	53	422	157	303	515	404	3,300	836	92	18	-----
6-----											-----
7-----	50	319	166	288	272	335	2,300	836	72	17	-----
8-----	50	272	477	303	272	303	3,400	1,000	79	22	-----
9-----	43	243	2,500	272	243	303	2,800	673	61	22	-----
10-----	41	216	1,180	272	203	303	2,800	515	58	11	-----
	41	1,130	1,360	243	61	335	1,310	515	58	11	-----
11-----	114	1,800	961	216	48	216	961	554	45	13	-----
12-----	85	1,400	1,000	243	96	243	1,000	477	43	12	-----
13-----	96	1,000	673	148	107	203	1,040	369	28	9.9	-----
14-----	99	713	515	166	85	335	836	673	24	12	-----
15-----	103	477	352	178	75	961	673	440	28	12	-----
16-----	96	404	319	130	75	673	713	272	30	13	-----
17-----	92	319	258	135	79	404	713	216	28	13	-----
18-----	82	288	258	126	82	369	2,650	178	26	13	-----
19-----	66	440	166	303	85	303	2,950	157	24	13	-----
20-----	61	190	148	2,250	216	243	2,200	166	22	13	-----
21-----	55	272	166	1,260	593	1,180	1,490	369	30	13	-----
22-----	48	272	126	1,130	633	1,440	877	422	24	26	-----
23-----	53	139	152	1,720	713	877	440	303	22	18	-----
24-----	45	166	335	1,440	919	593	440	243	20	21	-----
25-----	53	178	2,250	1,090	900	440	369	166	22	18	-----
26-----											-----
27-----	61	243	2,450	795	3,960	369	319	89	20	17	-----
28-----	92	243	2,200	754	2,850	369	230	82	18	17	-----
29-----	89	139	1,260	554	2,550	477	230	166	17	15	-----
30-----	99	203	836	554	-----	713	216	178	17	15	-----
31-----	114	203	554	272	-----	1,260	190	190	22	14	-----
	111	-----	554	335	-----	1,260	-----	178	-----	13	-----

• Result of discharge measurement.

Discharge, in second-feet, of Black River near Port Huron, Mich., 1921-33—Cont.

Month	Maximum	Minimum	Mean	Month	Maximum	Minimum	Mean
1921				1933			
April 17-30.....	67	30	48.5	January.....	2,250	126	566
May.....	190	12	59.4	February.....	3,960	48	636
June.....	101	4	25.9	March.....	2,550	203	683
1932				April.....	6,740	190	1,830
October.....	114	32	68.7	May.....	1,760	82	519
November.....	1,800	139	491	June.....	152	17	47.0
December.....	2,500	126	708	July.....	30	9.9	16.9

RIVER ROUGE AT DETROIT, MICH.

LOCATION.—Chain gage on line between secs. 33 and 34, T. 1 S., R. 10 E., in Detroit. Zero of gage is 579.90 feet above mean sea level.

DRAINAGE AREA.—194 square miles.

RECORDS AVAILABLE.—November 1930 to September 1933.

DISCHARGE.—Maximum during year, 3,300 second-feet May 1 (gage height, 18.10 feet); minimum, 7 second-feet Aug. 14, Sept. 9 (gage height, 3.68 feet). 1930-33: Maximum, that of May 1, 1933; minimum, 3.9 second-feet Aug. 2, 1931 (gage height, 3.61 feet).

REMARKS.—Records good except those for period of ice effect, Feb. 5-24, and other estimated periods, which are poor. Gage-height records and results of some discharge measurements furnished by city of Dearborn.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	21	170	92	390	100	131	875	2,460	84	76	9.4	9.4
2	20	140	62	320	113	113	1,440	2,220	72	76	8.8	11
3	18	108	68	287	122	108	465	850	65	76	54	10
4	18	76	100	113	108	100	342	452	68	56	62	10
5	36	72	100	122	* 95	100	265	331	76	37	31	9.4
6	34	68	92	113	* 85	92	402	478	68	* 30	* 24	9.4
7	29	65	287	113	* 80	96	504	402	62	* 25	18	9.4
8	24	62	309	104	* 75	100	354	309	62	23	14	8.8
9	26	54	265	104	* 70	96	265	320	46	* 22	13	7.0
10	24	131	232	96	* 65	100	210	478	39	* 20	12	7.9
11	68	113	200	100	* 65	100	221	320	34	* 19	11	8.8
12	65	92	160	140	* 65	76	287	265	29	* 17	11	10
13	50	72	113	131	* 65	190	221	232	29	16	* 9.0	9.4
14	42	68	100	84	* 65	180	160	190	27	* 15	7.0	12
15	38	65	100	84	* 65	160	170	170	22	* 15	12	11
16	38	68	76	88	* 65	122	180	150	24	* 15	13	11
17	36	62	76	76	* 70	113	180	221	22	* 15	* 18	10
18	32	84	76	76	* 70	113	265	160	24	* 17	23	10
19	43	84	72	254	* 200	113	190	140	22	* 15	18	8.5
20	35	84	72	180	* 250	122	160	140	22	* 14	* 14	11
21	27	84	68	190	* 225	331	140	170	22	* 13	11	13
22	22	84	68	366	* 200	200	122	190	20	* 12	10	15
23	20	68	378	342	* 200	150	108	140	20	* 12	* 13	11
24	34	72	720	210	* 200	122	100	113	20	* 13	16	12
25	33	108	* 526	* 190	287	131	92	100	18	* 13	11	12
26	62	100	331	170	243	170	* 88	96	18	13	11	13
27	100	96	232	200	170	210	84	92	18	13	* 10	24
28	92	96	170	190	150	221	* 82	* 116	22	10	9.4	24
29	76	68	140	190	-----	160	80	140	20	10	9.4	24
30	131	84	131	190	-----	160	* 100	140	100	* 9.7	11	18
31	160	-----	402	140	-----	170	-----	92	-----	9.4	11	-----

Month	Maximum	Minimum	Mean	Per square m ² le	Run-off in inches
October	160	18	46.9	0.242	0.28
November	170	54	86.6	.446	.50
December	720	62	188	.969	1.12
January	390	76	173	.892	1.08
February	287	65	127	.655	.68
March	331	76	140	.722	.83
April	1,440	80	272	1.40	1.56
May	2,460	92	377	1.94	2.24
June	100	18	39.2	.202	.23
July	76	9.4	23.5	.121	.14
August	62	7.0	16.3	.084	.10
September	24	7.0	12.0	.062	.07
The year	2,460	7.0	125	.644	8.78

* Estimated.

* Interpolated.

MIDDLE RIVER ROUGE AT DETROIT, MICH.

LOCATION.—Staff gage in sec. 9, T. 2 S., R. 10 E., 1 mile above mouth at Detroit.
DRAINAGE AREA.—99 square miles.

RECORDS AVAILABLE.—November 1930 to September 1933.

DISCHARGE.—Maximum during year, 1,420 second-feet May 1 (gage height, 11.55 feet); minimum, 2.4 second-feet Sept. 5 (gage height, 1.66 feet).

1930-33: Maximum, that of May 1, 1933; minimum, 1.4 second-feet Aug. 21, 24, 28, Sept. 21, 1931.

REMARKS.—Records poor. Stage-discharge relation affected by ice, Dec. 10-21, Feb. 5-23. Gage-height record and results of some discharge measurements furnished by city of Dearborn.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Jul.	Aug.	Sept.
1	7.9	95	31	205	68	103	640	1,380	54	61	11	2.7
2	10	83	38	140	75	83	820	1,100	46	^b 68	4.8	3.9
3	12	68	47	107	83	91	373	535	34	75	37	^b 3.4
4	15	54	61	83	64	87	290	301	44	43	39	^b 2.9
5	18	50	68	91	60	75	167	205	54	^a 30	29	2.4
6	19	19	61	83	55	72	257	290	36	^a 25	^b 22	4.4
7	25	47	205	87	50	64	313	257	33	^a 22	15	4.4
8	13	44	185	72	45	61	215	235	32	^a 19	15	2.7
9	19	37	107	75	40	68	149	268	34	^a 18	14	3.9
10	16	68	80	68	35	115	115	373	32	20	11	^b 6.0
11	34	64	65	68	35	75	131	205	33	^a 18	11	8.2
12	32	54	55	75	35	68	195	158	36	^a 17	5.3	12
13	27	47	45	75	35	91	140	140	26	17	^b 4.8	8.6
14	32	43	40	68	35	123	107	131	29	^a 15	4.4	11
15	28	39	35	54	35	123	103	107	21	^a 14	12	^a 10
16	25	40	30	50	35	91	115	103	21	^a 13	9.3	^a 9.0
17	20	47	25	47	35	72	123	140	21	^a 15	3.5	^a 8.0
18	21	54	25	50	35	72	123	107	26	18	5.3	6.9
19	20	58	25	131	125	75	115	83	27	13	4.4	12
20	23	54	25	176	150	83	103	79	26	^a 10	^b 4.0	^b 11
21	27	58	50	115	175	185	99	91	23	^a 8.0	3.5	9.3
22	20	50	79	246	165	140	75	87	19	4.8	11	10
23	19	44	425	140	155	91	75	68	18	^b 6.4	^b 7.0	4.4
24	25	64	820	149	149	83	72	61	17	7.9	3.0	^b 6.8
25	26	68	^b 566	115	246	87	64	54	17	13	4.8	9.3
26	31	64	313	99	225	95	^b 57	47	19	11	4.4	11
27	79	58	195	123	158	123	50	44	23	11	^b 3.9	15
28	54	75	140	95	123	140	54	^b 70	25	^b 7.9	3.5	^b 18
29	54	29	107	95	-----	115	47	95	25	4.8	3.9	21
30	64	29	91	95	-----	99	^a 60	72	64	^b 4.4	3.0	12
31	91	-----	225	64	-----	115	-----	61	-----	3.9	2.7	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	91	7.9	29.3	0.296	0.34
November	95	19	53.5	.540	.60
December	820	25	138	1.39	1.60
January	246	47	101	1.02	1.18
February	246	35	90.2	.911	.95
March	185	61	95.6	.966	1.11
April	820	47	175	1.77	1.97
May	1,380	44	224	2.26	2.60
June	64	17	30.5	.308	.34
July	75	3.9	19.8	.200	.23
August	39	2.7	10.1	.102	.12
September	21	2.4	8.34	.084	.09
The year	1,380	2.4	81.3	.821	11.13

^a Estimated.

^b Interpolated.

LOWER RIVER ROUGE AT DEARBORN, MICH.

LOCATION.—Staff gage in sec. 22, T. 2 S., R. 10 E., at Ford Park, 1 mile above confluence with Rouge River at Dearborn. Zero of gage is 576 875 feet above mean sea level.

DRAINAGE AREA.—96 square miles.

RECORDS AVAILABLE.—November 1930 to September 1933.

DISCHARGE.—Maximum during year, about 1,400 second-feet May 1 (gage height, 12.16 feet); minimum, 0.3 second-foot Sept. 2 (gage height, 1.42 feet).

1930-33: Maximum, that of May 1, 1923; minimum, that of Sept. 2, 1933.

REMARKS.—Records good except those for very low stages, which are fair. Gage-height record and results of some discharge measurements furnished by city of Dearborn.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.0	88	16	354	34	68	507	800	14	3.9	0.8	0.5
2	5.8	68	19	73	36	53	1,160	1,100	12	6.0	7.4	0.3
3	3.0	49	26	47	43	47	399	322	10	8.2	14.0	0.4
4	3.2	33	47	58	39	47	236	151	8.6	6.6	3.9	0.6
5	7.9	27	51	60	33	43	114	76	8.4	5.0	3.1	0.7
6	4.4	23	43	49	27	41	209	343	8.2	4.0	2.4	0.8
7	5.6	22	365	49	22	41	411	236	6.2	3.0	1.6	0.8
8	5.3	20	354	55	19	41	175	175	6.2	2.0	1.4	0.8
9	4.6	22	82	51	15	36	107	302	5.9	1.6	1.1	0.8
10	3.7	58	68	43	12	33	82	312	5.0	1.3	1.0	1.0
11	19	51	36	49	15	36	82	114	5.0	1.2	1.3	1.6
12	23	39	33	41	14	19	151	82	5.0	1.0	1.6	2.2
13	18	30	28	33	14	58	100	76	5.0	0.8	1.1	2.1
14	14	20	22	24	16	76	58	55	4.7	0.8	0.6	2.0
15	11	19	20	24	15	70	58	43	2.9	0.8	0.6	2.0
16	10	23	16	26	16	49	62	55	3.1	0.7	0.7	2.0
17	7.4	20	12	30	18	43	114	51	3.4	0.7	0.7	2.0
18	7.0	33	11	33	14	39	107	47	3.6	0.7	0.7	2.0
19	7.7	43	11	121	143	47	107	38	4.7	0.8	1.0	2.0
20	6.4	27	11	143	135	60	82	34	6.5	0.9	0.9	1.9
21	5.6	13	11	94	114	292	60	28	7.5	1.0	0.7	1.8
22	5.0	27	9.6	354	88	114	43	24	8.2	1.3	0.6	2.1
23	5.0	30	191	332	60	65	34	19	8.2	1.2	0.6	2.4
24	10	34	436	121	45	43	28	16	9.6	1.2	0.6	2.4
25	14	76	336	88	135	47	26	14	8.6	1.1	0.6	2.4
26	23	49	236	88	128	76	23	13	8.2	0.8	0.8	3.9
27	45	33	167	94	94	135	20	12	9.3	0.8	0.8	5.3
28	39	27	88	70	82	200	19	30	39	0.9	0.7	3.8
29	32	20	65	62	-----	94	16	49	2.4	1.0	0.7	2.4
30	38	15	62	45	-----	114	20	47	4.4	0.8	0.7	2.0
31	82	-----	416	30	-----	88	-----	47	-----	0.7	0.6	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	82	3.0	15.2	0.158	0.18
November	88	13	34.6	.360	.40
December	436	9.6	106	1.10	1.27
January	354	24	88.4	.921	1.06
February	143	12	50.9	.530	.55
March	292	19	71.5	.745	.86
April	1,160	16	154	1.60	1.78
May	1,100	12	152	1.58	1.82
June	39	2.4	7.79	.081	.09
July	8.2	.7	1.96	.020	.02
August	14	.6	1.72	.018	.02
September	5.3	.3	1.83	.019	.02
The year	1,160	.3	57.3	.597	8.07

* Estimated.

° Interpolated.

HURON RIVER AT BARTON, MICH.

LOCATION.—At dam and power plant of Eastern Michigan Edison Co. at Barton, Washtenaw County, near Ann Arbor.

DRAINAGE AREA.—723 square miles.

RECORDS AVAILABLE.—January 1914 to September 1933.

DISCHARGE.—Average, 19 years (1914–33), 404 second-feet.

REMARKS.—Flow computed from records of operation of power plant, flow through undersluice during floods, and depth of flow over dam. Daily-discharge record furnished by Ayres, Lewis, Norris & May, consulting engineers, Ann Arbor, Mich.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	161	238	257	689	555	612	983	1,300	405	139	73	70
2.....	149	289	265	547	556	617	944	1,180	369	203	88	73
3.....	137	264	296	566	521	564	937	1,020	364	221	155	72
4.....	183	289	271	530	466	560	917	903	331	163	169	88
5.....	192	300	298	587	333	573	884	940	236	173	124	63
6.....	183	261	345	529	463	438	1,130	1,120	229	173	124	57
7.....	174	295	382	536	397	532	997	1,240	251	153	124	83
8.....	169	294	399	511	254	527	1,000	1,240	235	169	122	54
9.....	178	293	376	471	303	384	953	1,240	214	173	123	89
10.....	193	297	318	474	333	427	934	1,230	209	154	119	53
11.....	201	313	352	458	313	403	922	1,120	247	181	118	106
12.....	193	300	300	406	315	565	903	1,030	146	137	122	69
13.....	194	261	247	403	341	220	871	937	174	123	113	72
14.....	195	298	366	369	349	496	870	897	131	139	108	108
15.....	195	307	206	351	253	522	958	899	157	134	100	80
16.....	204	316	296	366	250	467	1,120	834	161	126	108	78
17.....	199	298	240	359	297	504	555	860	158	113	99	103
18.....	211	302	252	379	302	503	871	743	145	114	89	92
19.....	199	261	351	538	353	510	837	736	154	112	96	98
20.....	194	299	151	527	324	544	781	683	147	120	82	88
21.....	178	299	245	510	391	562	768	647	134	96	93	93
22.....	181	244	254	597	437	551	774	596	107	104	98	88
23.....	178	298	753	705	467	569	647	530	131	117	83	92
24.....	203	253	935	667	562	485	692	542	115	101	66	79
25.....	198	299	878	645	778	546	614	544	131	73	110	116
26.....	223	299	796	659	749	522	610	504	119	106	84	130
27.....	225	261	705	596	679	561	584	534	111	91	82	153
28.....	230	276	630	603	659	570	543	472	109	94	82	160
29.....	230	234	664	531	561	512	527	527	111	91	71	124
30.....	219	255	752	561	537	668	426	213	99	91	91	124
31.....	302	671	503	503	629	393	393	393	92	75	75	---

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	302	137	196	0.270	0.31
November.....	316	234	283	.391	.44
December.....	935	151	427	.590	.68
January.....	705	351	522	.722	.83
February.....	778	250	429	.593	.62
March.....	629	220	518	.716	.83
April.....	1,130	512	826	1.14	1.27
May.....	1,300	393	834	1.15	1.33
June.....	405	107	191	.264	.29
July.....	224	78	133	.184	.21
August.....	169	66	103	.142	.16
September.....	160	53	92	.127	.14
The year.....	1,300	53	379	.524	7.11

RAISIN RIVER NEAR ADRIAN, MICH.

LOCATION.—Chain gage on line between secs. 29 and 32, T. 6 S., R. 4 E., half a mile below South Branch of Raisin River and 3 miles northeast of Adrian.
RECORDS AVAILABLE.—October 1930 to August 1931, October 1932 to August 1933 (discontinued).

DISCHARGE.—Maximum during periods, 2,010 second-feet Apr. 2, 1933 (gage height, 14.50 feet); minimum, 23 second-feet Aug. 20, 1931 (gage height, 4.34 feet).

REMARKS.—Records fair except those for periods of ice effect, Dec. 11–21, Feb. 6–16, which are poor.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
1.....	50	177	143	815	300	462	903	315	256	85	54
2.....	77	165	154	610	300	428	1,890	948	228	103	50
3.....	47	189	154	516	346	362	1,640	1,090	132	189	-----
4.....	54	165	215	498	330	300	1,210	994	189	202	-----
5.....	108	270	177	462	285	330	948	794	127	189	-----
6.....	54	143	215	394	270	315	773	1,340	215	165	-----
7.....	73	54	215	378	250	346	948	1,800	285	90	-----
8.....	94	143	610	378	230	285	925	1,360	315	108	-----
9.....	54	143	553	315	210	285	630	1,280	189	112	-----
10.....	58	177	330	346	200	242	773	1,410	165	85	-----
11.....	122	270	250	330	210	215	610	1,160	103	103	-----
12.....	154	270	230	228	210	165	498	903	103	94	-----
13.....	58	202	210	256	210	165	553	752	108	81	-----
14.....	94	143	200	228	210	498	462	670	85	85	-----
15.....	69	189	200	285	210	270	462	498	94	81	-----
16.....	54	189	200	215	210	411	462	794	112	103	-----
17.....	50	165	200	256	215	378	534	994	85	85	-----
18.....	58	143	200	228	300	330	690	731	112	189	-----
19.....	122	154	200	285	300	462	815	610	58	117	-----
20.....	117	189	200	428	498	285	752	516	81	54	-----
21.....	50	165	220	394	815	591	610	445	90	81	-----
22.....	58	189	300	516	610	710	445	378	77	58	-----
23.....	77	165	346	690	498	498	330	394	69	54	-----
24.....	61	177	1,040	630	428	394	362	378	73	61	-----
25.....	138	138	1,610	516	670	362	378	270	77	90	-----
26.....	138	202	1,480	480	1,040	330	330	300	65	81	-----
27.....	154	228	948	346	794	346	256	300	85	46	-----
28.....	154	138	650	315	462	498	300	330	81	69	-----
29.....	143	189	591	285	-----	498	270	285	73	65	-----
30.....	154	177	428	228	-----	445	228	300	77	50	-----
31.....	117	-----	971	270	-----	394	-----	242	-----	90	-----

Month	Maximum	Minimum	Mean	Month	Maximum	Minimum	Mean
October.....	154	47	90.7	March.....	710	165	374
November.....	270	54	177	April.....	1,890	228	666
December.....	1,610	143	438	May.....	1,800	242	728
January.....	815	215	391	June.....	315	58	127
February.....	1,040	200	379	July.....	202	46	98.9

MAUMEE RIVER AT ANTWERP, OHIO

LOCATION.—Water-stage recorder just below highway bridge 1 mile north of Antwerp, Paulding County, and about 7 miles downstream from State boundary. Zero of gage is 695.49 feet above mean sea level.

DRAINAGE AREA.—2,050 square miles.

RECORDS AVAILABLE.—September 1921 to September 1933.

DISCHARGE.—Maximum during year, 14,800 second-feet May 12 (gage height, 15.6 feet); minimum, 24 second-feet June 21–22 (gage height, 0.32 foot).

1921–33: Maximum, 22,000 second-feet Jan. 16, 1930 (gage height, 19.4 feet); minimum, 24 second-feet Oct. 17, 1930, and June 21–22, 1933 (gage height, 0.32 foot). Average, 12 years (1921–33), 1,690 second-feet.

REMARKS.—Records excellent except those for periods of ice effect, Dec. 12–22, Feb. 6–20, and other estimated periods, May 22 to June 6, June 27 to July 25, which are fair.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Jul	Aug.	Sept.
1	425	1,350	1,480	10,500	1,170	1,920	5,570	2,330	700	220	141	102
2	370	1,730	1,300	9,540	1,220	1,660	7,780	5,780	660	350	151	106
3	296	1,660	1,220	7,520	1,280	1,340	6,740	5,440	620	640	158	111
4	276	1,300	1,360	6,260	1,220	1,140	5,220	4,230	560	600	195	113
5	545	1,060	1,540	5,220	1,110	980	4,500	3,560	530	560	176	140
6	1,060	1,030	1,630	4,050	830	879	5,470	7,230	500	700	166	164
7	1,060	904	6,460	2,960	730	806	7,780	8,430	402	520	188	138
8	806	782	11,000	2,250	950	758	7,650	9,220	388	450	276	126
9	602	830	10,400	1,860	830	758	5,440	12,200	366	350	324	204
10	483	1,080	8,430	1,600	780	667	4,230	12,900	339	310	108	201
11	452	1,460	6,260	1,360	730	645	3,800	13,200	425	270	150	168
12	413	1,660	4,300	1,220	690	560	3,400	14,600	264	260	173	225
13	436	1,540	3,000	1,080	670	562	2,740	14,200	288	250	168	390
14	560	1,300	2,000	503	620	6,630	2,120	13,200	222	240	362	285
15	503	1,060	1,500	712	560	9,960	1,800	11,600	247	220	499	335
16	456	904	1,200	782	520	9,960	1,800	9,960	273	200	479	243
17	421	782	950	758	500	6,500	4,080	8,560	602	150	382	332
18	359	735	800	735	510	4,140	6,380	7,260	322	140	238	667
19	319	782	780	1,810	560	6,340	6,740	5,660	186	130	186	712
20	282	954	760	4,320	1,200	8,700	5,220	3,800	64	110	156	624
21	258	1,300	740	3,560	2,640	10,400	4,230	3,330	28	64	141	483
22	236	1,460	740	2,960	2,530	10,500	3,560	2,800	115	40	126	402
23	244	1,460	1,170	3,800	1,860	9,120	2,960	2,300	180	30	121	410
24	339	1,800	5,830	3,480	1,730	7,000	2,390	1,600	176	26	119	467
25	329	2,460	12,000	2,740	1,990	4,700	1,860	1,700	173	74	119	395
26	342	3,030	10,400	2,530	2,600	3,330	1,520	1,600	201	217	119	384
27	587	2,880	8,560	2,320	2,530	4,500	1,250	1,200	220	160	111	1,120
28	888	2,390	6,870	2,180	2,180	5,330	1,060	1,300	420	150	111	3,330
29	904	1,920	5,900	1,800	-----	4,410	980	1,100	310	150	109	3,560
30	854	1,660	5,000	1,480	-----	3,480	879	880	280	153	111	3,480
31	758	-----	8,830	1,250	-----	3,260	-----	750	-----	140	106	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	1,060	236	512	0.250	0.29
November	3,030	735	1,440	.702	.78
December	12,000	740	4,270	2.05	2.40
January	10,500	503	3,000	1.46	1.68
February	2,640	500	1,240	.605	.63
March	10,500	560	4,220	2.06	2.37
April	7,780	879	3,970	1.94	2.16
May	14,600	750	6,190	3.02	3.48
June	700	28	335	.133	.18
July	700	26	260	.127	.15
August	499	106	193	.094	.11
September	3,560	102	647	.316	.35
The year	14,600	26	2,210	1.00	14.58

MAUMEE RIVER NEAR DEFIANCE, OHIO

LOCATION.—Water-stage recorder in NW¼ sec. 22, T. 4 N., R. 5 E., at Independence Dam, 5 miles east of Defiance, Defiance County. Zero of gage is 659.12 feet above mean sea level.

DRAINAGE AREA.—5,530 square miles.

RECORDS AVAILABLE.—November 1924 to September 1933.

DISCHARGE.—Maximum during year, 41,300 second-feet May 13 (gage height, 8.04 feet); minimum, 37 second-feet July 23 (gage height, 1.37 feet).

1924-33: Maximum, 87,000 second-feet Jan. 16, 1930 (gage height, 12.9 feet); minimum, 23 second-feet Oct. 19, 1930 (gage height, 1.41 feet).

REMARKS.—Records good. Flow at extremely low water affected by regulation of Auglaize River at Toledo Edison Co.'s dam 3 miles south of Defiance. Leakage into abandoned Miami & Erie Canal above station; diversion not included in tables of discharge. (See list of miscellaneous measurements, p. 155.)

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	344	2,740	2,850	30,500	2,920	4,450	15,100	5,880	1,050	260	149	82
2	411	3,330	2,640	30,500	3,180	3,760	20,500	14,500	1,120	801	126	82
3	449	3,520	3,520	22,900	3,250	3,030	17,400	17,800	1,050	629	215	107
4	323	2,920	3,800	14,500	3,140	2,010	13,500	14,000	823	1,250	149	90
5	357	2,300	4,160	11,200	2,010	1,910	10,600	10,900	713	1,120	137	137
6	579	1,390	4,450	8,880	1,800	1,850	10,900	14,800	779	1,120	215	116
7	1,120	1,330	14,900	7,020	1,890	1,410	14,800	17,400	713	845	457	174
8	1,100	1,250	27,800	5,450	2,740	1,550	15,900	22,100	692	713	291	230
9	859	2,450	28,700	4,160	2,230	1,410	13,200	31,400	671	567	230	201
10	692	4,530	18,900	3,520	1,790	1,230	9,720	36,800	527	468	393	230
11	758	4,370	13,500	2,880	1,850	1,120	8,060	35,000	567	430	482	245
12	487	3,760	9,450	2,470	1,730	867	7,790	37,700	587	275	1,660	347
13	538	2,500	7,020	2,040	1,820	2,200	7,020	40,400	393	230	494	260
14	547	2,330	4,420	1,580	2,230	21,000	5,500	39,500	375	393	305	499
15	629	1,820	3,000	1,070	1,280	33,200	4,410	37,700	527	291	356	469
16	507	1,760	2,130	1,410	1,280	30,500	4,720	30,500	375	215	625	538
17	507	2,170	1,670	1,300	1,250	22,300	7,400	23,700	323	215	629	419
18	507	1,820	1,410	1,300	1,100	14,500	15,400	17,800	692	201	468	316
19	430	2,330	1,550	4,170	933	19,200	19,700	13,200	567	201	291	814
20	307	3,140	1,640	8,600	2,650	26,900	17,000	9,450	375	161	174	911
21	260	3,520	1,470	8,880	3,480	32,300	12,800	6,520	201	187	126	823
22	307	3,330	1,300	8,880	4,530	26,900	10,000	4,960	107	126	107	1,250
23	260	3,840	1,690	9,450	4,410	20,100	7,270	3,370	82	74	98	886
24	340	4,880	12,000	9,720	3,370	13,800	5,500	2,430	161	67	98	520
25	430	6,280	29,600	7,790	4,370	10,000	4,080	1,970	230	50	107	672
26	587	9,160	32,300	6,280	5,630	7,790	3,100	2,040	587	82	98	734
27	955	9,450	24,500	5,270	6,190	10,600	2,850	1,970	340	161	107	1,700
28	1,200	7,270	15,600	4,920	5,720	13,800	2,230	1,530	393	126	98	5,240
29	1,390	5,400	11,900	4,790	11,900	1,820	1,820	1,550	527	107	82	11,200
30	1,070	3,920	10,300	4,120	8,880	1,360	1,550	449	98	74	10,400	
31	1,530		21,600	2,740	7,270		1,000			82	74	

Month	Maximum	Minimum	Mean	Month	Maximum	Minimum	Mean
October	1,530	260	638	May	40,400	1,000	16,100
November	9,450	1,250	3,630	June	1,120	82	533
December	32,300	1,300	10,300	July	1,250	50	372
January	30,500	1,070	7,700	August	1,660	74	288
February	6,190	933	2,810	September	11,200	82	1,320
March	33,200	867	11,500				
April	20,500	1,360	9,650	The year	40,400	50	5,450

MAUMEE RIVER AT WATERVILLE, OHIO

LOCATION.—Water-stage recorder at highway bridge at Waterville, Lucas County, 3 miles below mouth of Tontogany Creek.

DRAINAGE AREA.—6,310 square miles.

RECORDS AVAILABLE.—November 1898 to December 1901, August 1921 to September 1933.

DISCHARGE.—Maximum during year, 52,200 second-feet May 14 (gage height, 10.48 feet); minimum, 88 second-feet Aug. 30 (gage height, 1.54 feet).

1921-33: Maximum, 75,000 second-feet Jan. 16, 1930 (gage height, 13.60 feet); minimum, 60 second-feet Oct. 21, 1930, Nov. 7, 1931; minimum gage height, 1.45 feet Nov. 7, 1932. Average, 12 years (1921-33), 4,960 second-feet.

REMARKS.—Records good except those for extremely low stages and those estimated, Dec. 14-23, Feb. 9-20, Mar. 11-12, which are fair. Flow at low water affected by regulation of Auglaize River at hydroelectric plant of Toledo-Edison Co. 3 miles south of Defiance.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	294	2,990	3,500	36,300	3,640	6,130	19,600	4,160	960	428	169	124
2	292	3,780	2,750	34,300	4,070	4,710	24,500	16,200	1,200	358	177	138
3	446	4,070	3,180	28,600	3,920	3,920	21,100	23,100	1,260	780	229	169
4	388	3,640	4,720	18,700	3,920	2,750	15,800	18,700	1,100	942	319	193
5	460	2,780	3,880	14,100	3,780	2,450	12,600	13,600	703	1,530	265	185
6	358	2,060	4,380	11,200	3,010	2,220	12,600	19,300	750	1,380	220	229
7	645	1,280	14,600	9,240	2,250	1,820	16,300	21,100	804	1,120	312	173
8	1,060	1,260	32,800	6,900	4,380	2,200	18,100	23,700	675	804	428	176
9	942	1,840	34,300	5,580	2,900	2,080	15,800	36,300	636	689	310	283
10	820	5,050	23,800	4,380	2,300	1,470	12,100	44,500	573	585	260	238
11	774	5,220	15,800	3,920	2,100	1,400	9,800	43,400	610	482	418	256
12	717	4,560	12,300	2,960	2,200	1,200	8,700	45,600	585	449	864	310
13	388	3,180	6,520	2,700	2,300	1,100	8,300	47,500	585	368	1,360	384
14	504	2,450	5,200	2,300	2,700	25,200	6,900	51,100	408	310	464	348
15	585	2,130	3,800	1,780	1,700	44,500	5,220	44,800	482	418	319	549
16	610	1,960	2,700	1,450	1,600	37,300	5,230	38,300	573	408	408	515
17	428	2,220	2,100	1,840	1,500	28,600	11,200	28,600	388	274	597	722
18	597	2,130	1,800	1,450	1,400	18,700	16,200	21,100	418	256	597	382
19	561	2,450	1,600	4,460	1,200	20,300	23,800	15,200	804	310	418	372
20	649	3,640	1,800	9,350	3,300	32,300	21,100	11,600	597	274	310	1,060
21	348	3,920	1,900	11,400	4,710	37,300	16,300	8,100	438	247	220	717
22	265	3,780	1,700	11,000	5,400	31,300	12,400	5,760	220	265	202	864
23	319	4,070	1,600	12,100	5,580	22,400	9,450	4,380	124	256	177	1,250
24	378	6,130	9,000	11,800	4,250	16,300	7,100	3,200	117	202	177	804
25	449	7,900	33,800	10,000	5,580	12,400	5,220	2,380	193	124	177	515
26	636	10,400	38,300	8,100	7,500	9,710	4,250	2,100	493	110	169	703
27	876	11,200	30,400	6,900	7,700	12,600	3,280	2,220	623	138	153	942
28	1,060	8,900	19,300	5,760	7,300	15,800	2,960	2,150	460	256	145	2,990
29	1,900	6,700	14,100	5,760	-----	13,600	2,300	1,690	549	256	138	10,800
30	1,020	5,050	11,700	5,050	-----	10,700	2,080	2,080	717	229	110	12,400
31	1,260	-----	24,400	3,780	-----	8,700	-----	1,200	-----	185	104	-----

Month	Maximum	Minimum	Mean	Month	Maximum	Minimum	Mean
October	1,900	265	646	May	51,100	1,200	19,500
November	11,200	1,260	4,220	June	1,260	117	602
December	38,300	1,600	11,900	July	1,530	110	466
January	36,300	1,450	9,460	August	1,360	104	330
February	7,700	1,200	3,650	September	12,400	124	1,290
March	44,500	1,100	13,900	The year	51,100	104	6,510
April	24,500	2,080	11,700				

ST. MARYS RIVER NEAR FORT WAYNE, IND.

LOCATION.—Chain gage in sec. 35, T. 30 N., R. 12 E., at highway bridge 12 miles above mouth of river and 4 miles south of Fort Wayne, Allen County.

DRAINAGE AREA.—810 square miles.

RECORDS AVAILABLE.—November 1930 to September 1933. Records October 1925 to November 1926, July to September 1927, published by the Indiana Department of Conservation.

DISCHARGE.—Maximum during year, 6,620 second-feet May 14 (gage height, 14.08 feet); minimum, 14 second-feet June 27 (gage height, 0.54 foot).

1930-33: Maximum, that of May 14, 1933; minimum, 9 second-feet Aug. 22, 1932 (gage height, 0.48 foot).

REMARKS.—Records good except those for periods of ice effect, Dec. 14-23, Feb. 5-20, which are poor.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	51	385	630	4,670	250	268	2,070	1,120	126	76	22	19
2.....	74	407	500	4,160	286	233	1,570	1,720	101	89	17	18
3.....	65	364	550	3,880	268	192	975	1,570	84	429	28	20
4.....	43	364	500	3,210	233	169	810	840	75	233	44	23
5.....	192	385	600	2,610	210	140	780	870	66	169	26	23
6.....	101	324	550	1,620	200	126	1,620	2,250	60	233	52	38
7.....	78	250	3,600	1,190	190	120	1,770	1,620	50	176	75	133
8.....	55	169	4,590	600	275	120	1,310	3,600	45	113	51	120
9.....	31	140	3,950	475	250	113	905	3,880	42	74	36	84
10.....	26	162	2,970	364	225	95	810	2,970	40	50	31	52
11.....	78	208	2,190	286	200	101	1,040	4,230	37	40	38	40
12.....	71	268	1,570	250	190	95	750	4,830	34	32	233	36
13.....	147	305	1,150	200	180	95	475	5,550	32	29	385	31
14.....	95	250	900	192	180	3,090	364	6,530	28	63	344	28
15.....	101	192	650	184	175	3,270	364	6,170	26	57	233	24
16.....	76	154	450	147	165	2,490	600	5,900	25	52	147	24
17.....	59	147	375	154	155	1,270	1,920	5,070	26	63	84	200
18.....	78	126	300	162	150	2,020	2,490	3,600	26	57	52	407
19.....	33	233	225	810	145	4,370	2,190	2,020	25	48	38	268
20.....	29	500	210	1,190	500	5,070	1,570	1,350	24	38	28	233
21.....	26	575	200	525	660	5,630	1,470	810	22	37	26	184
22.....	20	600	240	660	407	5,070	1,230	500	22	31	26	133
23.....	24	575	450	1,310	268	4,020	870	385	22	26	24	192
24.....	22	975	3,950	780	216	2,490	600	305	21	25	22	184
25.....	24	1,310	4,160	550	286	1,470	385	364	21	32	17	162
26.....	27	1,390	3,460	600	344	1,870	286	324	18	24	18	126
27.....	76	1,190	2,910	600	324	2,550	216	268	14	22	16	1,870
28.....	154	870	2,670	500	268	1,920	176	268	37	23	17	3,030
29.....	154	840	1,770	385	-----	1,270	154	233	50	22	17	3,150
30.....	169	810	1,310	305	-----	1,230	140	192	101	23	16	3,090
31.....	192	-----	4,830	286	-----	1,230	-----	154	-----	22	17	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	192	20	76.5	0.094	0.11
November.....	1,390	126	482	.595	.66
December.....	4,830	200	1,690	2.09	2.41
January.....	4,670	147	1,060	1.31	1.61
February.....	660	145	257	.317	.33
March.....	5,630	95	1,680	2.07	2.39
April.....	2,490	140	997	1.23	1.37
May.....	6,530	154	2,240	2.77	3.19
June.....	126	14	43.3	.053	.06
July.....	429	22	77.7	.096	.11
August.....	385	16	70.3	.087	.10
September.....	3,150	18	465	.574	.64
The year.....	6,530	14	769	.949	12.88

TIFFIN RIVER NEAR BRUNERSBURG, OHIO

LOCATION.—Water-stage recorder near highway bridge between secs. 32 and 33, T. 5 N., R. 4 E., three-eighths of a mile below mouth of Mud Creek and 3 miles northwest of Brunersburg, Defiance County.

DRAINAGE AREA.—766 square miles.

RECORDS AVAILABLE.—August 1928 to September 1933.

DISCHARGE.—Maximum during year, 7,380 second-feet Mar. 14 (gage height, 19.88 feet); minimum, 13 second-feet Sept. 2 (gage height, 0.73 foot).

1928-33: Maximum, 9,990 second-feet Jan. 14, 1930 (gage height, 23.3 feet); minimum, 9.5 second-feet Aug. 27, 28, 1932.

REMARKS.—Records good except those for estimated periods, Dec. 8-20, 27-30, Jan. 2, 3, 12-17, Feb. 5-18, Mar. 11-13, 15, which are fair.

Discharge in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Jul'y	Aug.	Sept.
1.....	45	592	287	3,610	387	885	2,700	1,580	178	38	22	14
2.....	36	618	279	2,800	486	656	4,120	2,360	158	40	23	14
3.....	30	468	378	2,200	504	542	3,320	2,160	135	54	25	14
4.....	30	336	486	1,720	468	450	2,900	2,040	121	60	28	15
5.....	45	242	542	1,160	330	387	2,670	1,920	106	61	38	17
6.....	85	185	595	819	260	344	2,620	3,500	100	56	42	16
7.....	74	156	3,210	695	230	319	2,940	4,280	106	44	39	17
8.....	66	140	4,500	618	210	311	2,320	4,600	106	38	31	16
9.....	47	455	3,000	561	210	303	1,820	5,790	90	35	26	15
10.....	42	1,250	2,200	504	210	264	1,490	5,140	77	32	27	15
11.....	54	1,220	1,700	468	200	200	1,160	4,580	66	30	28	16
12.....	61	910	1,200	390	190	160	863	4,500	60	30	27	22
13.....	72	637	900	320	180	390	695	3,420	64	29	24	22
14.....	76	432	640	270	180	6,040	599	2,720	115	27	23	30
15.....	68	311	500	260	180	4,500	523	2,040	98	26	21	35
16.....	62	256	420	250	180	2,700	749	1,490	68	26	20	30
17.....	56	249	380	250	210	1,420	1,470	1,160	59	26	18	27
18.....	51	287	340	249	260	1,010	2,160	1,080	55	28	17	25
19.....	51	387	320	826	390	1,450	2,200	960	52	26	17	24
20.....	49	486	300	1,720	1,020	1,940	1,900	755	48	25	17	24
21.....	46	504	287	1,340	1,430	2,760	1,650	580	44	25	16	22
22.....	44	468	279	1,550	1,250	2,320	1,340	486	40	24	15	22
23.....	54	423	333	1,860	1,080	1,760	927	396	37	22	15	28
24.....	93	590	2,030	1,550	841	1,340	618	344	35	24	14	27
25.....	107	841	4,060	1,340	1,220	910	504	311	34	25	14	26
26.....	137	1,060	3,620	1,140	1,650	766	423	272	40	25	14	26
27.....	353	863	3,000	841	1,340	1,610	370	242	44	30	14	91
28.....	396	599	2,400	675	1,135	1,620	327	234	51	31	14	101
29.....	319	441	2,100	542	-----	1,280	287	264	50	28	14	206
30.....	249	336	1,800	441	-----	960	264	256	42	24	13	190
31.....	201	-----	3,490	378	-----	885	-----	220	-----	22	13	-----

Month	Maximum	Minimum	Mean	Per square mil.	Run-off in inches
October.....	396	30	100	0.131	0.15
November.....	1,250	140	525	.685	.76
December.....	4,500	279	1,470	1.92	2.21
January.....	3,610	249	1,010	1.32	1.52
February.....	1,650	180	580	.757	.79
March.....	6,040	160	1,310	1.71	1.97
April.....	4,120	264	1,530	2.00	2.23
May.....	5,790	220	1,930	2.52	2.91
June.....	178	54	76.0	.099	.11
July.....	61	22	32.6	.043	.05
August.....	42	13	21.6	.028	.03
September.....	206	14	37.6	.049	.06
• The year.....	6,040	13	721	.941	12.78

AUGLAIZE RIVER NEAR FORT JENNINGS, OHIO

LOCATION.—Water-stage recorder in SE¼ sec. 15, T. 1 S., R. 5 E., at highway bridge 3½ miles northeast of Fort Jennings, Putnam County, and 6 miles above mouth of Ottawa River. Zero of gage is 713.92 feet above mean sea level.

DRAINAGE AREA.—333 square miles.

RECORDS AVAILABLE.—August 1921 to September 1933.

DISCHARGE.—Maximum during year ending Sept. 30, 1932, 3,130 second-feet Jan. 18 (gage height, 12.00 feet); minimum, 5.0 second-feet Aug. 28 (gage height, 0.75 foot).

Maximum during year ending Sept. 30, 1933, 4,270 second-feet Jan. 1 (gage height, 13.60 feet); minimum, 8.8 second-feet July 21 (gage height, 0.78 foot).

1921-33: Maximum, 7,860 second-feet Jan. 15, 1930 (gage height, 16.6 feet); minimum, 5.0 second-feet Aug. 28, 1932 (gage height, 0.75 foot). Average, 12 years (1921-33), 316 second-feet.

REMARKS.—Records good except those for periods of missing record and those for periods of ice effect, Mar. 7-18, Dec. 11-22, 1932, Jan. 2-9, 18-18, Feb. 4-21, and Mar. 5, 7, 10-12, 1933, which are fair. Diversion into this basin from Lake St. Marys by Miami & Erie Canal above station.

Discharge, in second-feet, 1931-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1931-32												
1.....	69	23	73	180	257	82	711	416	36	278	32	17
2.....	54	24	72	1,090	261	80	627	324	43	161	28	20
3.....	43	23	63	1,280	428	78	364	202	42	120	24	30
4.....	33	30	94	656	393	84	216	157	42	96	21	52
5.....	28	32	297	476	310	85	164	148	43	76	29	39
6.....	26	31	356	1,680	347	90	139	130	40	61	30	20
7.....	27	22	226	1,850	312	70	129	136	39	128	19	20
8.....	101	21	150	922	311	59	120	135	36	297	17	22
9.....	176	18	116	501	462	65	106	151	28	143	16	27
10.....	128	21	100	322	382	61	103	124	27	132	16	28
11.....	98	18	262	228	494	49	111	106	24	130	18	30
12.....	72	20	1,290	200	1,200	46	156	190	23	98	17	25
13.....	57	21	1,020	538	1,190	44	140	154	19	78	18	22
14.....	48	18	810	870	634	42	114	114	19	61	20	26
15.....	40	18	728	997	342	41	98	100	18	52	18	27
16.....	34	18	452	2,430	257	42	85	72	20	40	16	22
17.....	33	21	300	2,950	229	44	81	71	66	41	13	23
18.....	56	68	217	3,010	224	48	72	56	70	32	16	17
19.....	44	159	168	1,950	194	55	68	57	46	31	18	16
20.....	37	166	148	926	159	61	62	60	27	32	17	15
21.....	33	202	140	579	140	47	58	53	22	38	17	20
22.....	26	156	619	851	122	238	56	50	24	21	14	17
23.....	25	120	656	1,730	126	870	61	37	22	20	12	18
24.....	25	92	403	1,490	114	562	61	43	18	25	9.6	14
25.....	25	78	271	900	102	404	59	39	15	32	7.7	14
26.....	18	62	179	543	101	336	518	39	37	26	6.8	12
27.....	17	59	143	854	95	290	1,410	34	54	32	6.3	16
28.....	24	58	122	1,140	100	220	892	34	1,400	22	11	25
29.....	23	55	115	747	84	171	393	33	1,310	18	13	20
30.....	19	60	105	531	-----	143	272	26	538	20	17	18
31.....	18	-----	97	393	-----	181	-----	24	-----	31	18	-----

Discharge, in second-feet, of Auglaize River near Fort Jennings, Ohio, 1931-33—
Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1932-33												
1.....	15	186	189	4,030	168	176	958	250	69	43	22	22
2.....	30	657	271	3,000	206	145	1,000	592	63	85	22	24
3.....	26	312	474	1,200	235	129	675	633	62	119	32	32
4.....	24	162	393	650	170	110	416	358	58	117	40	26
5.....	24	114	268	560	120	92	290	257	43	120	48	44
6.....	22	90	243	510	100	87	405	324	54	111	49	161
7.....	18	69	1,480	370	140	86	772	301	57	90	41	115
8.....	24	65	2,470	280	310	90	555	904	53	67	31	90
9.....	31	138	1,230	230	220	97	382	1,930	48	54	26	74
10.....	24	601	555	198	180	74	279	1,450	46	32	23	59
11.....	33	416	320	176	150	63	237	1,670	42	32	551	42
12.....	25	235	200	142	140	68	279	2,830	50	23	347	52
13.....	27	159	150	110	130	207	218	2,370	45	17	124	53
14.....	45	119	120	100	120	1,850	169	2,890	40	15	93	42
15.....	40	102	110	100	120	2,360	149	2,500	34	14	93	39
16.....	37	104	98	100	110	1,390	242	1,460	39	12	80	43
17.....	31	118	94	98	100	723	776	947	43	12	64	84
18.....	26	290	92	98	95	814	1,190	603	41	11	58	77
19.....	22	358	90	304	100	2,420	1,160	404	33	10	40	75
20.....	28	416	87	306	140	2,920	895	290	34	9 6	37	102
21.....	28	404	87	248	170	1,880	579	218	33	10	23	518
22.....	26	404	95	312	180	1,030	382	151	29	18	30	324
23.....	33	393	176	748	139	627	264	119	30	17	23	192
24.....	32	700	1,550	567	115	439	206	129	31	20	22	153
25.....	24	1,140	3,160	347	157	370	178	112	25	23	20	166
26.....	32	1,190	2,120	277	312	576	156	102	46	16	20	129
27.....	43	888	892	279	324	1,390	137	112	44	18	22	918
28.....	45	486	486	257	208	1,110	125	109	38	22	17	2,900
29.....	96	290	290	200	-----	621	112	103	30	24	24	3,910
30.....	76	216	359	176	-----	393	103	85	38	22	27	2,030
31.....	65	-----	2,510	161	-----	312	-----	74	-----	19	21	-----

Month	1931-32			1932-33		
	Maximum	Minimum	Mean	Maximum	Minimum	Mean
October.....	176	17	47.0	96	15	33.9
November.....	202	18	57.1	1,190	65	361
December.....	1,290	63	316	3,160	87	666
January.....	3,010	180	1,060	4,030	98	520
February.....	1,200	84	323	324	95	166
March.....	870	41	150	2,920	63	730
April.....	1,410	56	248	1,190	103	443
May.....	416	24	107	2,890	74	783
June.....	1,400	15	138	69	25	43.3
July.....	297	18	76.5	120	9.6	38.8
August.....	32	6.3	17.2	551	17	66.8
September.....	52	12	22.4	3,910	22	417
The year.....	3,010	6.3	214	4,030	9.6	358

NOTE.—Records for the year ending Sept. 30, 1932, supersede those published in Water-Supply Paper 729, because the discharge figures above 143 second-feet have been revised for period Jan. 18 to Sept. 30, 1932.

AUGLAIZE RIVER NEAR DEFIANCE, OHIO

LOCATION.—Tail-water staff gage in NE¼ sec. 9, T. 3 N., R. 4 E., just below dam and power plant of Toledo Edison Co., 3 miles south of Defiance, Defiance County, and just below mouth of Beetree Creek. A staff gage on upstream side of power plant used to determine headwater elevation at the plant; prior to October 1932 a water-stage recorder was used. Crest of dam is 688.00 feet above mean sea level.

DRAINAGE AREA.—2,330 square miles.

RECORDS AVAILABLE.—April 1915 to September 1933. May to August 1903 at highway bridge 1¼ miles downstream.

DISCHARGE.—Maximum mean daily during year, 21,700 second-feet May 15; minimum, 24 second-feet on numerous days.

1915-33: Maximum mean daily, 38,700 second-feet Jan. 15, 1930; minimum, 6 second-feet Oct. 17, 1923. Average, 18 years (1915-33), 1,720 second-feet.

