Surface Water Supply of the United States 1952

Part 4. St. Lawrence River Basin

Prepared under the direction of J. V. B. WELLS, *Chief, Surface Water Branch*

GEOLOGICAL SURVEY WATER-SUPPLY PAPER 1237

Prepared in cooperation with the States of Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Vermont, and Wisconsin, and with other agencies

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PREFACE

This report was prepared by the Geological Survey in cooperation with the States of Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Vermont, and Wisconsin, and with other agencies, by personnel of the Water Resources Division, C. G. Paulsen, chief, under the general direction of J. V. B. Wells, chief, Surface Water Branch, and B. J. Peterson, chief, Annual Reports Section.

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

A. D. Ash	Lansing, Mich.
F. C. Christopherson	Madison, Wis.
D. M. Corbett	Indianapolis, Ind.
L. C. Crawford	Columbus, Ohio
A. W. Harrington	Albany, N. Y.
H. B. Kinnison	Boston, Mass.
J. H. Morgan	Champaign, Ill.
P. R. Speer (succeeded by L. R. Sawyer)	St. Paul, Minn.

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SURFACE WATER SUPPLY OF ST. LAWRENCE RIVER BASIN, 1952

SCOPE OF WORK

This volume is one of a series of 18 reports presenting measurements of stage, discharge, and content of streams, lakes, and reservoirs in the United States during the water year ending September 30, 1952. Since 1888, when the United States Geological Survey first studied streamflow in relation to problems of irrigation, similar measurements have been made at more than 12,800 gaging stations in the 48 States and at many others in the Territories of Alaska and Hawaii. On September 30, 1952, the Geological Survey and cooperating organizations were maintaining 6,700 gaging stations, including those in Alaska and Hawaii. Miscellaneous discharge measurements were made at many other points in the 1952 water year.

COOPERATION

Many State, municipal, and private organizations have cooperated with the Geological Survey in this work by either furnishing or helping to collect data. Organizations that supplied data are acknowledged in station descriptions, and organizations that assisted in the collection of data through cooperative agreements with the Survey are:

Illinois: State Department of Public Works and Buildings, C. P. Casey, director, through Division of Waterways, T. B. Casey, chief engineer; and Department of Highways, Cook County, W. H. Erickson, president of the Board of County Commissioners and G. A. Quinlan, superintendent.

Indiana: State Department of Conservation, K. M. Kunkel, director, through Division of Water Resources, C. H. Bechert, director; State Highway Commission, S. C. Hadden, chairman, and R. H. Bower, chief engineer; Indiana Flood Control and Water Resources Commission, Anton Hulman, Jr., chairman, J. I. Perrey, chief engineer; State Board of Health, Dr. L. E. Burney, commissioner, and B. A. Poole, director, Bureau of Sanitary Engineering; city of Fort Wayne Filtration Plant, L. R. Matthews, superintendent; and city of Elkhart Water Works, Warren Swartz, superintendent.

Michigan: State Department of Conservation, G. E. Eddy, director, through Geological Survey Division, F. G. Pardee, State geologist, Fish and Fisheries Division, F. A. Westerman, head, General Operations Division, G. A. Walker, head, and Parks Division, A. C. Elmer, head; State Water Resources Commission, M. P. Adams, executive secretary; and State Highway Department, C. M. Ziegler, commissioner.

Minnesota: State Department of Conservation, Division of Waters, S. A. Frellsen, director; and Minnesota State Iron Range Resources and Rehabilitation Commission, E. G. Bayuk, commissioner.

New York: State Department of Law, N. L. Goldstein, attorney-general; State Department of Public Works, B. D. Tallamy, superintendent; Board of Black River Regulating District, E. S. Cullings, chief engineer; Commission for the Improvement

of Oswegatchie River and the Hydraulic Power Thereon, A. E. Boughner, commissioner; city of Auburn, G. F. Train, city manager; and Department of Public Works, village of Lancaster, H. J. Huber, superintendent.

Ohio: State Department of Highways, T. J. Kauer, director; State Department of Natural Resources, A. W. Marion, director; and city of Van Wert, Department of Public Service, Robert Johns, director.

Vermont: Water Conservation Board, Philip Shutler, commissioner.