REMARKS.—Records good above and fair below 600 second-feet. Discharge for days when power plant was operating ascertained from power-plant records; for days when plant did not operate, it was determined from tail-water gage rating. Daily-discharge values not corrected for leakage when power plant was operating, but leakage was only small percentage of flow. Records of daily discharge for periods when power plant was operating furnished by Toledo Edison Co.

Discharge, in second-feet, 1932-33

Month	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	54	1,070	585	15,900	1,430	1,560	5,720	2,410	315	132	130	24.
2.....	54	1,190	820	17,200	1,580	1,290	7,450	6,260	312	561	38	24.
3.....	132	1,290	1,560	11,200	1,690	855	5,820	8,400	407	270	195	24
4.....	54	835	1,590	5,750	1,520	574	3,880	5,740	24	634	24	24.
5.....	132	780	1,940	3,790	593	502	2,890	3,740	115	523	24	104.
6.....	54	27	1,940	2,950	547	573	2,790	4,400	189	454	160	24.
7.....	54	267	5,620	2,510	1,280	292	4,180	4,760	118	291	281	132
8.....	158	246	12,700	1,980	1,630	653	5,240	7,870	118	431	105	129
9.....	54	1,260	12,900	1,430	1,050	528	4,220	13,600	116	24	93	232
10.....	54	1,740	5,930	1,270	1,110	398	3,100	16,200	138	127	24	24.
11.....	236	1,560	3,570	922	1,020	679	2,560	15,400	75	132	728	87
12.....	54	922	1,750	894	677	27	2,900	17,600	166	24	1,550	207
13.....	132	24	1,240	676	1,180	1,600	2,800	21,100	24	24	24	109
14.....	132	401	1,360	498	1,150	8,670	2,520	21,200	24	24	138	238
15.....	132	186	540	492	471	15,200	1,960	21,700	165	66	118	180.
16.....	37	632	678	655	550	16,200	1,900	16,400	24	24	247	427.
17.....	125	852	487	493	550	11,600	2,950	12,300	79	87	200	24
18.....	117	657	324	706	471	7,560	7,290	8,090	24	78	100	39
19.....	117	1,280	269	2,340	198	11,500	9,920	4,880	131	24	48	285
20.....	37	1,500	297	3,000	1,280	15,800	8,260	3,010	106	60	24	225
21.....	37	1,700	296	3,040	1,110	17,700	5,420	2,210	24	105	24	450.
22.....	106	1,280	296	3,120	1,280	13,400	3,890	1,890	24	24	24	861.
23.....	24	1,760	980	3,790	1,160	8,250	2,690	744	24	66	24	498
24.....	106	2,180	5,830	3,980	628	4,490	1,950	447	24	24	42	24
25.....	91	2,940	14,800	2,700	1,390	3,100	1,380	218	372	24	24	414.
26.....	297	4,350	16,600	2,560	1,380	2,710	990	630	161	24	66	334.
27.....	214	4,310	10,500	1,950	2,110	4,860	967	635	141	24	24	1,530
28.....	357	3,240	4,910	2,210	2,130	5,650	793	147	167	24	24	4,230
29.....	240	2,300	3,060	2,350	-----	4,720	679	693	107	24	24	7,040.
30.....	24	1,460	2,530	2,080	-----	3,320	24	278	137	24	24	6,250.
31.....	754	-----	9,800	1,100	-----	2,580	-----	256	-----	24	24	-----

Month	Max-imum	Min-imum	Mean	Month	Max-imum	Min-imum	Mean
October.....	754	24	134	May.....	21,700	147	7,200
November.....	4,350	24	1,410	June.....	407	24	128
December.....	16,600	269	4,050	July.....	63	24	141
January.....	17,200	492	3,340	August.....	1,557	24	148
February.....	2,130	198	1,110	September.....	7,947	24	836
March.....	17,700	27	5,380				
April.....	9,920	24	3,570	The year.....	21,700	24	2,310.

OTTAWA RIVER AT ALLENTOWN, OHIO

LOCATION.—Water-stage recorder in NW¼ sec. 29, T. 3 S., R. 6 E., at highway bridge at Allentown, Allen County. Zero of gage is 789.67 feet above mean sea level.

DRAINAGE AREA.—168 square miles.

RECORDS AVAILABLE.—November 1923 to September 1933.

DISCHARGE.—Maximum during year, 2,680 second-feet Sept. 27 (gage height, 8.55 feet); minimum, 1.4 second-feet June 28, 29.

1923-33: Maximum, 2,910 second-feet (revised) Mar. 20, 1927 (gage height, 9.0 feet); minimum, that of June 28, 29, 1933.

REMARKS.—Records good except those for September and those estimated for Dec. 14-18 and Feb. 5-16 (ice effect), July 4-21 and Aug. 18-31, which are fair.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.3	266	49	1,500	60	72	487	79	12	2.6	9.3	9.4
2	8.6	71	58	552	106	66	505	176	10	29	43	9.5
3	8.6	28	71	207	85	51	266	250	11	28	25	31
4	11	20	65	148	59	45	205	162	11	40	38	17
5	32	18	52	159	45	41	141	119	12	25	11	15
6	10	13	119	143	61	36	224	166	15	15	7.0	18
7	8.9	12	1,040	112	53	37	400	221	10	8.0	5.4	16
8	8.9	12	760	92	80	41	245	1,100	9.3	7.0	12	12
9	8.9	106	253	75	98	44	175	1,210	9.1	6.0	8.0	10
10	11	65	110	71	86	39	127	844	8.6	5.0	759	10
11	57	32	81	60	69	38	112	1,300	9.1	4.2	783	12
12	14	23	68	51	63	33	119	1,210	7.5	3.5	106	35
13	12	19	62	40	57	208	102	1,090	7.5	3.5	33	25
14	9.8	17	63	42	53	1,830	80	1,150	5.2	3.7	14	70
15	9.8	16	58	37	49	1,430	74	482	4.6	4.0	10	170
16	8.9	30	43	41	44	604	139	445	4.3	4.5	9.5	100
17	8.6	48	36	36	40	305	352	285	5.6	12	9.2	59
18	18	63	36	35	35	709	685	159	4.6	7.0	17	32
19	11	95	37	51	35	1,640	726	98	3.9	3.7	15	36
20	9.5	75	39	66	84	1,200	342	67	4.2	3.5	13	230
21	9.8	124	44	56	60	742	207	52	3.9	2.4	12	71
22	9.8	71	46	190	57	406	141	41	4.3	2.6	11	65
23	21	78	98	342	42	221	102	29	3.6	2.8	12	83
24	14	354	1,600	132	47	162	84	24	3.2	22	11	63
25	11	505	1,460	85	78	144	75	23	3.4	46	10	46
26	28	505	510	84	243	328	51	21	8.2	10	10	108
27	44	226	207	83	121	645	54	24	3.2	5.0	10	2,320
28	30	102	105	91	84	385	52	20	2.4	4.6	9.8	1,920
29	16	71	66	84	-----	205	42	15	2.6	5.0	9.8	720
30	12	56	285	66	-----	141	36	12	2.8	6.2	9.6	475
31	19	-----	2,280	59	-----	129	-----	12	-----	5.0	9.5	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	57	8.3	15.8	0.094	0.11
November	505	12	104	.619	.60
December	2,280	36	316	1.88	2.17
January	1,500	35	155	.923	1.06
February	243	35	71.2	.424	.44
March	1,830	33	386	2.30	2.65
April	726	36	212	1.26	1.41
May	1,300	12	351	2.09	2.41
June	15	2.4	6.74	.040	.04
July	46	10.6	10.6	.063	.07
August	783	5.4	65.9	.392	.45
September	2,320	9.4	226	1.35	1.51
The year	2,320	2.4	161	.958	13.01

OTTAWA RIVER AT KALIDA, OHIO

LOCATION.—Chain gage in SW¼ sec. 5, T. 1 S., R. 6 E., at highway bridge in Kalida, Putnam County. Zero of gage is 707.41 feet above mean sea level.

DRAINAGE AREA.—315 square miles.

RECORDS AVAILABLE.—September 1930 to September 1933.

DISCHARGE.—Maximum during year, 4,110 second-feet Jan. 1 (gage height, 13.90 feet); minimum, 6.3 second-feet Oct. 3-4 (gage height, 1.30 feet).

1930-33: Maximum, that of Jan. 1, 1933; minimum, 4.3 second-feet Sept. 18, 1932 (gage height, 1.22 feet).

REMARKS.—Records fair. Discharge estimated Dec. 11-19, Feb. 6, 10-19, Mar. 11, because of ice effect; and Dec. 7-8, 24-25, and May 9, 12, 14, because of backwater from the Auglaize River.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	11	210	124	3,690	183	151	938	268	43	13	13	12
2.....	8.4	359	196	1,620	224	119	1,030	480	40	24	9.3	12
3.....	6.3	124	268	538	210	95	498	538	36	70	90	14
4.....	6.6	60	238	392	145	82	409	298	31	109	78	46
5.....	19	43	170	375	86	63	298	210	28	60	70	49
6.....	33	32	162	343	70	56	343	426	28	34	33	30
7.....	15	28	1,400	283	52	60	794	375	26	26	18	33
8.....	13	24	2,400	238	298	63	538	1,240	35	17	19	26
9.....	9.6	124	938	196	162	66	343	2,000	22	17	15	23
10.....	9.0	462	426	170	120	60	283	1,570	18	16	28	16
11.....	19	196	240	140	100	56	224	1,680	20	14	1,160	15
12.....	74	95	150	109	90	52	283	2,500	20	13	375	29
13.....	33	66	110	100	82	151	224	1,850	18	12	140	74
14.....	18	46	90	78	76	2,540	170	2,500	17	12	56	63
15.....	15	40	84	60	70	2,480	145	1,590	16	14	33	140
16.....	13	49	74	78	66	1,400	210	1,400	14	16	20	238
17.....	12	86	72	74	62	682	748	890	16	20	19	119
18.....	16	183	70	66	58	770	1,190	498	16	14	17	60
19.....	15	283	68	268	54	2,280	1,350	343	17	10	22	60
20.....	22	283	66	224	134	2,480	748	253	16	8.7	19	74
21.....	13	253	70	183	183	1,570	444	151	14	11	17	328
22.....	10	313	78	238	104	866	298	140	14	11	16	124
23.....	12	238	124	618	86	498	238	114	13	9.6	16	114
24.....	22	660	1,500	426	70	343	162	90	12	10	16	109
25.....	30	1,460	3,000	238	74	313	145	82	12	46	14	86
26.....	19	1,160	1,680	170	343	409	119	70	29	43	13	70
27.....	43	409	660	196	313	1,160	86	78	25	33	12	986
28.....	90	298	392	253	170	748	86	78	20	19	13	3,830
29.....	52	196	238	210	-----	426	78	63	16	13	13	2,540
30.....	33	145	196	170	-----	298	63	52	14	10	13	890
31.....	27	-----	2,880	129	-----	238	-----	49	-----	8.7	13	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	90	6.3	23.2	0.074	0.09
November.....	1,160	24	254	.806	.90
December.....	3,000	66	586	1.86	2.14
January.....	3,690	60	383	1.22	1.41
February.....	343	52	132	.419	.44
March.....	2,540	52	664	2.11	2.43
April.....	1,350	63	416	1.32	1.47
May.....	2,500	49	706	2.24	2.58
June.....	43	12	21.5	.068	.08
July.....	109	8.7	23.7	.075	.09
August.....	1,160	9.3	77.1	.245	.28
September.....	3,830	12	340	1.08	1.20
The year.....	3,830	6.3	304	.965	13.11

BLANCHARD RIVER NEAR FINDLAY, OHIO

LOCATION.—Water-stage recorder on east line of sec. 10, T. 1 N., R. 10 E., at highway bridge 2 miles northwest of Findlay, Hancock County. Zero of gage is 754.55 feet above mean sea level.

DRAINAGE AREA.—343 square miles.

RECORDS AVAILABLE.—November 1923 to September 1933.

DISCHARGE.—Maximum during year, 4,900 second-feet Mar. 14 (gage height, 11.89 feet); minimum, 0.7 second-foot Sept. 5.

1923-33: Maximum, 6,320 second-feet Dec. 1, 1927 (gage height, 14.5 feet); minimum, that of Sept. 5, 1933.

The flood of March 1913 reached a stage corresponding to 18.5 feet on gage.

REMARKS.—Records good except those for extremely low water and those for periods of ice effect, Dec. 9-22, Jan. 12-18, Feb. 4-19, 23-24, Mar. 9-13, which are fair.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1-----	1.2	183	72	3,640	258	173	982	236	41	17	2.2	2.1
2-----	3.0	231	64	1,510	346	146	747	412	33	34	2.4	1.8
3-----	1.6	144	74	526	310	117	487	406	44	33	56	2.5
4-----	11	77	77	372	190	99	387	238	23	44	61	1.4
5-----	7.3	48	64	376	97	87	296	206	30	62	22	1.6
6-----	1.8	30	72	246	53	83	634	339	34	50	6.0	1.8
7-----	2.5	21	574	300	53	81	927	272	44	30	4.4	4.2
8-----	2.8	18	713	244	190	93	659	1,290	37	21	3.6	2.2
9-----	1.7	20	250	212	150	83	437	2,020	34	19	2.9	2.4
10-----	6.8	18	110	179	120	79	321	2,140	32	12	4.4	2.2
11-----	4.3	20	68	151	97	79	296	2,300	27	12	13	4.8
12-----	2.7	16	54	112	83	83	321	2,400	24	9.0	155	16
13-----	3.3	17	45	85	74	460	275	2,720	19	9.0	98	3.6
14-----	2.9	14	40	81	68	4,390	212	2,700	21	9.0	48	13
15-----	2.4	16	32	77	64	4,090	171	1,630	19	12	27	13
16-----	2.4	26	23	70	61	1,730	212	1,660	20	6.0	15	17
17-----	4.4	37	21	61	58	762	827	844	19	4.8	9.0	18
18-----	4.4	63	18	64	54	974	1,270	519	19	7.0	4.6	17
19-----	2.4	93	17	146	56	2,750	2,020	350	17	5.2	3.8	36
20-----	2.7	108	16	251	146	2,880	1,130	261	15	4.1	3.1	30
21-----	2.7	126	15	212	162	2,140	549	197	9.7	3.3	3.0	22
22-----	2.9	126	20	307	126	1,180	368	154	11	4.4	2.7	15
23-----	6.1	131	80	720	83	559	265	126	9.7	5.2	3.1	12
24-----	2.5	248	1,640	512	68	402	203	110	9.0	19	2.5	18
25-----	3.8	452	2,040	289	187	350	173	109	21	4.1	2.7	18
26-----	15	539	1,110	228	460	430	151	72	7.6	4.4	3.1	43
27-----	12	310	480	289	332	974	128	87	10	3.8	4.1	830
28-----	11	171	296	539	215	732	114	79	7.6	3.8	2.5	957
29-----	16	114	206	346	-----	421	97	66	14	4.1	2.7	802
30-----	12	89	370	255	-----	296	85	59	18	3.3	2.9	339
31-----	35	-----	3,800	197	-----	275	-----	59	-----	3.3	2.7	-----

Month	Maximum	Minimum	Mean	Per square mi e	Run-off in inches
October-----	35	1.2	6.15	0.018	0.02
November-----	539	14	117	.341	.38
December-----	3,800	15	402	1.17	1.35
January-----	3,640	61	410	1.20	1.38
February-----	460	53	149	.434	.45
March-----	4,390	79	871	2.54	2.93
April-----	2,020	85	491	1.43	1.60
May-----	2,720	59	776	2.26	2.61
June-----	44	7.6	22.3	.065	.07
July-----	62	3.3	14.7	.043	.05
August-----	155	2.2	18.5	.054	.06
September-----	957	1.4	108	.315	.35
The year-----	4,390	1.2	284	.828	11.25

BLANCHARD RIVER NEAR DUPONT, OHIO

LOCATION.—Water-stage recorder on east line of sec. 13, T. 1 N., R. 5 E., at highway bridge 4 miles east of Dupont, Putnam County. Zero of gage is 691.42 feet above mean sea level.

DRAINAGE AREA.—749 square miles.

RECORDS AVAILABLE.—July 1928 to September 1933.

DISCHARGE.—Maximum during year, 8,430 second-feet May 15 (gage height, 19.60 feet); minimum, 2.6 second-feet Aug. 31 to Sept. 1 (gage height, 0.54 foot).

1928-33: Maximum, 16,800 second-feet Jan. 15, 1930 (gage height, 26.7 feet); minimum, 1.4 second-feet Aug. 29, 30, 1932 (gage height, 0.46 foot).

REMARKS.—Records good except those for periods of ice effect, Dec. 7-10, 13-17, Feb. 6, 8-18, 21-23, Mar. 11-12, which are fair.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.8	272	206	5,720	456	374	1,620	592	106	100	16	3.5
2	11	362	224	6,600	550	300	2,210	1,580	97	66	16	9.4
3	9.1	314	272	5,200	550	248	1,870	1,760	84	68	26	10
4	8.4	224	248	2,520	456	212	1,100	1,130	68	132	43	9.4
5	8.0	156	212	993	321	184	718	674	66	150	58	9.1
6	7.4	106	232	696	220	162	790	1,040	62	112	80	8.8
7	6.3	74	970	590	354	156	1,420	1,060	56	77	55	8.4
8	9.2	59	2,200	492	630	156	1,720	1,770	56	67	36	8.0
9	13	267	1,900	406	470	162	1,310	3,580	55	53	25	8.0
10	12	242	890	350	400	150	824	4,630	53	40	20	7.7
11	13	143	464	307	340	140	590	5,240	46	32	17	7.0
12	16	104	314	266	290	160	510	6,400	41	26	25	22
13	24	71	250	224	260	332	510	7,200	38	21	47	29
14	24	54	210	194	220	3,170	447	8,010	37	19	46	28
15	18	47	170	178	200	6,480	366	8,120	34	18	97	33
16	13	50	150	167	180	7,960	471	6,800	32	17	72	28
17	11	85	130	156	160	6,280	735	5,130	30	16	47	21
18	12	162	113	156	150	3,610	1,710	3,420	29	16	34	21
19	13	248	98	648	154	3,740	2,960	1,680	28	17	24	25
20	12	286	90	674	310	5,530	3,270	779	28	16	19	43
21	11	314	88	510	290	6,210	2,660	492	24	14	16	36
22	12	307	96	725	250	5,220	1,350	366	23	13	13	42
23	17	332	130	836	220	3,300	655	293	21	12	10	49
24	20	592	2,000	934	194	1,610	447	248	20	12	7.7	42
25	16	999	4,150	764	321	812	358	212	32	12	6.6	33
26	26	1,270	4,800	510	420	841	307	189	39	12	7.0	29
27	67	1,100	3,300	501	610	1,460	266	178	32	15	5.6	457
28	66	635	1,560	687	530	1,720	230	167	28	20	5.3	1,310
29	69	367	635	860	-----	1,320	206	162	28	19	5.0	1,850
30	53	254	656	610	-----	790	184	143	30	18	3.8	1,410
31	73	-----	3,160	447	-----	581	-----	121	-----	15	2.9	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	73	6.3	21.9	0.029	0.03
November	1,270	47	317	.423	.47
December	4,800	88	965	1.29	1.49
January	6,600	156	1,094	1.46	1.68
February	630	150	340	.454	.47
March	7,960	140	2,044	2.73	3.15
April	3,270	184	1,060	1.42	1.58
May	8,120	121	2,359	3.15	3.63
June	106	20	44.1	.059	.07
July	150	12	39.5	.053	.06
August	97	2.9	28.6	.038	.04
September	1,850	3.5	187	.250	.23
The year	8,120	2.9	715	.955	12.95

MIAMI & ERIE CANAL AT DELPHOS, OHIO

LOCATION.—Staff gage at Old Lock 9, 70 feet below Third Street Bridge, in Delphos, Allen County.

RECORDS AVAILABLE.—March 1928 to September 1933.

DISCHARGE.—Maximum during year, 132 second-feet Dec. 24; no flow July 12-20, 25-26, Aug. 21, and Sept. 30.

1928-33: Maximum, that of Dec. 24, 1932; no flow at times when water was cut off from canal.

REMARKS.—Records fair. Water is diverted into canal by feeder at Lake St. Marys. Small amount of water diverted from canal above gage for flushing sewers in Delphos. Gage-height record furnished by State canal superintendent.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	26	18	100	20	23	12	39	14	16	11	12
2	11	24	27	17	18	28	6	34	22	24	11	18
3	10	12	20	21	18	30	5	33	14	24	16	12
4	9	14	29	21	18	16	3	36	6	12	23	18
5	9	11	14	24	14	8	2	33	14	14	28	22
6	9	6	12	35	17	12	8	41	8	16	8	12
7	18	7	84	27	14	9	6	39	16	11	7	11
8	27	14	24	21	22	14	4	42	12	12	8	8
9	12	19	24	17	8	11	3	48	12	1	8	11
10	14	22	13	29	15	10	4	54	12	8	18	6
11	12	20	29	18	23	10	5	84	14	4	20	12
12	14	18	28	14	16	10	6	68	25	0	20	19
13	24	11	26	16	15	16	4	33	8	0	6	11
14	20	9	31	10	10	43	4	25	6	0	5	11
15	20	8	32	18	18	30	4	47	16	0	19	14
16	7	3	44	18	29	29	8	44	19	0	12	14
17	14	11	36	16	20	8	38	39	14	0	22	7
18	10	14	27	12	30	47	11	34	10	0	15	9
19	18	14	26	33	20	76	30	33	14	0	13	8
20	20	12	18	26	22	6	4	34	17	0	8	12
21	23	14	26	20	23	8	16	23	10	3	0	6
22	23	8	33	35	27	6	21	8	10	3	12	24
23	20	13	44	20	26	5	33	16	10	3	11	23
24	15	34	115	20	24	5	28	46	4	6	7	11
25	16	28	80	18	37	4	29	27	5	0	13	11
26	21	17	80	16	32	10	27	31	12	0	12	5
27	20	19	43	12	16	7	29	24	10	6	6	76
28	15	13	12	18	22	5	33	36	6	8	10	18
29	10	11	24	14	-----	2	30	24	6	8	17	3
30	14	20	35	16	-----	2	22	17	18	6	9	0
31	14	-----	96	18	-----	4	-----	24	-----	11	10	-----

Month	Maximum	Minimum	Mean	Month	Maximum	Minimum	Mean
October	27	7	15.5	May	84	8	36.0
November	34	3	15.1	June	25	4	12.1
December	115	12	37.1	July	24	0	6.32
January	100	12	22.6	August	28	0	12.4
February	37	8	20.5	September	76	0	14.1
March	76	2	15.9				
April	38	2	14.5	The year	115	0	18.5

SOUTH BRANCH OF PORTAGE RIVER NEAR PEMBERVILLE, OH^o

LOCATION.—Chain gage in sec. 21, T. 5 N., R. 12 E., at highway bridge 2½ miles southwest of Pemberville, Wood County.

DRAINAGE AREA.—334 square miles.

RECORDS AVAILABLE.—August 1930 to September 1933.

DISCHARGE.—Maximum during year, 7,350 second-feet Mar. 14 (gage height, 13.00 feet); minimum, 0.3 second-foot Aug. 24-26, Sept. 1-2 (gage height, 0.34 foot).

1930-33: Maximum and minimum occurred during 1933.

REMARKS.—Records good except those for periods of ice effect, Dec. 11-23, Jan. 13-17, Feb. 5-19, Mar. 11, and other estimated periods, May 27 to June 4, June 6, 14-21, 28-30, July 16-18, Aug. 4-6, Sept. 28-29, which are fair.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	3.8	319	90	2,920	210	180	1,380	365	30	39	1.4	0.3
2.....	2.4	518	82	655	440	142	1,340	1,220	26	29	1.0	.3
3.....	1.7	171	108	365	230	105	625	1,300	23	115	1.8	.7
4.....	1.5	90	98	365	162	88	466	655	20	100	3.3	1.0
5.....	2.4	63	85	518	90	75	319	466	18	51	6.0	1.3
6.....	7.2	46	71	390	80	67	440	1,540	22	22	9.0	1.0
7.....	5.5	37	820	296	75	75	1,140	855	15	11	8.2	.5
8.....	4.1	31	1,970	230	450	96	655	1,340	14	7.5	4.7	.4
9.....	3.1	30	625	190	300	74	466	2,840	11	6.1	2.5	.4
10.....	2.7	52	296	162	220	53	319	2,920	8.2	4.7	2.5	.4
11.....	3.8	98	170	124	160	50	274	2,030	6.1	4.0	3.1	.5
12.....	30	74	130	85	130	47	365	3,080	8.2	2.7	3.1	1.6
13.....	19	48	110	72	110	50	319	1,640	5.3	2.2	2.7	17
14.....	12	34	96	66	90	5,810	230	4,470	4.7	1.9	1.8	9.1
15.....	8.5	29	80	62	80	5,920	162	1,690	4.2	1.6	1.1	4.7
16.....	5.8	26	58	60	70	1,540	252	2,090	5.0	1.5	1.0	4.2
17.....	4.3	57	50	58	62	960	2,030	1,260	4.7	1.4	.7	4.0
18.....	4.6	319	45	66	55	785	1,340	625	3.3	1.4	.7	2.7
19.....	5.2	296	43	655	70	2,220	2,600	390	3.1	2.5	.7	1.8
20.....	9.3	296	41	995	113	2,090	1,060	274	2.7	2.0	.5	1.6
21.....	5.8	241	39	466	319	1,740	625	220	2.7	1.9	.5	6.1
22.....	4.9	230	50	544	142	820	415	162	1.9	1.6	.4	4.7
23.....	5.2	210	100	715	124	544	274	142	1.9	1.6	.4	3.7
24.....	7.2	598	1,850	319	82	365	220	113	1.9	2.4	.3	2.5
25.....	16	925	3,080	241	263	342	190	115	2.2	2.2	.3	2.2
26.....	18	820	1,030	220	598	492	171	101	2.9	2.5	.3	2.2
27.....	75	365	544	210	319	750	142	86	2.7	2.7	.4	32
28.....	106	190	319	296	210	466	133	74	2.9	2.7	.4	150
29.....	68	142	220	171	-----	319	115	60	3.7	1.9	.4	120
30.....	40	110	200	152	-----	252	96	45	4.7	1.6	.4	78
31.....	26	-----	3,660	152	-----	274	-----	40	-----	1.9	.4	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	106	1.5	16.4	C.049	0.06
November.....	925	26	216	.647	.72
December.....	3,660	39	521	1.56	1.80
January.....	2,920	58	381	1.14	1.31
February.....	598	55	138	.563	.59
March.....	5,920	47	864	2.59	2.99
April.....	2,600	96	605	1.81	2.02
May.....	4,470	40	1,040	3.11	3.59
June.....	30	1.9	8.73	.026	.03
July.....	115	1.4	13.9	.042	.05
August.....	9.0	.3	1.94	.0058	.007
September.....	150	.3	15.2	.046	.05
The year.....	5,920	.3	325	.973	13.22

PORTAGE RIVER AT WOODVILLE, OHIO

LOCATION.—Staff gage installed July 12, 1933, in sec. 28, T. 6 N., R. 13 E., 50 feet downstream from new highway bridge at Woodville, Sandusky County. Chain gage with same datum at old highway bridge 50 feet upstream used prior to Mar. 29, 1933. Temporary gage used Apr. 7 to July 10, 1933. Zero of gage is 615.14 feet above mean sea level.

DRAINAGE AREA.—433 square miles.

RECORDS AVAILABLE.—July 1928 to September 1933.

DISCHARGE.—Maximum during year, 8,220 second-feet Mar. 15 (gage height, 12.52 feet); minimum, 0.8 second-foot Aug. 24 (gage height, 1.61 feet).

1928-33: Maximum, about 10,500 second-feet Jan. 15, 1937 (gage height, 12.96 feet); minimum, 0.3 second-foot Aug. 26, 1931; minimum gage height, 1.61 feet Aug. 24, 1933.

REMARKS.—Records fair. Stage-discharge relation affected by ice Dec. 13-23, Feb. 6-19, Mar. 10. The numerous estimated periods during October to January were made because of a poor gage-height record.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.7	* 450	* 130	* 3,800	248	312	* 1,800	206	35	46	2.0	1.1
2	5.1	* 700	* 120	1,190	568	248	* 1,700	* 1,500	29	35	1.8	1.1
3	4.2	* 280	* 180	590	366	192	* 850	* 1,800	27	* 120	2.3	1.3
4	3.7	* 140	156	* 500	248	166	* 610	* 1,000	22	* 150	4.0	1.1
5	5.1	* 90	124	* 680	128	142	* 450	* 660	22	* 60	6.3	1.4
6	* 14	* 64	94	* 520	* 110	119	* 600	* 1,900	40	24	12	2.0
7	* 11	51	* 1,100	* 400	* 100	128	* 1,400	* 1,700	17	15	10	2.0
8	8.5	41	* 2,600	296	* 500	161	* 900	* 1,600	15	13	9.2	2.3
9	* 6.6	35	* 950	* 270	* 540	142	* 650	* 3,900	12	9.2	5.5	2.9
10	5.4	* 70	* 500	* 240	* 350	* 70	* 480	* 3,500	9.2	5.8	4.2	3.6
11	13	* 140	* 300	219	* 260	76	* 420	* 2,900	8.4	* 4.5	3.6	3.6
12	31	* 100	* 240	179	* 200	66	* 400	* 4,200	11	3.2	4.0	3.6
13	43	* 70	* 200	* 130	* 150	77	* 440	* 2,200	7.6	3.0	3.6	4.2
14	26	* 48	* 170	* 120	* 130	5,160	312	* 4,800	7.0	2.6	3.2	19
15	15	* 40	* 150	* 110	* 110	7,540	264	* 2,800	9.2	2.2	2.4	18
16	* 9.0	* 38	* 110	* 100	* 95	3,020	328	* 2,300	14	1.8	2.2	12
17	* 7.0	* 80	* 90	* 96	* 85	1,690	* 2,400	* 1,800	13	1.8	2.3	11
18	* 7.0	* 430	* 74	128	* 80	1,120	* 1,900	* 1,000	7.0	1.6	1.8	7.3
19	* 8.0	* 410	* 66	* 850	* 90	2,920	* 3,300	* 680	6.6	2.3	1.6	6.3
20	* 15	* 400	* 62	* 1,300	152	3,300	* 1,600	460	5.8	3.2	1.6	5.2
21	* 9.0	* 360	* 58	* 610	525	2,830	* 1,000	328	5.8	2.4	1.2	5.5
22	* 7.8	* 330	* 70	* 700	328	1,470	* 640	234	4.2	2.6	1.0	5.0
23	7.0	* 310	* 160	* 950	234	830	* 440	166	3.0	2.3	1.0	8.0
24	* 12	780	* 2,400	* 480	140	568	328	137	3.4	* 3.3	.9	7.6
25	* 27	* 1,200	* 4,000	* 360	279	465	279	117	3.8	* 3.3	.9	6.0
26	* 65	* 1,000	1,330	328	1,000	545	234	104	3.4	* 3.5	1.0	4.5
27	* 100	* 550	1,000	296	545	1,120	179	91	2.8	3.6	1.1	8.4
28	* 150	* 290	680	366	366	730	149	82	3.0	4.5	1.3	192
29	* 100	* 210	366	279	-----	485	124	70	3.8	2.8	1.2	156
30	* 64	* 160	325	219	-----	* 350	117	53	4.8	2.0	1.3	94
31	* 45	-----	4,700	234	-----	* 380	-----	42	-----	1.8	1.3	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	150	3.7	26.8	0.062	0.07
November	1,200	35	296	.684	.76
December	4,700	58	726	1.68	1.94
January	3,800	96	534	1.23	1.42
February	1,000	80	283	.654	.68
March	7,540	66	1,170	2.70	3.11
April	3,300	117	814	1.88	2.10
May	4,800	42	1,370	3.16	3.64
June	40	2.8	11.9	.027	.03
July	150	1.6	17.3	.040	.05
August	12	.9	3.09	.0071	.008
September	192	1.1	19.9	.046	.05
The year	7,540	.9	442	1.02	13.86

* Estimated.

SANDUSKY RIVER NEAR BUCYRUS, OHIO

LOCATION.—Chain gage in NE¼ sec. 10, T. 3 S., R. 16 E., at highway bridge 1½ miles west of Bucyrus, Crawford County.

DRAINAGE AREA.—89.8 square miles.

RECORDS AVAILABLE.—August 1925 to September 1933.

DISCHARGE.—Maximum during year, 4,600 second-feet Dec. 31 (gage height, 8.46 feet); minimum, 0.6 second-foot Aug. 13-14 (gage height, 0.60 foot).

1925-33: Maximum, 6,900 second-feet Dec. 14, 1927 (gage height, 9.15 feet); minimum, that of Aug. 13-14, 1933.

REMARKS.—Records good except those estimated because of ice effect, which are fair.

Discharge, in second-feet, 1925-33

Day	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1925-26														
1.		3.0	10	70	58	• 11	150	83	150	40	9.4	5.1	5.9	2.2
2.		2.7	10	62	54	• 10	133	64	90	34	9.4	4.5	2.4	9.1
3.		2.7	8.7	50	54	• 10	78	46	692	31	8.1	4.5	10	10
4.		1.9	335	42	60	• 10	65	• 41	298	26	8.1	8.7	5.9	22
5.		2.1	274	36	158	40	52	• 37	141	20	7.1	4.0	3.7	389
6.		3.2	96	29	177	57	70	• 35	96	17	11	4.3	6.5	186
7.		2.7	45	74	79	32	76	68	892	15	8.4	4.3	4.5	68
8.		3.0	36	850	58	• 25	83	62	1,220	14	7.4	4.0	3.5	32
9.		2.7	30	186	59	• 20	68	53	1,070	13	7.1	3.5	3.3	389
10.		3.0	28	90	45	• 17	49	45	286	12	5.6	5.6	2.8	547
11.		2.7	27	68	35	• 15	• 45	• 42	150	11	7.4	3.5	2.6	103
12.		11	24	90	38	• 14	• 42	40	90	9.8	8.1	3.0	5.9	56
13.		60	21	810	39	• 13	• 40	• 36	66	9.4	5.6	10	2.6	76
14.		186	19	262	32	• 12	103	• 31	56	10	90	25	6.2	68
15.		238	19	133	23	• 12	110	25	46	14	70	14	3.3	37
16.		158	16	310	• 21	• 12	81	22	41	12	33	8.7	4.0	582
17.		55	58	118	20	• 12	83	20	35	17	25	4.5	4.8	186
18.		80	110	78	• 19	118	250	23	29	25	31	4.8	4.5	68
19.		52	57	71	• 18	310	850	44	25	141	28	5.6	3.5	40
20.	7.5	37	39	69	20	168	286	118	24	83	13	3.7	3.3	29
21.	6.8	23	30	58	22	118	158	118	22	42	10	3.0	62	22
22.	5.7	16	25	48	22	65	655	110	22	26	63	2.6	51	18
23.	4.7	13	22	39	16	• 43	262	1,070	22	18	42	2.4	12	25
24.	4.3	11	32	32	16	• 33	150	480	24	15	18	2.1	8.7	83
25.	4.0	9.5	216	30	16	• 28	1,220	216	25	12	12	1.6	6.2	66
26.	3.7	7.9	125	27	14	• 24	935	118	22	20	11	2.2	4.5	150
27.	3.7	15	65	361	12	• 21	196	83	19	22	8.7	21	4.0	66
28.	3.2	9.1	48	618	12	• 19	110	65	43	16	7.4	43	3.3	50
29.	3.2	8.7	40	125	• 11	• 18		57	54	13	6.8	26	4.0	58
30.	2.7	8.7	38	73	• 11	• 16		50	42	12	5.6	11	2.2	49
31.	3.2		52		• 11	• 20		79		10		7.8	2.2	

• Estimated because of ice.

Discharge, in second-feet, of Sandusky River near Bucyrus, Ohio, 1925-33—Contd.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1926-27												
1-----	38	227	90	26	90	70	150	58	64	5.6	6.8	2.8
2-----	186	133	61	24	78	37	310	37	41	12	5.6	2.8
3-----	125	96	48	24	90	45	141	31	31	11	5.1	3.0
4-----	110	72	41	27	206	36	96	25	58	10	4.5	1.2
5-----	1,360	59	32	31	655	39	361	24	76	9.4	4.5	1.6
6-----	1,420	49	37	31	618	227	186	19	34	7.4	4.0	2.2
7-----	389	40	28	35	335	298	90	16	23	13	4.0	11
8-----	168	35	40	* 25	196	418	65	16	20	6.8	5.6	8.7
9-----	96	48	54	* 20	150	150	158	19	16	5.9	4.3	12
10-----	66	96	38	* 16	118	90	158	27	14	5.6	4.5	43
11-----	52	55	37	* 14	72	72	80	26	12	110	4.0	24
12-----	43	40	32	* 13	47	66	56	20	11	21	4.0	14
13-----	38	34	158	* 12	54	76	59	16	11	12	4.0	29
14-----	35	32	286	* 12	68	547	69	18	12	13	4.5	61
15-----	30	38	58	* 11	335	186	50	16	10	13	3.7	20
16-----	25	141	* 35	* 11	186	96	47	25	9.1	8.1	3.7	11
17-----	34	118	* 26	* 11	196	70	46	40	8.1	8.1	3.5	8.1
18-----	37	82	* 20	* 10	150	103	41	37	29	6.5	3.3	7.4
19-----	28	82	* 17	206	71	418	35	1,360	16	5.9	3.5	6.8
20-----	25	59	* 16	1,780	54	1,520	29	692	13	5.1	3.3	5.6
21-----	22	50	22	582	48	2,530	26	177	11	7.1	3.0	5.6
22-----	33	45	22	1,470	38	618	24	83	20	125	3.0	6.5
23-----	56	38	21	389	79	238	22	335	13	68	3.0	5.6
24-----	125	40	53	168	227	150	19	418	10	29	4.0	4.5
25-----	360	41	110	110	262	110	19	361	9.4	16	3.5	3.7
26-----	418	216	34	103	361	96	27	238	8.1	11	3.3	3.5
27-----	168	418	48	90	141	83	31	110	7.1	9.4	3.5	3.0
28-----	103	125	37	46	76	68	32	66	6.8	8.1	3.0	3.3
29-----	810	96	33	125	-----	57	62	96	6.2	8.4	3.0	5.6
30-----	513	141	37	692	-----	50	141	150	6.2	8.7	4.0	4.5
31-----	692	-----	29	206	-----	45	-----	118	-----	7.4	3.0	-----
1927-28												
1-----	3.0	5.9	3,460	227	* 15	47	158	31	7.4	12	8.1	5.1
2-----	34	5.1	480	133	* 13	41	168	26	9.8	26	6.8	4.3
3-----	31	8.1	216	* 94	* 11	38	96	22	8.1	29	6.8	4.0
4-----	13	11	110	* 70	* 15	43	68	20	46	16	6.5	4.0
5-----	9.1	4.8	76	* 54	935	35	53	21	83	655	12	3.5
6-----	7.4	3.5	58	* 44	196	47	43	22	1,020	262	31	4.0
7-----	12	5.3	57	* 37	216	25	58	19	418	66	16	4.0
8-----	5.6	3.5	103	158	810	25	96	15	186	36	8.7	3.5
9-----	4.8	2.2	59	250	389	50	70	14	310	29	8.7	3.5
10-----	4.5	2.2	47	158	141	68	52	13	274	206	6.8	3.3
11-----	4.0	3.5	47	168	90	36	45	21	103	54	8.1	3.5
12-----	10	4.0	150	158	70	45	41	22	66	133	6.2	3.5
13-----	5.6	1.9	892	141	66	141	33	16	44	850	5.3	3.0
14-----	6.5	4.0	4,600	133	310	547	39	14	32	1,780	5.1	3.5
15-----	8.1	2.1	513	141	1,020	196	43	12	22	310	4.5	3.3
16-----	6.8	35	418	83	286	125	32	12	19	133	4.3	2.8
17-----	6.2	480	168	81	158	72	28	14	15	71	4.3	2.8
18-----	6.2	238	69	67	118	65	25	12	18	47	4.0	2.6
19-----	5.1	96	70	168	75	54	25	12	29	34	3.5	2.6
20-----	5.1	62	45	361	* 58	46	22	11	32	46	3.7	3.5
21-----	4.5	51	36	70	* 48	66	103	10	24	62	7.4	3.5
22-----	4.0	52	30	* 46	* 43	72	850	9.1	20	37	12	3.3
23-----	4.5	39	26	* 35	150	64	335	8.1	18	26	3.5	3.3
24-----	4.0	90	24	47	418	58	177	8.4	15	19	3.5	3.5
25-----	3.7	141	26	216	141	56	118	12	13	15	1.5	3.7
26-----	3.7	70	16	90	96	227	74	11	12	14	2.4	3.5
27-----	3.5	81	15	* 54	90	227	61	9.4	11	12	3.5	3.5
28-----	3.5	448	15	* 37	58	90	50	8.1	9.4	12	3.0	3.5
29-----	5.1	730	34	* 27	48	67	40	7.8	10	8.7	37	3.5
30-----	5.1	1,220	90	* 21	-----	730	35	7.4	12	8.4	12	3.0
31-----	4.0	-----	618	* 17	-----	238	-----	7.4	-----	7.8	8.1	-----

* Estimated because of ice.

Discharge, in second-feet, of Sandusky River near Bucyrus, Ohio, 1925-33—Contd

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1928-29												
1-----	3.3	4.5	31	17	* 23	206	655	60	14	40	14	5.1
2-----	3.3	12	32	13	* 20	196	227	73	12	25	12	5.1
3-----	4.0	14	23	* 11	* 17	133	125	770	12	14	22	4.8
4-----	4.0	15	18	* 10	* 15	186	216	238	11	10	18	4.5
5-----	4.5	11	18	* 12	* 14	310	480	480	10	1,260	14	4.5
6-----	3.3	9.4	13	* 25	* 13	141	168	310	9.8	547	11	4.8
7-----	2.8	7.4	14	* 40	* 12	118	96	118	9.8	770	10	8.1
8-----	3.0	8.4	12	* 23	* 12	58	71	78	9.8	1,360	8.7	5.1
9-----	3.5	6.2	9.8	* 16	15	50	79	56	9.1	263	8.1	5.6
10-----	4.0	6.8	10	* 13	* 13	32	286	43	8.7	125	7.8	5.1
11-----	3.7	6.2	8.7	* 11	* 12	25	58	35	8.7	72	6.5	4.5
12-----	3.5	5.9	4.3	* 10	* 11	32	216	38	8.7	47	6.2	4.3
13-----	4.5	5.6	8.1	* 9.2	* 11	37	158	48	7.8	37	5.6	5.3
14-----	5.1	5.1	103	* 8.6	* 10	103	168	227	11	50	21	4.5
15-----	5.3	3.0	186	* 8.2	* 9.7	196	96	618	8.7	32	15	4.5
16-----	5.9	5.1	83	* 8.0	* 9.3	262	96	286	7.4	22	12	4.5
17-----	6.5	4.0	216	* 40	* 9.0	216	75	83	8.1	16	8.7	7.4
18-----	8.1	6.5	480	513	* 8.6	110	58	60	7.4	14	7.4	4.0
19-----	6.8	10	158	2,800	* 8.4	79	45	186	21	11	6.8	4.8
20-----	6.2	43	79	418	* 8.2	480	53	168	12	9.8	6.2	4.5
21-----	5.6	37	47	186	* 8.0	168	1,020	238	16	8.7	5.6	4.0
22-----	5.1	29	41	103	* 8.0	547	480	206	9.4	8.1	7.1	3.5
23-----	9.4	38	28	361	* 8.0	274	168	83	7.4	7.4	58	3.5
24-----	7.4	31	24	110	* 11	238	96	56	7.4	6.8	52	3.5
25-----	6.8	21	21	1,470	* 16	168	67	45	60	24	18	10
26-----	5.3	12	18	361	2,800	1,420	692	36	43	196	12	12
27-----	5.6	12	20	141	850	418	216	30	18	310	8.7	8.1
28-----	5.3	12	20	76	361	158	110	29	20	103	7.4	8.1
29-----	5.9	10	20	* 48	-----	96	196	23	19	68	5.9	7.1
30-----	5.1	13	16	* 35	-----	83	83	20	19	38	5.9	5.3
31-----	4.8	-----	14	* 27	-----	72	-----	18	-----	22	5.6	-----
1929-30												
1-----	4.5	51	* 22	935	* 11	119	119	17	9.0	4.7	1.8	17
2-----	5.1	655	* 20	1,640	* 11	119	262	16	7.1	4.4	1.8	2.9
3-----	5.6	196	* 18	850	31	73	136	13	7.4	3.7	2.2	2.7
4-----	6.2	110	* 17	262	60	71	84	12	5.3	3.6	2.2	1.8
5-----	12	81	* 16	118	65	78	62	12	6.8	3.9	2.1	1.8
6-----	7.4	64	* 16	96	52	90	54	12	24	3.1	6.8	3.3
7-----	5.9	49	48	389	42	84	68	12	7.1	3.1	2.1	2.2
8-----	5.3	40	730	3,110	44	298	164	12	7.4	3.6	3.3	2.1
9-----	4.8	35	196	1,850	35	238	84	11	6.8	3.0	2.4	2.1
10-----	4.5	37	110	1,470	62	136	59	9.8	5.7	2.4	2.6	1.9
11-----	5.1	168	90	361	62	97	49	9.0	5.3	2.2	2.9	2.1
12-----	4.5	125	80	1,360	71	84	41	9.0	5.1	2.1	2.7	2.6
13-----	4.5	133	850	2,800	1,020	64	33	8.6	4.7	42	1.7	2.7
14-----	4.5	618	850	1,470	238	53	32	12	4.4	8.0	1.7	2.7
15-----	4.5	480	286	692	112	42	32	11	4.0	5.5	1.6	3.0
16-----	5.3	168	158	104	90	39	58	11	9.4	5.3	1.4	12
17-----	5.6	141	310	* 76	54	39	97	9.4	7.4	4.0	1.4	3.9
18-----	5.6	480	1,020	* 60	46	73	145	12	15	3.4	1.4	2.3
19-----	4.8	418	389	* 48	51	164	112	11	12	3.0	1.1	1.9
20-----	6.2	250	150	* 40	84	84	64	16	8.0	2.6	.8	1.8
21-----	64	133	118	* 33	128	66	57	13	5.9	2.6	.9	1.7
22-----	770	81	83	* 28	112	50	50	12	4.7	3.0	1.2	1.9
23-----	1,420	61	74	* 25	335	42	42	9.8	4.4	2.9	1.2	2.4
24-----	448	52	68	* 22	335	47	32	47	13	2.3	2.4	3.6
25-----	274	37	60	* 20	448	1,160	28	60	104	2.3	1.2	8.3
26-----	150	37	60	* 18	1,120	730	25	20	65	7.4	1.2	9.0
27-----	90	38	64	* 17	335	216	23	14	36	2.3	1.2	4.0
28-----	62	43	103	* 16	164	174	20	14	17	2.7	1.2	2.9
29-----	47	31	133	* 14	-----	361	20	12	9.8	3.4	1.3	2.4
30-----	37	* 25	125	* 13	-----	262	18	11	5.9	2.1	1.4	2.9
31-----	37	-----	238	* 12	-----	154	-----	9.8	-----	1.7	1.6	-----

* Estimated because of ice.

Discharge, in second-feet, of Sandusky River at Bucyrus, Ohio, 1925-33—Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1930-31												
1-----	2.3	2.9	13	* 3.2	16	17	71	39	77	27	13	23
2-----	2.3	2.7	9.0	* 3.0	12	14	119	33	29	15	4.8	119
3-----	2.4	3.3	5.5	* 2.9	12	14	547	27	16	11	4.0	418
4-----	2.4	3.0	3.6	* 2.8	22	13	418	22	26	8.4	4.0	262
5-----	2.6	3.3	3.0	* 11	11	12	154	16	17	7.2	3.6	298
6-----	2.6	3.6	4.2	41	8.0	11	84	18	14	7.0	3.6	104
7-----	2.7	3.4	3.0	60	24	9.8	60	22	112	6.2	3.6	47
8-----	9.0	3.3	3.6	57	36	13	46	26	227	6.4	3.6	28
9-----	8.0	3.1	3.0	30	44	22	37	29	84	5.9	3.6	19
10-----	6.6	3.7	3.0	17	30	22	34	24	42	5.2	66	15
11-----	3.9	3.6	4.6	7.6	14	17	34	20	26	5.4	119	11
12-----	3.0	6.8	4.6	8.6	14	17	29	20	18	5.0	24	9.8
13-----	3.4	3.6	5.9	7.6	72	24	24	22	15	5.4	60	9.1
14-----	4.6	3.0	6.3	6.6	335	55	21	23	32	5.7	119	8.1
15-----	6.6	3.3	5.7	5.7	60	84	18	18	22	5.7	42	7.5
16-----	6.1	2.7	4.9	* 4.5	55	73	16	16	14	4.8	17	10
17-----	7.4	3.1	* 4.1	* 4.2	39	64	17	145	11	20	11	49
18-----	6.6	3.0	* 3.7	* 4.0	54	51	15	97	9.1	56	8.1	16
19-----	6.3	3.3	* 3.3	30	64	52	14	50	7.8	50	13	11
20-----	7.1	2.7	3.1	47	71	65	11	37	7.0	19	7.8	8.8
21-----	8.3	2.7	2.7	31	62	145	16	34	6.2	12	6.4	7.2
22-----	9.4	3.0	* 2.4	* 11	51	84	216	25	7.8	9.1	5.7	6.7
23-----	7.4	3.0	* 2.2	* 8.5	50	52	480	22	6.4	7.5	5.2	5.9
24-----	9.4	3.1	* 2.1	* 7.6	41	42	128	20	5.9	6.2	5.0	5.7
25-----	7.6	3.3	* 2.0	12	28	78	78	23	5.7	5.4	4.8	10
26-----	5.3	3.6	* 2.3	48	25	154	513	29	8.1	5.0	36	90
27-----	6.1	* 3.2	4.2	42	22	78	389	20	97	4.8	205	45
28-----	3.3	* 2.9	4.2	29	18	389	136	15	42	4.4	54	22
29-----	3.6	* 2.7	4.2	26	-----	335	84	13	119	4.4	24	15
30-----	3.3	* 7.0	* 3.7	22	-----	112	53	18	71	4.4	15	11
31-----	3.3	-----	* 3.4	17	-----	78	-----	73	-----	4.0	12	-----
1931-32												
1-----	9.1	11	44	104	84	18	310	119	7.8	6.2	2.0	4.4
2-----	8.1	12	34	547	64	18	154	62	13	5.9	2.3	2.9
3-----	7.2	12	29	286	68	18	90	40	9.1	5.2	2.3	4.4
4-----	6.4	11	238	136	90	23	56	32	7.8	5.2	2.1	3.2
5-----	16	14	389	112	104	25	45	29	6.7	4.8	2.0	2.3
6-----	730	15	136	692	78	25	37	24	6.4	3.6	1.7	1.9
7-----	205	11	84	238	78	* 12	30	112	5.7	10	2.0	2.0
8-----	97	10	56	112	184	* 11	34	84	5.7	84	2.0	2.1
9-----	58	9.4	47	78	145	* 10	35	68	5.2	31	1.7	2.0
10-----	37	9.8	51	65	136	* 10	42	104	4.8	11	1.5	1.7
11-----	78	9.8	418	52	227	* 9	90	119	4.8	7.8	1.5	1.5
12-----	26	11	810	46	310	* 9	154	90	4.6	8.4	1.5	1.4
13-----	23	13	547	119	119	* 9	136	56	4.8	5.9	1.6	1.5
14-----	39	14	730	90	70	* 9	112	41	4.0	4.0	1.7	1.4
15-----	56	28	238	730	54	* 9	70	31	5.9	4.0	2.1	1.3
16-----	50	29	128	480	49	* 10	50	26	13	3.6	1.5	1.3
17-----	41	22	90	810	55	12	37	37	5.0	3.6	1.9	1.3
18-----	32	67	70	1,120	13	32	30	30	4.4	3.1	7.8	1.3
19-----	23	90	60	262	43	13	26	20	5.7	2.9	8.8	1.5
20-----	18	335	58	136	34	14	23	17	5.2	2.6	4.4	1.6
21-----	16	194	54	119	31	16	20	14	4.4	2.6	2.9	1.7
22-----	14	84	389	892	32	1,120	18	11	4.4	9.4	2.1	1.5
23-----	12	58	618	770	27	361	17	10	4.0	8.4	2.0	1.3
24-----	12	48	216	418	24	164	15	9.8	3.2	3.6	1.7	1.3
25-----	14	54	174	164	22	119	19	9.1	3.6	2.9	1.5	1.3
26-----	16	52	90	112	23	112	582	9.1	3.6	4.6	3.4	2.6
27-----	13	39	66	618	23	97	154	12	7.2	3.6	12	39
28-----	13	41	58	262	23	66	84	10	11	3.2	11	65
29-----	12	44	53	154	22	49	52	8.4	9.4	3.2	68	14
30-----	13	44	46	1,020	-----	42	84	7.2	7.8	2.6	8.4	8.4
31-----	14	-----	42	184	-----	194	-----	7.2	-----	2.6	7.2	-----

* Estimated because of ice.

Discharge, in second-feet, of Sandusky River at Bucyrus, Ohio, 1925-32—Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep
1932-33												
1-----	5.0	810	23	655	76	52	78	16	9.1	1.4	3.1	1.6
2-----	3.6	194	21	184	119	42	90	27	7.4	29	1.4	1.1
3-----	2.9	77	22	104	65	33	90	60	7.1	32	2.8	22
4-----	2.3	46	22	104	46	30	164	54	6.5	18	1.2	1.9
5-----	2.8	35	22	154	20	27	97	34	6.0	8 4	1.4	1.5
6-----	2.3	27	19	97	25	24	136	34	6.0	5 0	1.2	1.4
7-----	2.3	24	22	77	50	30	335	71	5.5	3 6	1.0	1.5
8-----	2.3	15	32	60	361	513	250	164	5.0	3 1	1.7	1.4
9-----	1.7	32	29	51	84	298	136	335	4.6	2.5	1.2	.9
10-----	1.4	174	15	45	52	78	84	238	4.6	2.3	11	1.2
11-----	2.0	104	12	39	37	50	448	418	3.8	2.4	2.8	1.5
12-----	1.4	119	10	30	28	37	892	361	3.4	1.9	2.0	6.0
13-----	1.7	53	9.2	18	24	361	227	513	2.9	1.7	.9	2.3
14-----	1.3	36	8.2	15	20	2,800	112	1,120	3.1	1.7	.9	6.2
15-----	1.3	27	7.6	14	18	730	78	286	3.1	1.4	.9	1.8
16-----	1.3	164	7.4	14	16	274	174	250	3.4	2.3	2.8	1.5
17-----	7.8	389	7.2	16	15	164	618	128	3.6	1.4	1.1	1.4
18-----	30	227	7.0	21	14	274	258	84	3.2	2.1	1.0	1.3
19-----	25	335	7.0	73	16	1,020	238	65	3.4	1.7	1.2	2.2
20-----	9.1	262	7.5	112	97	692	136	43	2.6	1.8	1.2	2.1
21-----	6.2	154	8.6	60	90	935	90	32	2.8	2.1	1.1	14
22-----	4.4	128	10	361	45	480	63	26	2.6	1.7	1.2	3.6
23-----	30	78	16	448	46	145	45	26	2.5	1.5	1.5	4.6
24-----	14	310	770	136	50	104	37	24	2.3	1.7	1.4	3.8
25-----	13	145	582	90	194	97	33	22	2.8	1.7	1.2	3.1
26-----	29	90	174	104	238	164	27	21	2.4	1.7	1.4	3.6
27-----	145	52	90	112	90	286	23	25	2.5	1.9	1.3	18
28-----	104	28	128	119	60	136	22	23	2.3	1.5	1.4	11
29-----	46	30	46	73	-----	84	18	18	2.4	1.4	1.4	11
30-----	17	26	136	48	-----	64	17	16	4.0	1.4	1.4	6.0
31-----	28	-----	3,110	46	-----	62	-----	15	-----	1.4	1.4	-----

• Estimated because of ice.

Discharge, in second-feet, of Sandusky River at Bucyrus, Ohio, 1925-33—Continued

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
1925					
August.....	7.5	2.7	4.39	0.049	0.06
September.....	238	1.9	34.3	.382	.43
1925-26					
October.....	335	8.7	63.1	.703	.81
November.....	850	27	164	1.83	2.04
December.....	177	11	39.7	.442	.51
January.....	310	10	42.7	.476	.55
February.....	1,220	40	229	2.55	2.66
March.....	1,070	20	109	1.21	1.39
April.....	1,220	19	193	2.15	2.40
May.....	141	9.4	24.5	.273	.31
June.....	90	5.6	19.2	.214	.24
July.....	43	1.6	8.19	.091	.10
August.....	62	2.2	8.04	.090	.10
September.....	582	2.2	116	1.29	1.44
The year.....	1,220	1.6	83.1	.925	12.55
1926-27					
October.....	1,420	22	278	3.10	3.57
November.....	418	32	91.5	1.02	1.14
December.....	286	16	51.6	.575	.66
January.....	1,780	10	204	2.27	2.62
February.....	655	38	179	1.99	2.07
March.....	2,530	36	278	3.10	3.57
April.....	361	19	87.7	.977	1.09
May.....	1,360	16	151	1.68	1.94
June.....	76	6.2	20.2	.225	.25
July.....	125	5.1	19.0	.212	.24
August.....	6.8	3.0	3.96	.044	.05
September.....	61	1.2	10.7	.119	.13
The year.....	2,530	1.2	115	1.28	17.33
1927-28					
October.....	34	3.0	7.54	.084	.10
November.....	1,220	1.9	130	1.45	1.62
December.....	4,600	15	405	4.51	5.20
January.....	361	17	109	1.21	1.39
February.....	1,020	11	210	2.34	2.52
March.....	730	25	117	1.30	1.50
April.....	850	22	101	1.12	1.25
May.....	31	7.4	14.4	.160	.18
June.....	1,020	7.4	96.2	1.07	1.19
July.....	1,780	7.8	162	1.80	2.08
August.....	37	1.5	8.20	.091	.10
September.....	5.1	2.6	3.49	.039	.04
The year.....	4,600	1.5	114	1.27	17.17
1928-29					
October.....	9.4	2.8	5.08	.067	.07
November.....	43	3.0	13.5	.150	.17
December.....	480	4.3	57.3	.638	.74
January.....	2,800	8.0	223	2.48	2.86
February.....	2,800	8.0	154	1.71	1.78
March.....	1,420	25	213	2.37	2.73
April.....	1,020	45	218	2.43	2.71
May.....	770	18	154	1.71	1.97
June.....	60	7.4	14.2	.158	.18
July.....	1,360	6.8	178	1.98	2.28
August.....	58	5.6	13.1	.146	.17
September.....	12	3.5	5.54	.062	.07
The year.....	2,800	2.8	104	1.16	15.73

Discharge, in second-feet, of Sandusky River at Bucyrus, Ohio, 1925-33—Continued

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
1929-30					
October.....	1,420	4.5	113	1.25	1.44
November.....	655	25	161	1.79	2.00
December.....	1,020	16	210	2.34	2.70
January.....	3,110	12	579	6.45	7.44
February.....	1,120	11	186	2.07	2.16
March.....	1,160	39	171	1.99	2.19
April.....	262	18	69.0	.768	.86
May.....	60	8.6	14.8	.165	.19
June.....	104	4.0	14.3	.159	.18
July.....	42	1.7	4.72	.053	.06
August.....	6.8	0.8	1.90	.021	.02
September.....	17	1.7	3.73	.042	.05
The year.....	3,110	0.8	128	1.44	19.29
1930-31					
October.....	9.4	2.3	5.25	.058	.07
November.....	7.0	2.7	3.40	.038	.04
December.....	13	2.0	4.21	.047	.05
January.....	60	2.8	19.6	.218	.25
February.....	335	8.0	46.1	.513	.53
March.....	389	9.8	70.9	.790	.91
April.....	547	11	129	1.44	1.61
May.....	145	13	32.1	.357	.41
June.....	227	5.7	39.2	.437	.49
July.....	56	4.0	11.1	.124	.14
August.....	205	3.6	29.2	.325	.37
September.....	418	5.7	56.4	.628	.70
The year.....	547	2.0	36.9	.411	5.57
1931-32					
October.....	730	6.4	55.1	.614	.71
November.....	335	9.4	46.4	.517	.58
December.....	810	29	196	2.18	2.51
January.....	1,120	46	353	2.93	4.53
February.....	310	22	78.5	.874	.94
March.....	1,120	9.0	84.4	.940	1.08
April.....	582	15	87.9	.979	1.09
May.....	119	7.2	40.3	.449	.52
June.....	13	3.2	6.27	.070	.08
July.....	84	2.6	8.37	.093	.11
August.....	68	.9	5.54	.062	.07
September.....	65	1.3	5.90	.066	.07
The year.....	1,120	.9	81.1	.903	12.29
1932-33					
October.....	145	1.3	17.5	.195	.22
November.....	810	15	140	1.56	1.74
December.....	3,110	7.0	174	1.94	2.24
January.....	665	14	112	1.25	1.44
February.....	361	14	71.3	.794	.83
March.....	2,800	24	325	3.62	4.17
April.....	892	17	167	1.86	2.08
May.....	1,120	15	147	1.64	1.89
June.....	9.1	2.3	4.03	.045	.05
July.....	32	1.4	4.57	.051	.06
August.....	11	.9	1.79	.020	.02
September.....	22	.9	4.65	.052	.06
The year.....	3,110	.9	97.7	1.09	14.80

NOTE.—Records of daily and monthly discharge for the years ending Sept. 30, 1925, to Sept. 30, 1932, supersede those published in previous water-supply papers.

SANDUSKY RIVER NEAR UPPER SANDUSKY, OHIO

LOCATION.—Water-stage recorder in sec. 21, T. 2 S., R. 14 E., at highway bridge 2 miles northeast of Upper Sandusky and three-quarters of a mile above mouth of Rock Run.

DRAINAGE AREA.—299 square miles.

RECORDS AVAILABLE.—October 1921 to September 1933.

DISCHARGE.—Maximum during year, 6,200 second-feet Mar. 15 (gage height, 9.98 feet); minimum, 1.2 second-feet Aug. 30 (gage height, 0.72 foot).

1921-33: Maximum, 6,750 second-feet Dec. 15, 1927 (gage height, 10.5 feet); minimum, that of Aug. 30, 1933. Average, 12 years (1921-33), 286 second-feet.

REMARKS.—Records excellent except those for periods of ice effect, Dec. 10-23, Jan. 14-17, Feb. 5-7, 10-23, Mar. 11-12, which are fair.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	24	579	94	5,100	169	181	239	76	45	8.0	3.9	2.1
2	17	952	85	1,560	327	150	310	138	41	11	4.2	2.3
3	11	374	79	591	302	128	310	153	35	103	5.4	23
4	9.9	187	77	414	190	111	283	181	34	73	5.4	59
5	9.9	122	76	436	85	96	327	153	31	55	3.9	30
6	9.9	96	73	422	62	88	253	140	27	32	3.9	17
7	9.2	77	73	327	120	90	664	181	27	22	3.9	9.2
8	9.9	68	87	260	310	490	750	498	24	17	4.2	6.8
9	9.2	62	92	222	554	1,040	535	1,090	21	14	4.2	4.6
10	6.8	84	73	184	230	475	344	925	20	13	109	3.9
11	5.4	246	55	167	160	240	418	1,210	18	9.2	178	3.0
12	4.6	232	49	140	130	190	1,980	1,740	17	8.0	52	14
13	5.0	218	49	88	110	633	1,210	1,220	14	6.8	30	17
14	6.8	130	49	73	100	4,650	512	2,460	9.9	5.9	20	21
15	5.9	94	48	65	92	5,260	327	1,740	9.9	5.4	13	22
16	4.6	120	47	63	90	1,610	504	875	9.9	5.4	8.6	22
17	4.2	580	45	69	83	775	2,240	700	11	11	6.8	17
18	5.4	650	43	81	74	2,060	1,620	427	11	9.2	4.6	11
19	20	489	39	118	76	1,990	1,400	287	11	6.3	3.9	7.4
20	33	650	38	283	130	2,610	800	205	11	5.4	3.3	9.2
21	20	507	41	257	260	2,770	521	161	11	5.0	3.0	14
22	13	400	48	272	230	1,570	361	122	9.9	3.9	2.8	22
23	11	318	73	1,120	150	675	253	98	9.2	3.6	2.3	26
24	11	546	650	700	142	471	190	88	8.6	3.3	1.9	29
25	20	800	1,880	356	215	383	161	79	8.6	3.9	1.9	29
26	25	471	948	275	754	427	142	74	20	6.3	1.7	29
27	146	271	431	294	444	775	120	83	19	6.8	1.6	83
28	239	167	264	378	239	596	102	85	14	5.9	1.5	116
29	145	125	187	314	-----	374	90	74	11	5.0	1.3	74
30	74	111	306	205	-----	267	83	63	8.6	5.0	1.6	50
31	49	-----	3,170	169	-----	232	-----	52	-----	4.2	1.9	-----

Month	Maximum	Minimum	Mean	Per square mi e	Run-off in inches
October	239	4.2	31.1	0.100	0.12
November	952	62	324	1.08	1.20
December	3,170	38	299	1.00	1.15
January	5,100	63	484	1.62	1.87
February	754	62	208	.696	.72
March	5,260	88	1,010	2.39	3.91
April	2,240	83	569	1.90	2.12
May	2,460	52	496	1.66	1.91
June	45	8.6	18.3	.061	.07
July	103	3.3	15.3	.051	.06
August	178	1.3	15.8	.053	.06
September	116	2.1	25.8	.086	.10
The year	5,260	1.3	293	.980	13.29

SANDUSKY RIVER NEAR MEXICO, OHIO

LOCATION.—Water-stage recorder in sec. 13, T. 1 N., R. 14 E., at highway bridge $4\frac{1}{4}$ miles north of Mexico, Wyandot County, and 3 miles above mouth of Honey Creek.

DRAINAGE AREA.—776 square miles.

RECORDS AVAILABLE.—March 1923 to September 1933.

DISCHARGE.—Maximum during year, 10,900 second-feet Mar. 16 (gage height, 17.05 feet); minimum, 7.9 second-feet Aug. 31 (gage height, 1.52 feet).

1923-33: Maximum, 13,900 second-feet Mar. 22, 1927 (gage height, 19.9 feet); minimum, 4 second-feet Aug. 25, 1928. Average, 10 years (1923-33), 655 second-feet.

REMARKS.—Records excellent except those for periods of ice effect, Dec. 11-20, Jan. 15-19, Feb. 6-9, 11-23, which are fair.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	60	481	200	5,770	454	438	756	192	124	37	24	11
2.....	43	1,340	170	7,670	737	344	875	420	113	42	21	36
3.....	35	912	152	5,190	680	284	773	643	102	80	31	36
4.....	31	429	142	1,520	486	242	643	554	94	190	43	35
5.....	29	242	134	1,020	281	207	554	454	88	207	38	23
6.....	28	172	152	975	170	184	623	438	83	168	30	12
7.....	27	134	333	815	180	178	1,130	486	76	115	27	18
8.....	25	114	537	661	520	489	1,530	820	72	80	24	20
9.....	24	103	298	520	1,530	1,930	1,200	2,490	66	62	20	18
10.....	23	100	193	438	1,340	1,540	815	4,040	60	52	22	16
11.....	23	175	138	358	950	658	764	3,420	56	45	76	16
12.....	22	281	125	312	680	385	2,270	4,040	55	41	383	38
13.....	22	281	119	250	520	1,220	2,880	3,720	50	35	274	45
14.....	22	218	114	193	400	7,400	1,580	4,520	46	32	137	50
15.....	22	154	108	160	330	9,340	815	4,360	42	28	78	56
16.....	22	152	107	140	260	10,000	665	3,620	41	27	55	56
17.....	24	387	105	130	210	5,160	3,460	2,180	41	27	41	66
18.....	26	935	105	125	180	2,100	3,960	1,290	42	26	35	64
19.....	26	835	103	160	160	2,910	4,120	855	40	26	25	55
20.....	26	775	103	438	260	5,000	3,300	607	37	27	8.9	55
21.....	39	895	100	520	420	6,130	2,240	454	36	27	9.4	57
22.....	54	718	100	641	450	5,500	1,130	350	32	23	9.4	49
23.....	54	643	121	1,760	380	3,370	756	279	31	22	8.4	42
24.....	47	737	1,510	1,830	279	1,480	554	240	30	21	8.4	46
25.....	45	1,380	3,160	1,030	545	975	422	211	34	20	25	55
26.....	56	1,240	2,880	643	1,160	935	364	192	38	19	39	53
27.....	124	775	1,580	607	1,110	1,630	308	180	38	20	11	326
28.....	279	470	795	1,160	625	1,780	260	178	45	20	8.9	680
29.....	312	303	503	795	-----	1,270	229	176	42	20	12	589
30.....	209	235	578	554	-----	775	200	264	38	21	30	355
31.....	152	-----	3,360	400	-----	607	-----	143	-----	23	8.9	-----

Month	Maximum	Minimum	Mean	Per square mi e	Run-off in inches
October.....	312	22	62.3	C. 080	0.09
November.....	1,380	100	521	.671	.75
December.....	3,360	100	585	.754	.87
January.....	7,670	125	1,190	1.53	1.76
February.....	1,530	160	546	.704	.73
March.....	10,000	178	2,400	3.09	3.56
April.....	4,120	200	1,310	1.69	1.89
May.....	4,520	143	1,350	1.74	2.01
June.....	124	30	56.4	.073	.08
July.....	207	19	51.1	.066	.08
August.....	383	8.4	50.4	.065	.07
September.....	680	11	99.3	.128	.14
The year.....	10,000	8.4	687	.885	12.01

SANDUSKY RIVER NEAR FREMONT, OHIO

LOCATION.—Water-stage recorder in sec. 17, T. 4 N., R. 15 E., at highway bridge $3\frac{1}{2}$ miles southwest of Fremont, Sandusky County, and $2\frac{1}{2}$ miles below mouth of Wolf Creek.

DRAINAGE AREA.—1,250 square miles.

RECORDS AVAILABLE.—November 1923 to September 1933; November 1898 to March 1901 at station 4 miles below present site.

DISCHARGE.—Maximum during year ending Sept. 30, 1931, 6,230 second-feet Apr. 4 (gage height, 4.02 feet); minimum, 17 second-feet on numerous days.

Maximum during year ending Sept. 30, 1932, 10,800 second-feet Jan. 18 (gage height, 5.56 feet); minimum, 13 second-feet Sept. 27 (gage height, 0.91 foot).

Maximum during year ending Sept. 30, 1933, 21,000 second-feet Mar. 14 (gage height, 9.73 feet); minimum, 13 second-feet July 31 to Aug. 1 (gage height, 0.91 foot).

1923-33: Maximum, that of Mar. 14, 1933; minimum, 13 second-feet Sept. 27, 1932, and July 31 to Aug. 1, 1933 (gage height, 0.91 foot). Average, 10 years (1923-33), 1,000 second-feet.

REMARKS.—Records good except those estimated because of ice effect.

Discharge, in second-feet, 1930-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1930-31												
1	59	39	* 59	* 39	* 200	168	1,060	669	141	516	37	178
2	34	37	* 120	* 39	173	152	917	508	131	426	34	201
3	44	32	* 150	* 37	* 140	136	3,660	426	141	253	30	664
4	50	37	* 100	* 37	131	122	6,040	352	162	162	32	1,790
5	30	39	* 70	* 42	112	94	5,340	310	173	117	37	1,670
6	26	34	* 63	* 99	112	122	3,510	266	241	66	32	1,930
7	21	32	108	* 150	86	117	1,600	253	285	63	28	1,160
8	22	37	74	* 170	117	117	917	260	1,080	59	26	612
9	24	34	86	* 170	141	112	669	266	1,570	53	28	385
10	22	26	70	* 160	224	147	599	278	1,000	47	37	272
11	22	28	59	* 140	266	224	743	285	599	44	47	201
12	26	32	66	* 130	224	247	608	285	426	42	165	157
13	42	30	37	* 120	* 180	230	474	291	310	37	310	108
14	66	28	42	* 110	* 170	235	388	317	260	34	319	115
15	44	34	* 53	* 94	* 370	380	324	291	235	37	862	108
16	34	30	* 53	* 82	755	608	272	291	184	37	838	112
17	37	30	* 53	* 70	500	590	235	304	168	32	499	86
18	34	32	* 53	* 82	358	482	218	714	152	47	285	103
19	34	34	* 53	* 310	345	418	201	838	126	100	184	103
20	28	34	* 53	* 730	388	395	184	618	99	373	141	131
21	26	37	* 53	* 450	418	482	173	457	90	373	131	112
22	28	34	44	* 310	418	628	360	366	74	324	134	112
23	21	34	* 42	* 280	358	648	1,930	310	50	201	241	86
24	21	30	* 42	* 260	345	516	2,600	266	74	147	201	47
25	24	34	* 42	* 250	297	426	1,570	247	78	117	131	47
26	28	34	* 42	* 270	247	426	1,680	230	53	63	99	81
27	26	* 34	* 44	* 280	235	516	3,940	212	47	47	103	850
28	28	* 34	* 44	266	195	900	3,940	195	103	53	492	1,140
29	26	* 34	* 44	* 280	-----	3,970	2,070	184	248	42	622	676
30	30	* 39	* 42	* 280	-----	3,640	1,020	157	570	42	386	374
31	37	-----	* 42	253	-----	2,040	-----	126	-----	42	245	-----

* Estimated because of ice.

Discharge, in second-feet, of Sandusky River near Fremont, Ohio, 1930-33—Contd.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1931-32												
1.	235	90	442	632	2,760	304	4,980	637	112	190	28	28
2.	173	90	457	3,860	1,380	297	4,010	637	88	130	34	26
3.	126	86	380	6,230	1,030	272	2,490	628	108	99	34	32
4.	103	78	352	5,160	850	272	1,320	516	122	86	26	44
5.	90	74	1,180	3,280	767	285	903	418	248	66	28	47
6.	106	70	2,570	3,840	838	291	701	373	291	63	24	34
7.	1,840	70	1,720	4,980	826	• 270	599	366	220	70	24	32
8.	2,680	63	931	3,740	943	• 250	525	403	157	124	22	34
9.	1,520	56	658	2,140	1,660	• 240	516	580	122	363	22	34
10.	783	63	491	1,170	1,740	• 240	570	669	112	388	32	32
11.	500	66	534	838	2,600	• 240	1,180	722	75	345	28	28
12.	366	90	3,130	711	6,230	• 230	1,550	1,100	47	221	24	22
13.	285	90	4,220	716	5,160	• 220	1,570	1,400	63	152	24	26
14.	241	86	4,420	1,420	2,900	• 220	1,360	890	59	108	24	30
15.	235	108	4,810	2,220	1,360	• 210	1,050	628	56	86	21	26
16.	266	189	3,640	6,600	903	• 200	814	474	56	63	17	24
17.	331	260	1,900	8,760	779	178	637	403	59	53	22	21
18.	359	317	1,070	10,300	743	178	534	352	64	47	20	19
19.	297	324	779	8,200	690	184	466	297	80	42	112	16
20.	235	608	637	6,040	628	178	411	253	122	34	168	19
21.	184	1,270	561	3,340	534	195	380	235	74	30	131	28
22.	152	1,850	732	4,140	482	2,230	366	206	50	32	99	28
23.	131	1,060	4,550	6,780	449	6,600	338	178	53	56	71	24
24.	94	658	5,160	7,130	411	6,600	324	168	50	141	34	22
25.	117	491	3,870	5,510	373	4,740	317	147	47	103	28	17
26.	122	442	1,980	3,120	359	3,120	380	131	44	78	37	16
27.	90	466	1,100	3,360	338	2,450	2,800	126	47	63	44	16
28.	103	395	779	4,810	331	1,620	2,240	117	59	56	42	26
29.	74	331	637	3,910	317	1,130	1,070	108	113	39	32	26
30.	90	366	561	3,700	-----	862	732	73	201	37	34	19
31.	90	-----	508	3,910	-----	2,360	-----	95	-----	37	32	-----
1932-33												
1.	28	414	324	10,600	637	767	1,280	380	230	44	17	30
2.	70	1,040	285	9,280	1,060	628	1,620	1,390	201	50	17	28
3.	90	1,340	260	8,200	1,110	525	1,300	2,380	189	78	22	30
4.	63	786	247	3,120	850	449	1,080	1,290	178	112	42	34
5.	39	452	235	1,490	• 520	380	890	945	157	266	70	28
6.	37	310	235	1,270	• 320	345	990	1,600	157	247	63	39
7.	28	241	668	1,160	• 270	324	1,820	1,340	152	184	56	37
8.	26	201	1,530	917	• 280	366	2,070	1,780	112	122	53	28
9.	28	184	882	767	• 2,800	1,690	1,820	4,810	108	74	47	26
10.	28	173	482	648	• 13,000	• 1,900	1,290	8,200	103	59	44	26
11.	30	173	373	561	• 12,000	• 860	1,100	7,130	90	53	37	26
12.	34	289	• 280	• 460	• 9,800	• 600	3,300	7,610	82	42	132	28
13.	34	359	• 230	• 360	• 7,600	1,380	4,110	6,970	78	39	418	83
14.	32	359	• 210	• 320	• 5,300	18,100	2,830	10,300	70	37	272	78
15.	28	291	• 200	304	• 3,600	14,700	1,340	7,290	70	28	152	53
16.	19	260	• 190	• 290	• 2,000	12,500	1,050	7,290	66	37	103	74
17.	21	253	• 180	• 280	• 1,000	9,100	5,390	4,810	66	24	82	66
18.	28	740	• 170	297	• 570	4,190	6,420	2,570	63	24	66	90
19.	32	1,100	• 160	331	• 350	6,780	6,780	1,440	56	24	56	70
20.	32	917	• 160	536	• 430	8,760	5,340	1,000	56	24	53	59
21.	30	945	• 150	690	• 710	10,100	3,640	743	50	22	47	83
22.	30	931	• 140	711	• 580	8,480	1,770	599	47	24	50	86
23.	44	850	• 250	2,490	• 470	6,040	1,080	491	42	22	53	84
24.	53	814	• 2,500	2,640	• 440	2,800	826	434	39	22	42	47
25.	44	1,580	6,780	1,600	626	1,620	658	380	39	26	37	42
26.	44	1,720	5,340	988	1,790	1,380	590	338	32	24	34	56
27.	66	1,270	3,220	791	1,740	2,410	516	324	37	17	34	212
28.	158	780	1,440	1,340	1,160	2,570	457	297	37	19	30	862
29.	348	542	876	1,230	-----	1,850	380	278	63	19	30	779
30.	359	403	690	862	-----	1,180	345	278	56	21	30	599
31.	278	-----	9,580	658	-----	959	-----	247	-----	17	34	-----

• Estimated because of ice.

Discharge, in second-feet, of Sandusky River near Fremont, Ohio. 1930-33—Contd.

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
1930-31					
October.....	66	21	32.1	0.026	0.03
November.....	39	26	33.4	.027	.03
December.....	150	37	61.4	.049	.06
January.....	730	37	193	.154	.18
February.....	755	86	270	.216	.22
March.....	3,970	94	622	.498	.57
April.....	6,040	173	1,570	1.26	1.41
May.....	838	126	341	.273	.31
June.....	1,570	47	296	.237	.26
July.....	516	32	129	.103	.12
August.....	862	26	218	.174	.20
September.....	1,930	47	454	.363	.40
The year.....	6,040	21	350	.280	3.79
1931-32					
October.....	2,680	74	388	.310	.36
November.....	1,850	56	340	.272	.30
December.....	5,160	352	1,770	1.42	1.64
January.....	10,300	632	4,210	3.37	3.89
February.....	6,230	317	1,320	1.06	1.14
March.....	6,600	178	1,180	.944	1.09
April.....	4,980	317	1,170	.936	1.04
May.....	1,400	73	430	.344	.40
June.....	291	44	100	.080	.09
July.....	388	30	110	.088	.10
August.....	168	17	42.5	.034	.04
September.....	47	16	26.5	.021	.02
The year.....	10,300	16	930	.744	10.11
1932-33					
October.....	359	19	70.4	.056	.06
November.....	1,720	173	657	.526	.59
December.....	9,580	140	1,230	.984	1.13
January.....	10,600	280	1,780	1.42	1.64
February.....	13,000	270	2,540	2.03	2.11
March.....	18,100	324	3,990	3.19	3.68
April.....	6,780	345	2,070	1.66	1.85
May.....	10,300	247	2,740	2.19	2.52
June.....	239	32	90.9	.073	.08
July.....	266	17	58.1	.046	.05
August.....	418	17	71.7	.057	.07
September.....	862	26	126	.101	.11
The year.....	18,100	17	1,280	1.02	13.89

NOTE.—Records of daily and monthly discharge for years ending Sept. 30, 1931 and 1932, supersede those published in Water-Supply Papers 714 and 729.

EAST BRANCH OF HURON RIVER NEAR NORWALK, OHIO

LOCATION.—Chain gage at highway bridge $1\frac{1}{4}$ miles northwest of Norwalk, Huron County, and $1\frac{1}{2}$ miles below mouth of Cole Creek.

DRAINAGE AREA.—84.9 square miles.

RECORDS AVAILABLE.—November 1923 to September 1933.

DISCHARGE.—Maximum during year, 4,610 second-feet Mar. 14 (gage height, 9.35 feet); minimum, 1.0 second-foot Oct. 2-4.

1923-33: Maximum, that of Mar. 14, 1933; minimum, 0.2 second-foot Aug. 9, 1931 (gage height, 0.58 foot). Average, 10 years (1923-33), 72.7 second-feet.

REMARKS.—Records good for months of January, March to August, and fair for remainder of year. Discharge estimated during periods of ice effect, Dec. 10-23, Feb. 5-7, 9-21.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	1.2	26	10	246	87	41	132	27	17	7.6	2.9	2.0
2.....	1.0	11	8.8	121	246	36	134	280	17	14	2.0	2.2
3.....	1.0	6.7	7.1	71	74	39	92	214	15	21	6.6	5.3
4.....	1.1	5.4	7.5	59	48	23	80	87	22	14	14	4.6
5.....	2.6	5.1	6.7	79	35	26	68	71	19	9.8	7.6	3.7
6.....	1.7	4.5	9.8	59	30	24	170	450	17	8.1	4.6	3.7
7.....	1.8	4.5	34	49	26	24	214	163	17	6.1	3.7	3.7
8.....	1.7	4.2	58	38	148	87	144	351	16	5.0	3.5	3.2
9.....	1.5	5.7	28	35	80	200	91	289	13	5.7	3.5	2.8
10.....	1.5	7.1	19	29	45	80	68	645	11	4.6	3.7	2.6
11.....	1.8	9.3	14	28	30	44	780	450	9.2	4.0	4.3	3.2
12.....	2.3	9.3	11	26	23	35	491	263	8.6	3.7	4.0	3.7
13.....	2.4	7.9	9.2	25	20	146	158	578	8.6	3.7	3.0	3.5
14.....	3.0	6.3	8.0	24	18	2,510	92	470	8.6	3.7	2.8	5.0
15.....	2.6	5.4	7.0	20	17	512	70	172	8.6	4.3	2.4	4.0
16.....	2.6	19	6.3	19	16	214	246	315	9.2	5.0	2.4	3.7
17.....	3.1	60	5.8	19	15	146	298	153	9.8	5.0	2.0	3.7
18.....	5.7	45	5.4	19	15	200	148	92	8.6	8.6	2.0	3.0
19.....	3.8	32	5.2	29	15	980	555	68	8.1	7.0	2.4	3.7
20.....	2.6	27	5.0	53	35	830	230	53	7.0	5.3	2.4	5.3
21.....	2.3	29	5.0	34	40	600	115	42	6.1	4.0	2.4	3.7
22.....	2.3	28	5.0	134	35	200	76	34	5.7	3.9	2.4	3.2
23.....	6.3	19	7.9	200	33	121	54	30	5.7	2.2	2.0	4.0
24.....	3.5	26	645	71	33	94	47	27	5.0	9.2	2.0	3.7
25.....	3.3	38	242	49	230	82	42	25	5.0	7.0	2.0	3.2
26.....	5.1	22	83	50	280	128	39	24	8.1	5.3	1.9	4.0
27.....	10	20	43	62	74	200	33	23	21	4.0	1.8	24
28.....	6.3	18	25	117	50	111	29	20	9.8	3.7	1.8	7.6
29.....	4.5	18	24	62	-----	76	28	21	7.0	3.5	1.8	4.6
30.....	3.8	13	27	59	-----	58	25	19	8.6	2.8	1.8	4.0
31.....	4.2	-----	1,400	36	-----	71	-----	18	-----	2.2	2.0	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	10	1.0	3.12	0.037	0.04
November.....	60	4.2	17.7	.208	.23
December.....	1,400	5.0	89.4	1.05	1.21
January.....	246	19	62.0	.730	.84
February.....	280	15	64.2	.756	.79
March.....	2,510	24	256	3.02	3.48
April.....	780	25	157	1.85	2.06
May.....	645	18	180	2.12	2.44
June.....	22	5	11.1	.131	.15
July.....	21	2.2	6.16	.073	.08
August.....	14	1.8	3.25	.038	.04
September.....	24	2.0	4.49	.053	.06
The year.....	2,510	1.0	71.5	.842	11.42

EAST BRANCH OF BLACK RIVER AT ELYRIA, OHIO

LOCATION.—Chain gage at Fuller Street Bridge, $1\frac{1}{4}$ miles southeast of center of Elyria, Lorain County, and 3 miles above junction with West Branch.

DRAINAGE AREA.—211 square miles.

RECORDS AVAILABLE.—July 1922 to September 1933.

DISCHARGE.—Maximum during year, 9,030 second-feet Mar. 14 (gage height, 10.10 feet); no flow Aug. 28–31, Sept. 1–3, 5–19.

1922–33: Maximum, that of Mar. 14, 1933; no flow Aug. 9–16, 18–22, 1930, Aug. 28–31, Sept. 1–3, 5–19, 1933. Average, 11 years (1922–32), 192 second-feet.

REMARKS.—Records good below and fair above 3,000 second-feet except those for periods of ice effect, Dec. 12–23, Feb. 12–19, and other estimated periods, June 7–12, July 17–23, which are fair.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	15	14	3,340	55	92	227	38	18	19	0.2	0
2	.2	12	12	545	177	70	236	52	16	30	.2	0
3	.1	12	11	231	145	55	222	286	14	53	.2	0
4	.1	22	12	155	88	49	480	346	14	13	1.3	.1
5	.1	20	12	181	63	45	390	227	16	9.0	.6	0
6	.1	16	14	122	50	42	374	545	15	7.6	1.3	0
7	.1	12	23	132	52	39	685	755	13	6.4	1.9	0
8	.1	9.0	34	97	205	450	390	346	12	5.2	2.7	0
9	.1	10	30	81	900	1,190	222	685	11	3.1	1.6	0
10	.1	13	30	64	510	258	145	1,100	10	2.3	1.0	0
11	.1	16	21	55	218	138	860	685	9.0	2.3	1.0	0
12	.1	12	18	53	80	95	2,220	900	8.3	2.3	.6	0
13	.4	9.7	15	44	40	249	825	685	8.3	1.9	.3	0
14	.6	16	13	36	30	6,080	263	1,730	7.6	1.9	.2	0
15	.6	20	11	30	26	5,000	151	755	7.0	1.6	.1	0
16	1.0	24	10	27	24	1,100	142	379	7.6	1.6	.2	0
17	1.6	66	9.4	24	23	420	291	357	7.6	.9	.1	0
18	2.3	97	8.0	27	23	272	258	196	6.4	.5	.2	0
19	2.3	125	8.6	33	22	1,370	545	119	6.4	.4	.1	.1
20	2.3	222	8.3	61	64	2,720	860	81	6.4	.4	.1	.2
21	1.6	166	8.2	125	72	2,920	357	63	5.2	.3	.1	.2
22	1.3	103	8.0	188	63	1,370	166	50	5.2	.3	.2	.1
23	1.6	72	10	650	55	450	95	41	4.1	.3	.2	.3
24	1.6	52	545	384	53	209	66	39	4.1	2.3	.1	.2
25	1.3	41	1,020	158	114	162	55	36	5.2	3.1	.1	.1
26	3.1	44	510	114	615	196	50	32	8.3	1.9	.1	1.0
27	2.7	45	192	125	272	755	45	30	7.6	.2	.1	2.7
28	4.6	30	86	185	142	545	41	27	6.4	.1	0	1.0
29	6.4	22	63	145	-----	263	38	23	9.0	.2	0	.6
30	14	17	55	86	-----	135	36	22	26	.3	0	.6
31	13	-----	3,780	57	-----	132	-----	20	-----	.2	0	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	14	0.1	2.05	0.097	0.11
November	222	9.0	44.7	.212	.24
December	3,780	8.0	213	1.01	1.16
January	3,340	24	244	1.16	1.34
February	900	22	149	.706	.74
March	6,080	39	867	4.11	4.74
April	2,220	36	358	1.70	1.90
May	1,730	20	344	1.63	1.88
June	26	4.1	9.82	.047	.05
July	53	.1	5.54	.026	.03
August	2.7	0	.48	.0023	.003
September	2.7	0	.24	.0011	.001
The year	6,080	(188	.891	12.19

ROCKY RIVER NEAR BEREÄ, OHIO

LOCATION.—Staff gage at highway bridge just below junction of East and West Branches and 3 miles northwest of Berea, Cuyahoga County. Zero of gage is 650.52 feet above mean sea level.

DRAINAGE AREA.—269 square miles.

RECORDS AVAILABLE.—November 1923 to September 1933.

DISCHARGE.—Maximum during year, about 10,600 second-feet Mar. 14 (gage height, 8.60 feet); minimum, 0.2 second-foot Aug. 18, 19, 22, 27, 28, 30, 31, 1923-33; Maximum, about 13,700 second-feet Dec. 14, 1927 (gage height, 10.6 feet); maximum stage, 18.6 feet June 29, 1924 (backwater caused by tornado); minimum, 0.2 second-foot Sept. 2, 1932, Aug. 18, 19, 22, 27, 28, 30, 31, 1933. Average, 10 years (1923-33), 284 second-feet.

Maximum known stage, 20.9 feet March 1913.

REMARKS.—Records good except those for periods of ice effect, Nov. 29 to Dec. 2, Dec. 11-22, Jan. 15-17, Feb. 5-7, 12-19, and estimated periods, May 3-16, July 12-26, which are fair.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.1	32	20	1,440	106	102	416	47	20	12.0	1.1	0.3
2	.8	28	19	670	352	84	517	62	17	18	1.1	.3
3	.8	25	19	233	278	76	572	350	16	20	5.2	.4
4	1.1	22	19	204	117	73	2,440	250	15	20	3.1	.4
5	2.1	17	16	179	100	69	1,160	200	17	15	.7	.4
6	3.8	14	22	228	95	59	828	700	15	8.6	.8	.4
7	2.1	26	34	142	90	59	727	800	15	7.4	.9	.3
8	2.1	14	67	117	1,440	1,700	416	350	14	6.4	4.0	.3
9	2.1	19	58	94	389	2,250	227	800	12	5.8	2.8	.4
10	2.1	25	84	84	179	1,500	176	1,200	10	5.8	1.2	.4
11	4.6	47	60	79	117	136	1,110	600	8.6	4.2	.9	.5
12	5.8	40	50	76	85	121	2,150	500	7.1	3.5	.5	1.2
13	5.8	33	43	64	74	284	440	900	5.8	3.0	.5	.4
14	5.0	24	39	46	65	9,070	227	950	5.2	2.7	.4	1.7
15	3.5	22	35	43	58	1,340	188	1,500	5.2	2.7	.3	.8
16	2.1	32	32	41	56	517	258	1,700	7.1	2.7	.3	.5
17	2.8	74	30	40	54	294	394	258	6.4	2.4	.3	.5
18	6.3	87	28	49	52	351	227	214	5.0	2.1	.3	.4
19	5.0	136	26	85	50	1,600	1,000	152	4.2	2.1	.3	.5
20	4.2	252	25	233	125	1,600	1,060	71	3.8	1.9	.3	2.8
21	4.2	128	24	142	133	2,150	416	58	3.4	1.7	.3	1.5
22	5.0	64	23	820	96	544	200	45	3.6	1.7	.2	.5
23	8.1	49	59	1,380	96	294	117	37	3.8	1.7	.3	1.2
24	8.1	43	1,970	301	93	200	105	58	3.6	2.5	.3	.9
25	8.1	53	1,200	159	1,030	176	84	65	3.4	5.0	.3	.5
26	8.6	43	391	133	1,140	294	81	44	5.0	2.0	.3	.5
27	11	47	161	150	262	491	72	42	20	.4	.2	5.7
28	20	53	91	238	123	694	59	32	25	.4	.3	2.6
29	28	32	76	166	---	330	51	30	14	.5	.3	1.1
30	23	21	87	100	---	200	45	25	12	.6	.2	.7
31	23	---	8,880	87	---	312	---	23	---	.9	.3	---

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	26	0.8	6.72	C.025	0.03
November	252	14	50.1	.186	.21
December	8,880	16	442	1.64	1.89
January	1,440	40	252	.937	1.08
February	1,440	50	245	.911	.95
March	9,070	59	870	3.23	3.72
April	2,440	45	525	1.95	2.18
May	1,700	23	389	1.45	1.67
June	25	3.4	10.1	.038	.04
July	20	.4	5.28	.020	.02
August	5.2	.2	0.90	.0033	.004
September	5.7	.3	0.94	.0035	.004
The year	9,070	.2	234	.870	11.80

CUYAHOGA RIVER NEAR HIRAM, OHIO

LOCATION.—Water-stage recorder 600 feet above highway bridge on road between Hiram and Mantua Corners and $2\frac{3}{4}$ miles west of Hiram, Portage County.

DRAINAGE AREA.—152 square miles.

RECORDS AVAILABLE.—August 1927 to September 1933.

DISCHARGE.—Maximum during year, 1,360 second-feet Mar. 16 (gage height, 6.12 feet); minimum, 5.1 second-feet Sept. 2.

1927-33: Maximum, 2,260 second-feet Jan. 20, 1929 (gage height, 8.2 feet); minimum, that of Sept. 2, 1933; minimum gage height, 0.56 foot Aug. 13, 1930.

REMARKS.—Records good except those for period July 27 to Sept. 30, periods of ice effect, Dec. 10-18, Feb. 5-9, 21-22, Mar. 10-12, and estimated periods, Oct. 21 to Dec. 1, Dec. 22 to Feb. 2, which are fair.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	17	40	47	1,000	100	406	386	69	52	33	8.8	8.0
2.....	14	38	37	900	110	321	386	66	45	25	10	7.0
3.....	14	56	37	760	109	244	408	67	41	24	13	14
4.....	15	52	39	680	108	189	444	69	40	22	18	22
5.....	15	48	42	530	100	152	444	72	41	21	25	27
6.....	16	47	45	450	110	126	456	83	42	18	23	25
7.....	18	46	51	470	130	117	508	92	54	17	21	18
8.....	19	46	69	400	190	196	534	98	67	15	26	12
9.....	18	48	83	250	260	310	534	116	61	15	25	8.0
10.....	17	52	90	160	300	350	456	138	47	15	28	6.6
11.....	18	64	76	120	300	330	397	148	37	14	31	7.0
12.....	18	70	69	90	258	340	495	144	34	13	33	8.8
13.....	18	64	65	66	208	403	562	141	33	12	33	9.6
14.....	21	54	59	58	172	706	590	143	33	12	32	13
15.....	23	50	56	54	154	1,200	521	140	31	12	24	14
16.....	24	60	54	56	143	1,290	444	130	32	12	18	14
17.....	24	70	51	58	135	1,100	420	120	33	13	18	15
18.....	27	80	49	70	135	812	408	110	37	13	15	13
19.....	29	90	47	90	138	665	420	103	39	12	12	12
20.....	33	120	47	100	173	620	444	94	36	11	11	14
21.....	38	140	47	110	210	635	432	79	30	12	9.2	22
22.....	35	130	47	120	230	665	307	64	26	12	8.4	28
23.....	32	100	110	150	242	635	342	56	23	13	7.6	30
24.....	32	90	150	180	240	534	270	60	22	15	7.3	26
25.....	32	100	270	230	270	408	210	105	20	15	7.6	21
26.....	35	90	320	220	364	342	167	115	29	17	9.6	17
27.....	40	80	290	210	432	300	130	116	87	15	10	15
28.....	54	74	260	160	456	310	108	109	99	13	14	16
29.....	60	64	210	120	-----	332	88	95	62	11	11	19
30.....	54	56	600	90	-----	364	76	79	42	11	10	16
31.....	45	-----	900	78	-----	375	-----	62	-----	10	9.6	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	60	14	27.6	0.182	0.21
November.....	140	38	70.6	.464	.52
December.....	900	37	139	.914	1.05
January.....	1,000	54	259	1.70	1.96
February.....	456	100	206	1.36	1.42
March.....	1,290	117	477	3.14	3.62
April.....	590	76	383	2.52	2.81
May.....	148	56	99.5	.655	.76
June.....	99	20	42.5	.280	.31
July.....	33	10	15.3	.101	.12
August.....	33	7.3	17.1	.112	.13
September.....	30	6.6	15.9	.105	.12
The year.....	1,290	6.6	146	.961	13.03

CUYAHOGA RIVER AT OLD PORTAGE, OHIO

LOCATION.—Water-stage recorder at highway bridge at Old Portage, Summit County, 4 miles northwest of Akron and 1¼ miles below mouth of Little Cuyahoga River.

DRAINAGE AREA.—405 square miles.

RECORDS AVAILABLE.—September 1921 to September 1933.

DISCHARGE.—Maximum during year, 3,560 second-feet Mar. 14 (gauge height, 9.40 feet); minimum, 31 second-feet Aug. 27–28, Sept. 11 (gauge height, 0.47 foot).

1921–33: Maximum, 3,820 second-feet Apr. 5, 1929 (gauge height, 10.1 feet); minimum, 26 second-feet Aug. 8, 1932. Average, 12 years (1921–33), 465 second-feet.

REMARKS.—Records good Oct. 1 to Feb. 28 and excellent thereafter.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	119	167	199	1,250	279	628	854	391	176	69	51	61
2.....	43	143	121	986	323	597	858	282	183	150	92	39
3.....	81	120	91	1,130	378	484	910	231	161	163	66	64
4.....	48	118	108	1,280	224	401	997	236	182	134	79	40
5.....	57	107	115	1,110	149	380	972	218	324	111	72	73
6.....	72	98	117	830	212	260	1,080	339	209	137	44	55
7.....	70	122	106	666	362	255	1,300	359	218	90	41	44
8.....	80	110	107	524	374	520	1,190	397	232	84	76	42
9.....	37	186	114	444	303	751	1,130	402	207	56	66	40
10.....	39	166	100	392	318	704	1,110	535	143	145	97	34
11.....	77	148	109	317	293	600	1,230	530	137	104	52	34
12.....	51	142	119	254	292	640	1,600	521	139	59	51	69
13.....	65	134	96	280	280	1,130	1,400	614	133	101	42	61
14.....	83	136	84	216	308	3,080	1,250	735	99	58	100	53
15.....	85	179	111	206	277	2,750	1,270	694	87	78	76	75
16.....	48	260	101	226	243	2,600	1,290	603	103	53	44	62
17.....	99	311	120	209	304	2,400	1,220	552	109	53	70	49
18.....	128	195	78	240	148	1,940	1,060	508	91	88	67	66
19.....	53	208	81	242	104	1,720	1,180	491	112	112	43	74
20.....	91	246	90	205	228	1,640	1,600	317	111	60	61	64
21.....	45	189	129	132	168	1,560	1,300	290	73	55	34	41
22.....	87	303	131	236	147	1,380	1,040	188	81	118	34	114
23.....	52	251	173	322	226	1,300	883	207	63	50	39	100
24.....	169	210	400	358	365	1,210	739	298	81	78	83	41
25.....	98	253	341	390	413	1,080	612	382	49	58	42	38
26.....	94	194	436	376	561	974	510	404	134	52	41	37
27.....	115	176	475	376	604	936	462	335	97	80	36	41
28.....	104	201	524	388	599	958	438	186	57	50	56	39
29.....	105	219	485	380	-----	875	310	207	185	88	68	70
30.....	37	150	510	307	-----	825	318	157	154	47	42	64
31.....	96	-----	1,350	252	-----	848	-----	197	-----	78	40	-----

Month	Maximum	Minimum	Mean	Month	Maximum	Minimum	Mean
October.....	169	37	78.3	May.....	73	157	381
November.....	311	98	181	June.....	32	49	138
December.....	1,350	78	230	July.....	163	47	85.8
January.....	1,280	132	468	August.....	107	34	58.2
February.....	604	104	303	September.....	114	34	56.1
March.....	3,080	255	1,140	The year.....		3,081	34
April.....	1,600	310	1,000				

CUYAHOGA RIVER AT INDEPENDENCE, OHIO

LOCATION.—Water-stage recorder in T. 6 N., R. 12 W., at highway bridge 1 mile north-east of Independence, Cuyahoga County. Zero of gages 1903-6, 1927 and thereafter, 584.14 feet above mean sea level; 1921-23, 586.56 feet above mean sea level.