Wisconsin: Public Service Commission of Wisconsin, G. P. Steinmetz, chief engineer; and Wisconsin Committee on Water Pollution, T. F. Wisniewski, director.

Assistance in the form of funds or services was given by the Corps of Engineers, Department of the Army, in collecting records published herein for 77 gaging stations, of which 5 were in Indiana, 33 in Michigan, 13 in New York, 14 in Ohio, 5 in Vermont, and 7 in Wisconsin.

Full cooperation exists between the Geological Survey, United States Department of the Interior, and the Water Resources Division, Department of Resources and Development, Canada. On waters adjacent to the international boundary certain stations are maintained jointly by the United States and Canada under the terms of the Boundary Waters Treaty of 1909, and others are maintained under a subsequent agreement between the two Governments. The records from all these stations are obtained in such a manner as to be equally acceptable and available in both countries. These stations are designated international gaging stations.

The following organizations aided in collecting records:

Indiana: Indiana & Michigan Electric Co.

Michigan: Wayne County Road Commission; Huron-Clinton Metropolitan Authority; cities of Allegan, Battle Creek, Birmingham, Crystal Falls, Dearborn, Detroit, Flint, Jackson, Grand Rapids, Lansing, Monroe, Niles, Owosso, and Saginaw; Alpena Power Co.; American Boxboard Co.; Consumers Power Co., Detroit Edison Co.; Dow Chemical Co.; Michigan Gas & Electric Co.; White Pine Copper Co.; Wisconsin-Michigan Power Co., and Upper Peninsular Power Co.

New York: Municipalities of Batavia, Canandaigua, Oneida, Rochester, and Syracuse; Cornell University; New York State Electric & Gas Corp.; Niagara Mohawk Power Corporation; and Rochester Gas & Electric Corp.

Wisconsin: State Conservation Department and Lake Superior District Power Co.

DIVISION OF WORK

The stream gaging was done by the Water Resources Division of the Geological Survey, Carl G. Paulsen, chief hydraulic engineer, under the direction of Joseph V. B. Wells, chief of the surface water branch. The data for stations in the several States were collected and prepared for publication under the supervision of the district engineers at the offices listed below. The records were reviewed and the manuscript prepared for publication under the direction of B. J. Peterson, chief, Annual Reports Section.

State	District office	Address
Illinois	Champaign	605 South Neil Street.
Indiana	Indianapolis	311 West Washington Street.
Michigan	Lansing	407 Capitol Saving & Loan Building.
Minnesota	St. Paul	1610 Post Office Building.
New York	Albany	526 Federal Building.
Ohio	Columbus	1509 Hess Street.
Vermont	Boston, Mass	939 Post Office Building.
Wisconsin	Madison	666 State Office Building.

Information of a more detailed nature than that published for most of the gaging stations given in this report is on file in the district offices listed above. Provisional records of discharge prior to publication, and other unpublished data concerning the gaging-station records may usually be obtained from the district office.

DEFINITION OF TERMS AND ABBREVIATIONS

The terms of streamflow and other hydrologic data, as used in this report, are defined as follows:

Cubic foot per second (cfs) is the rate of discharge of a stream whose channel is 1 square foot in cross-sectional area and whose average velocity is 1 foot per second.

Cubic feet per second per square mile (cfsm) is the average number of cubic feet of water flowing per second from each square mile of area drained, assuming that the runoff is distributed uniformly in time and area.

Runoff in inches is the depth to which an area would be covered if all the water draining from it in a given period were uniformly distributed on its surface. The term is used for comparing runoff with rainfall, which is also usually expressed in inches.

Acre-foot is the quantity of water required to cover an acre to the depth of 1 foot and is equivalent to 43,560 cubic feet. The term is commonly used in relation to storage for irrigation.

Cfs-day is the volume of water represented by a flow of 1 cubic foot per second for 24 hours. It is equivalent to 86,400 cubic feet, 1.983471 acre-feet, or 646,317 gallons, and represents a runoff of 0.0372 inch from 1 square mile.

Stage-discharge relation is the relation between gage height and the amount of water flowing in a channel, expressed as volume per unit of time.

Control designates a feature downstream from the gage that determines the stage-discharge relation at the gage. This feature may be a natural constriction of the channel, a long reach of the channel, or an artificial structure.