DRAINAGE AREA.—709 square miles.

RECORDS AVAILABLE.—September 1903 to July 1906, September 1921 to May 1923, September 1927 to September 1933.

DISCHARGE.—Maximum combined discharge of river and canal during year, 7,190 second-feet Dec. 31 (gage height of river, 15.54 feet); minimum combined daily discharge, 48 second-feet Aug. 29.

1921-23, 1927-33: Maximum combined discharge, 9,780 second-feet Jan. 19, 1929 (gage height of river, 18.9 feet); minimum, that of Aug. 29, 1933.

REMARKS.—Records good except those for period of ice effect, Dec. 14-15, and other estimated periods, Oct. 1-7, Feb. 1-2, 9-13, Mar. 17 to Apr. 25, which are poor. Water is diverted into Ohio Canal at Brecksville, 6 miles upstream, and carried past station. (For record of this diversion see p. 95.) A small amount of water is diverted into this drainage basin from Tuscarawas River by Ohio Canal.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	100	171	224	3,100	516	803	1,100	383	253	146	81	33
2.....	140	183	163	2,040	550	750	1,100	372	231	110	61	51
3.....	70	162	156	1,690	585	658	1,300	413	222	277	107	47
4.....	100	140	135	1,690	434	660	1,400	331	212	193	116	77
5.....	66	136	100	1,740	330	511	1,400	343	356	138	90	33
6.....	80	125	150	1,340	303	413	1,700	474	282	139	81	62
7.....	90	117	180	1,030	477	437	2,500	526	242	146	47	55
8.....	108	141	190	820	1,990	1,860	2,000	604	246	198	54	43
9.....	98	136	173	673	670	2,380	1,800	878	246	199	83	37
10.....	61	296	153	590	500	1,660	1,800	1,730	214	72	80	34
11.....	76	216	130	530	520	989	2,300	1,110	171	149	120	23
12.....	98	195	144	460	470	852	3,500	968	156	116	65	40
13.....	76	174	152	336	450	1,830	2,500	1,150	163	81	61	68
14.....	99	155	120	347	423	6,720	2,100	1,920	156	113	40	67
15.....	101	162	100	343	542	6,040	2,000	1,340	130	80	86	74
16.....	102	262	121	293	386	4,290	2,100	1,120	124	198	74	78
17.....	68	384	110	317	375	3,500	1,900	914	154	64	50	63
18.....	156	361	132	325	329	3,000	1,600	750	143	75	69	43
19.....	140	504	87	443	219	2,800	1,700	652	117	195	69	60
20.....	73	446	101	577	389	2,300	2,500	549	141	112	46	91
21.....	102	286	133	445	368	2,200	2,000	388	133	73	54	80
22.....	69	305	152	460	347	1,900	1,700	289	104	72	33	55
23.....	100	303	179	1,050	319	1,800	1,400	295	106	112	35	113
24.....	83	283	1,520	699	431	1,700	1,100	411	94	78	37	116
25.....	164	281	1,240	657	1,420	1,500	900	885	110	86	70	49
26.....	126	218	715	654	1,300	1,400	720	631	255	71	35	51
27.....	193	222	629	645	991	1,300	609	454	206	63	31	73
28.....	150	211	587	746	850	1,300	566	409	147	87	21	74
29.....	128	222	532	671	-----	1,200	467	264	101	61	44	60
30.....	123	188	614	524	-----	1,100	444	276	234	90	57	81
31.....	69	-----	6,240	482	-----	1,100	-----	219	-----	52	35	-----

Month	River			Canal (mean)	Combined		
	Maximum	Minimum	Mean		Maximum	Minimum	Mean
October.....	193	66	104	42.5	238	101	146
November.....	504	117	233	54.8	558	171	288
December.....	6,240	87	496	56.6	6,294	144	553
January.....	3,100	293	830	54.2	3,146	350	884
February.....	1,990	219	589	62.8	2,047	283	652
March.....	6,720	413	1,900	61.6	6,777	477	1,962
April.....	3,500	444	1,610	62.0	3,564	504	1,672
May.....	1,920	219	679	64.3	1,984	287	743
June.....	356	94	182	66.0	427	162	251
July.....	277	52	106	43.0	322	81	149
August.....	120	21	62.3	30.1	146	55	92
September.....	116	23	61.0	40.4	161	59	101
The year.....	6,720	21	571	53.3	6,777	55	624

CONGRESS LAKE OUTLET NEAR KENT, OHIO

LOCATION.—Water-stage recorder at bridge on Kent-Ravenna highway 2 miles east of Kent, Portage County, and 1 mile below mouth of Muddy Lake outlet.

DRAINAGE AREA.—76.9 square miles.

RECORDS AVAILABLE.—July 1927 to September 1933.

DISCHARGE.—Maximum during year, 1,020 second-feet Mar. 16 (gage height, 9.07 feet); minimum, 4.6 second-feet Sept. 18–19.

1927–33: Maximum, 1,060 second-feet Feb. 28, 1929 (gage height, 9.5 feet); minimum, 3.1 second-feet July 12, 1930.

REMARKS.—Records fair except those for periods of ice effect, Jan. 12–16, Feb. 9–18, Mar. 9–12, which are poor.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	11	21	18	176	50	57	119	35	34	32	10	7.8
2.....	10	20	19	144	53	47	116	34	34	28	10	7.2
3.....	9.0	18	20	154	54	42	129	35	36	27	12	9.0
4.....	9.8	19	21	124	53	40	144	35	42	18	15	8.2
5.....	11	18	21	83	40	38	144	36	64	15	12	6.5
6.....	12	16	22	62	49	36	165	46	76	15	10	6.5
7.....	12	16	24	56	43	40	200	47	98	15	8.5	6.2
8.....	11	18	24	45	72	107	212	51	105	15	9.8	6.8
9.....	9.8	22	23	38	60	140	232	65	64	12	11	6.5
10.....	9.0	34	21	33	51	120	212	79	41	11	12	6.0
11.....	10	31	20	30	43	110	182	83	34	12	14	5.4
12.....	10	33	20	27	38	84	244	79	32	11	13	7.0
13.....	12	29	21	21	34	112	258	85	32	12	11	6.0
14.....	13	24	20	18	32	396	291	129	32	11	9.2	7.2
15.....	13	22	20	17	30	871	264	124	32	11	9.5	8.5
16.....	12	27	20	17	28	936	218	129	36	9.5	10	8.0
17.....	14	40	20	18	28	570	194	119	39	8.0	10	6.2
18.....	20	36	20	21	28	334	188	92	36	9.2	10	5.0
19.....	17	61	26	38	30	264	225	69	32	10	10	5.0
20.....	16	62	33	41	45	238	284	53	32	10	8.5	8.8
21.....	15	55	27	42	51	251	244	44	34	9.5	7.5	8.5
22.....	14	54	27	62	50	264	206	38	34	10	9.0	8.8
23.....	15	47	32	76	49	251	165	36	34	8.5	9.2	8.2
24.....	15	38	101	77	45	225	112	39	34	19	9.8	7.2
25.....	15	31	109	75	68	170	82	60	34	16	9.8	6.0
26.....	18	28	103	65	92	144	67	45	34	12	9.5	7.0
27.....	24	25	106	59	84	154	58	43	36	11	7.2	8.0
28.....	19	21	89	60	78	170	46	42	36	10	6.5	9.0
29.....	19	21	59	55	-----	176	41	38	37	10	7.5	8.5
30.....	18	19	51	48	-----	176	38	38	36	9.8	7.5	8.0
31.....	16	-----	171	53	-----	154	-----	36	-----	9.2	7.5	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	24	9.0	13.9	0.181	0.21
November.....	62	16	30.2	.393	.44
December.....	171	18	42.2	.549	.63
January.....	176	17	59.2	.770	.89
February.....	92	28	49.2	.640	.67
March.....	936	36	217	2.82	3.25
April.....	291	38	169	2.20	2.45
May.....	129	34	60.8	.791	.91
June.....	105	32	42.7	.555	.62
July.....	32	8.0	13.4	.174	.20
August.....	15	6.5	9.89	.129	.15
September.....	9.0	5.0	7.23	.094	.10
The year.....	936	5.0	59.6	.775	10.52

LITTLE CUYAHOGA RIVER AT AKRON, OHIO

LOCATION.—Water-stage recorder at foot of Seiberling Street, Akron, Summit County, half a mile below mouth of Springfield Lake outlet. Zero of gage is 997.41 feet above mean sea level.

DRAINAGE AREA.—42.0 square miles.

RECORDS AVAILABLE.—July 1920 to September 1933.

DISCHARGE.—Maximum, during year not determined; minimum, 5.4 second-feet July 30 (gage height, 0.19 foot).

1920-33: Maximum not known; no flow June 24, July 14, 1923, on account of regulation above station. Average, 13 years (1920-33), 37.2 second-feet. REMARKS.—Records excellent except those for periods of ice effect, Nov. 27-28, Dec. 15-19, Jan. 1-2, Feb. 5-6, 9-16, Mar. 10-12, 14-15, and estimated periods, May 16-19, June 19-20, which are fair. Gage-height record furnished by Goodyear Tire & Rubber Co.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	13.5	23	14.0	76	15.4	18.8	52	26	11.7	16.3	12.6	11.8
2.....	13.0	15.8	13.8	46	17.4	19.0	57	34	11.6	20	12.0	12.2
3.....	13.5	12.8	13.7	32	17.0	18.6	58	22	11.8	30	14.5	17.7
4.....	13.1	20	13.5	26	12.9	17.4	66	24	32	17.8	13.8	10.6
5.....	13.4	10.7	16.6	30	9.2	16.4	58	25	42	13.5	12.0	12.6
6.....	11.9	10.1	15.5	25	17	14.8	76	43	33	11.6	7.1	11.7
7.....	12.2	13.4	15.6	19.4	23	20	96	39	21	10.5	12.8	11.8
8.....	12.6	12.1	15.4	17.8	35	73	73	42	17	13.6	13.8	11.6
9.....	11.8	19.6	14.4	17.2	16	96	70	62	13.9	10.9	13.4	11.5
10.....	13.0	25	12.9	14.8	16	40	55	56	14.7	14.0	20	7.7
11.....	12.6	24	12.8	14.6	16	26	172	49	15.2	13.6	13.8	12.0
12.....	12.6	20	15.6	14.4	16	23	113	48	14.0	13.4	11.7	14.9
13.....	14.0	14.3	14.6	13.2	16	103	73	72	12.9	13.2	7.2	15.8
14.....	11.6	13.4	13.8	14.2	18	838	63	92	13.2	12.8	11.8	14.7
15.....	11.6	12.3	12	13.6	18	367	59	68	13.2	13.0	12.0	12.8
16.....	9.0	22	11	15.3	18	203	94	55	13.9	10.4	11.1	12.4
17.....	18.2	31	11	15.5	16.3	86	81	45	12.2	12.2	10.6	9.1
18.....	14.5	26	13	16.2	11.5	75	72	36	13.0	16.8	10.4	11.3
19.....	11.1	45	14	25	12.9	90	80	30	13	16.4	10.5	12.4
20.....	9.4	42	14.7	26	30	114	96	25	12	12.0	8.1	12.6
21.....	10.6	31	13.4	19.6	21	117	82	21	11.4	12.0	11.1	11.4
22.....	10.6	22	14.6	39	17.2	86	56	18.1	12.4	12.0	11.7	11.2
23.....	10.4	17.1	24	45	16.2	62	36	16.7	12.1	11.3	11.6	12.5
24.....	14.2	17.1	75	32	25	48	32	15.0	10.5	24	12.0	9.8
25.....	15.5	15.4	69	22	40	42	33	14.2	11.5	14.4	11.9	11.2
26.....	21	13.8	45	20	40	55	30	14.4	12.5	14.0	11.9	11.8
27.....	22	11	26	21	28	72	29	14.8	11.5	13.0	10.0	12.8
28.....	14.6	14	17.8	21	23	86	24	14.9	10.2	12.0	12.2	12.5
29.....	10.0	13.6	13.8	19.2	-----	50	18.0	15.5	30	12.0	12.8	11.1
30.....	8.6	14.1	24	15.4	-----	48	17.6	14.4	18.9	9.5	11.8	10.9
31.....	13.7	-----	130	13.3	-----	51	-----	13.7	-----	13.0	11.2	-----

Month	Maximum	Minimum	Mean	Month	Maximum	Minimum	Mean
October.....	22	8.6	13.0	May.....	92	13.7	34.4
November.....	45	10.1	19.4	June.....	42	10.2	16.1
December.....	130	11	23.6	July.....	30	9.5	14.2
January.....	76	13.2	23.9	August.....	20	7.1	11.9
February.....	40	9.2	20.1	September.....	17.7	7.7	12.1
March.....	838	14.8	96.0				
April.....	172	17.6	64.1	The year.....	838	7.1	29.1

OHIO CANAL AT INDEPENDENCE, OHIO

LOCATION.—Water-stage recorder at highway bridge opposite gaging station on Cuyahoga River, 1 mile northeast of Independence, Cuyahoga County.

RECORDS AVAILABLE—September 1921 to May 1923, August 1927 to September 1933.

DISCHARGE.—Maximum during year, 79 second-feet June 15; minimum, 16 second-feet July 16.

1927-33: Maximum, 99 second-feet Apr. 5, 1929 (gage height, 5.09 feet); minimum not determined.

REMARKS.—Records fair. Water diverted into canal from Cuyahoga River by feeder at dam at Brecksville, 6 miles above station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	46	50	54	46	54	64	60	60	68	50	29	34
2	46	50	54	54	54	64	60	64	68	46	28	34
3	45	50	54	54	54	64	64	64	68	45	28	36
4	42	50	54	57	54	64	64	64	68	40	26	38
5	40	54	54	54	54	64	60	60	71	42	29	36
6	42	54	54	54	54	64	60	64	71	42	28	36
7	40	54	54	54	57	60	64	64	71	42	28	38
8	40	54	54	50	57	68	60	64	71	40	28	38
9	40	57	54	54	50	64	60	64	75	42	32	42
10	40	57	57	50	60	64	60	64	75	42	29	38
11	40	57	57	50	68	64	64	64	75	42	26	36
12	40	57	57	57	64	60	64	64	75	42	26	38
13	42	54	57	57	71	60	60	64	75	40	28	38
14	42	57	57	60	71	57	60	64	75	42	29	40
15	42	54	60	57	71	57	60	64	79	54	31	38
16	42	57	60	57	68	54	60	64	75	36	32	40
17	42	57	60	54	68	57	64	64	75	50	28	40
18	42	54	60	57	68	64	64	60	68	50	29	40
19	40	54	57	57	64	60	68	60	68	50	29	40
20	45	50	57	57	68	60	64	64	68	50	29	43
21	42	50	60	57	68	64	60	64	68	46	31	43
22	42	54	60	57	64	60	64	64	71	46	29	42
23	42	60	60	57	68	60	64	64	68	46	29	45
24	42	57	57	50	64	64	64	64	68	46	34	45
25	42	57	50	50	64	60	64	68	64	46	34	45
26	43	57	57	54	68	60	64	64	64	46	34	46
27	45	57	57	54	68	64	60	68	60	43	34	46
28	45	57	57	54	64	64	60	68	57	34	34	46
29	46	57	60	54	-----	60	60	68	57	32	34	46
30	46	57	57	54	-----	60	60	68	54	31	34	46
31	46	-----	54	50	-----	60	-----	68	-----	29	34	-----

Month	Maximum	Minimum	Mean	Month	Maximum	Minimum	Mean
October	46	40	42.5	May	68	60	64.2
November	60	50	54.8	June	76	54	69.0
December	60	50	56.6	July	54	29	43.0
January	60	46	54.2	August	34	26	30.1
February	71	50	62.8	September	46	34	40.4
March	68	54	61.6				
April	68	60	62.0	The year	76	26	53.3

CHAGRIN RIVER AT WILLOUGHBY, OHIO

LOCATION.—Staff gage at dam 0.9 mile southeast of Willoughby, Lake County, about 5 miles above mouth, and one-sixth of a mile below mouth of East Branch.

DRAINAGE AREA.—251 square miles.

RECORDS AVAILABLE.—July 1925 to September 1933.

DISCHARGE.—Maximum during year, 7,000 second-feet Dec. 31 (gage height, 4.98 feet); minimum, 6.2 second-feet Aug. 26–29, Sept. 1 (gage height, 0.19 foot).

1925–33: Maximum, 20,500 second-feet June 26, 1931 (gage height, 9.90 feet); minimum, 5.2 second-feet Aug. 12, 13, 15, 1930.

REMARKS.—Records good except those for periods of ice effect, Nov. 29–30, Dec. 1, 11–21, Jan. 14, Feb. 5–6, 10–23, Mar. 12, and periods when gates in dam were operated, Oct. 16–17, June 14–15, July 5–7, 11–17, 22–25, Sept. 17–30, which are fair.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	25	128	50	1,060	156	218	563	100	65	24	7.6	7.6
2	24	120	75	527	312	186	635	112	62	29	11	7.6
3	22	85	75	364	207	170	635	186	55	45	55	18
4	22	68	75	378	147	175	890	197	50	34	55	22
5	45	65	72	452	95	166	500	156	50	30	39	20
6	50	65	75	293	90	128	1,060	207	45	28	25	18
7	45	68	325	241	186	133	1,240	197	45	22	18	15
8	37	62	312	197	1,710	1,120	635	156	39	19	20	11
9	29	62	175	175	371	1,370	420	306	34	19	34	11
10	25	241	108	161	250	452	337	350	34	19	29	7.6
11	29	170	84	137	170	207	364	252	32	17	27	11
12	29	156	70	133	150	160	1,950	207	29	17	29	15
13	32	112	60	128	130	364	680	186	34	17	22	16
14	39	88	55	110	120	4,790	413	378	30	19	22	18
15	39	104	52	96	120	2,080	312	218	30	19	18	18
16	39	104	50	104	120	780	680	364	25	19	15	18
17	30	300	49	108	110	484	750	287	34	15	13	16
18	45	224	49	108	110	378	486	186	34	11	13	15
19	39	590	48	191	100	1,300	730	112	29	11	13	14
20	34	406	48	325	400	1,060	945	128	29	11	15	20
21	32	235	48	186	250	1,440	468	88	25	9.2	13	28
22	29	170	112	635	180	635	300	96	25	19	11	32
23	29	128	166	730	160	420	235	78	22	19	9.2	30
24	29	186	1,860	350	275	350	207	75	22	47	9.2	25
25	34	161	835	241	1,180	306	166	420	22	32	7.6	20
26	45	128	385	281	890	306	175	207	55	25	7.6	18
27	197	120	258	264	378	527	120	207	55	22	6.2	17
28	147	68	186	306	264	1,000	112	128	39	19	6.2	18
29	96	58	152	207	-----	635	147	104	27	13	6.2	20
30	68	54	156	128	-----	468	81	88	25	11	7.6	20
31	55	-----	5,420	156	-----	484	-----	75	-----	7.6	7.6	-----

Month	Observed				Corrected for diversion		
	Maximum	Minimum	Mean	Mean diversion	Mean	Per square mile	Run-off in inches
October	197	22	46.45	0.82	47.3	0.188	0.22
November	590	54	150.87	.82	152	.606	.68
December	5,420	48	370.48	.84	371	1.48	1.71
January	1,060	96	282.97	.74	284	1.13	1.30
February	1,710	90	308.25	.80	309	1.23	1.28
March	4,790	128	719.10	.75	720	2.87	3.31
April	1,930	81	539.86	.89	541	2.16	2.41
May	420	75	188.74	.93	190	.757	.87
June	65	22	36.73	1.46	38.2	.152	.17
July	47	7.6	20.83	1.53	22.4	.089	.10
August	55	6.2	18.45	1.33	19.8	.079	.09
September	32	7.6	17.56	1.15	18.7	.075	.08
The year	5,420	6.2	224.77	1.00	226	.900	12.22

GRAND RIVER NEAR MADISON, OHIO

LOCATION.—Chain gage at highway bridge 2 miles south of Madison, Lake County, and half a mile above Griswold Creek. Zero of gage is 674.47 feet above mean sea level.

DRAINAGE AREA.—587 square miles.

RECORDS AVAILABLE.—July 1922 to September 1933.

DISCHARGE.—Maximum during year, 8,970 second-feet Mar. 14 (gage height, 9.20 feet); minimum, 0.1 second-foot Sept. 1-2 (gage height, 0.5 foot).

1922-33: Maximum, about 16,400 second-feet Jan. 19, 1929 (gage height, 12.0 feet); minimum, that of Sept. 1-2, 1933. Average, 11 years (1922-33) 669 second-feet.

REMARKS.—Records good except those for periods of ice effect, Nov. 29-30, Dec. 1-3, 10-22, Jan. 14-16, Feb. 6-7, 11-21, which are fair.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	5.2	68	43	5,040	210	790	1,180	104	103	95	4.2	0.2
2.....	4.2	56	41	1,800	296	467	1,110	95	60	44	5.2	.2
3.....	4.2	38	40	1,320	349	280	1,320	90	49	21	13	1.6
4.....	3.9	34	39	1,110	223	210	2,220	101	43	20	33	4.2
5.....	4.2	40	39	1,040	168	199	1,620	112	55	9.0	24	1.3
6.....	4.4	38	44	790	150	178	1,250	114	44	16	23	.7
7.....	4.7	29	111	446	400	158	2,740	122	56	13	31	1.4
8.....	5.0	24	188	313	1,320	732	1,710	131	52	12	26	1.4
9.....	6.1	29	168	236	1,540	3,200	1,250	178	41	11	18	1.1
10.....	5.2	63	100	178	1,040	1,710	970	236	34	8.4	14	.6
11.....	5.2	68	75	158	650	1,180	652	280	28	8.4	11	.8
12.....	4.7	83	62	149	350	910	5,660	265	26	7.4	9.4	1.7
13.....	3.7	91	53	131	200	678	3,360	236	20	6.7	7.4	2.4
14.....	3.5	94	47	120	160	7,960	1,620	188	17	7.4	7.4	2.4
15.....	2.8	60	43	110	140	7,220	1,390	168	13	6.7	5.5	1.8
16.....	2.8	83	40	100	140	4,640	1,040	210	14	3.9	5.2	2.0
17.....	2.4	136	38	95	130	3,710	2,340	387	15	2.0	5.5	1.3
18.....	10	165	37	96	120	2,110	1,620	265	16	1.4	5.8	1.2
19.....	7.0	330	36	122	120	1,620	1,540	178	18	1.4	5.2	1.2
20.....	6.4	553	35	280	500	2,460	3,200	149	21	1.2	3.9	2.6
21.....	7.9	313	34	296	1,000	3,040	1,710	112	34	1.3	3.1	4.7
22.....	6.7	223	34	368	678	2,340	1,040	90	30	1.1	2.2	7.1
23.....	6.1	168	114	1,460	601	1,620	732	59	27	1.2	1.2	10
24.....	7.3	149	1,620	1,040	509	1,110	467	64	22	18	.9	12
25.....	5.8	114	1,540	652	970	850	236	58	16	23	.6	10
26.....	9.7	112	970	626	3,360	576	178	56	14	16	.6	7.4
27.....	34	109	553	732	1,540	530	149	910	31	12	.6	11
28.....	36	64	330	790	1,110	1,540	131	678	18	7.4	.4	14
29.....	29	54	199	652	-----	1,800	122	296	92	5.5	.7	11
30.....	21	47	149	368	-----	1,620	109	178	122	5.2	.3	8.7
31.....	25	-----	8,460	296	-----	1,250	131	-----	-----	5.2	.3	-----

Month	Maximum	Minimum	Mean	Per square m/e	Run-off in inches
October.....	36	2.4	9.16	0.016	0.02
November.....	553	24	114	.194	.22
December.....	8,460	34	493	.840	.97
January.....	5,040	95	675	1.15	1.33
February.....	3,360	120	642	1.09	1.14
March.....	7,960	158	1,830	3.12	3.60
April.....	5,660	109	1,420	2.42	2.70
May.....	910	56	201	.342	.39
June.....	122	13	37.7	.064	.07
July.....	95	1.1	12.6	.021	.02
August.....	33	.3	8.66	.015	.02
September.....	14	.2	4.20	.0072	.008
The year.....	8,460	.2	453	.772	10.49

CONNEAUT CREEK AT AMBOY, OHIO

LOCATION.—Water-stage recorder at highway bridge half a mile east of Amboy, Ashtabula County, 3 miles southwest of Conneaut, and about 6 miles above mouth.

DRAINAGE AREA.—178 square miles.

RECORDS AVAILABLE.—July 1922 to September 1933.

DISCHARGE.—Maximum during year, about 5,840 second-feet Jan. 1 (gage height, 6.54 feet); minimum, 0.2 second-foot July 31, Aug. 1 (gage height, 1.10 feet). 1922-33: Maximum, 6,160 second-feet Dec. 1, 1927, Jan. 19, 1929 (gage height, 8.2 feet); minimum, that of July 31, Aug. 1, 1933. Average, 11 years (1922-33), 231 second-feet.

REMARKS.—Records excellent except those for discharges above 3 500 second-feet and those for periods of ice effect, Nov. 22-30, Dec. 1-2, 10-24, 28-29, Jan. 2-4, 10-17, 30-31, Feb. 4-24, 27-28, Mar. 3-7, 9-12, which are fair.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10	27	27	2,710	95	133	369	51	51	7.0	0.4	0.4
2	13	17	22	430	121	110	439	49	38	8.2	1.1	.4
3	3.5	17	22	210	176	96	542	65	33	5.8	6.0	6.3
4	9.7	23	20	190	100	81	668	110	26	5.3	13	5.3
5	4.2	22	21	351	55	73	528	110	38	3.8	6.4	3.2
6	3.5	21	26	339	46	71	307	85	42	3.8	26	2.3
7	3.2	15	83	192	53	77	320	89	42	4.5	11	2.9
8	2.7	20	203	143	220	382	503	108	35	5.3	14	8.5
9	2.4	10	210	111	780	820	277	131	35	6.2	7.0	3.5
10	2.2	32	100	95	320	310	189	189	33	3.2	8.2	2.9
11	4.8	57	60	79	230	180	340	163	16	2.1	3.8	2.1
12	11	67	38	69	180	140	2,160	120	14	2.1	3.2	4.9
13	4.9	49	33	64	150	158	1,530	94	17	1.8	5.3	4.5
14	4.2	68	31	67	130	2,240	349	79	11	2.3	4.5	3.8
15	3.8	28	29	55	120	2,980	199	67	7.2	2.1	7.6	2.9
16	3.5	44	28	48	120	876	197	91	11	2.1	3.5	2.3
17	4.2	88	26	48	110	333	563	491	11	2.3	2.3	1.8
18	6.2	107	25	51	97	233	500	268	9.4	2.1	1.8	1.3
19	5.7	255	23	91	88	189	439	123	4.9	1.8	3.2	1.3
20	3.8	466	22	134	250	394	390	83	7.2	1.3	2.1	3.2
21	2.7	266	22	143	860	500	585	63	9.4	1.3	1.6	4.1
22	2.7	120	22	250	460	500	233	51	6.2	1.3	1.1	4.1
23	3.8	77	170	668	210	263	154	44	8.2	1.3	1.1	7.8
24	5.3	60	1,300	423	180	199	118	41	7.7	2.1	1.8	4.5
25	16	56	1,030	189	455	192	103	38	5.3	2.9	1.8	4.1
26	10	53	347	173	1,530	169	85	47	4.9	2.1	1.8	11
27	41	48	176	350	410	157	79	58	11	1.3	1.3	9.2
28	23	37	100	381	150	277	69	202	4.9	.9	.9	5.3
29	38	31	79	290	-----	535	65	133	3.8	.6	.7	8.2
30	23	28	343	140	-----	638	58	81	2.9	.3	.5	9.8
31	14	-----	3,760	100	-----	400	-----	69	-----	.3	.3	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	41	2.2	9.23	0.052	0.06
November	466	10	73.6	.413	.46
December	3,760	20	271	1.52	1.75
January	2,710	48	277	1.56	1.89
February	1,530	46	275	1.54	1.60
March	2,980	71	442	2.48	2.86
April	2,160	58	412	2.31	2.68
May	491	38	109	.612	.71
June	51	2.9	18.2	.102	1.14
July	8.2	.3	2.82	.016	.02
August	2.6	.3	4.62	.026	.03
September	11	.4	4.40	.025	.03
The year	3,760	.3	158	.898	13.04

STREAMS TRIBUTARY TO LAKE ONTARIO

LITTLE TONAWANDA CREEK AT LINDEN, N.Y.

LOCATION.—Staff gage above concrete weir at highway bridge in Linden, Genesee County.

DRAINAGE AREA.—22 square miles.

RECORDS AVAILABLE.—July 1912 to September 1933.

DISCHARGE.—Maximum during year, 1,300 second-feet Mar. 14 (gage height, 9.4 feet); minimum, about 0.3 second-foot Aug. 21.

1912-33: Maximum, about 2,400 second-feet Apr. 22, 1916 (gage height, 14.6 feet); minimum, that of Aug. 21, 1933. Average, 20 years (1912-19, 1920-33), 27.6 second-feet.

REMARKS.—Records good except those for periods of ice effect, Dec. 11-20, Feb. 6, Mar. 10-11, which are fair.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	0.7	1.4	5.0	59	17	26	173	12	10	3.0	0.6	0.8
2.....	.8	1.3	5.2	32	29	22	113	26	8.6	3.0	.4	.8
3.....	.6	1.3	6.6	24	17	20	90	108	7.6	3.4	.7	.8
4.....	.6	1.5	7.6	30	16	19	67	68	7.1	3.0	1.1	.8
5.....	.6	1.5	7.6	40	11	16	48	36	6.6	2.4	.7	.7
6.....	1.5	1.5	6.4	24	11	14	40	70	6.2	2.1	.5	.6
7.....	1.1	1.7	7.8	24	14	18	82	63	30	2.0	.5	.8
8.....	.8	1.6	7.8	19	34	135	60	34	79	1.7	.6	.8
9.....	.8	2.4	6.0	17	12	42	45	28	23	1.7	.6	.6
10.....	.7	64	5.0	14	15	32	42	26	12	1.7	.6	.6
11.....	.7	20	4.8	16	14	28	34	24	8.8	1.6	.8	.6
12.....	1.4	12	4.6	15	12	31	60	24	7.1	1.5	.7	.6
13.....	1.1	8.6	4.4	12	11	34	40	149	6.2	1.5	.6	.6
14.....	.9	6.9	4.2	8.3	12	625	33	74	6.2	1.4	.6	.7
15.....	.9	6.0	4.0	9.1	15	333	26	40	5.8	1.3	.5	.8
16.....	.8	5.4	3.8	9.1	12	111	42	29	5.4	1.3	.5	.7
17.....	.8	5.8	3.8	13	12	102	67	24	5.0	1.4	.6	.7
18.....	1.3	5.8	3.8	13	14	90	64	20	4.6	1.2	.4	.6
19.....	1.2	40	3.8	73	12	67	45	17	4.2	1.1	.4	.5
20.....	1.1	32	4.0	45	32	147	40	16	3.9	1.0	.4	.6
21.....	.9	20	4.2	24	24	329	30	19	3.6	.9	.3	.8
22.....	.9	14	7.1	116	17	118	24	15	3.2	.9	.4	.8
23.....	.9	9.1	30	140	28	70	21	12	3.0	.9	.6	.8
24.....	.8	11	112	48	23	57	18	71	2.7	.9	3.6	.8
25.....	.8	11	54	33	33	51	16	54	2.7	1.0	2.6	.7
26.....	.8	9.7	31	68	42	48	17	24	3.2	.9	1.5	.7
27.....	1.6	6.2	20	64	30	51	16	20	2.8	.8	1.1	.7
28.....	1.1	5.4	16	37	24	67	17	16	2.7	.8	.9	.7
29.....	1.1	5.0	13	18	-----	54	16	14	2.4	.6	.9	.6
30.....	1.3	5.2	16	16	-----	78	14	14	2.7	.6	.9	.6
31.....	1.2	-----	313	16	-----	120	-----	11	-----	.6	.8	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	1.6	0.6	0.96	0.044	0.05
November.....	64	1.3	10.6	.482	.54
December.....	313	3.8	23.3	1.06	1.22
January.....	140	8.3	34.7	1.58	1.82
February.....	42	11	19.4	.882	.92
March.....	625	14	95.3	4.33	4.99
April.....	173	14	46.7	2.12	2.36
May.....	149	11	37.4	1.70	1.96
June.....	79	2.4	9.21	.419	.47
July.....	3.4	.6	1.49	.068	.08
August.....	3.6	.3	.82	.037	.04
September.....	.8	.5	.70	.032	.04
The year.....	625	.3	23.5	1.07	14.49

GENESEE RIVER AT SCIO, N.Y.

LOCATION.—Staff gage at highway bridge three-quarters of a mile above Scio, Allegany County.

DRAINAGE AREA.—288 square miles.

RECORDS AVAILABLE.—June 1916 to September 1933.

DISCHARGE.—Maximum during year, 3,410 second-feet Apr. 7 (gage height, 4.9 feet from graph based on gage readings); minimum, 17 second-feet Oct. 3–5 (gage height, 0.00 foot.)

1916–33: Maximum, about 10,600 second-feet May 22, 1919 (gage height 9.1 feet); minimum (estimated), 13 second-feet Sept. 12, 13, 22–26, 1932. Average, 17 years (1916–33), 376 second-feet.

REMARKS.—Records good except those for periods of ice effect, Nov. 28–30, Dec. 11–20, Jan. 2–3, Feb. 10–16, Mar. 11–12, and those estimated, which are fair.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	19	93	116	211	172	105	850	199	298	• 99	43	81
2.....	18	162	110	360	242	95	1,150	214	246	• 120	62	64
3.....	17	121	138	300	167	97	1,070	411	214	• 240	79	• 65
4.....	17	103	140	242	125	91	1,230	374	184	• 750	218	158
5.....	22	99	135	260	103	85	990	316	317	• 240	69	114
6.....	120	103	118	194	87	99	785	416	928	• 160	51	78
7.....	127	107	148	209	125	103	2,300	395	746	• 120	43	71
8.....	58	116	209	178	157	466	1,570	335	1,600	• 100	55	67
9.....	• 39	110	132	167	120	464	1,180	298	663	85	58	61
10.....	34	1,700	105	145	120	194	900	502	416	79	79	57
11.....	29	871	95	148	120	150	746	416	316	76	282	52
12.....	29	494	90	194	110	150	1,080	374	263	71	114	51
13.....	28	400	85	103	110	242	835	• 350	214	68	67	49
14.....	28	316	80	107	100	2,140	718	• 420	199	65	86	145
15.....	26	278	80	107	100	2,680	584	395	184	61	65	205
16.....	25	242	75	103	95	1,180	488	298	170	57	55	118
17.....	25	278	70	128	95	920	835	438	167	76	57	95
18.....	34	242	70	130	105	990	1,090	298	149	62	44	81
19.....	50	894	65	158	101	818	1,040	263	127	46	38	73
20.....	43	895	65	209	103	990	805	298	118	39	35	64
21.....	38	520	74	148	101	1,540	636	461	101	37	33	61
22.....	35	400	85	235	95	1,330	534	335	92	39	31	76
23.....	33	336	93	380	91	850	438	263	79	39	38	70
24.....	36	316	477	260	116	660	395	298	71	62	946	76
25.....	33	260	470	209	95	494	354	395	311	49	343	67
26.....	32	209	378	260	• 80	572	354	280	733	55	165	65
27.....	93	145	297	336	• 74	690	298	711	283	43	134	67
28.....	114	130	242	260	103	630	263	461	170	38	125	105
29.....	83	120	209	175	-----	446	230	584	144	35	101	79
30.....	73	120	241	167	-----	446	214	438	116	32	85	73
31.....	64	-----	487	178	-----	446	-----	354	-----	29	70	-----

Month	Maximum	Minimum	Mean	Per square mi. ^a	Run-off in inches
October.....	127	17	45.9	C. 159	0.18
November.....	1,700	93	339	1.18	1.32
December.....	487	65	167	.580	.67
January.....	380	103	202	.701	.81
February.....	242	74	115	.399	.42
March.....	2,680	85	650	2.26	2.61
April.....	2,300	214	799	2.77	3.09
May.....	711	199	374	1.30	1.50
June.....	1,600	71	317	1.10	1.23
July.....	750	29	99.1	.344	.40
August.....	946	31	118	.410	.47
September.....	205	49	82.9	.288	.32
The year.....	2,680	17	276	.958	13.02

• Estimated.

GENESEE RIVER AT ST. HELENA, N.Y.

LOCATION.—Water-stage recorder at highway bridge in St. Helena, Wyoming County, 1½ miles below mouth of Wolf Creek.

DRAINAGE AREA.—992 square miles.

RECORDS AVAILABLE.—August 1908 to September 1933.

DISCHARGE.—Maximum during year, 17,200 second-feet Mar. 14 (gage height, 9.28 feet); minimum, 61 second-feet Aug. 3 (gage height, 2.02 feet).

1908-33: Maximum, about 44,400 second-feet May 17, 1916 (gage height, 12.8 feet); minimum, about 18 second-feet Oct. 5, 17, 1913 (gage height, 1.70 feet). Average, 25 years (1908-33), 1,200 second-feet.

REMARKS.—Records good except those for periods of ice effect, Nov. 27 to Dec. 1, Dec. 9-24, Jan. 1-14, Feb. 3-16, Feb. 26 to Mar. 2, Mar. 12, which are fair. Some diurnal fluctuation during low stages caused by power operations. Flow slightly regulated by storage in Caneadea Reservoir.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	65	452	380	1,700	794	600	3,800	567	982	335	83	182
2.....	185	599	323	800	592	600	3,800	581	793	372	65	164
3.....	284	563	431	650	480	699	3,490	909	692	501	68	160
4.....	284	446	536	560	550	584	3,200	1,250	625	1,230	96	175
5.....	222	365	563	650	500	556	2,920	937	567	663	271	313
6.....	143	313	549	550	480	516	2,080	872	1,750	442	168	376
7.....	178	303	549	650	500	551	4,470	1,610	1,630	362	122	286
8.....	366	334	490	800	550	2,670	4,870	1,250	9,610	304	113	186
9.....	262	365	440	750	280	2,760	3,020	964	3,620	257	139	157
10.....	329	4,870	400	700	190	1,190	2,400	902	1,620	244	214	150
11.....	323	3,650	340	650	320	740	1,950	1,000	1,050	227	268	127
12.....	252	1,660	300	600	360	700	2,590	1,040	801	206	543	124
13.....	150	1,090	280	500	360	818	2,990	1,810	685	195	356	114
14.....	114	834	260	700	300	8,310	1,950	1,650	588	179	266	124
15.....	94	695	240	778	260	13,200	1,540	1,130	539	172	219	195
16.....	140	672	240	770	320	5,250	1,430	946	492	187	187	428
17.....	308	650	260	762	355	3,390	1,850	1,330	539	168	148	405
18.....	360	620	420	770	360	3,200	3,190	1,080	560	165	122	360
19.....	276	1,930	420	790	323	2,340	4,620	769	525	154	110	339
20.....	133	4,130	420	1,420	360	3,270	2,810	751	499	137	104	323
21.....	136	1,740	420	1,050	381	7,600	1,950	1,530	466	131	94	257
22.....	203	1,200	340	981	382	5,800	1,540	1,100	338	131	119	164
23.....	313	922	260	1,670	405	2,940	1,290	777	262	122	99	236
24.....	313	794	2,900	1,090	471	2,200	1,100	977	248	128	534	339
25.....	240	748	2,370	770	606	1,770	955	2,420	569	128	1,660	339
26.....	130	815	1,490	778	550	1,600	825	1,220	841	110	754	334
27.....	157	700	957	1,350	460	1,430	801	2,060	944	104	452	349
28.....	325	650	740	1,340	420	2,200	769	2,050	602	107	334	281
29.....	428	600	642	791	-----	1,710	700	2,330	448	99	270	182
30.....	446	550	584	651	-----	1,770	648	2,200	378	96	235	251
31.....	428	-----	2,920	858	-----	2,420	-----	1,530	-----	91	202	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	446	65	245	0.247	0.28
November.....	4,870	303	1,110	1.12	1.25
December.....	2,920	240	692	.698	.80
January.....	1,700	500	867	.874	1.01
February.....	794	190	425	.428	.45
March.....	13,200	516	2,690	2.71	3.12
April.....	4,870	648	2,320	2.34	2.61
May.....	2,420	567	1,280	1.29	1.49
June.....	9,610	248	1,110	1.12	1.25
July.....	1,230	91	250	.252	.29
August.....	1,660	65	271	.273	.31
September.....	428	114	247	.249	.28
The year.....	13,200	65	960	.968	13.14

GENESSEE RIVER AT JONES BRIDGE, NEAR MOUNT MORRIS, N.Y.

LOCATION.—Water-stage recorder at highway bridge known as Jones Bridge, 3½ miles northeast of Mount Morris, Livingston County.

DRAINAGE AREA.—1,400 square miles.

RECORDS AVAILABLE.—May 1903 to April 1906, August 1908 to December 1913, July 1915 to September 1933.

DISCHARGE.—Maximum, during year, about 18,100 second-feet at 6 a.m. Mar. 15; maximum gage height, 21.72 feet at noon Mar. 15; minimum, 108 second-feet July 31, Aug. 1-2.

1903-6, 1908-13, 1915-33: Maximum, 55,100 second-feet May 17, 1916 (gage height, 25.44 feet); minimum, about 18 second-feet Aug. 29, 1909. Average, 23 years (1908-13, 1915-33), 1,590 second-feet.

REMARKS.—Records good except those for periods of ice effect, Nov. 29 to Dec. 1, Dec. 11-24, Jan. 1-6, 12, 14-16, Feb. 5-21, 27-28, Mar. 11-13, and those estimated, which are fair. Staff-gage readings used July 20 to Sept. 10. Diurnal fluctuation at low stages caused by power operations; slight seasonal regulation by storage in Canadea Reservoir.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	122	478	600	2,800	968	775	4,420	770	1,450	406	108	244
2.....	122	590	470	1,300	858	830	4,820	852	1,100	390	108	214
3.....	237	640	493	1,000	720	775	4,420	1,100	908	415	128	214
4.....	282	528	620	900	695	720	4,210	1,810	798	1,100	174	214
5.....	306	444	670	950	700	695	4,280	1,510	690	798	214	292
6.....	282	394	670	1,000	650	620	3,020	1,270	1,420	524	260	320
7.....	291	360	670	940	650	645	4,140	2,130	1,900	423	187	406
8.....	250	367	645	1,050	700	3,340	4,600	2,060	8,340	379	174	214
9.....	273	410	605	995	500	4,040	4,350	1,510	5,530	323	179	200
10.....	356	*2,800	516	912	*320	1,980	3,230	1,300	2,140	256	182	182
11.....	363	*5,500	420	885	*380	1,300	2,530	1,360	1,390	253	332	174
12.....	367	*2,300	420	850	480	1,100	2,930	1,730	1,020	253	552	164
13.....	248	1,440	380	830	480	1,300	4,000	3,020	825	232	356	157
14.....	187	1,070	360	800	420	7,490	2,670	2,530	715	223	406	169
15.....	167	825	340	950	360	16,600	2,120	1,750	640	*240	260	166
16.....	141	742	340	900	380	10,200	1,930	1,390	590	*260	260	321
17.....	266	742	400	940	420	5,990	2,460	1,510	566	*240	244	423
18.....	371	715	550	912	460	5,000	3,980	1,570	615	*220	200	386
19.....	415	*1,500	550	912	440	3,860	5,410	1,130	561	*220	154	369
20.....	220	*5,000	550	1,510	420	4,550	4,000	935	542	200	174	352
21.....	213	*3,000	550	1,340	460	8,670	2,740	1,710	514	192	164	316
22.....	161	*1,900	500	1,160	586	9,630	2,120	1,630	448	174	159	290
23.....	311	*1,400	460	1,940	540	*5,370	1,810	1,130	348	182	139	179
24.....	313	*1,100	2,400	1,580	600	*3,720	1,510	1,290	316	174	1,340	334
25.....	320	*900	3,580	1,050	670	*2,810	1,360	2,980	269	150	2,090	330
26.....	229	*1,000	2,140	968	858	2,390	1,160	1,920	767	174	1,370	356
27.....	153	885	1,350	1,570	650	2,120	1,070	2,000	1,160	139	542	345
28.....	271	802	995	1,700	600	2,880	1,020	2,460	770	139	448	371
29.....	427	750	802	1,140	-----	2,530	962	2,740	538	150	309	257
30.....	474	700	695	802	-----	2,320	852	2,600	435	118	276	206
31.....	452	-----	2,330	968	-----	2,810	-----	2,060	-----	108	260	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	474	122	277	0.198	0.28
November.....	5,500	360	1,310	.936	1.04
December.....	3,580	340	841	.601	.69
January.....	2,800	800	1,150	.821	.95
February.....	968	320	570	.407	.42
March.....	16,600	620	3,780	2.70	3.11
April.....	6,600	852	3,000	2.14	2.39
May.....	3,020	770	1,730	1.24	1.43
June.....	8,340	269	1,240	.886	.99
July.....	1,100	108	292	.209	.24
August.....	2,090	108	379	.271	.31
September.....	423	157	271	.194	.23
The year.....	16,600	108	1,240	.886	12.02

* Estimated.

GENESEE RIVER AT DRIVING PARK AVENUE, ROCHESTER, N.Y.

LOCATION.—Water-stage recorder 40 feet below plant 5 of Rochester Gas & Electric Corporation and 100 feet above Driving Park Avenue Bridge, in Rochester, Monroe County.

DRAINAGE AREA.—2,460 square miles.

RECORDS AVAILABLE.—December 1919 to September 1933.

DISCHARGE.—Maximum during year, 19,900 second-feet Mar. 16 (gage height, 10.03 feet); minimum, about 30 second-feet, occurs frequently when power plant shuts down.

1919-33: Maximum, about 29,600 second-feet Dec. 2, 1927 (gage height, 13.5 feet); minimum, approaching zero, occurs frequently during low-water periods when power plant shuts down. Average, 13 years (1920-33), 2,750 second-feet.

REMARKS.—Records good. Barge Canal crosses river about 9 miles upstream. It discharges water from Lake Erie into Genesee River and diverts, in general, a smaller amount to the east for canal purposes. Some additional regulation is provided by headwater storage in Canadea Reservoir.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	792	1,140	1,460	5,190	2,000	1,330	6,400	2,140	2,960	1,370	824	976
2.....	737	1,110	1,410	3,710	2,140	1,360	8,190	2,090	2,460	1,070	801	911
3.....	721	1,140	1,310	2,890	2,170	1,460	7,910	2,290	2,070	1,170	734	857
4.....	754	1,150	1,290	2,460	1,830	1,380	7,840	2,970	1,910	1,220	720	876
5.....	1,010	1,140	1,510	2,380	1,270	1,190	7,770	3,660	1,830	1,920	803	868
6.....	1,170	970	1,480	2,240	1,340	1,600	6,860	2,980	1,770	1,670	732	966
7.....	938	1,020	1,550	2,340	1,400	1,360	6,500	3,010	2,740	1,370	787	1,040
8.....	915	932	1,600	1,860	1,540	3,920	10,800	3,740	4,150	1,170	823	1,060
9.....	868	883	1,650	2,270	1,420	8,680	9,390	3,310	10,300	973	770	989
10.....	890	1,480	1,570	1,910	1,340	4,950	6,790	2,770	5,770	1,070	759	832
11.....	1,010	5,430	1,170	1,910	1,140	3,000	5,350	2,640	2,960	973	760	836
12.....	1,030	5,180	1,670	1,940	916	1,990	5,010	2,630	2,330	970	928	834
13.....	957	2,940	1,420	1,700	1,180	2,570	6,340	7,550	1,970	973	1,210	770
14.....	949	2,140	1,230	1,580	1,280	5,060	6,150	9,890	1,780	976	1,100	768
15.....	733	1,790	1,160	1,240	1,390	15,000	4,440	7,440	1,660	975	1,090	710
16.....	666	1,580	996	1,970	1,410	18,100	4,110	4,420	1,590	979	1,000	767
17.....	798	1,420	902	1,950	1,340	18,600	4,580	3,630	1,560	978	942	860
18.....	721	1,420	586	1,860	1,080	10,900	6,410	3,320	1,430	978	848	1,070
19.....	920	1,740	866	1,980	1,180	7,980	7,960	3,130	1,520	974	825	1,100
20.....	1,060	3,430	939	2,130	1,300	7,060	8,310	2,630	1,550	975	764	1,080
21.....	954	4,770	1,070	2,750	1,370	10,900	6,000	2,300	1,460	874	774	1,040
22.....	809	3,190	1,160	2,500	1,380	16,500	4,400	3,220	1,370	878	779	1,060
23.....	716	2,380	1,320	3,030	1,550	15,200	3,870	2,830	1,270	877	763	927
24.....	868	2,100	1,550	4,080	1,550	9,240	3,490	2,530	1,150	879	1,210	843
25.....	917	1,830	3,160	3,380	1,800	5,810	2,880	3,440	1,110	871	1,230	922
26.....	939	1,770	4,390	2,580	1,630	4,780	2,740	4,770	1,190	870	2,360	981
27.....	917	1,610	3,350	2,480	1,890	4,860	2,660	3,500	1,620	734	1,760	1,010
28.....	888	1,570	2,400	3,070	1,350	4,390	2,440	3,530	1,950	875	1,210	1,020
29.....	890	1,240	1,930	3,350	-----	5,240	2,390	3,730	1,560	879	1,110	1,000
30.....	1,020	1,460	1,600	2,510	-----	4,250	2,120	3,870	1,410	874	1,070	984
31.....	978	-----	2,230	1,990	-----	4,160	-----	3,660	-----	819	983	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	1,170	666	889	-----	-----
November.....	5,430	883	2,000	-----	-----
December.....	4,390	586	1,610	-----	-----
January.....	5,190	1,240	2,490	-----	-----
February.....	2,170	916	1,470	-----	-----
March.....	18,100	1,190	6,460	-----	-----
April.....	10,800	2,120	5,670	-----	-----
May.....	9,890	2,090	3,670	-----	-----
June.....	10,300	1,110	2,280	-----	-----
July.....	1,920	794	1,020	-----	-----
August.....	2,360	720	983	-----	-----
September.....	1,100	710	931	-----	-----
The year.....	18,100	586	2,460	1.00	13.57

CANASERAGA CREEK NEAR DANSVILLE, N.Y.

LOCATION.—Water-stage recorder at highway bridge 1 mile west of Dansville, Livingston County.

DRAINAGE AREA.—148 square miles.

RECORDS AVAILABLE.—July 1910 to December 1912, July 1915 to June 1917, March 1919 to September 1933.

DISCHARGE.—Maximum during year, 3,160 second-feet Mar. 14 (gage height, 10.34 feet); minimum, 15 second-feet Aug. 2 (gage height, 6.30 feet).

1910-12, 1915-17, 1919-33: Maximum, about 6,900 second-feet Nov. 30, 1927 (gage height, 12.7 feet); minimum, 11 second-feet Dec. 4, 1930 (gage height, 5.93 feet). Average, 13 years (1920-33), 145 second-feet.

REMARKS.—Records good except those for periods of ice effect, Nov. 26-30, Dec. 9-23, Jan. 1-3, 12-15, 29-31, Feb. 4-22, Feb. 26 to Mar. 2, Mar. 6-7, 10-12, and that estimated, Oct. 7, which are fair.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Jul.	Aug.	Sept.
1.....	20	54	38	140	54	50	496	83	86	44	23	32
2.....	20	66	38	100	59	50	428	88	74	53	19	27
3.....	19	54	43	95	48	54	405	199	68	70	41	28
4.....	18	45	45	94	42	52	532	249	61	50	67	30
5.....	25	40	43	106	34	50	391	198	81	39	32	26
6.....	92	37	41	77	32	46	290	261	108	36	22	25
7.....	46	41	45	74	38	48	822	362	167	33	20	23
8.....	26	40	48	68	40	583	502	214	366	32	22	22
9.....	23	40	38	61	34	388	370	177	163	30	25	22
10.....	23	500	36	54	30	200	294	170	108	28	23	22
11.....	23	220	36	55	28	150	241	160	86	27	39	21
12.....	27	131	36	44	26	130	204	147	70	26	28	22
13.....	26	96	34	36	26	181	312	140	61	25	50	21
14.....	23	77	32	34	34	1,950	245	144	57	25	34	32
15.....	24	63	32	36	32	1,750	202	134	53	25	27	30
16.....	24	57	30	43	30	648	184	120	55	33	23	26
17.....	26	57	28	46	34	481	245	114	50	28	21	25
18.....	46	54	28	45	38	410	392	106	46	25	19	23
19.....	40	326	28	63	42	335	345	96	44	23	20	23
20.....	34	273	26	79	48	436	281	114	39	21	19	23
21.....	30	163	28	57	48	1,120	237	198	36	21	16	27
22.....	28	120	32	72	50	612	198	131	34	28	19	28
23.....	27	94	46	117	55	380	170	103	33	23	23	27
24.....	27	86	224	84	59	290	150	161	32	26	187	25
25.....	26	74	173	68	55	225	134	172	33	25	115	25
26.....	28	70	123	84	50	202	125	117	56	25	61	25
27.....	68	55	86	112	44	204	114	195	80	23	46	25
28.....	46	48	77	94	48	277	106	140	46	22	38	28
29.....	40	42	59	55	-----	209	100	117	38	23	34	25
30.....	40	40	63	42	-----	217	90	120	36	21	28	23
31.....	38	-----	290	42	-----	299	-----	100	-----	21	27	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	92	18	32.4	0.219	0.25
November.....	500	37	102	.689	.77
December.....	290	26	62.1	.420	.48
January.....	140	34	70.2	.474	.55
February.....	59	26	41.4	.280	.29
March.....	1,950	46	388	2.62	3.02
April.....	822	90	290	1.96	2.19
May.....	362	83	156	1.05	1.21
June.....	366	32	75.6	.511	.57
July.....	70	21	30.0	.203	.23
August.....	187	16	37.7	.255	.29
September.....	32	21	25.4	.172	.19
The year.....	1,950	16	110	.743	10.04

CONESUS CREEK NEAR LAKEVILLE, N.Y.

LOCATION.—Staff gage at highway bridge known locally as Millville Bridge, 1½ miles below Lakeville, Livingston County.

DRAINAGE AREA.—72 square miles.

RECORDS AVAILABLE.—November 1919 to September 1933.

DISCHARGE.—Maximum during year, 189 second-feet May 14 (gage height, 2.22 feet); minimum, 0.4 second-foot Dec. 18, 20, 21.

1919-33: Maximum, about 625 second-feet Dec. 1, 1928 (gage height, 3.6 feet from graph based on gage readings); minimum, that of Dec. 18, 20, 21, 1932. Average, 13 years (1920-33), 51.6 second-feet.

REMARKS.—Records good except those for periods of ice effect, Jan. 29, Feb. 4-6, 9-14, Mar. 12, period of backwater from trash June 6-10, and extremely low stages, which are fair. Natural storage and regulation afforded by Conesus Lake. Water supply for Avon and Geneseo taken from Conesus Lake.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	2.0	2.0	9.4	9.4	11	12	124	117	120	15	1.8	17
2.....	2.8	1.8	8.0	5.5	11	14	124	111	117	14	2.0	17
3.....	2.8	2.0	5.9	5.5	8.9	14	133	108	114	12	2.0	17
4.....	3.1	2.0	4.8	5.9	8	14	165	108	108	10	1.2	17
5.....	3.1	1.8	3.7	5.9	8	14	147	108	105	8.4	1.0	16
6.....	5.9	1.8	2.8	8.0	9	14	165	108	100	23	.8	15
7.....	4.4	1.6	3.7	7.5	12	15	175	108	100	17	.7	15
8.....	4.4	1.4	3.4	7.5	12	44	185	108	95	11	.7	14
9.....	3.7	5.5	3.1	7.1	12	43	175	100	95	8.8	.7	14
10.....	3.7	8.9	2.8	7.5	11	36	175	99	90	8.8	1.0	14
11.....	3.4	8.4	2.3	7.1	10	32	165	96	91	6.2	2.4	13
12.....	3.1	3.7	2.3	6.3	10	30	165	99	89	5.8	10	12
13.....	2.8	2.8	2.0	7.1	10	37	156	173	86	9.3	3.0	12
14.....	2.8	2.8	1.4	8.0	11	52	156	185	82	10	2.4	11
15.....	2.6	3.4	.8	7.5	12	104	156	185	79	9.3	2.8	10
16.....	2.8	3.4	.6	7.1	12	91	185	165	77	8.4	3.3	9.3
17.....	2.3	3.4	.6	7.1	12	79	175	156	74	7.5	3.9	8.4
18.....	2.8	3.4	.4	7.1	12	79	175	156	71	7.5	3.9	6.6
19.....	2.8	3.4	.6	7.1	12	88	165	156	68	7.5	3.3	5.1
20.....	2.8	4.1	.6	7.5	13	132	165	147	66	7.5	2.8	4.8
21.....	2.6	4.4	.4	8.0	13	145	156	140	58	7.5	2.4	5.1
22.....	2.3	4.8	.6	11	12	137	156	133	56	6.6	2.4	5.1
23.....	2.0	5.1	.8	12	11	130	156	130	51	5.8	3.9	5.1
24.....	1.8	5.1	.8	11	10	130	156	133	49	5.8	5.1	10
25.....	4.1	5.1	1.0	11	15	125	137	130	48	6.6	5.8	9.8
26.....	4.8	5.5	1.6	13	15	127	124	130	45	6.2	5.8	9.8
27.....	2.8	6.3	2.3	12	14	127	120	130	40	5.8	5.8	9.3
28.....	2.3	8.0	3.1	12	13	124	117	128	35	5.8	5.8	9.3
29.....	2.3	9.4	4.1	12	-----	124	120	127	19	1.1	5.8	9.3
30.....	2.3	9.9	6.3	11	-----	124	124	124	15	1.4	7.9	10
31.....	2.3	-----	12	11	-----	120	-----	120	-----	1.6	14	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	5.9	1.8	3.02	0.042	0.05
November.....	9.9	1.4	4.37	.061	.07
December.....	12	.4	2.97	.041	.05
January.....	13	5.5	8.57	.119	.14
February.....	15	8	11.4	.158	.16
March.....	145	12	76.0	1.06	1.22
April.....	185	117	153	2.12	2.36
May.....	185	96	130	1.81	2.09
June.....	120	15	74.8	1.04	1.16
July.....	23	1.1	8.43	.117	.13
August.....	14	.7	3.69	.051	.06
September.....	17	4.8	11.0	.153	.17
The year.....	185	.4	40.6	.564	7.66

CANADICE LAKE OUTLET NEAR HEMLOCK, N.Y.

LOCATION.—Hook gage above weir at foot of Canadice Lake, Ontario County, 4 miles southeast of Hemlock, Livingston County.

DRAINAGE AREA.—12.6 square miles.

RECORDS AVAILABLE.—April 1903 to September 1933.

REMARKS.—Data collected, computed, and furnished for publication by city engineer of Rochester, N.Y.

Month	Mean elevation of lake above low-water mark (feet)	Discharge in second-feet		Run-off in inches
		Mean	Per square mi ^a	
October.....	-1.243	4.512	0.358	0.413
November.....	-1.073	3.628	.288	.321
December.....	-1.140	5.363	.426	.491
January.....	-.949	8.076	.641	.739
February.....	-1.068	7.176	.570	.694
March.....	.069	18.029	1.431	1.650
April.....	1.233	31.422	2.494	2.782
May.....	2.763	4.840	.384	.443
June.....	3.218	14.882	1.181	1.318
July.....	1.000	18.025	1.431	1.650
August.....	-.262	6.490	.515	.594
September.....	-1.210	4.287	.340	.379
The year.....	.112	10.556	.838	11.374

NOTE.—Terminal water-surface elevation for year was 0.50 foot lower than that for preceding year, corresponding to a decrease in storage of 13,507,956 cubic feet, or a discharge of 0.428 second-foot for year. This correction applied to the above gives a mean for year of 10.128 second-feet, 0.804 second-foot per square mile, and 10.913 inches run-off from drainage area.

FALL CREEK NEAR ITHACA, N.Y.

LOCATION.—Water-stage recorder in Forest Home, Tompkins County, half a mile above Cornell University Dam and 1½ miles northwest of Ithaca.

DRAINAGE AREA.—126 square miles.

RECORDS AVAILABLE.—February 1925 to September 1933, July 1908 to June 1909, at station 1¼ miles below present site.

DISCHARGE.—Maximum during year, 1,700 second-feet Aug. 24 (gage height, 3.34 feet); minimum, 14 second-feet Oct. 4 (gage height, 0.38 foot).

1925-33: Maximum, about 6,290 second-feet Nov. 16, 1926; maximum gage height, 7.6 feet Feb. 27, 1929; minimum, about 3 second-feet Aug. 25, 1927 (gage height, 0.18 foot).

REMARKS.—Records good except those for periods of ice effect, Nov. 28, 29, Dec. 10-24, Jan. 30, 31, Feb. 6-20, and those estimated, which are fair. Water supply for Cornell University diverted from Fall Creek about 1 mile above gage.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	20	164	85	159	58	94	802	• 115	• 44	• 30	• 19	59
2.....	19	230	94	118	70	79	826	• 100	• 40	• 32	• 19	53
3.....	20	160	97	104	58	81	603	• 130	• 38	• 60	• 25	48
4.....	17	120	101	111	50	79	537	• 170	• 40	• 40	• 62	93
5.....	29	104	109	160	38	72	498	• 120	• 41	• 30	• 30	89
6.....	515	106	96	122	36	• 65	364	• 125	• 185	• 28	• 25	59
7.....	375	316	96	113	55	• 75	1,070	• 145	• 75	• 26	• 23	56
8.....	136	234	94	99	70	• 800	784	114	• 58	• 25	• 23	58
9.....	• 95	160	76	92	55	• 550	460	101	• 47	• 24	• 23	48
10.....	• 75	445	42	85	38	• 260	341	122	• 38	• 23	• 22	43
11.....	• 65	336	44	86	36	• 160	284	119	• 34	• 23	22	35
12.....	• 60	214	50	96	34	• 120	473	98	• 31	• 22	25	36
13.....	• 57	166	48	51	32	• 160	491	• 98	• 28	• 22	• 30	31
14.....	54	144	44	59	34	• 800	• 420	• 110	• 28	• 21	• 75	47
15.....	41	130	40	59	44	• 1,400	• 290	• 88	29	• 20	• 280	80
16.....	36	120	38	69	50	• 700	251	• 75	29	• 30	• 100	72
17.....	32	133	36	76	50	• 500	496	• 70	28	• 28	• 50	68
18.....	59	130	34	81	55	• 458	576	• 65	• 26	• 23	• 38	53
19.....	99	408	32	82	65	• 412	466	• 60	• 25	• 20	• 33	44
20.....	73	574	32	122	90	591	323	• 55	• 24	• 19	30	35
21.....	59	282	34	83	111	970	247	• 78	• 23	• 19	• 28	40
22.....	52	210	48	106	87	741	208	• 67	• 25	• 30	• 34	51
23.....	42	140	60	210	96	401	186	• 60	• 24	• 24	• 50	68
24.....	35	150	200	136	118	329	161	• 63	• 23	• 21	1,030	53
25.....	38	142	273	94	87	291	151	• 73	• 21	• 20	792	53
26.....	36	133	199	97	78	282	189	• 63	• 80	• 20	317	60
27.....	255	87	116	94	64	302	220	• 69	• 48	• 19	171	49
28.....	200	70	104	87	72	407	189	• 70	• 38	• 19	127	91
29.....	116	75	86	51	-----	301	154	• 62	• 34	• 20	96	67
30.....	94	81	89	50	-----	296	• 130	• 57	• 32	• 19	79	50
31.....	83	-----	203	55	-----	369	-----	• 52	-----	• 19	67	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	515	17	93.1	0.739	0.85
November.....	574	70	192	1.52	1.70
December.....	273	32	87.1	.691	.80
January.....	210	50	97.0	.770	.89
February.....	118	32	61.8	.490	.51
March.....	1,400	65	392	3.11	3.58
April.....	1,070	130	406	3.22	3.59
May.....	170	52	90.1	.715	.82
June.....	185	21	41.2	.327	.36
July.....	60	19	25.0	.198	.23
August.....	1,030	19	121	.960	1.11
September.....	93	31	56.3	.447	.50
The year.....	1,400	17	139	1.10	14.94

• Estimated.

NOTE.—During the year Cornell University diverted 27,600,000 cubic feet of water for its supply, thus reducing the mean yearly discharge about 0.9 second-foot.

OWASCO LAKE OUTLET NEAR AUBURN, N.Y.

LOCATION.—Water-stage recorder above concrete dam $2\frac{1}{2}$ miles below center of Auburn, Cayuga County, and 4 miles below State dam at outlet of Owasco Lake.

DRAINAGE AREA.—206 square miles.

RECORDS AVAILABLE.—November 1912 to September 1933.

DISCHARGE.—Maximum during year, 920 second-feet Apr. 8 (gage height, 3.32 feet); minimum, 8 second-feet Feb. 7 (gage height, 1.44 feet).

1912-33: Maximum, 2,750 second-feet during period Mar. 25-30, 1913 (gage height, from flood marks, 6.4 feet); minimum, 3.8 second-feet Aug. 21, 1920. Average, 20 years (1913-33), 288 second-feet.

REMARKS.—Records good except those for period of backwater from weeds, June 16 to Sept. 30, and those estimated, which are fair. Diurnal fluctuation in flow caused by operation of mills in Auburn; seasonal regulation at State dam. Water supply for Auburn taken from Owasco Lake, part of which returns to outlet above gaging station as sewage.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	82	84	* 130	110	170	110	620	390	225	12'	122	90
2.....	80	78	* 120	120	175	114	640	270	225	120	118	92
3.....	88	88	* 125	118	175	120	740	270	230	10'	122	80
4.....	82	82	116	114	175	120	760	260	210	155	120	88
5.....	96	84	118	122	175	125	760	260	235	11'	118	88
6.....	124	76	120	120	145	118	760	260	230	12'	110	100
7.....	90	88	124	114	135	125	800	250	185	12'	100	98
8.....	84	84	124	* 120	175	145	860	270	185	145	110	92
9.....	82	90	120	* 170	112	135	860	260	195	12'	100	88
10.....	86	106	125	* 210		* 125	840	260	210	145	100	84
11.....	76	96	122	190		* 140	840	230	220	13'	104	82
12.....	82	106		175		* 130	840	270	190	13'	92	82
13.....	82	102		180		* 135	840	260	185	122	92	80
14.....	80	98	* 130	175	* 110	* 150	820	225	175	12'	92	82
15.....	78	110		190		* 165	760	250	175	13'	88	76
16.....	70	110		190		* 185	740	240	135	14'	92	82
17.....	82	114		190		* 210	760	235	130	13'	88	80
18.....	90	110		180		* 240	760	245	124	135	88	76
19.....	88	125		190	96	290	740	245	130	135	88	82
20.....	82	145	* 110	190	145	370	700	235	122	145	76	72
21.....	76	110		185	108	480	680	190	135	15'	78	76
22.....	74	130		195	98	600	640	245	135	14'	86	78
23.....	68	150		195	110	620	620	250	124	14'	86	68
24.....	78	122		200	114	620	560	235	130	13'	104	74
25.....	70	124		205	110	600	520	235	122	14'	110	98
26.....	78	112		190	116	580	490	270	135	14'	88	72
27.....	104	* 120	* 100	190	112	580	490	280	118	13'	82	76
28.....	78	* 130		170	100	600	450	300	124	12'	98	78
29.....	74	* 120		185		600	430	320	135	13'	88	78
30.....	56	* 125		190		560	410	225	145	122	98	68
31.....	86			180		560		185		125	90	

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	124	56	82.1		
November.....	150	76	107		
December.....			115		
January.....	210	110	169		
February.....	175	96	126		
March.....	620	110	311		
April.....	860	410	691		
May.....	390	185	255		
June.....	235	118	167		
July.....	155	100	132		
August.....	122	76	97.7		
September.....	100	68	82.0		
The year.....	860	56	195	0.947	12.81

* Estimated.

NOTE.—Elevation of surface of Owasco Lake decreased from 705.14 feet on Oct. 1 to 705.09 feet on Sept. 30. This indicates a net decrease in storage of about 14,357,000 cubic feet, equivalent to an average yearly discharge of 0.46 second-foot, 0.002 second-foot per square mile, or a run-off of 0.027 inch on drainage area.

EAST BRANCH OF FISH CREEK AT TABERG, N.Y.

LOCATION.—Water-stage recorder at highway bridge in Taberg, Oneida County, just below mouth of Furnace Creek.

DRAINAGE AREA.—188 square miles.

RECORDS AVAILABLE.—April 1923 to September 1933.

DISCHARGE.—Maximum during year, about 16,500 second-feet Oct. 6 (gage height, 9.18 feet); minimum, 11 second-feet Sept. 2 (gage height, 0.08 foot).

1923-33: Maximum, that of Oct. 6, 1932; minimum, that of Sept. 2, 1933.

Average, 10 years (1923-33), 584 second-feet.

REMARKS.—Records good below and fair above 3,000 second-feet, except those for periods of ice effect, Dec. 17-21, Feb. 6-15, 26-28, Mar. 5-8, 11-13, and those estimated, which are fair. Small amount of water is diverted above station by city of Oneida for municipal supply. Some diurnal fluctuation at low stages.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	325	2,830	256	1,240	237	212	1,280	486	332	193	22	50
2	387	1,900	256	759	330	203	2,180	576	216	110	30	17
3	335	812	349	552	288	195	2,590	1,480	173	67	21	25
4	224	462	445	502	267	195	2,560	1,300	* 161	46	23	28
5	2,360	872	470	541	233	180	2,170	685	* 136	36	20	44
6	13,600	1,210	398	465	170	170	2,440	519	119	31	* 16	15
7	4,940	1,080	543	407	190	160	4,160	440	110	29	* 13	85
8	1,670	787	583	326	480	400	2,610	367	87	28	31	60
9	880	585	359	326	360	540	1,630	318	77	34	39	65
10	579	2,350	303	295	280	398	1,410	326	70	34	28	* 53
11	530	1,830	277	288	240	320	1,880	326	70	31	37	* 59
12	690	1,060	243	285	200	300	3,140	281	63	31	39	23
13	885	832	270	270	190	360	2,110	402	53	29	93	41
14	664	664	267	250	200	548	1,960	416	52	22	97	23
15	536	585	243	237	200	766	2,360	315	55	21	49	57
16	465	568	221	230	215	752	2,180	253	56	23	33	35
17	394	658	200	290	215	738	3,760	221	58	29	25	* 34
18	398	524	190	389	212	664	4,260	195	54	23	25	* 35
19	464	1,560	180	833	197	558	2,910	178	50	20	34	* 39
20	450	1,840	170	1,060	233	470	1,980	192	48	19	* 44	* 59
21	545	888	200	678	315	565	1,280	* 215	46	17	* 28	103
22	795	571	292	660	315	645	960	* 176	45	* 20	* 25	182
23	515	430	431	2,260	307	536	695	* 145	42	* 18	* 98	180
24	372	480	1,420	1,270	326	408	552	138	38	16	* 58	118
25	311	435	1,580	620	311	456	508	138	34	15	* 320	87
26	274	398	1,530	524	240	* 416	546	136	35	14	* 240	73
27	910	230	826	376	200	* 380	508	127	47	14	* 160	66
28	878	267	635	342	200	372	475	154	37	14	* 86	64
29	759	250	470	243	-----	346	814	240	33	15	62	63
30	* 615	243	402	230	-----	416	684	758	50	13	57	56
31	470	-----	2,830	230	-----	486	-----	485	-----	13	23	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	13,600	224	1,200	6.38	7.36
November	2,830	230	907	4.82	5.38
December	2,830	170	543	2.89	3.33
January	2,260	230	548	2.91	3.36
February	480	170	255	1.36	1.42
March	766	160	427	2.27	2.62
April	4,260	475	1,890	10.0	11.22
May	1,480	127	387	2.06	2.38
June	332	33	81.6	.434	.48
July	193	13	33.1	.176	.20
August	320	13	60.5	.322	.37
September	182	15	61.3	.326	.36
The year	13,600	13	533	2.84	33.48

* Estimated.

BLACK RIVER NEAR BOONVILLE, N.Y.

LOCATION.—Water-stage recorder at highway bridge three-quarters of a mile above mouth of Sugar River and 2 miles northeast of Boonville, Oneida County. Chain gage with same datum at same location prior to Sept. 27, 1933.

DRAINAGE AREA.—305 square miles.

RECORDS AVAILABLE.—February 1911 to September 1933.

DISCHARGE.—Maximum during year, 6,240 second-feet Oct. 7 (gage height, 10.5 feet); minimum, 46 second-feet Aug. 10, 11, 12 (gage height, 3.28 feet).

1911-33: Maximum, about 10,000 second-feet Mar. 28, 1913 (gage height, about 12.5 feet); minimum, about 5 second-feet Aug. 26, 1918 (gage height, 2.40 feet). Average, 22 years (1911-33), 666 second-feet.

REMARKS.—Records good except those for periods of ice effect, Dec. 12-22, Feb. 3 to Mar. 7, and Mar. 12-13, which are fair. Flow partly regulated by storage in State Pond at Forestport and other headwater reservoirs. Forestport Feeder diverts water from State Pond at Forestport. That portion of diversion which does not pass down Black River Canal (flowing south) returns to Black River below station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Jul	Aug.	Sept.
1	377	1,160	457	1,560	545	500	839	700	619	416	94	202
2	358	1,950	457	993	500	480	1,290	755	545	416	101	202
3	377	1,790	457	700	500	480	1,720	940	457	366	106	156
4	322	1,380	500	672	440	480	1,540	1,000	416	377	107	146
5	954	1,000	522	645	380	480	1,290	875	377	322	101	120
6	4,040	940	500	593	320	460	1,680	815	340	229	95	104
7	5,810	1,000	522	500	340	460	2,780	755	322	167	74	202
8	3,490	940	545	457	600	545	3,750	755	289	156	61	215
9	2,510	1,040	522	416	500	500	2,140	672	229	166	55	202
10	1,440	1,660	457	396	440	457	1,520	619	202	156	48	156
11	875	2,020	416	377	400	457	1,540	672	190	167	46	124
12	755	1,290	400	340	360	440	2,300	645	178	202	52	110
13	700	1,000	400	340	360	420	1,860	503	167	178	119	106
14	645	755	380	340	360	593	2,980	569	167	133	210	104
15	645	645	380	358	380	672	2,620	545	167	115	140	117
16	619	645	380	396	400	645	2,400	436	156	106	110	106
17	593	645	360	377	420	619	2,620	289	135	156	95	100
18	569	755	360	358	400	593	2,510	215	133	142	76	92
19	645	945	360	483	400	545	3,280	215	127	156	61	89
20	593	2,230	360	693	440	522	3,110	202	127	167	56	100
21	545	2,200	360	587	500	645	2,860	289	106	142	54	120
22	500	1,610	400	803	500	875	2,180	289	100	125	83	138
23	500	1,450	457	1,340	550	755	1,540	243	89	135	146	167
24	500	1,140	755	1,070	550	619	1,210	229	76	146	319	131
25	500	700	875	875	500	645	1,000	229	69	124	545	102
26	500	645	1,000	672	500	700	755	215	177	117	500	88
27	619	500	875	593	480	645	755	202	330	115	473	81
28	755	478	755	569	500	545	672	202	478	107	250	84
29	593	478	645	545	-----	522	755	273	457	108	178	81
30	500	457	593	500	-----	545	940	500	436	95	229	87
31	529	-----	965	500	-----	545	-----	619	-----	95	215	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	5,810	322	1,040	-----	-----
November	2,230	457	1,110	-----	-----
December	1,000	360	530	-----	-----
January	1,560	340	614	-----	-----
February	600	320	449	-----	-----
March	875	420	561	-----	-----
April	3,750	672	1,950	-----	-----
May	1,000	202	502	-----	-----
June	619	69	255	-----	-----
July	416	95	181	-----	-----
August	545	46	155	-----	-----
September	215	81	128	-----	-----
The year	5,810	46	622	2.04	27.67

BLACK RIVER AT WATERTOWN, N. Y.

LOCATION.—Water-stage recorder at Vanduzee Street Bridge, in Watertown' Jefferson County.

DRAINAGE AREA.—1,880 square miles.

RECORDS AVAILABLE.—July 1920 to September 1933.

DISCHARGE.—Maximum during year, 26,000 second-feet Oct. 8 (gage height, 8.90 feet); minimum, 57 second-feet July 31 (gage height, 0.07 foot).

1920-33: Maximum, 33,900 second-feet Apr. 9, 1928 (gage height, 10.6 feet); minimum, that of July 31, 1933. Average, 13 years (1920-33), 4,050 second-feet.

REMARKS.—Records good except those for periods of ice effect, Dec. 16-17 and Feb. 9-10, and those estimated, which are fair. Flow partly regulated by storage in Stillwater reservoir, Fulton Chain of Lakes, Forestport Reservoir and other reservoirs in upper drainage basin. During canal season water is diverted out of drainage basin through Forestport Feeder and Black River Canal (flowing south). Large diurnal fluctuation caused by operation of mills and power plants in Watertown and above.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	2,170	4,940	2,420	7,350	2,450	2,670	5,460	5,350	4,620	1,840	848	1,320
2.....	1,790	7,340	2,260	5,080	3,210	2,600	9,970	5,390	4,430	1,740	1,060	1,290
3.....	1,760	7,680	2,450	5,240	3,540	2,550	10,900	5,720	3,760	1,880	1,110	976
4.....	2,130	8,470	2,930	6,520	3,050	2,210	11,900	7,150	2,720	1,650	1,100	770
5.....	2,290	8,220	3,390	7,230	3,010	2,490	12,300	8,150	2,390	1,250	1,640	942
6.....	8,330	7,500	3,470	7,020	2,830	1,990	12,500	8,220	2,390	1,340	827	1,050
7.....	14,500	6,680	3,560	6,690	2,440	2,320	12,700	7,230	2,190	1,200	583	1,000
8.....	23,300	6,310	3,860	5,420	2,990	2,400	13,800	6,300	1,880	1,190	781	1,040
9.....	20,600	5,720	3,600	3,930	3,600	3,040	14,800	5,440	1,960	1,000	842	1,210
10.....	14,300	6,300	2,590	4,100	3,400	2,880	13,900	4,830	1,470	1,120	949	935
11.....	10,800	7,850	2,160	3,640	3,340	2,760	12,300	4,160	1,430	1,140	1,000	705
12.....	8,300	8,060	2,560	3,870	3,250	2,760	10,900	3,690	1,400	1,210	1,510	998
13.....	6,920	7,630	2,410	2,910	3,150	2,700	10,800	3,170	1,670	1,350	614	1,090
14.....	5,920	7,280	2,450	2,330	3,500	2,760	11,100	3,370	1,290	1,480	536	1,030
15.....	5,000	6,490	2,460	2,570	3,280	4,330	11,100	3,080	1,350	1,310	863	1,120
16.....	4,060	5,760	2,600	2,780	3,090	5,240	11,100	2,680	1,220	1,110	1,210	1,050
17.....	3,540	4,980	2,600	2,590	2,870	5,510	12,000	2,770	1,310	1,010	1,200	891
18.....	3,520	4,420	2,420	3,140	2,480	4,820	13,900	2,560	1,360	831	1,220	851
19.....	3,440	4,460	2,520	3,340	2,370	4,420	16,000	2,280	1,100	1,260	988	958
20.....	3,440	6,750	2,560	4,490	2,930	4,050	16,900	2,150	1,280	1,070	902	1,030
21.....	3,320	7,460	2,660	4,420	3,090	4,380	15,200	2,170	1,250	1,250	840	1,080
22.....	3,380	7,980	2,590	4,140	3,420	5,320	12,500	2,270	1,240	1,270	884	1,430
23.....	3,030	7,860	2,910	6,070	3,360	5,230	10,400	2,430	1,280	956	1,040	1,810
24.....	2,960	6,630	3,590	7,240	3,580	4,940	9,300	2,870	1,260	1,110	1,260	1,380
25.....	2,940	5,460	6,530	7,040	3,510	4,600	7,300	2,280	1,030	743	1,560	1,350
26.....	2,510	4,700	9,580	6,330	3,360	4,300	6,250	2,320	1,120	961	2,880	1,480
27.....	2,790	3,070	8,800	5,250	2,890	3,940	5,210	2,320	1,040	1,010	3,120	1,420
28.....	4,030	2,970	7,920	4,010	2,820	4,370	5,190	1,950	1,950	963	2,230	1,140
29.....	4,460	3,310	7,100	2,400	-----	4,170	5,000	2,030	2,160	1,620	1,820	1,290
30.....	4,220	2,700	5,970	1,900	-----	3,770	4,930	2,290	1,940	780	1,350	1,380
31.....	4,970	-----	7,060	2,580	-----	4,080	-----	3,470	-----	503	1,430	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	23,300	1,760	5,960	3.17	3.66
November.....	8,470	2,700	6,170	3.28	3.66
December.....	9,580	2,160	3,870	2.06	2.38
January.....	7,350	1,900	4,570	2.43	2.80
February.....	3,600	2,370	3,100	1.65	1.72
March.....	5,510	1,990	3,660	1.95	2.25
April.....	16,900	4,930	10,900	5.80	6.47
May.....	8,220	1,950	3,870	2.06	2.38
June.....	4,620	1,030	1,850	.984	1.10
July.....	1,880	503	1,200	.638	.74
August.....	3,120	536	1,230	.654	.75
September.....	1,810	705	1,130	.601	.67
The year.....	23,300	503	3,950	2.10	28.58

• Estimated.

FORESTPORT FEEDER NEAR BOONVILLE, N. Y.

LOCATION.—Slope station with two water-stage recorders at lower end of feeder, above point where it enters the basin at Boonville, Oneida County. Gage 1 is in Hawkinsville; gage 2 is 2.53 miles downstream from gage 1 and 1 mile upstream from basin in Boonville.

RECORDS AVAILABLE.—October 1915 to September 1933 during canal seasons.

REMARKS.—Records fair. Discharge determined by use of Chezy formula, variation in coefficient "C" during season being based on current-meter measurements. Effective slope relation nonexistent Apr. 19–20. May 7–12; flow determined from stage-discharge relation. Canal diverts water from Black River at Forestport.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Apr.	May	June	July	Aug.	Sept.
1.....	69	* 72	-----	34	34	107	95	* 141
2.....	78	* 96	-----	35	* 35	117	95	* 137
3.....	87	* 64	-----	46	34	120	95	147
4.....	87	* 47	-----	41	33	115	97	144
5.....	125	* 42	-----	39	32	119	92	149
6.....	152	* 49	-----	36	34	122	91	* 150
7.....	58	49	-----	32	38	123	101	* 119
8.....	61	* 47	-----	22	49	120	121	* 129
9.....	* 63	* 41	39	22	57	117	135	* 153
10.....	* 57	58	37	26	58	122	137	150
11.....	* 53	61	39	27	58	123	140	154
12.....	58	54	59	26	60	135	136	153
13.....	* 63	45	57	34	63	151	125	147
14.....	* 58	42	* 55	39	73	150	86	* 146
15.....	* 52	* 40	49	* 36	* 75	146	143	* 146
16.....	* 50	* 39	43	* 37	* 77	142	150	* 144
17.....	48	* 41	59	* 37	* 79	145	150	141
18.....	51	* 40	62	* 36	84	127	* 150	147
19.....	54	* 61	31	* 37	88	106	* 148	148
20.....	52	* 78	* 31	37	89	102	144	150
21.....	49	52	* 37	38	91	101	148	150
22.....	49	* 55	* 40	36	109	98	151	151
23.....	45	* 58	39	35	110	94	150	149
24.....	44	* 53	38	35	110	96	* 128	149
25.....	38	-----	35	35	109	96	* 69	147
26.....	32	-----	37	* 35	118	95	117	148
27.....	41	-----	38	35	119	96	118	150
28.....	* 46	-----	36	35	121	94	151	149
29.....	* 34	-----	42	39	122	91	154	* 150
30.....	* 36	-----	39	40	119	87	154	147
31.....	* 34	-----	-----	38	-----	94	* 154	-----

Month	Maximum	Minimum	Mean	Month	Maximum	Minimum	Mean
October.....	152	32	58.8	June.....	122	32	75.9
November 1–24.....	96	39	53.5	July.....	151	87	115
April 9–30.....	62	31	42.8	August.....	154	69	127
May.....	46	22	34.8	September.....	154	119	146

* Estimated.

NOTE.—Canal probably carried normal winter flow of about 30 second-feet from Nov. 25, 1932, to Apr. 8, 1933.

BLACK RIVER CANAL (FLOWING SOUTH) NEAR BOONVILLE, N.Y.

LOCATION.—Two water-stage recorders, No. 1 on main canal at Lock 69 and No. 2 on Lansingkill Spillway 100 feet downstream from head gates in summit level of canal, 600 feet upstream from Lock 70, and 2 miles south of Boonville, Oneida County.

RECORDS AVAILABLE.—September 1915 to September 1933 during canal seasons.

REMARKS.—Records good except those estimated, which are fair. This record includes combined flow at gages 1 and 2 and represents total diversion from Black River through Forestport Feeder, which passes out of Black River Basin into Mohawk River Basin.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	June	July	Aug.	Sept.	Day	Oct.	Nov.	June	July	Aug.	Sept.
1.....	56	97	-----	60	54	112	16.....	47	2	34	* 119	102	126
2.....	78	95	-----	92	55	118	17.....	37	2	32	* 108	104	138
3.....	74	45	-----	86	55	133	18.....	31	2	69	* 96	104	117
4.....	75	40	-----	107	54	133	19.....	39	54	53	* 77	113	115
5.....	122	37	-----	82	65	127	20.....	39	88	40	* 59	124	117
6.....	184	41	-----	68	78	128	21.....	35	30	41	* 59	111	120
7.....	60	41	-----	69	61	78	22.....	35	2	55	* 64	108	122
8.....	54	42	-----	81	72	84	23.....	* 33	-----	56	78	116	128
9.....	71	35	-----	107	90	130	24.....	* 30	-----	71	60	103	141
10.....	46	42	11	84	95	142	25.....	* 26	-----	85	55	35	121
11.....	34	57	27	72	94	120	26.....	* 22	-----	82	58	69	123
12.....	43	40	24	78	104	116	27.....	* 27	-----	73	54	102	119
13.....	42	51	16	97	116	117	28.....	* 30	-----	72	53	114	128
14.....	43	22	20	101	45	122	29.....	* 10	-----	67	64	114	118
15.....	42	3	25	* 107	80	116	30.....	* 4	-----	68	77	115	* 128
							31.....	3	-----	-----	59	114	-----
Month			Maxi- mum	Mini- mum	Mean		Month			Maxi- mum	Mini- mum	Mean	
October.....			184	3	47.5		July.....			119	53	78.4	
November 1-22.....			97	2	39.5		August.....			124	35	89.2	
June 10-30.....			85	11	48.6		September.....			142	78	121	

* Estimated.

NOTE.—Practically no diversion Nov. 23 to June 9.

MOOSE RIVER AT MCKEEVER, N.Y.

LOCATION.—Water-stage recorder half a mile west of McKeever, Herkimer County, and 2 miles below mouth of South Branch of Moose River.

DRAINAGE AREA.—365 square miles.

RECORDS AVAILABLE.—May 1922 to September 1933.

DISCHARGE.—Maximum during year, 10,600 second-feet Oct. 7 (gage height, 12.77 feet); minimum, 99 second-feet June 12 (gage height, 1.56 feet).

1922-33: Maximum, 11,000 second-feet June 22, 1922 (gage height, 12.9 feet); minimum, 64 second-feet Sept. 2, 1925 (gage height, 1.37 feet). Average, 11 years (1922-33), 872 second-feet.

REMARKS.—Records good except those for periods of ice effect, Nov. 28 to Dec. 1, Dec. 12-31, Jan. 12-16, Jan. 31 to Mar. 29, which are fair. Flow regulated to some extent by storage in Fulton Chain of Lakes. Diurnal fluctuation during medium and low stages caused by operation of paper mill in McKeever.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1-----	404	1,360	600	2,420	550	360	588	1,700	899	357	109	155
2-----	408	3,300	572	1,800	550	360	1,060	1,710	735	412	109	138
3-----	420	2,080	581	1,490	550	340	1,510	1,820	612	317	109	135
4-----	388	1,460	590	1,180	500	340	1,880	2,410	518	255	109	132
5-----	783	1,270	612	1,120	460	340	1,820	2,080	476	227	109	135
6-----	6,680	1,390	586	918	440	340	1,850	1,660	420	189	109	142
7-----	8,230	1,370	590	835	480	320	2,790	1,430	370	185	109	152
8-----	3,570	1,290	660	760	550	380	3,340	1,270	334	179	109	177
9-----	2,280	1,180	563	760	480	400	2,460	1,090	303	177	109	196
10-----	1,680	1,340	536	735	420	380	1,850	882	278	177	109	239
11-----	1,330	2,310	518	660	380	380	1,710	810	265	245	109	223
12-----	1,180	1,950	500	650	360	360	1,990	735	171	227	109	211
13-----	1,150	1,600	480	600	380	360	1,840	748	130	199	118	214
14-----	1,000	1,330	460	600	380	360	2,010	760	163	174	148	220
15-----	918	1,180	440	600	400	480	2,830	710	191	157	166	226
16-----	890	1,080	440	550	420	600	3,180	635	208	159	166	226
17-----	862	1,120	420	550	420	650	3,980	586	217	163	148	226
18-----	785	1,300	420	550	420	600	5,740	568	211	174	132	217
19-----	835	1,360	420	586	420	500	5,680	464	208	174	138	252
20-----	835	3,170	420	685	440	440	4,480	464	205	157	135	303
21-----	760	2,110	440	685	460	480	3,470	735	199	150	140	442
22-----	835	1,420	480	685	480	650	2,940	890	194	157	138	509
23-----	817	1,150	550	1,350	500	750	2,260	646	185	145	135	460
24-----	580	1,090	650	1,730	480	700	2,020	572	177	149	173	416
25-----	545	945	850	1,260	420	600	1,730	550	174	130	1,380	321
26-----	545	860	1,200	1,000	380	550	1,790	527	326	123	1,040	334
27-----	790	710	1,200	835	380	500	1,560	488	828	121	594	306
28-----	1,090	650	1,000	710	380	480	1,260	472	529	117	342	320
29-----	927	600	850	612	-----	480	1,380	460	362	114	268	396
30-----	862	600	750	572	-----	464	1,910	638	292	112	208	366
31-----	858	-----	1,500	550	-----	460	-----	812	-----	107	177	-----
Month	Maximum			Minimum			Mean			Per square mile		Run-off in inches
October-----	8,230			388			1,390			3.81		4.39
November-----	3,300			600			1,420			3.89		4.34
December-----	1,500			420			641			1.76		2.03
January-----	2,420			550			904			2.48		2.86
February-----	550			360			446			1.22		1.27
March-----	750			320			465			1.27		1.46
April-----	5,740			588			2,430			6.66		7.43
May-----	2,410			460			942			2.58		2.97
June-----	899			130			339			.929		1.04
July-----	412			109			184			.504		.68
August-----	1,380			109			228			.625		.72
September-----	509			132			260			.712		.79
The year-----	8,230			109			804			2.20		29.88

MIDDLE BRANCH OF MOOSE RIVER AT OLD FORGE, N.Y.

LOCATION.—Staff gage in Old Forge, Herkimer County, 400 feet below State dam.

DRAINAGE AREA.—52 square miles.

RECORDS AVAILABLE.—November 1911 to September 1933.

DISCHARGE.—Maximum during year, 379 second-feet Apr. 22 (gage height, 3.3 feet); minimum, about 1 second-foot Aug. 28–31 (gage height, 0.20 foot).

1911–33: Maximum, 862 second-feet Mar. 23, 1921; minimum, 0.7 second-foot Oct. 20–23, 1928 (gage height, 0.11 foot). Average, 21 years (1912–33), 109 second-feet.

REMARKS.—Records good except those for periods of backwater, Oct. 6–16, Apr. 18–21, Sept. 21–22, which are fair. Flow regulated by storage in Fulton Chain of Lakes.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	115	79	129	182	129	63	48	112	190	59	31	39
2	115	97	129	182	129	63	14	94	156	59	31	39
3	115	150	129	182	129	63	14	162	101	59	31	51
4	115	150	129	182	129	63	14	238	84	59	33	57
5	115	169	129	182	129	63	14	264	60	59	33	61
6	60	198	122	182	129	63	14	264	38	59	33	67
7	16	198	122	182	129	63	14	284	9	59	33	67
8	16	198	122	182	129	63	15	209	9	59	33	78
9	16	219	122	182	129	63	15	128	9	42	34	90
10	16	244	122	182	129	63	15	102	9	42	34	90
11	16	263	122	182	129	63	15	102	32	42	34	90
12	16	285	122	182	129	63	14	102	42	42	34	103
13	16	285	122	182	129	63	14	102	42	42	34	122
14	16	285	122	182	129	63	17	102	56	42	34	122
15	16	274	122	182	129	65	26	102	65	39	34	122
16	16	261	122	182	129	65	38	102	65	31	34	122
17	16	244	122	182	129	65	61	102	65	31	34	122
18	16	216	122	174	129	65	150	102	65	31	34	122
19	16	143	122	174	129	65	220	102	62	31	34	143
20	16	143	122	174	129	65	280	72	61	31	34	158
21	16	143	150	174	129	65	340	50	61	31	34	160
22	16	150	182	174	129	65	379	50	59	31	34	160
23	16	150	182	174	129	65	354	59	59	31	34	158
24	16	143	182	174	129	65	298	79	59	31	34	158
25	16	143	182	174	98	65	244	79	59	31	35	158
26	16	143	182	174	63	65	244	79	59	31	35	158
27	16	143	182	160	63	65	193	79	59	31	35	158
28	16	136	182	129	63	65	148	79	59	31	18	158
29	16	136	182	129	-----	65	143	79	59	31	1	158
30	17	129	182	129	-----	65	143	113	59	31	1	158
31	38	-----	190	129	-----	65	-----	176	-----	31	24	-----

Month	Maximum	Minimum	Mean	P. square mile	Run-off in inches
October	115	16	34.1	-----	-----
November	285	79	184	-----	-----
December	190	122	144	-----	-----
January	182	129	172	-----	-----
February	129	63	121	-----	-----
March	65	63	64.1	-----	-----
April	379	14	116	-----	-----
May	264	50	121	-----	-----
June	190	9	60.4	-----	-----
July	59	31	40.3	-----	-----
August	35	1	30.7	-----	-----
September	160	39	115	-----	-----
The year	379	1	99.8	1.92	26.08

NOTE.—Elevation of water surface in Old Forge Reservoir in Fulton Chain of Lakes at end of year was 1.05 feet higher than at beginning of year, corresponding to an increase in storage of 145,776,154 cubic feet. This is equivalent to a yearly mean discharge of 4.62 second-feet, 0.089 second-foot per square mile, or 1.21 inches on drainage area.

MIDDLE BRANCH OF MOOSE RIVER NEAR McKEEVER, N.Y.

LOCATION.—Water-stage recorder half a mile above confluence of Middle and South Branches of Moose River and 1½ miles northeast of McKeever, Herkimer County.

DRAINAGE AREA.—148 square miles.

RECORDS AVAILABLE.—October 1925 to September 1933.

DISCHARGE.—Maximum during year, 1,590 second-feet Apr. 20 (gage height, 5.96 feet); minimum, 45 second-feet Sept. 2 (gage height, 2.01 feet).

1925-33: Maximum, 2,100 second-feet Apr. 27, 1926 (gage height, 6.6 feet); minimum, about 42 second-feet Aug. 26, 1931 (gage height, 1.98 feet).

REMARKS.—Records good except those for periods of ice effect, Nov. 27 to Dec. 1, Dec. 10-31, Jan. 3-21, Jan. 26 to Mar. 19, Mar. 24-25, which are fair. Flow partly regulated by storage in Fulton Chain of Lakes.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Jul 7	Aug.	Sept.
1	197	401	360	625	320	170	254	560	390	144	59	47
2	197	500	338	625	320	170	310	520	377	138	60	48
3	194	520	331	600	300	160	352	580	322	127	61	55
4	192	540	331	600	280	160	422	715	270	119	61	68
5	354	540	335	550	280	150	428	790	243	111	60	80
6	1,020	560	319	500	260	150	476	815	210	108	60	88
7	805	560	322	480	260	150	638	790	184	105	59	111
8	870	540	325	460	260	160	670	740	161	104	61	130
9	948	540	316	460	240	170	692	625	147	99	61	131
10	865	602	300	440	220	170	692	488	142	99	58	133
11	740	625	280	420	220	170	692	432	130	111	59	130
12	625	648	260	400	200	160	670	383	67	96	61	135
13	560	625	260	380	200	160	648	380	73	87	74	151
14	480	625	240	360	200	170	670	370	104	92	71	163
15	422	580	240	340	220	220	715	354	117	82	69	163
16	364	560	240	340	220	260	740	344	125	92	68	159
17	328	540	220	320	220	240	865	319	127	78	63	157
18	310	540	220	320	220	240	1,060	322	127	71	64	157
19	301	540	220	340	240	220	1,340	228	123	69	64	194
20	287	580	220	360	240	215	1,580	256	122	69	62	215
21	281	580	240	360	240	222	1,550	254	120	67	61	222
22	289	580	260	387	260	243	1,440	256	112	68	62	235
23	281	580	280	480	260	243	1,300	251	111	68	61	228
24	201	540	320	488	240	240	1,150	262	112	67	91	215
25	171	500	380	480	220	240	975	262	116	64	147	215
26	232	472	420	460	180	235	865	254	158	63	161	222
27	301	440	440	420	170	228	765	245	192	61	131	206
28	301	420	420	380	170	218	648	238	155	59	106	204
29	295	400	420	340	-----	208	540	235	133	59	80	199
30	292	380	420	320	-----	204	560	278	130	59	59	197
31	295	-----	550	300	-----	204	-----	338	-----	58	49	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	1,020	171	419	2.83	3.26
November	648	380	535	3.61	4.03
December	550	220	317	2.14	2.47
January	625	300	430	2.91	3.36
February	320	170	238	1.61	1.68
March	260	150	198	1.34	1.54
April	1,580	254	790	5.34	5.96
May	815	228	416	2.81	3.24
June	390	67	163	1.10	1.23
July	144	58	86.3	.583	.67
August	161	49	73.0	.493	.57
September	235	47	155	1.05	1.17
The year	1,580	47	318	2.15	29.18

OTTER CREEK NEAR GLENFIELD, N.Y.

LOCATION.—Water-stage recorder $1\frac{1}{4}$ miles above mouth and $2\frac{1}{2}$ miles northeast of Glenfield, Lewis County.

DRAINAGE AREA.—64 square miles.

RECORDS AVAILABLE.—July 1924 to July 1933 (discontinued.)