Contents is the volume of water in a reservoir. Unless otherwise indicated, volume is computed on the basis of a level pool and does not include bank storage.

The drainage area of a stream at a specified location is that area, measured in a horizontal plane, which is so enclosed by a topographic divide that direct surface runoff from precipitation normally would drain by gravity into the river above the specified point. Figures of drainage area given herein include all closed basins, or noncontributing areas, within the area unless otherwise noted.

DOWNSTREAM ORDER OF LISTING GAGING STATIONS

Beginning with the series of reports for the water year ending September 30, 1951, the order of listing gaging-station records was changed. In this report, in a downstream direction along the main stem all stations on a tributary entering above a main-stem station are listed before that station. If a tributary enters between two main-stem stations, it is listed between them. A similar order is followed in listing stations on first rank, second rank, and other ranks of tributaries. To indicate the rank of any tributary on which a gaging station is situated and the stream to which it is immediately tributary, each indention in the listing of gaging stations in the table of contents of this report represents one rank. This downstream order and system of indention show which gaging stations are on tributaries between any two stations on a main stem and the rank of the tributary on which each gaging station is situated.

The order of listing used before the publication of the 1951 report listed first all stations on the main stem from headwaters toward mouth, then all stations on the uppermost tributary to the main stem from the tributary's source to mouth, and then all stations from source to mouth of the uppermost tributary to the tributary.

EXPLANATION OF DATA

The base data collected at gaging stations consist of records of stage and measurements of discharge. In addition, observations of factors affecting the stage-discharge relation, weather records, and other information are used to supplement base data in determining the daily flow. The records of stage are obtained either from direct readings on a nonrecording gage or from a water-stage recorder that gives a continuous record of fluctuations. Measurements of discharge are made with a current meter by the general methods adopted by the Geological Survey on the basis of experience in stream gaging since 1888. These methods are described in Water-Supply Paper 888 and are also outlined in standard textbooks on the measurement of stream discharge. Typical structures in use at gaging stations are shown in figure 1.

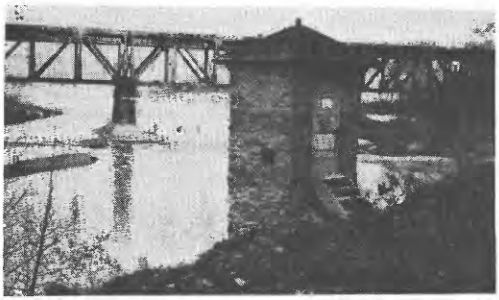
Rating tables giving the discharge for any stage are prepared from stage-discharge relation curves defined by discharge measurements. If extensions to the rating curves are necessary to define the extremes of discharge, they are made on the basis of indirect measurements of peak discharge (such as slope-area or contracted-opening measurements, computation of flow over dams or weirs, and by other methods), velocity-area studies, and logarithmic plotting. The application of the daily mean gage height to those rating tables gives the daily mean discharge, from which the monthly and the yearly mean discharge are computed. If the stage-discharge relation is subject to change because of frequent or continual change in the physical features that form the control, the daily mean discharge is determined by the shifting-control method, in which correction factors based on individual discharge measurements and notes by engineers and observers are used in applying the gage heights to the rating tables. If the stage-discharge relation for a station is temporarily changed by the presence of aquatic growth or debris on the control, the daily mean discharge is computed by what is essentially the shifting-control method.

At some gaging stations the stage-discharge relation is affected by backwater from reservoirs, tributary streams, or other sources. This necessitates the use of the slope method in which the slope or fall in a reach of the stream is a factor in determining discharge. Information requisite for determining the slope or fall is obtained by means of an auxiliary gage set at some distance from the base gage. At some stations the stage-discharge relation is affected by changing stage. If so, the rate of change of stage is used as a factor in the determination of discharge.

At most gaging stations in the northern part of the United States and at some in the mountainous regions of other parts the stage-discharge relation is affected by ice during the winter, and it becomes impossible to compute the discharge in the usual manner. Discharge for periods of ice effect is computed on the basis of the gage-height record and occasional winter discharge measurements, consideration being given to the available information on temperature and precipitation, notes by gage observers and engineers, and comparable records of discharge for other stations in the same or nearby basins. If the stage-discharge relation is affected by ice, this information is given in a note to the

A, Kalamazoo River at Battle Creek, Mich.