DISCHARGE.—Maximum during year, 1,490 second-feet Oct. 6 (gage height, 6.23 feet); minimum (estimated), 31 second-feet June 25.

1924-33: Maximum, about 2,130 second-feet Apr. 8, 1928 (gage height, 7.1 feet); minimum, about 20 second-feet Sept. 27, 1932.

REMARKS.—Records fair. Corrected for ice effect Feb. 7-16, Mar. 8-14.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
1	43	289	* 90	* 300	* 85	66	* 180	162	204	70
2	47	404	* 95	* 250	* 90	64	* 370	196	152	66
3	46	373	* 100	* 220	* 90	63	* 480	303	132	51
4	39	328	* 100	* 190	* 85	63	* 530	418	128	45
5	131	290	* 110	* 160	80	* 60	* 480	333	109	40
6	1,130	249	* 100	* 150	68	57	* 470	269	93	33
7	1,280	209	* 110	* 140	70	57	* 610	230	81	36
8	756	173	* 130	* 130	95	70	705	196	73	34
9	435	155	* 120	* 120	90	80	493	175	66	-----
10	278	208	* 100	* 110	85	80	344	156	62	-----
11	220	283	* 95	* 110	75	80	314	148	58	-----
12	205	258	* 90	* 100	65	75	395	140	54	-----
13	212	218	* 85	* 100	60	70	421	156	51	-----
14	203	188	* 80	* 100	55	100	395	148	49	-----
15	177	169	* 75	* 95	55	* 144	408	130	48	-----
16	157	159	* 70	* 95	55	* 155	407	122	47	-----
17	140	147	* 70	* 90	54	* 153	421	111	48	-----
18	134	138	* 65	* 95	56	147	517	98	47	-----
19	140	178	* 65	* 100	64	129	496	89	44	-----
20	138	294	* 65	* 110	74	116	404	91	41	-----
21	130	265	* 70	* 120	80	136	314	120	40	-----
22	132	212	* 75	* 120	82	157	257	107	40	-----
23	127	* 170	* 85	* 160	79	153	217	96	37	-----
24	121	* 150	* 110	* 220	76	140	198	89	33	-----
25	114	* 140	* 190	* 170	71	* 130	179	88	* 31	-----
26	111	* 130	* 220	* 130	69	* 120	168	86	* 40	-----
27	176	* 110	* 200	* 110	72	* 120	164	83	* 70	-----
28	218	* 100	* 190	* 100	71	* 110	158	81	* 55	-----
29	192	* 95	* 180	* 95	-----	* 110	175	80	* 44	-----
30	181	* 90	* 170	* 90	-----	* 110	183	165	* 40	-----
31	177	-----	* 280	* 85	-----	* 120	-----	226	-----	-----

Month	Maximum	Minimum	Mean	P r square mile	Run-off in inches
October	1,280	39	245	3.83	4.42
November	404	90	206	3.22	3.59
December	280	65	116	1.81	2.09
January	300	85	134	2.09	2.41
February	95	54	73.2	1.14	1.19
March	157	57	104	1.62	1.87
April	705	158	362	5.66	6.32
May	418	80	158	2.47	2.85
June	204	31	67.2	1.05	1.17
July 1-8	70	34	47.5	.742	.22

* Estimated.

INDEPENDENCE RIVER AT SPERRYVILLE, N.Y.

LOCATION.—Staff gage half a mile above highway bridge at Sperryville, Lewis County, and $9\frac{1}{2}$ miles east of Lowville.

DRAINAGE AREA.—85 square miles.

RECORDS AVAILABLE.—December 1927 to September 1933.

DISCHARGE.—Maximum during year, 4,700 second-feet Oct. 6 (gage height, 9.2 feet); minimum, 16 second-feet July 30 to Aug. 3, Aug. 5-7, 9-10.

1927-33: Maximum, that of Oct. 6, 1932; minimum, 15 second-feet Aug. 26, 27, 1931 (gage height, 0.97 foot).

REMARKS.—Records good except those for periods of ice effect, Nov. 28 to Dec. 1, Dec. 9-29, Jan. 2-3, 12-19, Jan. 27 to Mar. 17, and those for extremely high stages, which are fair.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	63	339	100	666	95	90	241	216	528	50	16	21
2.....	76	670	100	440	100	85	521	299	288	53	16	20
3.....	75	498	109	320	100	80	700	500	185	41	16	19
4.....	62	312	115	261	95	70	790	821	147	34	18	19
5.....	119	261	120	227	90	80	649	573	116	30	16	19
6.....	2,810	250	114	206	85	85	593	339	95	26	16	18
7.....	2,990	238	130	175	85	65	946	261	79	24	16	19
8.....	1,090	250	147	147	110	80	1,110	206	69	25	17	19
9.....	496	216	130	147	100	90	595	175	60	2'	16	20
10.....	312	282	120	130	90	90	384	156	53	2'	16	20
11.....	227	507	110	116	85	85	384	147	47	41	17	22
12.....	227	416	100	110	80	80	580	130	43	38	17	20
13.....	250	299	100	110	80	75	593	166	38	32	21	19
14.....	227	227	95	110	80	95	618	185	36	27	20	19
15.....	216	195	90	100	80	150	728	147	36	2'	23	19
16.....	195	175	90	100	85	200	728	121	38	23	19	19
17.....	175	166	85	95	85	240	840	108	36	2'	19	19
18.....	175	156	85	100	85	250	1,060	98	36	20	18	19
19.....	185	198	80	110	90	206	910	89	34	19	20	19
20.....	185	438	80	156	90	156	671	88	33	2'	21	20
21.....	166	384	85	166	100	147	449	172	31	20	20	53
22.....	206	250	85	156	110	185	339	185	30	2'	20	70
23.....	195	185	90	261	110	195	261	138	28	20	20	79
24.....	156	166	140	354	110	195	216	112	27	19	35	59
25.....	138	156	280	227	100	166	195	109	26	19	164	45
26.....	130	147	440	175	100	130	195	95	38	18	156	38
27.....	220	114	380	130	100	120	185	87	68	18	89	34
28.....	354	110	300	110	95	112	166	86	50	18	49	26
29.....	286	100	240	100	-----	106	216	82	37	17	36	36
30.....	238	100	216	95	-----	106	261	203	34	16	28	31
31.....	238	-----	450	90	-----	121	-----	556	-----	16	24	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	2,990	63	403	4.74	5.46
November.....	670	100	260	3.08	3.41
December.....	450	80	155	1.82	2.10
January.....	666	90	184	2.15	2.49
February.....	110	80	93.4	1.10	1.14
March.....	250	65	127	1.43	1.72
April.....	1,110	166	537	6.32	7.05
May.....	821	82	215	2.53	2.92
June.....	528	26	78.9	.928	1.04
July.....	53	16	25.8	.374	.35
August.....	164	16	32.2	.379	.44
September.....	79	18	29.3	.315	.38
The year.....	2,990	16	178	2.07	28.50

BEAVER RIVER BELOW STILLWATER DAM, NEAR BEAVER RIVER, N.Y.

LOCATION.—Staff gage at Stillwater Dam, at outlet of Beaver River Flow, 7½ miles west of Beaver River post office, Herkimer County.

DRAINAGE AREA.—172 square miles.

RECORDS AVAILABLE.—May 1908 to September 1933.

DISCHARGE.—1908-33: Maximum, 3,700 second-feet May 3, 1926; practically no flow at times when gates in dam are closed and there is no spill'ng. Average, 25 years (1908-33), 364 second-feet.

REMARKS.—Records good. Flow regulated by storage in Stillwater Reservoir. Discharge determined from Stillwater Dam gate and spillway ratings. Record of gate openings and reservoir elevations furnished by board of Black River Regulating District.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	390	29	290	700	640	610	12	155	73	405	520	310
2.....	11	23	290	700	640	610	83	640	75	12	520	228
3.....	375	57	290	700	640	240	122	1,480	255	270	520	11
4.....	560	136	290	690	640	11	122	1,260	340	12	520	11
5.....	560	206	290	650	630	11	285	910	450	430	395	335
6.....	230	270	290	670	630	11	390	910	560	620	11	490
7.....	11	335	290	600	630	260	485	600	560	620	360	490
8.....	12	420	290	440	630	610	550	450	550	455	560	490
9.....	12	216	290	590	630	610	560	410	550	12	580	360
10.....	12	146	290	670	630	610	570	390	410	425	580	10
11.....	12	124	290	670	630	315	610	390	275	530	580	370
12.....	12	265	290	480	630	11	690	290	455	480	435	550
13.....	12	520	290	350	780	410	770	240	540	480	11	550
14.....	12	600	290	350	950	610	870	455	540	495	365	550
15.....	12	445	290	350	950	260	1,000	550	540	405	540	540
16.....	12	365	290	560	750	11	1,200	450	530	12	540	405
17.....	242	365	290	650	620	11	1,480	290	405	375	540	10
18.....	395	365	290	650	620	11	1,780	240	48	540	540	370
19.....	395	365	460	640	620	11	2,020	204	400	530	400	540
20.....	395	520	700	640	620	11	2,040	400	580	530	11	540
21.....	285	780	680	640	620	11	1,900	400	580	530	355	540
22.....	12	910	670	640	620	11	1,700	400	570	405	540	530
23.....	12	620	670	640	620	12	1,480	395	560	11	540	208
24.....	280	355	320	640	620	12	790	395	420	360	500	10
25.....	410	290	45	435	244	12	270	590	12	530	390	10
26.....	410	290	56	23	11	12	270	740	370	530	200	330
27.....	234	290	485	23	415	12	270	560	550	530	11	530
28.....	12	290	690	23	620	12	218	390	550	530	212	530
29.....	12	290	680	23	-----	12	180	300	550	530	315	530
30.....	12	290	670	395	-----	12	180	66	550	202	315	385
31.....	22	-----	680	650	-----	12	-----	182	-----	360	310	-----

Month	Observed			Corrected for storage		
	Maximum	Minimum	Mean	Mean	Per square mile	Run-off in inches
October.....	560	11	173	724	4.21	4.85
November.....	910	23	359	520	3.02	3.37
December.....	700	45	388	353	2.05	2.36
January.....	700	23	513	405	2.35	2.71
February.....	950	11	617	265	1.54	1.60
March.....	610	11	173	266	1.55	1.79
April.....	2,040	12	763	1,150	6.69	7.46
May.....	1,480	66	491	479	2.78	3.20
June.....	580	12	428	149	.866	.97
July.....	620	11	392	41	.238	.27
August.....	580	11	394	71	.413	.48
September.....	550	10	359	88	.512	.57
The year.....	2,040	10	417	376	2.19	29.63

NOTE.—Midnight elevation of water surface in Stillwater Reservoir was 1,671.33 feet Sept. 30, 1932, and 1,664.33 feet Sept. 30, 1933. Corrections for storage based on data furnished by board of Black River Regulating District.

BEAVER RIVER AT CROGHAN, N.Y.

LOCATION.—Water-stage recorder about 1,000 feet above Black Creek and half a mile west of Croghan, Lewis County.

DRAINAGE AREA.—293 square miles.

RECORDS AVAILABLE.—September 1930 to September 1933.

DISCHARGE.—Maximum during year, 3,390 second-feet Apr. 19 (gauge height, 5.80 feet); minimum, 61 second-feet Sept. 11 (gauge height, 1.21 feet).

1930-33: Maximum, that of Apr. 19, 1933; minimum, 48 second-feet May 3, 1931 (gauge height, 1.13 feet).

REMARKS.—Records excellent. Flow of Beaver River was almost completely regulated during year at Stillwater Dam and partly regulated by various forebay reservoirs, principally those at Moshier Creek and Soft Maple developments.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	540	598	336	1,420	488	620	591	881	992	661	688	546
2.....	136	415	330	1,560	775	498	484	802	950	377	678	450
3.....	554	566	414	1,340	699	590	1,020	1,060	808	578	665	186
4.....	630	440	352	1,380	526	597	1,360	1,970	354	30	608	324
5.....	808	460	456	1,040	868	343	910	2,200	695	380	522	421
6.....	1,810	514	760	800	1,010	493	978	1,420	606	412	126	417
7.....	2,230	821	508	795	872	662	1,240	1,210	624	385	490	426
8.....	1,290	704	562	800	632	484	1,800	1,420	734	38	487	427
9.....	720	868	336	1,040	824	330	1,460	1,110	416	16	546	287
10.....	882	601	333	910	936	312	1,220	957	394	615	528	88
11.....	544	704	925	934	1,060	350	1,250	827	542	480	563	269
12.....	562	602	740	689	1,010	307	1,370	644	669	483	423	436
13.....	582	524	592	886	1,230	426	1,550	522	567	700	110	480
14.....	412	820	768	775	1,090	500	1,550	197	605	557	486	447
15.....	288	1,090	665	460	944	581	1,570	372	603	492	615	449
16.....	128	862	608	385	760	968	1,860	617	607	12	606	274
17.....	452	693	368	582	524	501	2,350	724	582	412	522	191
18.....	595	322	202	813	306	402	2,510	754	182	52	471	389
19.....	450	628	631	794	742	211	2,820	670	630	539	418	429
20.....	460	599	694	494	830	326	2,540	560	564	638	114	432
21.....	546	1,100	736	685	682	402	2,480	397	568	634	415	482
22.....	318	1,200	702	788	856	432	2,220	580	567	502	469	722
23.....	157	1,210	574	1,170	661	358	1,990	518	641	156	475	306
24.....	506	753	474	1,080	464	340	1,880	596	348	37	491	234
25.....	397	768	670	958	636	312	1,670	655	278	414	570	484
26.....	582	570	804	1,030	636	110	845	772	308	418	606	455
27.....	544	332	637	680	714	441	650	701	521	436	164	425
28.....	450	816	922	267	580	552	454	580	381	670	461	434
29.....	320	694	879	182	-----	354	588	641	476	46	446	554
30.....	283	400	938	562	-----	346	595	496	625	111	504	261
31.....	414	-----	1,390	407	-----	364	-----	897	-----	57	514	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	2,230	128	600	-----	-----
November.....	1,210	322	689	-----	-----
December.....	1,390	202	623	-----	-----
January.....	1,560	183	829	-----	-----
February.....	1,230	306	763	-----	-----
March.....	968	110	436	-----	-----
April.....	2,820	454	1,460	-----	-----
May.....	2,200	197	831	-----	-----
June.....	992	182	561	-----	-----
July.....	700	111	450	-----	-----
August.....	688	110	476	-----	-----
September.....	722	88	391	-----	-----
The year.....	2,820	88	674	2.30	31.22

NOTE.—For effect of Stillwater Reservoir regulation of flow see Beaver River below Stillwater Dam, near Beaver River, N.Y.

DEER RIVER AT COPENHAGEN, N.Y.

LOCATION.—Water-stage recorder at power plant half a mile northeast of Copenhagen, Lewis County.

DRAINAGE AREA.—88 square miles.

RECORDS AVAILABLE.—September 1929 to September 1933.

DISCHARGE.—Maximum during year, 2,660 second-feet Oct. 6 (gage height, 7.15 feet); minimum, 0.8 second-foot July 22 to Aug. 2.

1929-33: Maximum, about 4,500 second-feet Jan. 8, 1930 (gage height, 9.3 feet); minimum, that of July 22 to Aug. 2, 1933.

REMARKS.—Records fair; corrected for ice effect Dec. 11-21, Jan. 30-31, Feb. 10-18, Mar. 11-13. Diurnal fluctuation caused by operation of power plant.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	126	1,080	70	509	98	83	* 496	135	266	9.5	0.8	14
2.....	91	794	98	334	272	71	* 934	191	91	9.0	.8	12
3.....	123	453	230	242	106	65	* 1,280	609	52	17	4.5	11
4.....	92	326	254	280	99	61	1,260	503	50	14	1.0	10
5.....	314	476	261	405	87	69	1,140	274	44	16	1.0	14
6.....	2,100	430	206	259	48	61	1,230	177	35	11	1.0	13
7.....	1,370	329	378	223	72	56	1,600	143	24	7.4	1.0	12
8.....	563	247	377	164	388	164	898	102	28	9.0	5.0	12
9.....	276	197	166	167	90	235	646	87	15	11	2.1	13
10.....	178	878	113	141	46	204	686	83	16	11	2.1	13
11.....	192	621	100	156	42	170	831	90	17	9.0	2.2	13
12.....	390	512	95	189	40	150	924	78	16	9.0	2.2	13
13.....	444	342	95	131	38	160	679	189	16	10	* 2.2	14
14.....	310	266	90	100	40	234	765	174	15	11	* 9.6	12
15.....	247	240	75	95	55	361	844	99	15	10	12	10
16.....	193	225	85	106	50	354	714	65	15	5.9	12	9.5
17.....	173	218	80	220	50	351	1,040	50	17	5.8	8.6	8.5
18.....	159	189	80	233	65	297	1,250	44	19	1.4	1.3	14
19.....	163	616	75	495	76	264	978	41	15	7.2	1.3	13
20.....	150	487	85	* 532	110	274	555	38	14	4.1	1.3	13
21.....	187	291	120	* 300	209	323	366	67	11	1.0	1.3	17
22.....	262	176	165	* 340	216	336	241	59	8.5	.8	1.3	43
23.....	175	142	233	* 550	209	281	200	35	8.5	.8	1.3	43
24.....	146	186	626	375	191	249	175	30	14	.8	75	26
25.....	110	186	1,590	247	165	218	165	36	14	.8	126	41
26.....	91	164	1,230	223	128	186	189	29	12	.8	63	22
27.....	471	88	588	170	106	166	170	28	10	.8	36	22
28.....	370	84	372	94	91	135	162	28	12	.8	25	30
29.....	326	72	278	56	-----	141	301	24	9.5	.8	21	48
30.....	816	56	228	55	-----	143	187	87	9.5	.8	21	30
31.....	632	-----	1,120	55	-----	159	-----	599	-----	.8	20	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	2,100	91	363	4.12	4.75
November.....	1,080	56	346	3.93	4.38
December.....	1,590	70	308	3.50	4.04
January.....	550	55	240	2.73	3.15
February.....	388	33	114	1.30	1.35
March.....	361	56	194	2.20	2.54
April.....	1,600	162	697	7.92	8.84
May.....	609	24	135	1.53	1.76
June.....	266	8.5	29.6	.336	.37
July.....	17	.8	6.36	.072	.08
August.....	126	.8	14.9	.169	.19
September.....	48	8.5	18.9	.215	.24
The year.....	2,100	.8	206	2.34	31.69

* Estimated.

STREAMS TRIBUTARY TO ST. LAWRENCE RIVER

EAST BRANCH OF OSWEGATCHIE RIVER AT CRANBERRY LAKE, N.Y.

LOCATION.—Staff gage 850 feet below dam at outlet of Cranberry Lake, in Cranberry Lake village, St. Lawrence County.

DRAINAGE AREA.—144 square miles.

RECORDS AVAILABLE.—May 1923 to September 1933.

DISCHARGE.—Maximum daily during year, 1,620 second-feet Apr. 17–20; minimum, 18 second-feet Oct. 15–16.

1923–33: Maximum daily, that of Apr. 17–20, 1933; minimum occurs when gates in dam are closed and there is no discharge over spillway. Average, 10 years (1923–33), 325 second-feet.

REMARKS.—Records good except those estimated, which are fair. Flow almost completely regulated by operation of gates in Cranberry Lake Dam.

Discharge, in second-feet, 1932–33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	296	360	270	245	282	282	270	520	233	251	233	211
2.....	296	430	270	245	282	282	270	612	430	233	233	211
3.....	296	475	270	245	282	282	270	965	557	233	233	211
4.....	296	681	267	315	282	282	270	1,240	557	233	233	211
5.....	296	875	257	338	282	282	282	1,240	316	233	233	211
6.....	309	965	257	338	282	282	282	1,000	222	233	233	211
7.....	309	722	257	338	282	282	282	602	222	233	222	211
8.....	324	652	257	338	282	282	418	399	222	233	222	212
9.....	280	532	257	338	282	282	568	399	222	233	222	211
10.....	222	500	257	338	282	282	566	399	211	233	222	211
11.....	222	500	257	338	282	282	566	399	190	233	222	211
12.....	222	500	257	338	282	282	791	338	170	233	222	211
13.....	222	500	257	302	282	270	1,060	309	170	233	222	211
14.....	148	500	257	282	282	270	1,060	309	161	242	222	211
15.....	18	500	257	282	282	270	1,060	309	152	270	222	211
16.....	18	359	275	282	282	270	1,380	259	152	270	222	211
17.....	116	270	257	282	282	270	1,620	233	152	270	222	211
18.....	211	270	257	282	282	270	1,620	233	152	267	222	211
19.....	211	270	257	282	282	270	1,620	215	168	233	222	211
20.....	211	270	257	282	282	270	1,620	192	211	233	222	211
21.....	211	270	257	282	282	270	1,480	180	211	233	222	211
22.....	211	270	257	282	282	270	1,480	180	211	233	211	211
23.....	211	270	257	282	282	270	1,000	180	211	233	211	211
24.....	211	270	257	282	282	270	520	180	211	233	211	211
25.....	211	270	257	282	282	270	520	180	211	233	211	211
26.....	268	270	245	282	282	270	520	180	211	233	211	211
27.....	324	270	245	282	282	270	520	180	211	233	211	211
28.....	324	270	245	282	282	270	520	180	211	233	211	211
29.....	324	270	245	282	-----	270	520	180	233	233	211	211
30.....	324	270	245	282	-----	270	520	180	257	233	211	211
31.....	324	-----	245	282	-----	270	-----	203	-----	233	211	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	324	18	241	-----	-----
November.....	965	270	428	-----	-----
December.....	270	245	256	-----	-----
January.....	338	245	295	-----	-----
February.....	282	282	282	-----	-----
March.....	282	270	275	-----	-----
April.....	1,620	180	784	-----	-----
May.....	1,240	180	393	-----	-----
June.....	557	152	235	-----	-----
July.....	270	233	239	-----	-----
August.....	233	211	221	-----	-----
September.....	212	211	211	-----	-----
The year.....	1,620	18	321	2.23	30.23

* Estimated.

NOTE.—Elevation of water surface in Cranberry Lake Reservoir at end of year was 2.41 feet lower than at beginning of year, corresponding to a loss in storage of 739,056,384 cubic feet. This is equivalent to a mean yearly discharge of 23.4 second-feet, 0.162 second-foot per square mile, or a run-off of 2.20 inches on drainage area.

EAST BRANCH OF OSWEGATCHIE RIVER NEAR OSWEGATCHIE, N.Y.

LOCATION.—Water-stage recorder at Flat Rock hydroelectric plant of Northern New York Utilities, Inc., $2\frac{3}{4}$ miles north of Oswegatchie, St. Lawrence County.

DRAINAGE AREA.—262 square miles.

RECORDS AVAILABLE.—October 1924 to September 1933.

DISCHARGE.—Maximum during year, 3,800 second-feet Apr. 1st (gage height, 6.93 feet); minimum, 20 second-feet Aug. 20 (gage height, 1.29 feet).

1924-33: Maximum, 4,010 second-feet Apr. 6, 1928 (gage height, 7.1 feet); minimum, approaching zero flow occasionally following complete shut-down of power plant.

REMARKS.—Records good except those estimated, which are fair. Large diurnal fluctuation caused by operation of power plant; seasonal flow partly regulated by storage in Cranberry Lake.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	326	840	394	583	445	398	* 780	970	* 540	* 250	281	282
2.....	372	950	483	760	604	538	936	830	* 590	* 249	274	212
3.....	430	862	401	658	418	250	1,400	962	* 390	* 224	393	192
4.....	494	754	402	754	603	390	1,370	1,240	198	* 220	267	167
5.....	537	778	612	614	405	410	1,140	1,490	499	* 290	227	166
6.....	1,360	868	615	604	500	518	1,140	1,540	535	* 240	207	276
7.....	1,930	1,090	504	542	580	470	1,570	1,310	529	* 280	272	212
8.....	1,680	1,090	592	710	440	298	1,630	1,230	366	* 365	339	222
9.....	1,170	1,060	478	642	477	401	1,310	838	309	* 204	296	193
10.....	1,110	866	500	654	490	430	1,240	631	419	* 285	407	198
11.....	575	1,030	532	518	626	463	1,230	678	* 190	* 325	225	279
12.....	506	966	444	536	519	330	1,430	533	* 270	* 385	202	336
13.....	577	909	730	628	438	584	1,660	606	* 340	* 465	193	348
14.....	604	948	378	508	468	246	1,760	535	* 460	* 383	203	373
15.....	433	852	424	430	454	506	1,810	544	* 410	258	199	266
16.....	326	828	462	452	382	634	1,810	495	* 340	202	246	265
17.....	490	526	372	386	310	508	2,200	541	* 210	223	255	211
18.....	313	624	496	432	305	580	2,440	498	* 190	341	237	288
19.....	303	658	620	500	434	509	2,480	617	* 290	304	133	270
20.....	235	650	398	536	394	512	2,350	394	* 410	423	165	406
21.....	329	707	462	520	504	500	2,140	238	* 390	244	214	305
22.....	255	738	294	503	537	636	1,770	420	* 440	227	290	329
23.....	298	664	416	709	401	534	1,250	408	* 330	231	237	286
24.....	352	384	520	562	337	524	1,080	439	* 250	224	291	203
25.....	446	688	362	584	514	* 540	808	484	* 200	237	426	226
26.....	427	398	586	530	510	* 475	856	509	* 224	350	300	355
27.....	337	329	488	508	430	* 630	632	299	* 224	359	252	245
28.....	348	488	708	516	463	* 570	687	212	* 224	298	237	438
29.....	458	427	510	454	-----	* 485	832	347	* 290	222	343	452
30.....	680	361	520	542	-----	* 610	836	277	* 490	247	224	246
31.....	650	-----	706	394	-----	* 470	-----	514	-----	294	360	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	1,930	235	592	2.26	2.61
November.....	1,090	329	744	2.84	3.17
December.....	730	294	497	1.90	2.19
January.....	760	386	557	2.13	2.46
February.....	626	305	464	1.77	1.84
March.....	636	246	484	1.85	2.13
April.....	2,480	632	1,420	5.42	6.05
May.....	1,540	212	665	2.54	2.93
June.....	590	190	352	1.34	1.50
July.....	465	202	285	1.09	1.26
August.....	426	165	266	1.02	1.18
September.....	452	166	275	1.05	1.17
The year.....	2,480	165	549	2.10	28.49

* Estimated.

OSWEGATCHIE RIVER NEAR HEUVELTON, N.Y.

LOCATION.—Water-stage recorder $2\frac{1}{2}$ miles above Heuvelton, St. Lawrence County.

DRAINAGE AREA.—967 square miles.

RECORDS AVAILABLE.—June 1916 to September 1933.

DISCHARGE.—Maximum during year, 7,780 second-feet Apr. 3 (gage height, 5.95 feet); minimum, 263 second-feet Aug. 17 (gage height, 0.80 foot).

1916-33: Maximum, 15,600 second-feet Jan. 11, 1930 (gage height, 9.1 feet); minimum, 211 second-feet Sept. 2, 1925 (gage height, 0.67 foot). Average, 17 years (1916-33), 1,760 second-feet.

REMARKS.—Records excellent except those for periods of ice effect, Nov. 26-28, Dec. 11-19, Jan. 8, 13, 18, Feb. 5, 6, 9-13, 27-28, Mar. 9-13, and those estimated, which are fair. Seasonal flow slightly regulated by storage in Cranberry Lake; diurnal fluctuation caused by power operations.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	464	2,370	1,080	4,560	1,300	1,170	4,820	2,020	890	385	326	385
2.....	529	3,330	1,010	4,310	1,360	1,060	6,840	2,400	1,130	385	320	379
3.....	543	3,620	1,030	2,850	1,480	1,050	7,670	3,780	1,370	484	357	374
4.....	574	3,580	1,090	3,000	1,550	1,030	7,670	4,930	1,430	446	368	374
5.....	679	3,300	1,150	3,080	1,400	961	7,240	4,740	1,240	403	357	326
6.....	981	2,920	1,250	2,850	1,200	862	6,820	4,220	1,050	374	403	310
7.....	2,720	2,700	1,650	2,700	1,080	889	6,400	3,860	994	368	374	282
8.....	4,120	2,550	1,980	2,200	1,360	989	6,400	3,540	976	346	315	282
9.....	5,200	2,480	1,980	1,920	1,400	950	6,610	3,080	966	379	326	282
10.....	5,600	2,700	1,720	2,120	1,200	850	6,400	2,620	827	379	305	286
11.....	5,210	3,460	1,300	1,780	1,200	900	6,000	2,130	655	379	352	305
12.....	4,190	3,700	1,200	1,710	1,100	1,000	5,400	1,810	577	385	385	301
13.....	3,020	3,620	1,200	1,500	1,200	1,000	5,210	1,750	577	420	439	310
14.....	2,330	3,380	1,100	1,350	1,120	1,040	5,210	1,650	512	471	397	331
15.....	1,980	3,080	1,200	1,440	1,060	1,210	5,020	1,520	484	491	326	397
16.....	1,770	2,700	1,100	1,280	1,070	1,300	4,740	1,440	519	526	320	433
17.....	1,470	2,400	1,000	1,270	961	1,580	5,020	1,360	655	478	296	446
18.....	1,240	2,050	950	1,200	907	1,850	5,800	1,240	554	426	296	391
19.....	1,230	1,870	950	1,280	826	1,780	6,400	1,190	478	385	291	320
20.....	1,120	2,680	1,050	1,640	936	1,780	6,400	1,130	433	341	296	362
21.....	1,020	3,080	1,160	1,670	1,550	1,720	6,400	1,170	* 450	357	310	352
22.....	970	2,920	1,120	1,710	1,620	2,170	6,000	1,040	* 480	414	282	385
23.....	916	2,620	1,180	2,050	1,560	2,780	5,300	994	* 550	458	282	433
24.....	871	2,330	1,590	2,480	1,640	2,850	4,430	1,070	* 600	433	315	426
25.....	925	2,120	2,490	2,550	1,520	2,700	3,520	1,050	* 520	368	368	403
26.....	961	1,900	3,460	2,050	1,200	2,700	2,860	956	* 460	346	385	391
27.....	970	1,700	3,620	1,850	1,300	2,920	2,400	966	420	296	446	420
28.....	998	1,300	3,380	1,640	1,200	3,380	2,130	976	414	315	478	420
29.....	1,090	1,190	3,000	1,220	-----	3,860	1,940	854	414	352	420	452
30.....	1,260	1,220	2,780	1,070	-----	3,860	1,870	836	414	391	433	452
31.....	1,610	-----	2,880	1,280	-----	3,950	-----	956	-----	357	403	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	5,600	464	1,820	1.88	2.17
November.....	3,700	1,190	2,630	2.72	3.04
December.....	3,620	950	1,670	1.73	1.99
January.....	4,560	1,070	2,050	2.12	2.44
February.....	1,640	826	1,260	1.30	1.35
March.....	3,950	850	1,810	1.87	2.16
April.....	7,670	1,870	5,300	5.48	6.11
May.....	4,930	836	1,980	2.05	2.36
June.....	1,430	414	701	.725	.81
July.....	526	296	398	.412	.48
August.....	478	262	354	.366	.42
September.....	452	282	367	.380	.42
The year.....	7,670	282	1,690	1.75	23.75

* Estimated.

WEST BRANCH OF OSWEGATCHIE RIVER NEAR HARRISVILLE, N.Y.

LOCATION.—Staff gage at highway bridge half a mile northeast of Geers Corners and 4 miles below Harrisville, Lewis County.

DRAINAGE AREA.—256 square miles.

RECORDS AVAILABLE.—July 1916 to September 1933.

DISCHARGE.—Maximum during year, 4,380 second-feet Oct. 8 (gage height, 7.6 feet); minimum, 33 second-feet Aug. 1, 2, 3, 7, 8 (gage height, 1.00 foot).

1916-33: Maximum, 6,920 second-feet Jan. 9, 1930 (gage height, 9.6 feet); minimum, 27 second-feet several times during August and October 1923 (gage height, 0.90 foot). Average, 17 years (1916-33), 536 second-feet.

REMARKS.—Records fair; corrected for ice effect Dec. 12-20, Jan. 2, 3, 13, 18, 30 31, Feb. 5-15, Feb. 26 to Mar. 1, Mar. 6-13, 18-20. Diurnal fluctuations, principally during low flow, caused by pondage regulation.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	150	1,070	252	1,000	310	280	851	760	582	93	33	93
2.....	150	1,210	280	1,300	377	266	1,570	760	705	86	34	83
3.....	150	1,360	280	1,300	435	252	2,200	760	655	83	35	73
4.....	150	1,280	326	1,000	395	252	2,480	940	538	82	41	65
5.....	244	1,140	435	880	360	214	2,380	1,070	415	86	40	56
6.....	1,120	940	435	820	320	200	2,020	1,070	295	93	35	54
7.....	3,010	760	455	655	300	200	1,760	1,000	239	80	35	49
8.....	4,190	680	515	515	320	220	2,290	820	226	100	37	51
9.....	3,200	655	415	515	340	240	2,480	605	202	83	40	59
10.....	1,990	655	359	435	300	260	2,110	515	170	80	41	71
11.....	1,240	940	342	395	260	260	1,520	475	141	93	39	73
12.....	820	1,140	320	377	240	260	1,360	435	150	83	43	69
13.....	760	1,140	300	360	240	260	1,520	395	141	83	42	86
14.....	655	1,070	280	359	240	326	1,600	415	132	77	53	93
15.....	582	880	260	326	260	582	1,600	395	115	86	53	83
16.....	515	630	260	326	266	655	1,520	342	100	93	53	74
17.....	475	560	240	310	266	655	1,600	326	82	73	52	71
18.....	455	515	220	320	266	600	1,840	295	77	76	49	61
19.....	395	495	220	415	239	600	2,110	266	93	76	51	57
20.....	395	820	200	560	252	600	1,840	239	100	69	51	66
21.....	359	1,000	202	655	310	680	1,600	280	100	73	49	73
22.....	395	1,000	202	705	310	705	1,280	359	115	66	51	86
23.....	395	760	239	705	377	760	1,070	310	141	61	50	86
24.....	415	705	435	760	359	760	820	280	115	51	76	86
25.....	342	605	820	680	326	760	630	280	124	49	93	86
26.....	326	435	1,140	680	300	705	630	266	115	40	108	93
27.....	359	342	1,280	605	280	655	680	239	150	43	141	100
28.....	560	310	1,280	475	280	605	655	202	124	39	132	108
29.....	680	280	1,000	359	-----	538	655	202	108	39	132	108
30.....	760	239	760	280	-----	515	705	214	100	36	124	108
31.....	880	-----	880	260	-----	605	-----	326	-----	35	124	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	4,190	150	842	3.29	3.79
November.....	1,360	239	787	3.07	3.42
December.....	1,280	200	472	1.84	2.12
January.....	1,300	260	591	2.31	2.66
February.....	435	239	305	1.19	1.24
March.....	760	200	467	1.82	2.10
April.....	2,480	630	1,510	5.90	6.58
May.....	1,070	202	479	1.87	2.16
June.....	705	77	212	.828	.92
July.....	100	35	71.2	.278	.32
August.....	141	33	62.5	.244	.28
September.....	108	49	77.4	.302	.34
The year.....	4,190	33	490	1.91	25.93

GRASS RIVER AT PYRITES, N.Y.

LOCATION.—Water-stage recorder 1,000 feet below lower bridge in Pyrites, St. Lawrence County, and half a mile above mouth of Harrison Creek.

DRAINAGE AREA.—334 square miles.

RECORDS AVAILABLE.—August 1924 to September 1933.

DISCHARGE.—Maximum during year, 4,420 second-feet Oct. 7 (gage height, 8.65 feet); minimum, 37 second-feet July 15 (gage height, 0.99 foot).

1924-33: Maximum, about 8,300 second-feet Nov. 18, 1927 (gage height, 13.0 feet); minimum, that of July 15, 1933.

REMARKS.—Records good except those for periods of ice effect, Nov. 27 to Dec. 1, Dec. 10-26, Jan. 2-6, 13-19, Jan. 30 to Mar. 2, Mar. 9-16, those for period of backwater from tree on control, June 22 to Sept. 29, and those estimated, which are fair.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	178	1,200	280	1,270	340	300	1,820	976	605	* 160	76	86
2.....	167	1,380	293	1,100	480	300	2,950	1,490	550	* 100	74	82
3.....	167	1,270	354	950	500	289	2,750	1,980	456	* 92	78	78
4.....	162	980	443	800	440	286	2,820	1,980	391	* 120	88	76
5.....	177	760	566	700	380	317	2,420	1,770	335	* 130	92	72
6.....	1,470	652	588	650	320	314	2,100	1,460	283	* 110	92	70
7.....	3,940	582	694	622	340	296	2,430	1,140	276	* 100	82	70
8.....	3,810	550	796	604	420	293	3,300	885	283	* 96	80	70
9.....	2,520	496	496	525	420	300	2,760	725	272	98	86	78
10.....	1,540	822	420	469	380	280	2,040	650	233	110	94	140
11.....	938	1,180	380	447	340	280	1,680	650	201	165	86	245
12.....	620	1,180	360	496	320	280	2,090	610	182	205	86	195
13.....	515	935	340	440	300	280	2,860	700	167	160	86	145
14.....	464	706	320	400	320	300	2,480	775	157	125	88	125
15.....	401	555	320	360	320	480	2,220	700	152	98	92	122
16.....	354	487	* 300	320	300	650	2,220	575	152	104	86	135
17.....	325	469	* 300	360	280	700	2,550	496	155	116	78	125
18.....	310	409	* 300	340	260	646	3,230	446	152	108	80	114
19.....	296	755	* 300	420	260	560	3,370	407	162	100	96	100
20.....	289	1,270	* 300	640	440	443	2,630	415	162	100	100	100
21.....	279	1,300	* 320	604	460	508	1,920	565	164	106	100	102
22.....	296	948	* 360	530	420	844	1,490	650	215	116	92	114
23.....	321	604	460	740	360	915	1,180	565	235	110	86	140
24.....	303	646	600	882	360	896	980	460	185	100	102	145
25.....	272	555	950	727	360	754	855	428	145	92	130	135
26.....	250	469	1,500	599	360	652	828	415	130	86	270	125
27.....	300	400	1,370	460	320	688	800	403	* 130	82	245	130
28.....	443	360	1,040	421	320	802	775	407	* 130	78	170	155
29.....	492	320	772	332	-----	634	800	403	* 150	74	125	245
30.....	594	280	582	280	-----	622	915	442	* 175	72	102	216
31.....	838	-----	1,020	300	-----	700	-----	536	-----	70	92	-----

Month	Maximum	Minimum	Mean	Per square mil.	Run-off in inches
October.....	3,940	162	743	2.22	2.56
November.....	1,380	280	751	2.25	2.51
December.....	1,500	280	552	1.65	1.90
January.....	1,270	280	574	1.72	1.98
February.....	500	260	363	1.09	1.14
March.....	915	280	504	1.51	1.74
April.....	3,370	775	2,040	6.11	6.82
May.....	1,980	403	778	2.33	2.69
June.....	605	130	233	.698	.78
July.....	205	70	109	.326	.38
August.....	270	74	104	.311	.36
September.....	245	70	124	.371	.41
The year.....	3,940	70	572	1.71	23.27

* Estimated.

RAQUETTE RIVER AT PIERCEFIELD, N.Y.

LOCATION.—Water-stage recorder half a mile below dam of International Paper Co. at Piercefield, St. Lawrence County.

DRAINAGE AREA.—723 square miles.

RECORDS AVAILABLE.—August 1908 to September 1933.

DISCHARGE.—Maximum during year, 6,620 second-feet Apr. 23 (gage height, 11.01 feet); minimum, 97 second-feet Aug. 27 (gage height, 2.22 feet).

1908-33: Maximum, 7,580 second-feet Apr. 17, 1922 (gage height, 11.8 feet); minimum, about 10 second-feet Sept. 2, 1913 (gage height, 0.85 foot).

Average, 25 years (1908-33), 1,310 second-feet.

REMARKS.—Records good except those estimated, which are fair. Large diurnal fluctuation in flow caused by operation of paper mill. Seasonal distribution of flow appreciably regulated by natural storage in lakes and ponds in upper drainage basin.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	521	1,690	*1,690	*1,220	952	998	885	4,890	1,500	459	307	* 342
2.....	267	1,980	1,460	*1,200	975	975	930	4,760	1,530	322	312	252
3.....	299	1,980	1,380	1,270	*1,270	* 760	1,100	4,630	1,500	347	322	174
4.....	353	1,900	1,410	1,350	*1,220	* 400	1,300	4,630	1,470	347	332	110
5.....	430	1,900	1,380	1,590	* 952	* 420	1,530	4,760	1,380	347	422	234
6.....	1,070	1,940	1,380	1,560	* 840	* 430	1,800	4,760	1,300	347	340	299
7.....	1,630	1,940	1,590	*1,560	* 840	* 430	2,140	4,630	1,240	354	440	297
8.....	2,320	1,940	1,470	*1,470	* 885	* 470	2,400	4,500	1,220	350	474	295
9.....	2,630	1,940	1,470	*1,350	*1,170	* 500	2,580	4,380	1,140	307	394	297
10.....	2,960	1,940	1,220	*1,300	*1,140	* 540	2,760	4,140	1,070	403	347	186
11.....	3,050	2,060	1,170	*1,300	1,100	* 570	*2,760	3,900	1,040	627	344	* 230
12.....	2,950	1,980	1,220	1,530	785	604	2,850	3,680	975	416	332	* 319
13.....	2,760	1,820	1,380	1,470	* 677	622	3,050	3,460	908	332	275	269
14.....	2,760	1,830	1,320	1,380	715	640	3,250	3,250	840	379	304	262
15.....	2,670	1,830	1,300	1,090	1,080	715	3,460	3,050	797	379	307	239
16.....	2,580	1,940	1,040	1,020	1,040	776	3,680	2,850	755	313	316	269
17.....	2,400	1,900	930	1,040	1,020	797	4,140	2,670	735	293	309	176
18.....	2,310	1,860	908	1,320	* 930	797	4,630	2,580	677	285	304	244
19.....	2,310	1,860	908	1,270	* 715	755	5,150	2,400	818	299	304	252
20.....	2,400	1,760	*1,200	1,200	* 604	776	5,710	2,310	862	307	205	267
21.....	2,220	1,830	*1,120	1,200	* 622	818	6,300	2,140	862	312	251	267
22.....	2,140	1,900	* 885	930	* 797	885	6,450	2,060	840	322	292	264
23.....	1,890	2,060	* 797	885	*1,100	998	6,600	1,980	776	190	285	267
24.....	2,030	2,060	862	998	1,020	972	6,450	1,900	784	260	274	182
25.....	1,980	1,980	908	1,320	998	930	6,300	1,830	522	262	199	* 331
26.....	1,900	1,760	975	1,270	619	818	6,000	1,720	596	237	119	* 387
27.....	1,800	*1,720	1,040	1,240	490	797	5,710	1,660	769	297	* 99	* 314
28.....	1,760	*1,760	1,320	1,200	998	885	5,430	1,500	677	295	* 227	* 292
29.....	1,720	*1,860	1,270	939	-----	930	5,150	1,440	689	299	292	* 290
30.....	1,560	*1,720	1,220	885	-----	885	5,020	1,440	* 594	194	290	* 295
31.....	1,560	-----	1,300	908	-----	885	-----	1,500	-----	260	* 290	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	3,050	267	1,910	2.64	3.04
November.....	2,060	1,690	1,890	2.61	2.91
December.....	1,690	797	1,210	1.67	1.92
January.....	1,590	885	1,230	1.70	1.96
February.....	1,270	490	913	1.26	1.31
March.....	998	400	735	1.02	1.18
April.....	6,600	885	3,850	5.33	5.95
May.....	4,890	1,440	3,080	4.26	4.91
June.....	1,530	522	962	1.33	1.48
July.....	627	190	327	.462	.52
August.....	474	99	300	.415	.48
September.....	387	110	263	.364	.41
The year.....	6,600	99	1,390	1.92	28.07

* Estimated.

ST. REGIS RIVER AT BRASHER CENTER, N.Y.

LOCATION.—Water-stage recorder 600 feet above highway bridge at Brasher Center, St. Lawrence County, and $6\frac{1}{2}$ miles below junction of East and West Branches at Winthrop.

DRAINAGE AREA.—616 square miles.

RECORDS AVAILABLE.—August 1910 to November 1917, January 1919 to September 1933.

DISCHARGE.—Maximum during year, 7,300 second-feet Oct. 7 (gage height, 9.98 feet); minimum, 153 second-feet July 2, Aug. 17 (gage height, 5.76 feet).

1910-33: Maximum, about 16,200 second-feet Mar. 27, 1914 (gage height, 9.1 feet, old datum); minimum, about 34 second-feet Aug. 8, 1917 (gage height, 5.25 feet). Average, 20 years (1910-13, 1914-17, 1919-33), 1,110 second-feet.

REMARKS.—Records excellent except those for periods of ice effect Dec. 22-29, Jan. 2-5, 18-19, Jan. 26 to Feb. 2, Mar. 14-27, and those estimated, which are fair.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.		
1.....	409	1,360	a 750	1,880	600	a 500	2,800	1,670	1,110	313	177	196		
2.....	276	1,780		1,700	950		4,360	3,010	1,160	174	166	190		
3.....	276	1,700		1,500	4,060		3,480	980	173	183	190			
4.....	313	1,440		1,300	3,960		4,470	860	247	171	190			
5.....	298	1,260		1,200	3,580		4,160	881	269	247	190			
6.....	2,720	1,160	a 1,000	1,110	a 500	3,760	3,390	763	221	202	208			
7.....	7,050	1,050		1,150		5,130	2,680	620	172	171	208			
8.....	5,690	1,100		1,010		5,940	2,190	702	196	208	202			
9.....	3,860	a 1,500		881		4,720	1,950	702	196	221	255			
10.....	2,670			804		3,860	1,770	670	221	190	360			
11.....	1,740		a 1,100	936	3,390	1,530	580	170	171	514				
12.....	1,470			925	4,340	1,340	392	255	171	390				
13.....	1,300			784	5,240	1,670	532	262	177	280				
14.....	1,150	681		4,580	1,840	505	233	177	240					
15.....	1,020	660		4,680	1,510	477	208	162	220					
16.....	903	a 1,100	a 700	650	a 650	800	4,790	1,200	418	221	162	300		
17.....	1,020			765		950	5,350	1,140	409	277	157	280		
18.....	796			700		850	6,560	969	337	255	171	270		
19.....	807			750		850	6,060	892	337	214	190	260		
20.....	723			1,290		800	4,900	987	523	214	183	255		
21.....	712	a 1,500	a 700	980	a 1,300	850	3,960	1,480	409	173	183	247		
22.....	702			870		1,100	3,210	1,430	384	269	190	262		
23.....	642			750		1,300	2,770	1,240	523	214	190	262		
24.....	702			950		1,300	2,350	1,090	468	240	233	313		
25.....	666			1,500		1,220	2,110	1,000	321	227	329	262		
26.....	560	a 850	a 700	1,000	a 1,300	1,200	2,110	903	240	221	480	240		
27.....	560			750		1,200	1,970	1,020	255	196	681	255		
28.....	838			1,400		1,340	1,940	983	240	190	568	283		
29.....	1,040			1,200		550	1,440	1,840	925	293	184	322		
30.....	992			1,110		400	1,460	1,680	1,040	426	234	240		
31.....	1,040			1,470		500	500	1,660	1,660	1,200	1,200	162	208	208

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	7,050	276	1,390	2.26	2.61
November.....	1,780	950	1,260	2.05	2.29
December.....	2,000	941	941	1.53	1.76
January.....	1,880	400	987	1.60	1.84
February.....	950	659	659	1.07	1.11
March.....	1,660	850	850	1.38	1.59
April.....	6,560	1,680	3,870	6.28	7.01
May.....	4,470	892	1,750	2.84	3.27
June.....	1,160	240	551	.894	1.00
July.....	313	162	227	.369	.43
August.....	681	157	235	.381	.44
September.....	514	190	266	.432	.48
The year.....	7,050	157	1,080	1.75	23.83

* Estimated.

SALMON RIVER AT CHASM FALLS, N.Y.

LOCATION.—Water-stage recorder at Chasm Falls, Franklin County, a quarter of a mile below power plant of Malone Light & Power Co.

DRAINAGE AREA.—131 square miles.

RECORDS AVAILABLE.—July 1925 to September 1933.

DISCHARGE.—Maximum during year, 2,300 second-feet Apr. 18 (gage height, 4.52 feet); minimum, 25 second-feet July 10 (gage height, 0.51 foot).

1925-33: Maximum, 2,890 second-feet Apr. 25, 1926 (gage height, 5.0 feet); minimum, that of July 10, 1933.

REMARKS.—Records good except those estimated, which are fair. Some diurnal fluctuation caused by operation of power plant. A small diversion from a tributary stream above gage is used as water supply for Malone.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	111	202	125	280	154	140	258	332	300	118	176	109
2.....	122	280	129	307	187	140	387	506	248	120	149	92
3.....	114	230	166	280	145	124	550	572	228	125	114	93
4.....	110	200	206	248	156	128	672	859	216	96	130	111
5.....	110	189	231	262	151	104	648	772	197	86	114	126
6.....	406	203	206	218	169	132	660	550	180	81	109	117
7.....	827	192	234	206	184	180	910	434	226	90	96	131
8.....	598	183	259	174	184	164	1,020	352	245	99	101	151
9.....	368	171	168	196	198	174	796	320	206	115	113	199
10.....	270	195	189	177	170	142	606	300	163	148	96	246
11.....	226	262	208	178	* 132	161	688	280	161	198	92	183
12.....	203	228	191	180	* 105	135	1,080	262	159	137	93	166
13.....	202	206	168	138	* 150	127	1,140	296	133	124	101	151
14.....	175	183	164	175	167	112	1,020	252	128	110	113	151
15.....	161	173	149	165	178	142	1,180	278	133	107	87	156
16.....	168	170	131	168	175	156	1,180	256	129	103	89	137
17.....	187	173	126	168	163	170	1,610	232	128	111	89	137
18.....	170	150	148	164	153	149	2,170	216	137	103	102	144
19.....	162	214	131	186	102	149	1,900	209	143	96	109	161
20.....	156	370	140	222	166	137	1,470	265	139	99	109	124
21.....	120	296	131	189	131	149	1,090	458	121	106	97	148
22.....	157	238	137	172	118	190	845	356	186	107	96	154
23.....	150	181	142	318	116	189	660	288	164	96	87	151
24.....	164	209	150	294	122	169	519	252	142	93	110	140
25.....	133	186	226	199	101	161	458	235	121	96	170	143
26.....	130	165	374	206	118	164	458	219	121	92	197	117
27.....	151	145	280	172	138	159	420	260	122	89	134	137
28.....	172	160	230	169	149	151	361	292	111	90	117	164
29.....	160	163	201	142	-----	148	365	242	117	92	105	140
30.....	154	144	182	178	-----	151	344	266	118	87	115	128
31.....	172	-----	333	185	-----	153	-----	336	-----	86	98	-----

Month	Maximum	Minimum	Mean	Per square mi. ^a	Run-off in inches
October.....	827	110	210	1.60	1.84
November.....	370	144	202	1.54	1.72
December.....	374	125	189	1.44	1.66
January.....	318	138	204	1.56	1.80
February.....	198	101	149	1.14	1.19
March.....	190	104	150	1.15	1.33
April.....	2,170	258	849	6.48	7.23
May.....	859	209	348	2.66	3.07
June.....	300	111	164	1.25	1.40
July.....	198	81	106	.809	.93
August.....	197	87	113	.863	.99
September.....	246	92	143	1.09	1.22
The year.....	2,170	81	235	1.79	24.38

^a Estimated.

CHATEAUGAY RIVER NEAR CHATEAUGAY, N.Y.

LOCATION.—Water-stage recorder 150 feet below dam of International Paper Co. 1 mile south of Chateaugay, Franklin County.

DRAINAGE AREA.—114 square miles.

RECORDS AVAILABLE.—September to December 1908, October 1926 to September 1933.

DISCHARGE.—Maximum during year, 1,700 second-feet Apr. 18 (gage height, 6.46 feet); minimum, 57 second-feet June 2 (gage height, 1.07 feet).

1908, 1926-33: Maximum, 2,060 second-feet Apr. 8, 1928 (gage height, 7.3 feet); minimum, 6 second-feet Nov. 20, 1928 (gage height, 0.23 foot).

REMARKS.—Records good except those for periods of ice effect, Nov. 27 to Dec. 2, Dec. 9-21, Feb. 10-14, 26-27, Mar. 6-19, which are fair. Flow regulated by storage in Upper and Lower Chateaugay Lakes. Large diurnal fluctuations caused by power operations.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	95	100	85	158	143	171	311	270	255	114	115	101
2	94	95	120	174	142	161	387	360	224	114	108	100
3	98	94	94	161	143	159	673	410	214	114	104	97
4	93	92	83	164	155	158	698	485	202	110	107	102
5	99	95	88	162	144	159	662	510	184	112	106	102
6	192	95	97	162	146	160	680	490	166	104	106	97
7	131	94	103	161	152	160	795	430	168	110	108	106
8	99	95	94	156	148	160	680	400	162	116	104	100
9	95	94	90	159	143	160	644	370	176	112	99	107
10	94	100	90	155	140	160	698	350	124	120	101	102
11	96	100	90	148	140	160	735	320	128	114	105	105
12	96	98	90	136	140	160	795	295	126	116	104	98
13	98	96	90	150	140	160	735	315	118	112	103	99
14	95	94	90	161	140	160	795	265	146	112	101	104
15	96	94	90	130	142	160	875	260	150	110	102	102
16	95	93	85	115	146	160	975	260	144	114	98	98
17	97	96	95	117	142	160	1,300	244	132	114	100	95
18	96	94	100	118	145	160	1,620	224	120	112	100	100
19	95	116	120	153	174	160	1,620	216	134	112	99	99
20	95	104	120	138	170	164	1,520	230	138	112	98	100
21	97	99	120	140	168	170	1,360	265	132	114	98	98
22	96	94	121	145	162	171	1,180	280	136	116	98	100
23	94	98	118	174	171	167	1,040	265	138	110	99	99
24	93	99	120	168	167	167	930	250	134	112	108	96
25	89	99	161	171	162	168	800	230	126	110	112	97
26	78	93	128	162	160	166	610	220	130	111	104	98
27	95	80	111	152	160	167	570	260	122	112	97	100
28	92	75	92	147	162	189	380	232	118	110	99	101
29	91	80	94	148	-----	288	198	242	112	112	97	99
30	92	80	97	155	-----	280	228	265	112	109	98	98
31	91	-----	148	152	-----	278	-----	270	-----	108	99	-----

Month	Maximum	Minimum	Mean	Per square m ²	Run-off in inches
October	192	78	98.6	0.865	1.00
November	116	75	94.5	.829	.92
December	161	83	104	.912	1.05
January	174	115	151	1.32	1.52
February	174	140	152	1.33	1.38
March	288	158	175	1.54	1.78
April	1,620	198	816	7.16	7.99
May	510	216	306	2.68	3.09
June	255	112	149	1.31	1.46
July	120	104	112	.982	1.13
August	115	97	102	.895	1.03
September	107	95	100	.877	.98
The year	1,620	75	196	1.72	23.33

RICHELIEU RIVER (LAKE CHAMPLAIN) AT ROUSES POINT, N.Y.

LOCATION.—Staff gage at Rutland Railroad bridge in Rouses Point, Clinton County, 1 mile south of Fort Montgomery. Zero of gage is 92.50 feet above mean sea level.

DRAINAGE AREA.—7,870 square miles.

RECORDS AVAILABLE.—1875 to September 1933.

EXTREMES.—Maximum elevation during year, 100.50 feet Apr. 21; minimum, 93.07 feet Sept. 22.

1869-1933: Maximum elevation known, 103.28 feet April 1869 (see Water-Supply Paper 97, p. 340); minimum, 91.9 feet Nov. 13, 1908.

REMARKS.—Gage heights observed under direction of Corps of Engineers, United States Army, and reported monthly to United States Geological Survey.

Gage height, in feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.80	1.93	3.04	2.45	2.18	1.68	2.42	7.77	4.52	2.43	1.25	0.95
2	.63	1.72	3.15	2.65	2.12	1.62	2.70	7.47	4.57	2.25	1.15	.95
3	.85	1.67	2.90	2.55	2.00	1.62	3.07	7.39	4.40	2.27	1.13	1.05
4	.93	2.05	3.18	2.58	2.10	1.70	3.39	7.42	4.39	2.18	1.10	.88
5	.78	2.15	2.95	2.42	1.98	1.62	3.62	7.59	4.32	2.10	1.08	.78
6	.85	1.90	2.83	2.65	2.00	1.65	4.02	7.57	4.25	2.20	1.15	.90
7	1.23	1.85	3.05	2.70	1.98	1.60	4.40	7.42	4.14	2.12	1.30	.83
8	1.70	1.72	2.62	2.32	1.90	1.62	4.77	7.32	4.02	1.97	1.20	.85
9	1.90	1.90	2.92	2.60	1.98	1.75	5.17	7.25	4.17	1.95	1.02	.80
10	1.93	1.85	2.65	2.38	2.00	1.72	5.39	7.12	3.67	2.00	1.00	.72
11	1.98	2.20	2.60	2.50	1.98	1.70	5.59	7.02	3.80	1.88	1.10	.70
12	2.00	2.17	3.10	2.30	1.90	1.65	5.77	6.85	3.67	1.90	1.25	.72
13	1.80	2.12	2.70	2.30	2.05	1.60	5.97	6.87	3.47	1.85	1.20	.65
14	1.73	2.45	2.53	2.42	1.97	1.72	6.25	6.45	3.42	1.85	.95	.68
15	1.85	2.40	2.45	2.35	1.83	1.75	6.27	6.34	3.37	1.97	.86	.65
16	2.20	2.15	2.48	2.27	1.80	1.73	6.39	6.34	3.35	1.90	.92	.75
17	1.53	2.08	2.50	2.23	1.78	1.78	6.62	6.22	3.18	1.70	.98	.65
18	1.62	2.20	2.48	2.20	1.78	1.70	7.02	6.09	2.92	1.55	1.17	.63
19	1.60	2.35	2.48	2.22	1.77	1.75	7.57	5.94	3.05	1.58	.87	.58
20	1.68	2.72	2.42	2.05	1.95	1.77	7.89	5.75	3.00	1.62	.70	1.03
21	1.72	3.30	2.43	2.15	1.78	1.78	8.00	5.72	2.95	1.50	.68	.62
22	1.67	3.10	2.30	2.10	1.75	1.83	7.97	5.67	2.90	1.62	.70	.57
23	1.52	3.42	2.40	2.12	1.80	1.92	7.99	5.59	2.83	1.47	.68	.60
24	1.62	3.17	2.33	2.12	1.65	1.90	7.90	5.42	2.78	1.45	.62	.70
25	2.00	3.52	2.32	2.20	1.68	1.87	7.87	5.37	2.75	1.28	1.02	.65
26	2.15	2.85	2.30	2.15	1.65	1.90	7.80	5.22	2.70	1.32	.95	.70
27	1.60	3.18	2.35	2.18	1.68	1.92	7.72	5.17	2.73	1.33	.98	.78
28	1.53	3.18	2.33	1.98	1.70	2.02	7.77	5.04	2.60	1.42	.95	.62
29	1.62	3.12	2.38	2.05	-----	2.04	7.57	4.95	2.57	1.28	.92	.58
30	1.60	3.07	2.40	2.15	-----	2.12	7.49	5.22	2.62	1.12	.97	.75
31	1.55	-----	2.42	2.18	-----	2.25	-----	4.77	-----	1.15	1.02	-----

LAKE CHAMPLAIN AT BURLINGTON, VT.

LOCATION.—Staff gage on south side of wharf of Champlain Transportation Co., at foot of King Street, Burlington, Chittenden County. Zero of gage is about 92.5 feet above mean sea level.

RECORDS AVAILABLE.—May 1907 to September 1933.

EXTREMES.—Maximum gage height recorded during year, 8.47 feet Apr. 21; minimum, 0.58 foot Sept. 27.

1907-33: Maximum stage recorded, that of Apr. 21, 1933; minimum, -0.25 foot Dec. 4, 1908.

REMARKS.—Gage-height record furnished by D. A. Loomis, general manager, Champlain Transportation Co.

Gage height, in feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Mar.	Apr.	May	June	Ju'y	Aug.	Sept.
1.....	0.68		3.12			2.37		4.77	2.47	1.28	0.98
2.....		1.70	3.02	2.50			7.47	4.65		1.26	.98
3.....	.67	1.81	3.02	2.54		3.37	7.47	4.47	2.41	1.26	
4.....	.59	1.85		2.52		3.47	7.67		2.37	1.28	.94
5.....			2.88	2.56		3.77	7.87	4.37	2.27	1.28	.90
6.....	.79		2.92			4.07	7.87	4.17	2.25		.88
7.....	1.33	1.85	2.86			4.37		4.15	2.21	1.18	.88
8.....	1.67	1.97	2.80		1.74	4.46	7.57	4.07	2.17	1.08	.86
9.....	1.77	1.93					7.37	4.03		1.08	.90
10.....		1.97	2.78			5.51	7.17	3.79	2.07	1.08	
11.....	1.85				1.76	5.65	6.87		2.03	1.02	.88
12.....	1.85	2.20	2.68			5.75	6.77	3.71	1.99	.98	.86
13.....				2.40	1.76	6.01	6.67	3.62	1.91		.78
14.....			2.68	2.34		6.09		3.51	1.87	.98	.78
15.....	1.80	2.20				6.17	6.57	3.47	1.79	.96	.78
16.....		2.24	2.60	2.26	1.86		6.45	3.37		.90	.78
17.....	1.76	2.23	2.54	2.24		6.67	6.33	3.35	1.69	.88	
18.....	1.73	2.34		2.24	1.86	7.17	6.17		1.65	.86	.68
19.....	1.73	2.31	2.44	2.21		7.67	6.01	3.15	1.61	.84	.70
20.....	1.77		2.42		1.82	8.27	5.79	3.09	1.59		.72
21.....		3.15	2.40	2.21		8.47		3.01	1.57	.82	.68
22.....	1.73	3.23	2.40		1.86		5.77	2.87	1.55	.80	.68
23.....	1.71	3.27	2.34	2.23	1.96		5.57	2.95		.78	.68
24.....	1.71		2.35	2.23		8.17	5.55	2.87	1.51	.86	
25.....				2.26	2.06	8.17	5.41		1.53	.88	.68
26.....				2.26			5.27	2.77	1.47	.98	.66
27.....	1.71		2.31	2.25			5.17	2.67	1.43		.58
28.....	1.67	3.21	2.36	2.27				2.61	1.37	1.08	.68
29.....		3.19	2.38			7.77	5.03	2.57	1.29	1.08	.68
30.....		3.13	2.38		2.16		4.87	2.51		1.06	.66
31.....	1.65		2.41		2.26		4.85		1.27	1.06	

NOTE.—No record on days omitted.

GREAT CHAZY RIVER AT PERRY MILLS, N.Y.

LOCATION.—Water-stage recorder 500 feet above highway bridge at Perry Mills, Clinton County.

DRAINAGE AREA.—243 square miles.

RECORDS AVAILABLE.—September 1928 to September 1933.

DISCHARGE.—Maximum during year, 2,940 second-feet Apr. 18 (gage height, 7.22 feet); minimum, 8.1 second-feet July 20 (gage height, 1.67 feet).

1928-33: Maximum, 5,810 second-feet Mar. 16, 1929; maximum gage height, 11.2 feet Mar. 15, 1929; minimum, about 0.8 second-foot Sept. 18, 1932 (gage height, 1.33 feet).

REMARKS.—Records good except those for periods of ice effect, Nov. 26-30, Dec. 10 to Apr. 1, those estimated, and those for extremely low stages, which are fair. Diurnal fluctuation caused by operation of sawmill nearby.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	20	64	165	550	190	170	400	308	255	49	82	76
2	20	169	158	460	220	170	* 550	792	205	49	58	80
3	23	178	172	420	190	170	* 700	1,330	161	50	59	78
4	21	149	208	460	180	150	* 900	2,080	144	42	82	61
5	21	138	208	500	170	130	* 900	1,210	135	50	79	53
6	118	131	198	500	170	120	* 1,200	663	122	46	75	87
7	642	133	197	420	190	110	* 1,800	508	115	68	61	103
8	267	131	295	360	240	100	* 2,300	412	118	68	70	102
9	159	125	245	320	260	100	* 2,150	348	110	58	83	111
10	110	146	260	320	220	90	1,470	338	103	53	75	100
11	101	344	220	360	170	90	1,520	356	98	64	77	74
12	91	292	200	360	160	90	2,260	285	91	71	80	101
13	92	192	220	300	160	90	2,000	289	88	44	82	86
14	103	154	220	260	170	90	1,590	290	77	31	92	94
15	101	148	200	260	180	85	1,810	302	69	31	100	86
16	96	140	190	260	160	100	1,520	287	65	37	92	98
17	93	149	220	280	150	140	2,110	241	76	37	92	98
18	98	134	220	240	150	130	2,740	217	73	37	94	53
19	92	217	200	260	150	120	2,420	192	71	34	94	91
20	91	519	200	400	140	120	1,540	193	70	21	100	94
21	89	342	190	300	150	130	959	442	65	24	52	74
22	94	248	190	280	180	180	687	426	62	31	86	47
23	87	233	190	550	170	160	556	328	63	19	94	36
24	95	296	190	550	300	150	443	246	62	23	129	55
25	97	282	320	380	260	140	436	214	51	28	181	72
26	71	220	600	280	220	140	569	191	48	72	105	110
27	49	180	440	220	170	150	570	292	56	64	99	90
28	47	160	360	180	170	150	435	379	50	69	67	103
29	67	150	300	170	-----	170	341	272	47	72	109	85
30	51	150	260	170	-----	190	316	225	48	70	93	79
31	49	-----	600	170	-----	260	-----	246	-----	66	83	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	642	20	102	0.420	0.48
November	519	64	197	.811	.90
December	600	158	253	1.04	1.20
January	550	170	340	1.40	1.61
February	300	140	187	.770	.80
March	260	85	135	.556	.64
April	2,740	316	1,240	5.10	5.69
May	2,080	191	448	1.84	2.12
June	255	47	93.3	.384	.43
July	72	19	47.7	.196	.23
August	181	52	87.9	.362	.42
September	111	36	82.6	.340	.38
The year	2,740	19	267	1.10	14.90

* Estimated.

SARANAC RIVER AT SARANAC, N.Y.

LOCATION.—Water-stage recorder 500 feet above highway bridge at Saranac, Clinton County.

DRAINAGE AREA.—520 square miles.

RECORDS AVAILABLE.—September 1930 to September 1933.

DISCHARGE.—Maximum during year, 5,780 second-feet Apr. 17; maximum gage height, 11.0 feet Feb. 10, backwater from ice jam; minimum, 106 second-feet Aug. 7 (gage height, 1.71 feet).

1930-33: Maximum, that of Apr. 17, 1933; maximum gage height, that of Feb. 10, 1933; minimum, about 100 second-feet (revised) Nov. 2, 1930 (gage height, 1.65 feet).

REMARKS.—Records good except those for periods of ice effect, Dec. 13 to Jan. 2, Feb. 6-8, Mar. 12-20, and those estimated, which are fair. Considerable diurnal fluctuation caused by power operations. Flow partly regulated by storage in Lower Saranac Lake and elsewhere.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	282	656	* 500	1,000	430	* 420	812	1,860	936	441	394	255
2.....	195	722	* 550	900	416		1,110	2,320	888	260	316	208
3.....	244	754	* 550	874	519		1,600	2,520	832	309	284	144
4.....	280	718	* 600	874	498		1,710	3,110	776	297	292	194
5.....	260	634	* 650	952	481		1,920	2,720	732	301	298	* 250
6.....	901	682	607	934	480	* 450	2,160	2,450	694	343	206	* 305
7.....	1,190	744	784	863	500		3,280	2,180	750	403	177	322
8.....	435	720	740	773	550		3,330	1,860	758	412	309	333
9.....	328	723	736	705	550		2,800	1,660	380	333	270	378
10.....	759	661	654	722	550		2,460	1,530	238	345	220	252
11.....	1,010	740	583	740	* 450	* 460	2,530	1,400	198	389	261	208
12.....	1,040	700	574	829			3,280	1,240	197	353	295	200
13.....	1,010	768	550	681			3,020	1,300	263	351	256	147
14.....	886	778	500	624			3,060	1,260	370	490	324	188
15.....	742	588	500	573			750	3,420	1,700	400	498	328
16.....	629	624	* 500	521	* 500	950	3,440	1,080	364	346	278	280
17.....	684	648	* 480	498		800	5,260	1,000	264	299	280	197
18.....	668	705	* 480	582		700	5,440	944	570	434	285	233
19.....	586	890	* 460	564		650	5,080	912	501	466	292	351
20.....	468	1,150	460	480		1,000	4,210	1,040	331	518	194	346
21.....	454	* 900	500	495	* 450	1,150	3,550	1,350	260	432	198	260
22.....	586	* 700	550	602		1,030	3,080	1,260	434	414	280	165
23.....	550	* 600	700	928		752	2,550	1,120	220	260	282	153
24.....	* 600	* 550	1,000	722		718	2,310	1,020	320	226	385	* 150
25.....	* 500	* 600	1,300	657		590	2,180	960	396	338	426	* 213
26.....	* 450	* 550	900	604	* 420	555	2,260	952	267	322	280	* 314
27.....	* 500	* 550	750	600		630	2,040	1,000	450	316	188	* 340
28.....	* 550	* 500	650	509		635	2,010	928	376	309	200	* 260
29.....	* 500	* 480	600	335		578	2,010	832	342	* 300	277	* 200
30.....	* 500	* 480	600	623		628	1,910	832	394	* 250	292	* 170
31.....	* 550	-----	1,000	608	-----	680	-----	932	-----	188	249	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	1,190	195	592	1.14	1.31
November.....	1,150	480	684	1.32	1.47
December.....	1,300	460	645	1.24	1.43
January.....	1,000	335	689	1.32	1.52
February.....	550	-----	463	.890	.93
March.....	1,150	-----	616	1.18	1.36
April.....	5,440	812	2,790	5.37	5.99
May.....	3,110	832	1,440	2.77	3.19
June.....	936	197	463	.890	.99
July.....	518	188	353	.679	.78
August.....	426	177	278	.535	.62
September.....	378	144	243	.467	.52
The year.....	5,440	144	771	1.48	20.11

* Estimated.

WEST BRANCH OF AUSABLE RIVER NEAR NEWMAN, N.Y.

LOCATION.—Water-stage recorder 4 miles northeast of Newman, Essex County, and 4 miles below mouth of Lake Placid outlet.

DRAINAGE AREA.—116 square miles.

RECORDS AVAILABLE.—June 1916 to December 1917, July 1918 to September 1933.

DISCHARGE.—Maximum during year, 6,200 second-feet Oct. 6 (gauge height, 9.61 feet); minimum, 27 second-feet July 29, Aug. 1 (gauge height, 2.24 feet).

1916-17, 1919-33: Maximum, that of Oct. 6, 1932; minimum, practically zero Sept. 13, 1920, caused by closing gates in logging dam (gauge height, 1.60 feet). Average, 14 years (1919-33), 226 second-feet.

REMARKS.—Records good except those for periods of ice effect, Nov. 22 to Dec. 1, Dec. 8 to Jan. 2, Jan. 9, 14-15, Jan. 23 to Feb. 18, Feb. 27 to Mar. 25, Apr. 1-9, which are fair. Diurnal fluctuation at low and medium stages caused by power operations.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	54	790	100	320	95	90	260	1,090	282	78	37	52
2.....	62	1,180	117	260	95	90	650	1,620	206	76	44	49
3.....	81	517	125	222	90	95	750	1,610	176	70	43	50
4.....	69	320	139	195	85	90	750	1,700	192	56	52	42
5.....	120	283	151	183	80	90	500	768	168	52	48	50
6.....	2,960	359	137	151	75	85	480	531	138	72	44	43
7.....	3,400	286	149	144	80	90	1,300	439	167	48	38	47
8.....	944	276	180	128	120	90	900	380	178	52	44	47
9.....	509	244	150	120	130	85	500	312	143	51	43	75
10.....	332	305	130	119	110	80	376	290	119	62	40	345
11.....	262	444	120	121	95	80	429	272	107	70	39	222
12.....	215	343	110	119	90	75	649	283	94	58	38	119
13.....	198	265	100	93	85	75	513	475	86	57	54	82
14.....	172	212	95	90	80	95	691	515	82	50	54	76
15.....	154	186	90	85	80	160	1,220	351	78	66	51	99
16.....	151	172	85	89	80	240	1,170	272	74	62	43	82
17.....	232	209	80	99	80	260	2,560	230	73	50	38	73
18.....	244	203	80	110	75	200	3,000	214	86	44	40	82
19.....	279	468	75	97	84	170	1,990	223	86	42	47	93
20.....	258	850	75	137	106	130	1,290	308	73	63	43	101
21.....	222	422	75	112	123	170	900	581	70	51	52	147
22.....	262	280	80	102	100	260	782	409	148	40	29	121
23.....	212	220	85	400	112	260	524	305	113	47	37	146
24.....	170	180	120	300	108	200	439	248	83	47	297	109
25.....	151	170	170	160	95	170	556	230	75	44	955	89
26.....	134	140	240	150	91	175	613	214	72	43	327	79
27.....	262	120	190	120	90	173	426	217	73	62	167	74
28.....	286	110	150	110	90	153	339	233	81	32	100	97
29.....	265	100	120	95	-----	159	866	203	65	32	76	92
30.....	258	100	130	90	-----	136	865	216	70	38	64	81
31.....	234	-----	380	90	-----	164	-----	325	-----	36	55	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	3,400	54	424	3.66	4.22
November.....	1,180	100	325	2.80	3.12
December.....	380	75	130	1.12	1.29
January.....	400	85	149	1.28	1.48
February.....	130	75	93.7	.808	.84
March.....	260	75	142	1.22	1.41
April.....	3,000	260	876	7.55	8.42
May.....	1,700	203	486	4.19	4.83
June.....	282	65	115	.991	1.11
July.....	78	32	53.3	.459	.53
August.....	955	29	98.0	.845	.97
September.....	345	42	95.5	.823	.92
The year.....	3,400	29	249	2.15	29.14

AUSABLE RIVER NEAR AUSABLE FORKS, N.Y.

LOCATION.—Water-stage recorder $1\frac{1}{4}$ miles below junction of East and West Branches of Ausable River at Ausable Forks, Clinton County.

DRAINAGE AREA.—448 square miles.

RECORDS AVAILABLE.—September 1924 to September 1933.

DISCHARGE.—Maximum during year, 14,800 second-feet Oct. 7 (gage height, 9.20 feet); minimum, 89 second-feet Aug. 6 (gage height, 1.06 feet).

1924-33: Maximum, about 19,100 second-feet Oct. 1, 1924 (gage height, 10.55 feet); minimum, 78 second-feet Oct. 12, 1930, and Sept. 25, 1932 (gage height, 1.01 feet).

REMARKS.—Records good except those for periods of ice effect, Nov. 24 to Dec. 2, Dec. 11 to Jan. 2, Jan. 9-18, 20, 21, Jan. 26 to Feb. 7, Mar. 6-15, 19-23, 26-30, and those estimated, which are fair. Flow partly regulated by storage, principally in Taylor Pond and Fern Lake.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	170	1,220	380	950	300	* 260	903	3,250	778	266	170	194
2	166	3,070	* 420	750	280	* 240	1,780	4,420	603	268	150	178
3	200	1,460	* 460	624	280	* 240	2,740	4,870	504	195	162	169
4	214	899	* 500	569	260	* 240	2,580	5,690	516	172	166	139
5	197	705	* 480	533	240	* 240	2,060	2,700	474	192	162	166
6	6,560	847	* 440	449	220	240	1,980	1,750	404	188	128	166
7	8,890	726	* 420	433	300	260	5,260	1,420	496	191	130	172
8	2,640	691	* 400	387	410	280	4,130	1,210	533	191	133	166
9	1,300	650	* 340	380	468	240	2,120	1,020	418	198	133	188
10	821	927	* 340	360	* 380	240	1,640	929	344	237	130	466
11	618	1,580	* 300	340	* 340	220	1,670	879	293	248	128	528
12	499	1,160	300	* 340	* 280	220	2,770	879	265	205	120	* 350
13	444	879	280	* 340	* 260	240	2,060	1,320	252	181	130	* 290
14	392	684	240	* 340	* 220	280	2,490	1,650	254	195	147	* 230
15	349	575	220	* 340	* 220	380	4,240	1,160	244	188	166	* 241
16	327	522	200	440	* 200	602	4,000	920	241	201	150	234
17	397	610	200	400	* 220	612	8,120	762	260	201	144	212
18	504	653	180	340	* 220	545	10,200	677	257	188	142	230
19	633	1,070	180	405	* 220	440	7,280	670	290	184	147	234
20	631	2,890	180	380	* 320	380	4,430	880	256	188	144	241
21	539	1,470	180	320	* 360	360	3,090	1,940	245	208	142	318
22	587	940	180	344	* 340	440	2,700	1,360	382	205	142	318
23	504	630	200	786	* 340	480	1,810	1,020	344	188	133	358
24	428	550	260	892	* 300	438	1,470	800	260	178	986	309
25	373	480	440	534	* 300	392	1,810	719	230	172	3,490	248
26	358	400	700	420	* 260	360	2,120	670	212	162	1,280	* 220
27	473	300	650	340	* 260	320	1,520	664	230	156	654	* 200
28	726	360	600	280	* 260	300	1,160	726	237	144	360	* 200
29	644	340	500	260	-----	320	2,370	644	243	142	260	* 240
30	599	340	480	240	-----	400	2,610	618	248	136	237	* 220
31	569	-----	1,300	240	-----	522	-----	798	-----	133	195	-----

Month	Maximum	Minimum	Mean	Per square mi ^a	Run-off in inches
October	8,890	166	1,020	2.28	2.63
November	3,070	300	921	2.06	2.30
December	1,300	180	385	.859	.99
January	950	240	444	.991	1.14
February	468	200	288	.643	.67
March	612	220	346	.772	.89
April	10,200	903	3,100	6.92	7.72
May	5,690	618	1,520	3.39	3.91
June	778	212	344	.768	.86
July	268	133	190	.424	.49
August	3,490	120	347	.775	.89
September	528	139	247	.551	.61
The year	10,200	120	763	1.70	23.10

* Estimated.

BLACK BROOK AT BLACK BROOK, N.Y.

LOCATION.—Staff gage 100 feet below hydroelectric plant of Associated Gas & Electric System and three-quarters of a mile south of Black Brook, Clinton County.

DRAINAGE AREA.—49.3 square miles.

RECORDS AVAILABLE.—September 1924 to September 1933.

DISCHARGE.—Maximum during year, 533 second-feet Apr. 18 (gage height, 4.9 feet); minimum, 4.0 second-feet Aug. 28, 29, Sept. 23 (plant shut down).

1924-33: Maximum, 720 second-feet Apr. 25, 1926 (gage height, 5.6 feet); minimum, 0.8 second-foot July 2, Aug. 29, 1931 (plant shut down).

REMARKS.—Records fair. Flow regulated by storage in Taylor Pond and Fern Lake and by operation of power plant.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8	* 11	17	36	49	44	60	130	62	72	53	33
2	5	* 11	* 24	36	49	44	93	135	54	48	59	38
3	29	* 11	33	36	* 47	44	140	176	49	18	61	15
4	24	* 11	* 41	36	45	37	239	235	47	9	44	8
5	38	12	40	36	16	7	221	205	47	43	42	32
6	67	* 16	36	36	23	33	244	166	46	57	13	38
7	182	21	37	36	28	40	370	132	47	57	23	28
8	91	* 26	37	* 36	40	43	470	112	41	60	28	34
9	31	* 31	* 28	55	44	17	316	105	38	66	31	43
10	36	* 35	32	35	23	24	201	98	37	72	31	20
11	41	* 39	19	32	35	32	277	92	33	70	30	20
12	21	43	50	53	32	* 68	348	89	33	53	31	14
13	* 8	* 39	58	44	28	107	348	81	33	42	31	19
14	* 10	* 33	66	32	11	62	284	81	60	52	31	34
15	11	* 28	36	* 7	* 7	64	302	81	56	60	44	34
16	11	24	32	32	35	88	* 321	81	49	66	45	29
17	* 11	* 28	29	15	39	75	* 410	81	60	72	43	27
18	* 11	* 34	21	15	38	64	510	70	28	74	41	36
19	* 11	37	37	29	25	66	428	65	56	64	44	30
20	* 11	69	26	* 7	41	58	315	82	79	78	46	27
21	* 11	* 90	34	11	45	68	247	115	65	81	46	23
22	11	58	54	29	* 44	52	* 212	98	56	80	40	22
23	11	* 26	48	* 29	42	39	* 187	80	59	72	47	14
24	* 11	31	39	28	44	34	158	68	43	65	52	8
25	* 11	* 30	45	25	45	28	125	72	41	59	52	8
26	* 11	31	47	34	28	* 39	156	65	48	54	36	8
27	* 11	* 32	* 47	* 24	42	51	162	62	45	46	11	7
28	* 11	29	47	21	44	29	138	60	69	43	5	7
29	11	17	41	21	-----	30	140	60	74	43	10	7
30	11	19	33	46	-----	32	132	60	73	43	39	7
31	* 11	-----	35	* 47	-----	38	-----	72	-----	43	24	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	162	5	24.5	0.497	0.57
November	90	11	30.7	.623	.70
December	66	17	37.7	.765	.88
January	55	7	30.7	.623	.72
February	49	7	35.3	.716	.75
March	107	7	47.0	.953	1.10
April	510	60	252	5.11	5.70
May	235	60	100	2.03	2.34
June	79	28	50.9	1.03	1.15
July	81	9	57.2	1.16	1.34
August	61	5	36.5	.740	.85
September	43	7	22.3	.452	.50
The year	510	5	60.3	1.22	16.60

* Gage not read; discharge estimated from plotted gage-height graphs.

EAST BRANCH OF AUSABLE RIVER AT AUSABLE FORKS, N.Y.

LOCATION.—Staff gage at lower highway bridge in Ausable Forks, Essex County, 400 feet above confluence with West Branch of Ausable River.

DRAINAGE AREA.—199 square miles.

RECORDS AVAILABLE.—September 1924 to September 1933.

DISCHARGE.—Maximum during year, 8,550 second-feet Oct. 6 (gage height, 6.6 feet); minimum, about 26 second-feet several times July 25 to Aug. 23.

1924-33: Maximum stage, 11.4 feet Mar. 28, 1925 (discharge not determined).

Minimum, that of July 25 to Aug. 23, 1933.

REMARKS.—Records good except those for periods of ice effect, Nov. 22 to Dec. 2, Dec. 8-26, 28, 31, Jan. 9-16, Jan. 19 to Apr. 3, and those estimated, which are fair.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	62	642	200	413	130	75	700	1,520	304	67	34	70
2	62	1,370	240	292	110	75	1,400	2,060	240	100	30	64
3	64	688	252	257	95	75	2,000	2,200	184	70	35	57
4	67	452	286	235	90	65	1,240	2,440	208	57	40	57
5	62	354	246	208	85	65	910	1,180	169	50	37	54
6	3,730	439	218	224	85	65	830	803	144	45	30	52
7	4,010	354	218	184	170	80	2,560	605	228	40	27	52
8	1,110	354	180	144	240	85	1,750	535	238	40	26	50
9	528	311	95	130	220	80	850	452	161	78	32	57
10	342	560	120	120	180	75	712	406	121	59	30	153
11	246	882	95	120	160	75	726	394	100	70	26	179
12	194	675	80	120	130	75	1,190	413	90	54	26	121
13	174	486	75	110	110	70	830	665	81	42	29	90
14	148	361	65	120	100	85	1,110	791	76	42	38	81
15	140	298	65	140	95	100	1,910	605	76	37	37	84
16	136	274	60	220	90	180	1,770	452	70	35	35	81
17	148	335	60	246	90	190	4,000	400	70	35	30	70
18	189	335	60	224	85	150	5,110	317	73	37	29	76
19	348	555	55	220	100	110	3,560	329	81	34	34	76
20	329	1,360	55	190	160	85	1,900	430	76	32	30	78
21	286	730	55	170	150	110	1,390	898	67	35	27	118
22	286	460	55	170	120	160	1,200	522	136	37	26	121
23	246	360	55	400	150	130	830	458	100	34	26	165
24	208	280	95	380	130	120	675	368	73	29	917	124
25	169	220	240	300	110	130	910	342	67	27	2,160	96
26	153	170	400	220	95	130	1,000	311	62	29	742	87
27	252	95	292	160	85	130	675	335	62	29	368	78
28	348	170	240	120	80	140	514	328	57	27	198	81
29	329	170	189	110	-----	150	1,040	274	52	29	140	87
30	292	180	165	95	-----	190	1,110	263	70	27	93	78
31	268	-----	700	85	-----	320	-----	329	-----	26	81	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	4,010	62	481	2.42	2.79
November	1,370	95	464	2.33	2.60
December	700	55	168	.844	.97
January	413	85	198	.995	1.15
February	240	80	123	.618	.64
March	320	65	115	.578	.67
April	5,110	514	1,480	7.44	8.30
May	2,440	263	691	3.47	4.00
June	304	52	118	.593	.66
July	100	26	43.6	.219	.25
August	2,160	26	175	.879	1.01
September	179	50	87.9	.442	.49
The year	5,110	26	345	1.73	23.53

• Estimated.

BOUQUET RIVER AT WILLSBORO, N.Y.

LOCATION.—Water-stage recorder half a mile southwest of Willsboro, Essex County.

DRAINAGE AREA.—271 square miles.

RECORDS AVAILABLE.—August and September 1904, August to November 1908, July 1923 to September 1933.

DISCHARGE.—Maximum during year, 5,490 second-feet Apr. 18 (gage height, 7.53 feet); minimum, 37 second-feet Aug. 13 (gage height, 2.18 feet).

1923-33: Maximum, about 11,800 second-feet Oct. 1, 1924 (gage height, 10.85 feet); minimum, 27 second-feet Sept. 11, 1932 (gage height, 2.10 feet). Average, 10 years (1923-33), 320 second-feet.

REMARKS.—Records good except those for periods of ice effect, Nov. 23 to Dec. 3, Dec. 8 to Apr. 3, and those estimated, which are fair.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	42	* 477	170	550	120	140	900	926	233	* 75	42	60
2.....	43	1,270	220	380	110	120	1,200	1,030	197	* 150	42	54
3.....	47	636	240	280	100	110	1,400	1,370	185	* 100	40	51
4.....	* 50	422	276	240	95	100	1,730	2,050	189	* 80	46	48
5.....	* 50	333	271	223	90	95	1,420	1,110	168	* 65	45	45
6.....	1,570	302	266	220	90	90	* 1,300	797	149	* 62	45	43
7.....	4,190	291	252	240	120	110	2,570	667	202	* 59	47	46
8.....	916	281	260	180	220	* 130	3,250	570	238	* 58	46	* 45
9.....	481	276	150	160	240	140	1,430	518	181	* 150	* 42	* 48
10.....	333	721	110	150	190	110	1,210	480	141	* 120	39	* 55
11.....	266	1,060	95	140	160	85	1,140	442	119	* 140	39	58
12.....	215	685	85	130	130	80	1,810	412	105	* 100	38	58
13.....	185	506	75	130	120	75	1,420	496	91	* 85	39	54
14.....	164	378	70	130	110	85	1,280	532	89	* 86	42	51
15.....	149	328	65	160	100	120	2,030	454	85	65	43	51
16.....	141	296	65	220	95	200	1,730	378	83	58	46	51
17.....	152	356	65	260	90	300	2,840	339	87	52	43	49
18.....	189	448	60	240	85	200	4,940	302	89	49	* 40	51
19.....	210	994	60	220	90	120	3,980	281	91	46	* 44	* 52
20.....	276	1,990	60	200	130	100	2,360	297	89	45	* 41	* 54
21.....	220	915	60	190	220	110	1,560	660	83	45	* 40	* 65
22.....	206	679	60	190	180	300	1,320	524	102	45	* 39	53
23.....	181	360	* 65	360	220	340	957	412	119	49	39	81
24.....	160	280	* 100	500	340	200	837	328	89	50	75	67
25.....	149	220	* 240	340	240	180	877	286	* 76	50	1,090	62
26.....	149	180	* 400	240	200	180	877	271	* 68	52	444	62
27.....	176	150	* 300	170	180	170	716	252	* 63	49	205	56
28.....	281	140	* 260	130	150	170	597	252	* 56	47	130	49
29.....	247	140	220	110	-----	190	753	238	* 50	* 45	106	56
30.....	210	150	190	100	-----	300	993	220	* 75	* 42	* 79	49
31.....	202	-----	750	90	-----	550	-----	262	-----	* 40	* 67	-----

Month	Maximum	Minimum	Mean	Per square mi. ^a	Run-off in inches
October.....	4,190	42	382	1.41	1.63
November.....	1,990	140	505	1.86	2.08
December.....	750	60	179	.661	.76
January.....	550	90	222	.819	.94
February.....	340	85	151	.557	.58
March.....	550	75	168	.620	.71
April.....	4,940	597	1,650	6.09	6.80
May.....	2,050	220	553	2.04	2.35
June.....	238	50	120	.443	.49
July.....	150	40	69.3	.256	.30
August.....	1,090	38	102	.376	.43
September.....	83	43	55.1	.203	.23
The year.....	4,940	38	345	1.27	17.30

* Estimated.

LAKE GEORGE AT ROGERS ROCK, N.Y.

LOCATION.—Staff gage about 500 feet north of Hoopers dock, on south side of Stones Bay, Rogers Rock, Essex County.

RECORDS AVAILABLE.—July 1913 to September 1933.

EXTREMES.—Maximum gage height during year, 4.91 feet Apr. 21; minimum, 2.11 feet Sept. 30.

1913-33: Maximum gage height, 5.07 feet Apr. 18, 1922; minimum, 1.06 feet Dec. 29, 1922.

REMARKS.—Records good. Elevation of lake surface regulated by power operations and flood gates at Ticonderoga.

Gage height, in feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.02	3.40	3.76	3.34	3.32	3.36	3.54	4.51	3.67	3.18	2.65	2.57
2	3.00	3.56	3.74	3.36	3.34	3.40	3.60	4.53	3.63	3.17	2.63	2.55
3	3.02	3.58	3.72	3.38	3.36	3.38	3.80	4.55	3.61	3.15	2.61	2.53
4	2.98	3.56	3.70	3.36	3.34	3.40	3.88	4.51	3.59	3.14	2.59	2.51
5	3.30	3.54	3.68	3.34	3.32	3.42	3.98	4.49	3.57	3.13	2.57	2.49
6	3.52	3.48	3.62	3.32	3.30	3.40	3.96	4.51	3.53	3.11	2.55	2.47
7	3.54	3.46	3.58	3.30	3.31	3.38	4.16	4.47	3.51	3.07	2.53	2.45
8	3.56	3.44	3.52	3.32	3.32	3.36	4.27	4.43	3.52	3.05	2.51	2.43
9	3.58	3.46	3.42	3.30	3.32	3.38	4.29	4.33	3.51	3.03	2.49	2.35
10	3.60	3.48	3.40	3.32	3.34	3.40	4.27	4.39	3.49	3.04	2.51	2.39
11	3.58	3.50	3.36	3.30	3.36	3.42	4.31	4.35	3.47	3.03	2.49	2.37
12	3.60	3.54	3.42	3.28	3.38	3.40	4.39	4.33	3.45	2.89	2.51	2.35
13	3.58	3.56	3.38	3.26	3.36	3.38	4.43	4.23	3.43	3.03	2.47	2.33
14	3.56	3.58	3.36	3.28	3.34	3.36	4.52	4.19	3.41	3.01	2.49	2.31
15	3.54	3.60	3.30	3.36	3.32	3.38	4.56	4.17	3.39	2.89	2.47	2.29
16	3.50	3.58	3.28	3.34	3.34	3.40	4.58	4.13	3.33	2.90	2.45	2.27
17	3.52	3.60	3.32	3.26	3.32	3.44	4.62	4.09	3.31	2.89	2.43	2.27
18	3.44	3.62	3.34	3.28	3.30	3.42	4.74	4.07	3.29	2.87	2.42	2.25
19	3.46	3.72	3.32	3.26	3.32	3.40	4.82	4.05	3.27	2.85	2.41	2.24
20	3.48	4.10	3.30	3.28	3.30	3.38	4.88	4.03	3.29	2.87	2.39	2.23
21	3.46	4.14	3.32	3.28	3.28	3.40	4.91	3.97	3.31	2.88	2.37	2.21
22	3.44	3.96	3.34	3.30	3.26	3.50	4.73	3.91	3.30	2.87	2.35	2.19
23	3.42	3.94	3.32	3.38	3.28	3.48	4.81	3.91	3.29	2.85	2.33	2.17
24	3.44	3.92	3.30	3.40	3.30	3.44	4.75	3.81	3.28	2.83	2.43	2.15
25	3.46	3.88	3.28	3.42	3.28	3.40	4.67	3.79	3.27	2.81	2.63	2.17
26	3.40	3.86	3.32	3.36	3.34	3.46	4.65	3.77	3.25	2.79	2.67	2.15
27	3.38	3.82	3.30	3.32	3.40	3.42	4.69	3.75	3.23	2.77	2.65	2.13
28	3.36	3.84	3.28	3.30	3.38	3.44	4.63	3.73	3.22	2.75	2.61	2.15
29	3.30	3.80	3.26	3.28	-----	3.42	4.59	3.71	3.21	2.73	2.59	2.13
30	3.32	3.78	3.28	3.26	-----	3.44	4.53	3.70	3.19	2.71	2.57	2.11
31	3.30	-----	3.26	3.30	-----	3.48	-----	3.69	-----	2.69	2.53	-----

POULTNEY RIVER BELOW FAIR HAVEN, VT.

LOCATION.—Water-stage recorder a third of a mile below Carver Falls, 1.9 miles above mouth of Hubbardton River, and 3¼ miles northwest of Fair Haven, Rutland County.

DRAINAGE AREA.—187 square miles.

RECORDS AVAILABLE.—October 1928 to September 1933.

DISCHARGE.—Maximum during year, 3,870 second-feet Nov. 20 (gage height, 16.26 feet); minimum, 9 second-feet Aug. 4 (gage height, 1.84 feet).

1928-33: Maximum, that of Nov. 20, 1932; minimum, that of Aug. 4, 1933.

REMARKS.—Records good except those estimated, which are fair. Stage-discharge relation affected by ice Dec. 15-25, Feb. 10-14, Feb. 2^o to Mar. 13. Lake Bomoseen may produce seasonal storage. Slight diurnal regulation at low stages.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	124	302	* 258	224	136	* 165	1,060	346	207	31	24	31
2.....	76	692	* 265	154	153	* 155	1,520	335	193	26	23	23
3.....	47	357	* 285	212	184	* 150	1,730	257	189	26	23	16
4.....	90	273	* 313	202	124	* 142	1,730	482	178	26	18	24
5.....	91	254	324	196	127	* 142	1,520	357	142	26	20	31
6.....	145	240	247	181	* 120	* 135	1,330	249	66	26	20	23
7.....	448	291	247	193	* 230	* 140	1,470	227	69	24	20	27
8.....	258	280	142	130	284	* 200	1,960	221	72	25	20	44
9.....	128	229	140	183	243	* 270	1,300	222	42	25	20	20
10.....	176	379	116	164	* 168	* 205	1,040	170	56	25	20	35
11.....	97	424	110	183	* 182	* 180	910	207	36	25	20	40
12.....	168	324	155	190	* 152	* 135	910	186	40	26	20	35
13.....	157	273	153	142	* 163	* 165	1,140	197	39	28	18	37
14.....	168	232	125	150	* 160	197	1,360	126	43	25	18	29
15.....	152	210	* 140	123	155	230	1,520	182	33	25	19	26
16.....	98	196	* 150	164	166	261	1,360	175	36	25	20	33
17.....	127	459	* 155	175	133	233	1,360	182	37	25	20	20
18.....	185	402	* 140	162	135	221	1,640	160	37	25	20	29
19.....	240	927	* 150	137	120	180	1,440	129	38	25	20	27
20.....	170	2,760	* 155	221	175	202	1,140	175	33	38	20	32
21.....	148	1,250	* 143	160	227	212	910	153	36	25	20	37
22.....	131	836	* 145	133	186	368	740	185	56	25	20	36
23.....	94	* 597	* 150	322	186	302	630	221	41	24	20	29
24.....	127	* 500	* 150	238	234	280	540	218	33	25	22	27
25.....	175	* 430	* 152	197	193	324	505	218	44	25	58	33
26.....	198	* 380	156	176	162	390	494	216	52	25	72	30
27.....	184	* 320	194	158	* 168	424	470	212	31	27	30	24
28.....	198	* 270	182	146	* 170	482	413	124	41	31	50	28
29.....	180	* 260	156	117	-----	482	379	142	35	29	22	35
30.....	116	* 255	172	138	-----	620	357	76	35	24	23	19
31.....	168	-----	277	135	-----	644	-----	115	-----	24	19	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	448	47	157	0.840	0.97
November.....	2,760	196	487	2.60	2.90
December.....	324	110	182	.973	1.12
January.....	322	117	174	.930	1.07
February.....	284	120	173	.925	.96
March.....	644	135	266	1.42	1.64
April.....	1,960	357	1,100	5.88	6.56
May.....	482	76	212	1.13	1.30
June.....	207	28	66.0	.353	.39
July.....	38	24	26.2	.140	.16
August.....	72	18	24.5	.131	.15
September.....	44	16	29.3	.157	.18
The year.....	2,760	16	240	1.28	17.40

* Estimated.

OTTER CREEK AT CENTER RUTLAND, VT.

LOCATION.—Water-stage recorder at highway bridge in Center Rutland, Rutland County, 100 feet below dam and 1 mile below mouth of East Creek.

DRAINAGE AREA.—307 square miles.

RECORDS AVAILABLE.—May 1928 to September 1933.

DISCHARGE.—Maximum during year, 6,470 second-feet Apr. 18 (gage height, 9.08 feet); minimum not determined.

1928-33: Maximum, that of Apr. 18, 1933. The maximum as previously published for Apr. 30, 1929, and several daily figures for flood periods in the same year are too high in discharge. Minimum not determined.

REMARKS.—Records good except those for Oct. 1 to Jan. 19, which are fair. Diurnal regulation. Seasonal storage on East Creek at Fittsford and Chittendon.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	* 155	410	384	657	236	336	962	1,410	354	167	166	178
2.....	* 140	1,340	374	377	288	253	1,410	1,480	273	128	149	137
3.....	* 130	920	384	357	335	330	1,750	1,410	314	163	138	102
4.....	* 125	525	364	351	225	255	1,960	1,410	755	142	256	152
5.....	* 120	391	405	388	209	263	1,710	1,130	464	172	284	231
6.....	* 450	360	374	374	150	270	1,820	920	354	176	130	194
7.....	* 1,400	525	347	325	236	295	2,440	834	335	179	114	185
8.....	* 900	780	364	287	884	332	3,290	730	313	197	188	190
9.....	* 580	525	325	262	726	408	2,390	612	278	130	179	347
10.....	* 400	464	292	270	327	277	1,820	568	249	183	157	703
11.....	* 270	1,070	257	262	482	202	1,630	590	206	200	160	510
12.....	* 220	862	267	504	330	241	1,770	472	234	198	142	264
13.....	* 230	612	278	525	388	301	1,540	484	202	177	114	246
14.....	* 220	504	298	357	293	227	1,690	464	157	166	262	227
15.....	* 220	408	254	328	390	335	2,340	445	136	172	248	244
16.....	* 230	347	236	351	287	352	2,790	402	130	148	176	206
17.....	* 200	500	222	351	326	264	3,560	381	157	156	123	344
18.....	* 300	680	195	367	321	348	6,110	367	149	160	122	334
19.....	* 500	848	222	325	246	254	5,390	335	206	160	133	302
20.....	* 1,240	3,190	234	479	376	300	4,250	313	195	181	107	254
21.....	* 840	2,200	229	398	593	275	2,990	384	206	140	144	368
22.....	* 550	1,070	239	310	476	507	2,510	374	434	365	145	276
23.....	* 430	890	262	846	417	336	1,970	341	204	443	144	259
24.....	* 320	730	267	644	507	297	1,520	408	190	363	367	184
25.....	* 260	730	351	362	390	348	1,560	394	130	238	1,170	200
26.....	* 230	612	504	320	279	390	1,680	289	209	182	806	217
27.....	* 300	449	488	361	267	438	1,560	292	210	189	345	183
28.....	* 340	405	374	358	338	546	1,160	254	224	142	285	190
29.....	* 280	398	357	226	-----	479	1,130	270	164	140	198	197
30.....	* 250	381	289	276	-----	536	1,300	270	176	96	204	186
31.....	* 331	-----	371	292	-----	590	-----	331	-----	153	146	-----

Month	Maximum	Minimum	Mean	Per square mi. ^a	Run-off in inches
October.....	1,400	120	392	1.28	1.48
November.....	3,190	347	771	2.51	2.80
December.....	504	195	316	1.03	1.19
January.....	846	226	384	1.25	1.44
February.....	884	150	369	1.20	1.25
March.....	590	202	341	1.11	1.28
April.....	6,110	962	2,270	7.39	8.24
May.....	1,480	254	592	1.93	2.22
June.....	755	130	254	.827	.92
July.....	443	96	187	.609	.70
August.....	1,170	107	236	.769	.89
September.....	703	102	254	.827	.92
The year.....	6,110	96	528	1.72	23.35

* Estimated.

OTTER CREEK AT MIDDLEBURY, VT.

LOCATION.—Chain gage on railroad bridge at Middlebury, Addison County, 3½ miles below Middlebury River.

DRAINAGE AREA.—628 square miles.

RECORDS AVAILABLE.—April 1903 to May 1907, October 1910 to January 1920, October 1928 to September 1933.

DISCHARGE.—Maximum during year, 6,450 second-feet Apr. 21 (gage height, 8.73 feet); minimum, 220 second-feet July 31.

1903-7, 1910-20, 1928-33: Maximum, 10,100 second-feet Mar. 30, 1913 (gage height, 11.07 feet, present datum); minimum, 93 second-feet Mar. 5, 1929. Average, 17 years (1903-6, 1910-19, 1928-33), 943 second-feet.

Maximum known, 13,600 second-feet Nov. 4, 1927 (gage height, 13.3 feet, present datum).

REMARKS.—Records good above 1,500 second-feet; fair below. Stage-discharge relation affected by ice Dec. 13-18. Small seasonal storage in Chittenden Reservoir, on East Creek.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	440	775	845	1,290	740	610	2,240	2,970	640	348	235	370
2.....	325	1,910	705	990	672	580	2,600	2,780	610	305	268	348
3.....	235	1,990	672	880	705	550	2,780	2,690	520	285	268	325
4.....	305	1,910	740	775	672	520	2,970	2,780	775	285	325	285
5.....	325	1,590	705	740	550	550	2,970	2,890	1,060	285	370	348
6.....	775	1,220	775	810	465	520	2,970	2,518	810	285	415	370
7.....	1,910	1,060	672	740	492	580	3,270	2,330	640	325	325	440
8.....	1,990	1,290	640	640	740	550	3,470	2,150	580	348	268	370
9.....	1,670	1,290	580	520	1,290	740	3,470	1,750	520	392	268	440
10.....	1,220	1,360	492	465	1,140	810	3,470	1,440	492	370	305	810
11.....	845	1,590	492	520	845	672	3,670	1,220	440	392	305	1,060
12.....	740	1,750	392	775	810	520	3,880	1,060	415	348	305	845
13.....	610	1,670	460	1,060	640	520	3,990	990	440	348	268	590
14.....	580	1,360	520	640	640	550	3,990	990	415	325	305	465
15.....	550	1,140	500	610	705	520	3,990	880	392	325	348	520
16.....	492	1,060	490	580	672	705	3,880	775	370	268	465	440
17.....	415	1,290	410	610	672	810	3,880	705	370	268	392	440
18.....	520	1,590	370	520	640	705	4,320	640	305	285	325	465
19.....	1,290	1,910	415	520	610	672	4,650	610	348	325	305	560
20.....	1,670	2,780	492	672	580	610	5,590	640	392	305	305	465
21.....	1,440	2,600	465	845	845	672	6,450	915	392	305	235	550
22.....	1,140	2,600	520	740	990	845	6,190	845	492	465	250	580
23.....	845	2,510	550	1,140	915	1,060	6,070	740	610	580	268	550
24.....	672	2,510	580	1,360	990	990	5,470	610	465	672	325	465
25.....	640	2,420	640	1,060	1,060	845	4,760	610	348	580	990	370
26.....	610	2,330	845	775	640	990	4,320	672	305	415	1,670	392
27.....	610	1,990	915	640	610	1,060	3,990	610	392	370	1,290	370
28.....	705	1,590	845	610	580	1,360	3,670	550	415	305	880	370
29.....	640	1,220	740	520	-----	1,590	3,370	492	415	305	640	348
30.....	580	990	610	520	-----	1,670	3,170	492	415	250	492	348
31.....	465	-----	990	740	-----	1,830	-----	550	-----	220	440	-----

Month	Maximum	Minimum	Mean	Per square mi. ^a	Run-off in inches
October.....	1,990	235	815	1.30	1.60
November.....	2,780	775	1,710	2.72	3.04
December.....	990	370	615	.979	1.13
January.....	1,360	465	752	1.20	1.38
February.....	1,290	465	747	1.19	1.24
March.....	1,830	520	813	1.29	1.40
April.....	6,450	2,240	3,980	6.34	7.07
May.....	2,970	492	1,280	2.04	2.35
June.....	1,060	305	493	.785	.88
July.....	672	220	351	.559	.64
August.....	1,670	235	447	.712	.82
September.....	1,060	285	476	.758	.85
The year.....	6,450	220	1,040	1.66	22.53

WINOOSKI RIVER AT MONTPELIER, VT.

LOCATION.—Water-stage recorder three-eighths of a mile above mouth of Dog River and 1 mile downstream from depot in Montpelier, Washington County. Zero of gage is 499.97 feet above mean sea level.

DRAINAGE AREA.—420 square miles.

RECORDS AVAILABLE.—May 1909 to September 1923, August 1928 to September 1933.

DISCHARGE.—Maximum during year, 14,300 second-feet Apr. 18 (gage height, 14.24 feet); minimum, 15 second-feet Sept. 3 (gage height, 2.64 feet).

1909-23, 1928-33: Maximum, 20,200 second-feet Apr. 7, 1912 (gage height, about 16.7 feet, present datum, which was established in June, 1914); minimum, 6 second-feet Sept. 30, 1921 (gage height, 2.58 feet). Average, 14 years (1914-23, 1928-33), 574 second-feet.

Maximum known, 57,000 second-feet Nov. 3, 1927 (gage height, 27.1 feet).

REMARKS.—Records good. Stage-discharge relation affected by ice Dec. 17-23, Jan. 4, 8-10, 18-21, Feb. 3-19, Mar. 12-14. Complete storage on 24 square miles and considerable diurnal fluctuation caused by several small plants above station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	238	553	388	690	383	304	1,560	1,740	410	164	100	90
2.....	172	1,320	378	553	336	306	1,950	1,600	333	164	190	87
3.....	184	576	379	448	320	312	2,300	1,780	280	125	168	17
4.....	224	398	408	420	295	339	2,040	2,290	247	132	240	37
5.....	219	245	438	384	260	314	2,540	1,380	218	130	206	94
6.....	402	409	405	412	240	225	2,520	1,050	268	211	122	89
7.....	2,030	442	406	318	275	363	4,990	827	222	244	120	147
8.....	614	460	444	305	700	262	5,070	682	254	254	104	134
9.....	369	361	316	295	460	300	2,750	694	226	183	100	170
10.....	285	926	324	300	330	279	2,960	688	219	170	96	159
11.....	232	1,250	312	393	285	252	3,300	682	185	280	114	128
12.....	202	686	270	665	280	230	2,670	616	164	284	74	122
13.....	204	512	407	451	270	220	1,940	746	232	241	58	112
14.....	204	422	370	370	295	200	2,490	652	244	239	100	74
15.....	173	380	376	316	270	191	4,230	519	244	228	76	86
16.....	156	387	276	274	255	215	4,560	500	251	154	88	67
17.....	186	1,880	255	278	245	281	7,870	441	251	182	104	50
18.....	206	1,030	250	260	230	276	12,300	378	290	228	124	101
19.....	407	4,040	255	260	220	272	7,420	396	372	226	112	104
20.....	248	4,950	300	275	214	196	4,550	445	320	197	99	122
21.....	231	1,520	290	295	295	207	3,330	693	250	190	108	206
22.....	275	1,090	290	352	310	324	2,890	493	555	220	90	168
23.....	207	760	310	1,620	296	316	1,940	415	294	185	112	117
24.....	196	752	344	862	402	338	1,740	339	180	145	234	106
25.....	188	685	433	501	410	316	2,040	350	152	164	764	107
26.....	186	614	630	512	310	342	1,990	321	143	202	297	87
27.....	234	458	452	442	208	350	1,650	398	262	128	174	100
28.....	277	465	366	370	311	381	1,340	483	270	141	152	86
29.....	226	385	324	360	-----	419	2,300	341	289	95	136	93
30.....	168	417	402	359	-----	588	1,940	318	180	43	125	87
31.....	198	-----	1,290	408	-----	761	-----	347	-----	102	90	-----

Month	Maximum	Minimum	Mean	Per square mil.	Run-off in inches
October.....	2,030	156	301	0.717	0.83
November.....	4,950	345	949	2.26	2.52
December.....	1,290	250	390	.929	1.07
January.....	1,620	260	443	1.05	1.21
February.....	700	208	311	.740	.77
March.....	761	191	312	.743	.86
April.....	12,300	1,340	3,370	8.02	8.95
May.....	2,290	318	729	1.74	2.01
June.....	555	143	260	.619	.69
July.....	284	43	182	.433	.50
August.....	764	58	151	.360	.42
September.....	206	17	105	.250	.28
The year.....	12,300	17	622	1.48	20.11

WINOOSKI RIVER NEAR ESSEX JUNCTION, VT.

LOCATION.—Water-stage recorder half a mile below mouth of Muddy Brook, 2 miles southwest of Essex Junction, Chittenden County.

DRAINAGE AREA.—1,070 square miles.

RECORDS AVAILABLE.—October 1928 to September 1933.

DISCHARGE.—Maximum during year, 34,600 second-feet Apr. 19 (gage height, 18.60 feet); minimum not determined.

1928-33: Maximum, that of Apr. 19, 1933; minimum not determined.

Maximum known, 116,000 second-feet Nov. 4, 1927 (gage height, 50.4 feet, from flood marks).

REMARKS.—Records excellent except those estimated, which are fair. Considerable diurnal regulation at low stages.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	528	1,020	1,010	3,960	932	670	4,160	5,730	903	324	255	316
2.....	369	4,870	1,060	2,220	988	838	6,190	5,950	852	414	292	218
3.....	443	2,570	941	2,150	934	722	6,950	5,630	706	388	240	131
4.....	474	1,560	1,070	1,590	848	766	7,570	10,100	408	394	582	216
5.....	444	1,330	1,300	1,500	576	618	6,600	5,000	456	454	430	274
6.....	2,030	1,310	1,160	1,450	* 650	794	6,460	3,530	659	382	228	245
7.....	10,500	1,350	1,130	1,360	* 750	770	11,100	2,890	666	388	178	186
8.....	3,160	1,530	1,270	1,140	1,010	685	17,000	2,340	656	266	242	146
9.....	1,620	1,310	1,190	891	1,760	* 750	8,570	2,120	552	270	246	534
10.....	1,100	1,730	1,070	949	* 1,150	* 850	6,350	1,970	403	384	260	247
11.....	777	4,640	776	924	* 1,000	* 750	8,080	1,970	368	448	332	474
12.....	676	2,760	770	1,410	* 900	686	8,020	1,780	418	394	190	490
13.....	594	2,010	974	1,360	* 1,000	* 650	5,690	2,120	506	342	130	398
14.....	527	1,610	945	724	* 900	* 600	6,240	2,260	445	311	315	273
15.....	359	1,340	* 900	798	* 800	594	10,200	1,790	425	272	306	243
16.....	404	1,300	* 800	864	* 750	684	11,100	1,540	496	152	252	414
17.....	665	2,640	553	747	* 700	734	19,200	1,340	296	410	170	124
18.....	767	3,640	* 750	840	* 650	606	27,500	1,220	326	397	170	226
19.....	803	4,630	* 1,000	837	* 600	734	28,300	1,020	330	342	124	248
20.....	993	18,900	* 900	962	* 650	732	15,100	1,110	714	294	125	318
21.....	643	5,710	* 850	788	784	650	9,210	1,340	678	377	254	592
22.....	876	3,530	814	777	830	684	8,080	1,650	982	140	255	473
23.....	1,060	2,440	802	1,430	726	912	5,400	1,380	720	124	202	364
24.....	786	2,280	1,010	3,300	1,180	968	4,450	1,310	556	342	254	315
25.....	705	2,040	1,250	1,580	1,250	795	5,290	1,300	463	246	2,060	314
26.....	725	1,780	1,770	1,270	804	830	5,400	1,110	426	182	2,380	278
27.....	860	1,180	1,870	1,180	784	1,090	4,450	940	389	210	1,030	250
28.....	1,140	1,080	1,470	1,000	586	1,310	3,490	1,080	366	157	825	291
29.....	1,010	964	1,100	720	-----	1,330	5,200	798	568	133	297	231
30.....	438	954	1,030	612	-----	1,740	6,340	1,100	561	128	282	238
31.....	660	-----	4,530	810	-----	2,350	-----	888	-----	230	342	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	10,500	359	1,170	1.09	1.26
November.....	18,900	954	2,800	2.62	2.92
December.....	4,530	553	1,160	1.08	1.24
January.....	3,960	612	1,290	1.21	1.40
February.....	1,760	576	875	.818	.85
March.....	2,350	594	867	.810	.93
April.....	28,300	3,490	9,260	8.65	9.65
May.....	10,100	798	2,400	2.24	2.58
June.....	982	296	543	.507	.57
July.....	454	124	300	.280	.32
August.....	2,380	124	427	.399	.46
September.....	592	124	302	.282	.31
The year.....	28,300	124	1,770	1.65	22.49

* Discharge estimated because of ice effect.

DOG RIVER AT NORTHFIELD, VT.

LOCATION.—Water-stage recorder at highway bridge at Norwich University, Northfield, Washington County, 1 mile above Union Brook.

DRAINAGE AREA.—52 square miles.

RECORDS AVAILABLE.—May 1909 to October 1920, October 1928 to September 1933.

DISCHARGE.—Maximum during year, 2,420 second-feet Apr. 18 (gage height, 7.17 feet); minimum (estimated), 4.4 second-feet Sept. 3, 6, 8.

1910-20, 1928-33: Maximum, 3,400 second-feet Mar. 25, 1913 (gage height, 8.50 feet); minimum (estimated), 2.0 several times during August, September, 1929. Average, 14 years (1911-20, 1928-33), 81.2 second-feet.

Maximum known, 8,000 second-feet Nov. 3, 1927 (gage height, 10.9 feet).
REMARKS.—Records fair.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.3	136	47	67	• 35	• 30	• 100	• 240	• 37	• 20	• 6	5.2
2	8.5	158	46	64	• 33	• 30	• 250	• 250	• 33	• 17	• 7	4.7
3	8.5	67	51	61	• 31	• 30	• 350	• 340	36	• 14	• 10	4.4
4	7.9	44	48	54	• 28	• 30	• 240	• 270	41	• 12	• 20	5.5
5	8.5	39	49	58	• 26	• 29	• 300	• 220	34	• 11	• 12	5.2
6	43	38	44	48	• 24	• 28	• 320	• 180	30	• 11	• 9	4.4
7	114	42	48	47	• 28	28	• 630	• 150	28	• 10	• 8	4.7
8	18	41	46	37	• 130	27	• 450	• 130	26	• 10	• 7	4.4
9	15	35	36	38	49	26	• 330	• 120	23	• 11	• 7	10
10	13	163	36	38	• 36	• 24	• 270	• 110	20	• 14	• 6	12
11	12	184	35	50	• 34	• 22	• 310	• 96	19	• 11	• 6	8.1
12	• 11	119	36	100	• 34	• 20	• 270	• 90	17	• 10	• 6	5.5
13	• 11	82	36	36	• 34	• 20	• 240	• 140	17	• 10	• 6	5.2
14	• 12	65	35	38	• 34	• 19	• 320	• 110	16	• 9	• 6	5.5
15	10	57	32	36	• 33	• 20	670	• 86	16	• 8	• 6	6.3
16	10	55	28	35	• 31	• 21	739	• 74	16	• 7	• 6	5.5
17	11	216	28	38	• 29	• 23	1,140	• 64	20	• 7	• 5	5.5
18	17	132	30	36	• 27	• 24	1,750	• 58	28	• 7	• 5	8.6
19	79	822	29	30	• 25	• 23	1,010	• 52	28	• 7	• 5	7.2
20	36	545	29	36	• 24	• 22	• 600	• 70	22	• 6	• 5	9.5
21	30	240	28	31	• 30	• 22	• 500	• 94	19	• 6	• 5	14
22	28	165	30	37	• 29	• 23	• 420	• 74	• 41	• 6	• 5	12
23	24	119	30	287	• 30	• 24	286	• 62	• 29	• 6	• 5	9.0
24	20	112	30	78	• 39	• 34	326	• 56	• 20	6 0	• 12	8.1
25	19	102	49	44	• 36	• 26	304	• 50	• 18	6 5	• 62	7.2
26	17	82	100	46	• 33	• 27	227	• 47	• 18	6 0	• 20	6.8
27	24	51	50	40	• 31	• 28	187	• 74	• 18	• 6	• 10	5.9
28	25	51	47	• 37	• 30	• 29	338	• 60	• 18	• 6	• 8	6.3
29	21	49	39	• 32	-----	• 30	271	• 47	• 51	• 6	• 7	6.3
30	19	49	37	• 35	-----	• 32	• 240	• 42	• 33	• 6	• 6	6.3
31	19	-----	238	• 37	-----	• 40	-----	• 43	-----	• 6	• 5	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	114	7.9	22.6	0.435	0.50
November	822	35	135	2.60	2.90
December	238	28	46.7	.898	1.04
January	287	30	53.3	1.03	1.19
February	130	24	35.1	.675	.70
March	40	19	25.8	.496	.57
April	1,750	100	446	8.58	9.57
May	340	42	113	2.17	2.50
June	51	16	25.7	.494	.55
July	20	5	8.98	.173	.20
August	62	6.0	9.45	.182	.21
September	14	4.4	6.98	.134	.15
The year	1,750	4.4	76.9	1.48	20.08

• Estimated.

MAD RIVER NEAR MORETOWN, VT.

LOCATION.—Water-stage recorder at highway bridge 2.4 miles north of Moretown, Washington County.

DRAINAGE AREA.—139 square miles (revised).

RECORDS AVAILABLE.—November 1928 to September 1933.

DISCHARGE.—Maximum during year, 7,360 second-feet Apr. 18 (gage height, 9.45 feet); minimum, 4.0 second-feet Aug. 13 (gage height, 1.79 feet).

1928-33: Maximum, that of Apr. 18, 1933; minimum, 1.4 second-feet Oct. 1, 1930 (gage height, 1.73 feet).

Maximum known stage, about 20.5 feet on Nov. 3, 4, 1927.

REMARKS.—Records good except those estimated, which are fair. Stage-discharge relation affected by ice Nov. 25, 26, Nov. 28 to Dec. 5, Dec. 10 to Jan. 11, Jan. 14-21, Feb. 8 to Apr. 2. Considerable diurnal regulation.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	33	521	• 140	• 280	111	• 105	• 400	1,090	114	48	17	34
2	39	737	• 140	• 220	122	• 105	• 750	1,010	98	34	26	23
3	44	352	• 133	• 195	108	• 110	1,090	1,340	82	36	19	18
4	41	239	• 130	• 170	120	• 120	749	1,310	90	23	60	37
5	31	210	• 125	• 155	112	• 110	937	695	76	34	54	34
6	349	219	125	• 145	92	• 90	937	531	64	20	18	26
7	977	248	145	• 135	132	• 110	1,990	434	62	26	29	25
8	243	234	142	• 130	• 420	• 105	1,250	362	62	20	18	• 28
9	132	189	98	• 130	• 140	• 120	880	312	51	23	19	• 55
10	95	554	• 95	• 130	• 120	• 110	832	302	42	41	19	• 135
11	78	604	• 95	• 135	• 115	• 95	974	278	40	31	16	• 95
12	76	419	• 90	280	• 110	• 85	859	248	34	30	10	• 45
13	80	322	• 115	166	• 110	• 75	768	408	36	30	4.5	• 30
14	72	248	• 125	• 145	• 115	• 70	916	327	37	25	21	• 30
15	64	205	• 105	• 140	• 110	• 70	1,450	278	33	15	18	• 35
16	57	184	• 90	• 130	• 105	• 75	1,910	224	32	8.1	14	• 30
17	66	798	• 75	• 130	• 95	• 90	2,910	184	37	26	5.0	• 30
18	72	460	• 75	• 120	• 90	• 100	5,500	164	65	22	16	• 35
19	358	1,800	• 90	• 120	• 85	• 90	2,660	151	85	16	12	• 45
20	194	1,630	• 100	• 120	• 80	• 75	1,540	221	56	16	11	• 40
21	166	650	• 100	• 130	• 100	• 80	1,290	383	44	15	26	• 120
22	231	445	• 110	159	• 100	• 105	1,090	258	116	16	13	• 80
23	145	327	• 120	670	• 100	• 95	713	193	65	14	13	• 65
24	116	317	• 150	298	• 135	• 90	684	164	46	24	265	• 50
25	101	• 195	• 260	176	• 135	• 105	974	148	36	18	594	• 55
26	90	• 170	• 400	183	• 110	• 125	873	132	36	20	382	• 50
27	154	142	• 200	154	• 120	• 120	610	222	38	18	146	• 45
28	158	• 140	• 150	132	• 110	• 140	477	184	36	13	86	• 45
29	118	• 140	• 140	116	-----	• 120	1,330	135	147	13	62	• 50
30	103	• 140	• 140	126	-----	• 180	1,050	123	60	6.8	42	• 35
31	106	-----	• 800	126	-----	• 260	-----	128	-----	24	42	-----

Month	Maximum	Minimum	Mean	Per square m ^{le}	Run-off in inches
October	977	31	148	1.06	1.22
November	1,800	140	428	3.08	3.44
December	800	75	155	1.12	1.29
January	670	116	176	1.27	1.46
February	420	80	122	.878	.91
March	260	70	107	.770	.89
April	5,500	400	1,280	9.21	10.28
May	1,340	123	385	2.77	3.19
June	147	32	60.7	.437	.49
July	48	6.8	22.8	.164	.19
August	594	4.5	67.0	.482	.56
September	135	18	47.5	.342	.38
The year	5,500	4.5	249	1.79	24.30

• Estimated.

LAMOILLE RIVER AT JOHNSON, VT.

LOCATION.—Water-stage recorder at falls 0.9 mile above original location at bridge in Johnson, Lamoille County, and 1½ miles above mouth of Gihcn River.

DRAINAGE AREA.—289 square miles.

RECORDS AVAILABLE.—July 1910 to December 1913, and September 1928 to September 1933.

DISCHARGE.—Maximum during year, 7,720 second-feet Apr. 18 (gage height, 13.78 feet); minimum, 15 second-feet Aug. 20 (gage height, 1.00 foot).

1910-13, 1928-33: Maximum recorded, about 11,700 second-feet Apr. 8, 1912; minimum, that of Aug. 20, 1933.

REMARKS.—Records good except those estimated and those above 4,500 second-feet, which are fair. Stage-discharge relation affected by ice Feb. 9 to Mar. 28. Slight diurnal fluctuation at low stages caused by power plant above station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Jul'y	Aug.	Sept.
1.....	199	509	° 200	° 1,350	186	° 220	1,170	1,580	282	185	90	121
2.....	170	1,520	° 200	° 610	213	° 210	1,740	1,470	226	79	131	102
3.....	180	876	329	° 520	191	° 180	1,970	1,470	312	129	130	47
4.....	175	552	397	° 450	262	° 190	2,210	2,270	172	118	164	90
5.....	175	471	471	° 570	178	° 110	2,030	1,270	134	127	166	152
6.....	1,560	552	443	° 430	298	° 170	2,150	853	210	159	75	162
7.....	4,840	455	507	° 370	223	° 170	2,930	677	174	106	124	155
8.....	1,550	451	720	° 320	188	° 190	4,050	572	123	140	140	170
9.....	698	374	319	° 300	° 380	° 270	2,390	491	131	149	119	116
10.....	443	451	308	° 290	° 270	° 210	2,090	455	130	173	139	77
11.....	350	785	° 270	° 320	° 320	° 210	2,810	401	92	118	130	108
12.....	362	572	° 240	° 370	° 170	° 110	2,930	315	150	142	126	178
13.....	149	451	° 230	° 240	° 300	° 200	1,970	435	169	123	96	108
14.....	210	374	° 200	° 220	° 200	° 240	2,330	499	152	127	102	107
15.....	292	342	° 180	° 200	° 210	° 210	4,050	495	132	178	138	106
16.....	269	339	° 170	° 190	° 200	° 270	4,260	359	93	172	152	82
17.....	259	1,490	° 160	° 200	° 200	° 250	6,040	325	92	96	111	48
18.....	272	1,220	° 150	177	° 200	° 220	7,400	356	159	143	106	77
19.....	259	2,240	° 150	240	° 140	° 110	6,040	319	138	170	74	89
20.....	246	4,920	° 150	207	° 200	° 210	4,420	332	170	84	30	106
21.....	236	1,500	° 160	262	° 200	° 220	3,140	116	180	96	80	117
22.....	374	995	° 190	97	° 200	° 250	2,690	261	471	178	139	93
23.....	292	741	° 220	782	° 210	° 270	1,630	292	401	86	96	89
24.....	242	593	° 220	853	° 280	° 260	1,420	329	210	132	176	60
25.....	272	531	° 260	393	° 180	° 240	1,970	246	164	130	450	91
26.....	185	507	° 720	308	° 120	° 230	1,850	252	149	178	626	154
27.....	308	° 350	° 700	289	° 180	° 280	1,420	210	140	132	347	117
28.....	370	° 280	° 480	229	° 210	° 380	1,100	424	219	115	256	107
29.....	305	° 250	° 370	239	-----	491	1,960	342	210	67	228	84
30.....	242	° 220	° 300	188	-----	614	1,850	282	180	50	176	76
31.....	298	-----	° 600	193	-----	808	-----	282	-----	96	117	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	4,840	149	509	1.76	2.03
November.....	4,920	220	830	2.87	3.20
December.....	720	150	323	1.12	1.29
January.....	1,350	97	367	1.27	1.46
February.....	380	120	218	.754	1.79
March.....	808	110	258	.893	1.03
April.....	7,400	1,100	2,800	9.69	10.81
May.....	2,270	116	580	2.01	2.32
June.....	471	92	186	.644	.72
July.....	185	50	118	.408	.47
August.....	626	30	162	.551	.65
September.....	178	47	106	.367	.41
The year.....	7,400	30	536	1.85	25.18

• Estimated.

LAMOILLE RIVER NEAR MILTON, VT.

LOCATION.—Water-stage recorder $2\frac{1}{2}$ miles north of Milton, Chittendon County.
DRAINAGE AREA.—692 square miles.

RECORDS AVAILABLE.—August 1929 to September 1933.

DISCHARGE.—Maximum during year, 16,300 second-feet Apr. 19 (gage height, 10.18 feet); minimum, 49 second-feet July 30 (gage height, 0.67 foot).

1929-33: Maximum, that of Apr. 19, 1933; minimum, that of July 30, 1933.

REMARKS.—Records excellent except those for periods of ice effect, Nov. 30, Dec. 1, 14-16, 18-21, Jan. 13-18, Feb. 5, Feb. 8 to Apr. 2, which are fair.
Diurnal regulation from plants above station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	395	910	550	2,860	484	410	3,350	3,600	582	324	236	292
2	390	3,090	539	1,660	589	420	5,000	3,840	544	316	240	240
3	370	2,360	622	1,220	608	440	5,900	3,460	478	304	240	94
4	390	1,540	1,010	1,070	484	440	6,110	6,740	544	232	292	138
5	365	1,240	1,120	1,370	455	430	5,900	4,000	435	252	288	177
6	2,900	1,370	1,140	1,240	456	420	5,100	2,490	340	284	260	248
7	12,500	1,260	1,240	970	451	410	7,330	1,900	375	282	272	256
8	7,270	1,190	1,600	778	555	420	10,900	1,600	365	264	228	252
9	2,300	1,050	1,290	730	600	500	7,580	1,360	316	224	232	252
10	1,480	1,240	880	692	600	470	4,540	1,260	300	296	216	276
11	1,110	2,300	796	708	550	460	5,100	1,290	220	304	220	292
12	1,020	1,720	692	890	500	460	6,320	1,110	288	292	213	284
13	1,010	1,360	650	605	475	460	5,100	1,060	300	276	110	292
14	760	1,130	560	560	455	460	4,360	1,320	296	264	256	252
15	745	970	505	550	450	460	6,320	1,190	288	256	232	236
16	722	890	460	545	445	460	7,790	1,060	300	216	220	205
17	752	1,460	446	545	445	460	10,400	814	276	249	232	164
18	760	2,630	420	545	445	460	14,600	738	232	224	228	220
19	708	2,770	410	550	450	460	15,400	671	324	236	190	161
20	650	8,720	415	643	450	460	10,900	738	390	228	120	187
21	622	5,580	460	563	450	500	6,950	1,050	328	202	164	220
22	990	2,490	570	544	460	700	5,500	671	607	177	150	260
23	1,010	1,900	570	842	490	740	3,760	700	880	108	145	209
24	745	1,600	589	1,720	540	670	2,860	671	556	255	180	168
25	650	1,420	1,150	1,170	470	630	3,300	678	355	232	774	209
26	622	1,370	1,660	778	440	650	3,760	582	350	224	1,480	220
27	940	850	1,600	678	420	720	3,230	576	312	220	980	252
28	1,350	769	1,160	602	410	850	2,490	860	292	216	563	280
29	960	650	880	539	-----	1,000	2,630	860	355	198	435	308
30	814	590	738	495	-----	1,170	3,840	629	380	91	375	272
31	890	-----	2,670	478	-----	1,850	-----	602	-----	252	324	-----

Month	Maximum	Minimum	Mean	Per square m ² le	Run-off in inches
October	12,500	365	1,490	2.15	2.48
November	8,720	590	1,880	2.72	3.04
December	2,670	410	884	1.28	1.48
January	2,860	478	875	1.26	1.45
February	608	410	487	.704	.73
March	1,850	410	595	.860	.99
April	15,400	2,490	6,210	8.97	10.01
May	6,740	576	1,550	2.24	2.58
June	880	220	387	.550	.62
July	324	91	242	.350	.40
August	1,480	110	326	.471	.54
September	308	94	231	.334	.37
The year	15,400	91	1,260	1.82	24.69

MISSISQUOI RIVER NEAR NORTH TROY, VT.

LOCATION.—Water-stage recorder just above Big Falls, $1\frac{1}{2}$ miles below mouth of Jay Branch, and $2\frac{1}{2}$ miles above North Troy, Troy County.

DRAINAGE AREA.—131 square miles.

RECORDS AVAILABLE.—August 1931 to September 1933.

DISCHARGE.—Maximum during year, 7,200 second-feet Oct. 7 (gage height, 12.26 feet); minimum, 14 second-feet July 27 (gage height, 0.95 foot).

1931-33: Maximum, that of Oct. 7, 1932; minimum, that of July 27, 1933.

REMARKS.—Records excellent except those estimated and those above 2,000 second-feet, which are fair. Some diurnal regulation from small power plant above station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	58	378	115	397	84	74	562	1,450	112	• 23	78	30
2.....	39	953	112	198	88	76	1,010	1,540	91	• 35	110	37
3.....	62	404	248	226	90	78	1,060	1,160	80	• 28	67	30
4.....	45	252	328	174	88	76	1,110	1,240	74	• 24	100	31
5.....	50	240	294	204	86	74	1,060	584	• 68	• 23	83	25
6.....	1,590	300	234	165	78	70	1,060	415	• 60	• 23	39	31
7.....	4,780	234	344	148	83	72	1,940	344	• 54	• 30	45	26
8.....	754	204	380	133	110	75	2,150	290	• 49	• 53	34	25
9.....	344	167	146	115	146	75	1,340	243	• 45	• 39	35	30
10.....	217	178	135	113	112	68	1,060	258	• 42	• 33	29	33
11.....	163	312	118	122	107	63	1,280	260	• 39	• 31	26	45
12.....	161	232	120	223	88	69	1,440	223	• 34	• 29	24	41
13.....	195	183	127	124	84	76	1,020	263	• 30	• 28	23	26
14.....	146	154	124	97	83	78	1,300	252	• 28	• 27	24	25
15.....	127	146	112	91	87	75	2,460	272	• 27	• 26	25	25
16.....	122	146	104	91	81	74	2,540	185	• 26	• 26	24	24
17.....	167	560	102	151	83	76	3,950	148	• 29	• 25	21	23
18.....	144	397	99	193	79	75	4,290	127	• 33	• 25	22	24
19.....	120	940	96	113	78	70	3,220	115	• 39	• 25	26	29
20.....	110	2,140	93	110	80	79	2,230	181	• 38	• 24	26	33
21.....	162	530	100	97	86	84	1,540	152	• 35	• 26	24	38
22.....	338	338	125	96	81	156	1,330	120	• 33	• 31	22	36
23.....	193	223	117	520	86	185	700	104	• 45	• 25	20	31
24.....	138	249	107	354	109	131	691	95	• 38	• 29	180	29
25.....	115	220	160	156	83	113	1,240	88	• 34	• 24	624	38
26.....	104	192	662	133	82	113	1,100	83	• 30	• 24	338	34
27.....	232	127	367	103	80	122	654	354	• 27	• 21	131	43
28.....	240	120	212	93	73	169	476	322	• 25	• 24	83	81
29.....	161	118	165	83	-----	167	780	161	• 24	• 83	63	73
30.....	190	122	133	87	-----	204	1,060	125	• 23	• 166	53	39
31.....	263	-----	739	87	-----	269	-----	124	-----	83	39	-----

Month	Maximum	Minimum	Mean	Per square mil.	Run-off in inches
October.....	4,780	39	372	2.84	3.27
November.....	2,140	118	359	2.74	3.06
December.....	739	93	204	1.56	1.80
January.....	520	83	161	1.23	1.42
February.....	146	73	89.1	.680	.71
March.....	269	63	103	.786	.91
April.....	4,290	476	1,520	11.6	12.94
May.....	1,540	83	364	2.78	3.20
June.....	112	23	43.7	.334	.37
July.....	166	21	35.9	.274	.32
August.....	624	20	78.6	.600	.69
September.....	81	23	34.5	.263	.29
The year.....	4,780	20	280	2.14	28.98

• Estimated.

MISSISQUOI RIVER NEAR RICHFORD, VT.

LOCATION.—Water-stage recorder $1\frac{1}{2}$ miles (corrected) above mouth of Trout River, 3 miles south of Richford, Franklin County, and $3\frac{3}{4}$ miles below mouth of North Branch.

DRAINAGE AREA.—445 square miles.

RECORDS AVAILABLE.—May 1909 to November 1910, July 1911 to September 1923, October 1928 to September 1933.

DISCHARGE.—Maximum during year, 10,300 second-feet Apr. 18; maximum gage height, 13.61 feet (affected by ice) Apr. 3; minimum, 53 second-feet July 1 (gage height, 2.38 feet).

1909-10, 1911-23, 1928-33: Maximum, 13,000 second-feet Apr. 7, 1923, is the same as originally published in Water-Supply Paper 56⁴ (gage height, 14.38 feet); the revised discharge for this date as published in Water-Supply Papers 684, 699, 714, and 729, and the maximum discharge for June 21, 1930, in Water-Supply Paper 699 are too large. Minimum, 8 second-feet July 14, 1911. Average, 13 years (1911-19, 1928-33), 932 second-feet.

Maximum known, 45,000 second-feet, flood of November 1927 (gage height, 23.1 feet).

REMARKS.—Records good except those for periods of ice effect. Dec. 2, 10-25, Jan. 2 to Apr. 6, and for estimated period, Nov. 27 to Dec. 1, which are fair. Slight diurnal regulation at low stages.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	139	728	630	3,000	310	280	2,100	2,620	614	70	390	153
2	114	1,990	640	1,650	340	300	3,200	3,100	473	114	950	136
3	118	1,660	1,080	1,100	330	310	4,100	3,300	390	107	526	114
4	109	1,020	1,260	970	320	310	4,800	4,360	344	94	424	123
5	114	860	1,080	850	310	320	3,900	2,970	300	107	419	107
6	1,300	920	860	740	300	320	3,200	1,860	263	67	278	103
7	8,740	890	950	640	300	320	7,050	1,380	233	98	201	100
8	7,050	890	1,220	630	420	320	7,960	1,080	210	126	174	98
9	2,710	669	890	620	460	310	7,180	920	192	162	156	98
10	1,260	658	500	580	450	310	5,320	860	177	147	123	100
11	860	890	490	570	430	290	5,200	890	150	126	111	100
12	731	890	500	700	350	310	6,040	771	147	123	105	96
13	771	771	510	570	320	330	5,320	771	123	105	98	96
14	652	636	500	470	310	320	4,970	834	121	98	89	92
15	531	561	470	430	310	320	6,160	714	114	98	92	78
16	469	526	430	410	310	310	7,180	636	109	65	98	65
17	473	799	410	470	300	310	8,740	521	114	85	103	69
18	492	1,260	400	530	310	300	10,100	446	131	98	89	70
19	432	1,970	400	460	310	300	9,280	407	168	72	144	72
20	382	4,740	400	430	320	300	7,180	432	168	70	126	76
21	415	3,480	440	400	320	320	5,320	460	147	61	109	83
22	742	1,620	500	380	330	480	4,160	390	144	72	94	105
23	680	1,050	460	1,050	350	570	2,800	336	180	70	89	98
24	492	1,050	440	1,250	370	500	1,940	300	153	92	92	92
25	411	980	700	740	330	440	2,260	281	114	61	1,260	96
26	361	860	2,710	600	310	420	2,900	263	118	61	1,560	100
27	669	770	2,800	460	300	480	2,440	1,230	87	60	771	107
28	830	700	1,580	370	300	600	1,700	1,880	100	58	455	243
29	636	650	980	300	-----	660	1,540	950	92	183	320	210
30	556	630	830	330	-----	720	2,170	675	78	522	236	180
31	647	-----	2,500	330	-----	1,000	-----	680	-----	675	204	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October	8,740	109	1,090	2.45	2.82
November	4,740	526	1,170	2.63	2.93
December	2,800	400	889	2.00	2.31
January	3,000	300	711	1.60	1.84
February	460	300	336	.755	.79
March	1,000	280	399	.897	1.03
April	10,100	1,640	4,870	10.94	12.20
May	4,360	263	1,170	2.63	3.03
June	614	78	192	.431	.48
July	675	58	127	.285	.33
August	1,560	89	319	.717	.83
September	243	65	109	.245	.27
The year	10,100	58	947	2.13	28.86

LAKE MEMPHREMAGOG AT NEWPORT, VT.

LOCATION.—Chain gage on wood highway bridge in Newport, Orleans County.
Zero of gage is 673.15 feet above mean sea level.

RECORDS AVAILABLE.—May 1931 to September 1933.

EXTREMES.—Maximum gage height, 12.92 feet Apr. 20; minimum, 7.10 feet Sept. 30.

1931-33: Maximum gage height, that of Apr. 20, 1933; minimum, that of Sept. 30, 1933.

Gage height, in feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Jul.	Aug.	Sept.
1	8.34	9.39	10.35	10.04	9.86	9.74	9.36	10.86	-----	9.02	8.40	8.17
2	8.32	9.48	10.35	10.10	9.84	9.74	9.38	10.78	-----	9.00	8.44	8.15
3	8.32	9.52	10.34	10.19	9.84	9.68	9.44	10.68	-----	8.89	8.45	8.12
4	8.32	9.55	10.32	10.21	9.84	9.68	9.56	10.66	-----	8.87	8.48	8.11
5	-----	9.59	10.30	10.23	9.82	9.62	9.62	10.63	-----	8.86	8.46	8.09
6	8.32	9.64	10.30	10.24	9.82	9.62	9.78	10.57	-----	8.86	8.43	8.04
7	8.70	9.68	10.28	10.26	9.82	9.62	9.98	-----	-----	8.86	8.42	7.99
8	9.11	9.76	10.27	10.28	9.82	9.58	10.30	10.52	-----	8.88	8.40	7.97
9	9.21	9.73	10.26	10.34	9.82	9.58	10.51	10.44	-----	8.87	8.38	7.97
10	9.28	-----	10.26	10.28	9.82	-----	10.62	10.36	-----	8.84	8.35	-----
11	9.32	9.74	10.24	10.28	9.82	-----	10.72	10.26	-----	8.78	8.32	7.93
12	9.37	9.75	10.21	10.28	9.82	-----	10.90	10.17	-----	8.72	8.30	7.77
13	9.41	9.76	10.18	10.24	9.82	-----	11.05	10.13	-----	8.68	8.29	7.74
14	9.42	9.78	10.14	-----	9.82	-----	11.08	10.08	9.20	8.65	8.26	7.70
15	9.45	9.78	10.12	10.00	9.82	-----	11.26	10.05	9.26	8.60	8.21	7.73
16	9.47	9.83	10.08	-----	9.82	-----	11.54	10.00	9.28	8.56	8.16	7.68
17	9.46	9.92	10.05	9.98	9.82	-----	11.60	10.00	9.30	8.51	8.14	7.56
18	9.44	10.04	10.02	9.97	9.82	-----	12.40	9.99	9.33	8.48	8.11	7.56
19	9.44	10.10	9.97	9.93	9.82	-----	12.60	9.98	9.35	8.46	8.10	7.55
20	9.43	10.46	9.96	9.87	9.82	-----	12.92	9.96	9.33	8.45	8.08	7.44
21	9.42	10.68	9.94	9.87	9.82	10.16	12.86	9.96	9.28	8.43	8.07	7.40
22	9.42	10.74	9.93	9.88	9.82	-----	-----	9.95	9.25	8.42	8.05	7.39
23	9.40	10.72	9.93	9.91	9.82	-----	12.38	9.95	9.23	8.42	8.04	7.36
24	9.38	10.65	9.93	9.93	9.82	-----	12.26	9.94	9.20	8.40	8.02	7.36
25	9.37	10.57	9.93	9.96	9.82	-----	12.04	9.92	9.17	8.40	8.10	7.35
26	9.37	10.52	9.96	9.97	9.82	-----	11.82	9.90	9.15	8.39	8.17	7.32
27	9.45	10.48	9.96	9.97	9.76	-----	11.70	9.88	9.12	8.39	8.24	7.28
28	9.40	10.42	9.98	9.93	9.74	-----	11.60	9.88	9.11	8.36	8.30	7.20
29	9.36	10.38	9.96	9.88	-----	-----	11.49	9.87	9.07	8.31	8.27	7.14
30	9.34	10.36	9.97	9.88	-----	9.34	11.24	-----	9.04	8.34	8.23	7.10
31	9.37	-----	9.98	9.86	-----	9.36	-----	-----	-----	8.36	8.20	-----

NOTE.—No record Oct. 5, Nov. 10, Jan. 14, 16, Mar. 10-20, 22-29, Apr. 22, May 7, 30, 31, June 1-13, Sept. 10. Readings taken to top of ice Nov. 23 to Apr. 13.

CLYDE RIVER AT NEWPORT, VT.

LOCATION.—Water-stage recorder just below plant of Newport Electric Light Co., Newport, Orleans County, $1\frac{1}{4}$ miles above mouth.

DRAINAGE AREA.—140 square miles (revised).

RECORDS AVAILABLE.—May 1909 to September 1924, November 1928 to September 1933.

DISCHARGE.—Maximum during year 2,780 second-feet Apr. 19 (gage height, 5.19 feet); minimum, about 3 second-feet July 30 (gage height, 1.42 feet).

1909-24, 1928-33: Maximum, that of Apr. 19, 1933. This maximum supersedes that previously published as of Mar. 25-30, 1913, because the gage height as determined for the 1913 flood is believed to be 1 foot too high. Practically no flow at various times when water was held back by dams. Average, 14 years (1909-19, 1929-33), 244 second-feet.

REMARKS.—Records good. Some diurnal regulation caused by power plant above station.

Discharge, in second-feet, 1932-33

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1.....	92	232	246	291	142	104	273	1,010	241	87	71	151
2.....	82	273	232	291	142	110	391	1,070	223	67	70	126
3.....	98	263	268	291	136	110	404	1,200	206	98	153	100
4.....	93	346	346	297	136	108	452	1,340	200	76	180	94
5.....	97	320	268	314	129	101	592	1,310	180	82	165	91
6.....	115	346	193	291	132	101	653	1,220	177	76	158	89
7.....	320	327	221	268	132	101	793	1,010	158	76	139	87
8.....	404	302	314	241	132	108	909	824	142	72	126	80
9.....	505	268	384	222	121	113	909	713	132	58	116	87
10.....	536	273	364	212	113	110	909	634	121	83	100	74
11.....	520	219	251	203	127	110	963	590	107	84	95	84
12.....	498	241	256	207	127	105	974	549	105	89	91	87
13.....	445	222	222	187	132	103	920	524	95	93	74	80
14.....	397	227	139	160	132	103	931	508	93	86	84	82
15.....	227	217	146	150	127	124	1,100	508	78	104	82	82
16.....	212	212	164	150	127	132	1,310	508	69	72	80	84
17.....	176	346	108	150	124	132	1,620	508	70	84	78	76
18.....	190	333	* 110	142	121	132	2,200	508	91	84	78	80
19.....	217	438	* 115	150	108	127	2,660	470	102	78	74	84
20.....	155	679	* 118	142	124	124	2,480	448	105	80	69	74
21.....	153	726	* 120	142	93	124	2,340	433	110	80	76	64
22.....	118	745	* 120	132	78	116	2,900	392	124	84	80	70
23.....	145	688	* 125	142	79	118	1,660	392	121	65	75	77
24.....	167	609	* 133	153	84	118	1,420	263	129	80	76	72
25.....	187	552	* 155	171	85	164	1,290	74	132	82	76	84
26.....	167	475	207	171	84	156	1,230	199	135	75	72	83
27.....	167	391	241	167	91	167	1,230	246	132	69	156	72
28.....	171	314	246	164	99	183	1,170	246	124	73	214	64
29.....	179	291	251	150	-----	199	1,070	246	104	78	228	62
30.....	191	262	236	150	-----	195	996	274	102	45	205	80
31.....	207	-----	308	139	-----	227	-----	252	-----	66	180	-----

Month	Maximum	Minimum	Mean	Per square mile	Run-off in inches
October.....	536	82	233	1.66	1.91
November.....	745	212	371	2.65	2.96
December.....	384	108	213	1.52	1.75
January.....	314	132	195	1.39	1.60
February.....	142	78	116	.829	.86
March.....	227	101	130	.929	1.07
April.....	2,660	273	1,190	8.50	9.48
May.....	1,340	74	596	4.26	4.91
June.....	241	69	130	.929	1.04
July.....	104	45	78.3	.559	.64
August.....	228	69	114	.814	.94
September.....	151	62	84.0	.600	.67
The year.....	2,560	45	287	2.05	27.83

* Estimated.

MISCELLANEOUS DISCHARGE MEASUREMENTS

Discharge measurements of streams in the St. Lawrence Basin at points other than regular gaging stations, made during the year ending September 30, 1933, are listed in the following table:

Miscellaneous discharge measurements in St. Lawrence River drainage basin during the year ending Sept. 30, 1933

Date	Stream	Tributary to—	Locality	Gage height	Discharge
				<i>Feet</i>	<i>Sec.-ft.</i>
Dec. 17	Miami & Erie Canal	Maumee River	Independence Dam, near Defiance, Ohio.	0.78	25.7
Apr. 20	do	do	do	.53	37.2
June 8	do	do	do	.48	34.5
Aug. 3	do	do	do	.84	44.0
Sept. 29	do	do	do	.70	42.2
Sept. 27	do	do	do	.57	35.7
Dec. 24	East Branch of Portage River.	Portage River	Fostoria, Ohio.	2.92	198
May 16	do	do	do	2.39	179
Oct. 7	Cuyahoga River	Lake Erie.	Lake Rockwell Dam, near Kent, Ohio.	46.74	5.03
Nov. 10	do	do	do	47.65	46.4
Dec. 1	do	do	do	47.70	55.3
Jan. 5	do	do	do	52.00	734
Feb. 2	do	do	do	49.10	182
May 22	do	do	do	47.60	57.6
July 17	do	do	do	46.65	5.61
Aug. 29	do	do	do	47.2	3.90
Nov. 11	Barge Canal bypass.		Lock 30, Macedon, N. Y.		59.2
11	do		do		34.2
11	do		do		230
Feb. 4	Forestport feeder.	Lake Ontario.	Boonville, N. Y.		33.6
Mar. 19	do	do	do		41.0
Oct. 10	East Branch of St. Regis River	St. Lawrence River.	Meacham Lake outlet, near McColloms, N. Y.	1.31	38.8
10	do	do	do	1.305	36.5
11	do	do	do	1.415	39.7
11	do	do	do	1.495	48.8
11	do	do	do	1.59	55.7
11	do	do	do	1.66	72.9
11	do	do	do	1.91	98.8
11	do	do	do	2.20	125
Nov. 1	do	do	do	1.68	71.3
Dec. 21	do	do	do	1.55	52.0
Jan. 31	do	do	do	1.62	60.1
Mar. 12	do	do	do	1.44	44.1
Apr. 12	do	do	do	2.73	230
June 6	do	do	do	2.15	113

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