B, Huron River at Milan, Ohio



C, Genesee River at Portageville, N. Y.

Figure 1.--GAGING-STATION STRUCTURES

table. No mention is made of occasional days of ice effect if the degree of accuracy of daily records is not changed.

The data herein presented generally comprise a description of the station, a skeleton rating table, and a table showing the daily discharge and monthly and yearly discharge and runoff of the stream.

The description of the station gives the location, drainage area, records available, type and history of gages, average discharge, extremes of discharge, general remarks, and notations of revisions of the previously published record. The location of the gaging station and the drainage area are obtained from the most accurate maps available. River mileage, given under "Location" for some stations, is that determined and used by the Corps of Engineers unless otherwise noted. Under "Gage" are given the type of gage currently in use and the datum of the present gage above mean sea level, and a condensed history of the types of gages, locations, and datums of previous gages for which discharge records are generally equivalent to those at the present site. Under "Average discharge" is given the average discharge for the number of years indicated. It is not given for stations having fewer than five complete years of record or for stations where changes in water development during the period of record cause the figure to have little significance. Under "Extremes" are given the maximum discharge and gage height; the minimum discharge if there is little or no regulation; the minimum daily discharge if there is extensive regulation (also the minimum discharge if useful); and the minimum gage height (unless it is of no importance). Unless otherwise qualified, the maximum discharge corresponds to the crest-stage obtained by use of a water-stage recorder, a crest-stage indicator, or a nonrecording gage read at the time of the crest. If the maximum gage height did not occur at the same time as the maximum discharge, it is given separately. Information pertaining to the accuracy of the records and conditions which affect the natural flow at the gaging station is given under "Remarks."

Previously published records of some stations have been found to be in error on the basis of data or information later obtained. Revisions of such records are usually published along with the current records in one of the annual reports. In order to make it easier to find such revised records, a paragraph headed "Revisions (water years)" has been added to the description of all stations for which revised records have been published. Listed therein are all the reports in which revisions have been published, each followed by the water years for which figures are revised in that report. In listing the report number, "W" means water-supply paper. In listing the water years only one number is given; for instance, 1933 stands for the water year October 1, 1932, to September 30, 1933. If no daily, monthly, or annual figures of discharge are concerned in the revision, that fact is brought out by notations after the year dates as follows: "(M)" means that only the instantaneous maximum discharge was revised; "(m)" that only the instantaneous minimum was revised; and "(P)" that only peak discharges were revised. If the drainage area has been revised, the report in which the revised figure was first published is given. It should be noted that for all stations for which cubic feet per second per square mile and runoff, in inches, are published, a revision of the drainage area necessitates corresponding revision of all figures based on the drainage area. Revised figures of cubic feet per second per square mile and runoff, in inches, resulting from a revision of the drainage area only are usually not published in the annual series of reports.

Skeleton rating tables are published for all stations except those at which the daily discharge for the greater part of the open-water period was determined by the shifting-control method, the slope method, or other special methods involving an equivalent adjustment to the gage height of more than one-tenth foot.

For stations equipped with water-stage recorders, except those on streams subject to sudden or rapid fluctuation, the daily table gives the discharge corresponding to the daily mean gage height. For stations subject to such fluctuation the daily mean gage height may not indicate the true daily mean discharge, which must be obtained by averaging the discharge for parts of the day or by using the discharge integrator, an instrument for obtaining the daily mean discharge from a continuous gage-height graph and containing, as an essential element, a curve representing the stage-discharge relation at the station. For stations equipped with nonrecording gages, the table of daily discharge gives the discharge corresponding to once-daily readings of the gage, or to the mean of twice-daily readings, or to the mean gage height determined from gage-height graphs based on gage readings. For periods of rapidly changing stage, the daily mean discharge is determined from gage-height graphs based on gage readings, the frequency of which is stated in the station description.

In the table of daily discharge, the values for the maximum day and the minimum day for each month are underlined. If the value is repeated, it is underlined only on the first day of its occurrence.

In the monthly summary below the daily table, the line headed "Total" gives the sum of the daily values; it is the total cfs-days for the month. The line headed "Mean" gives the average flow in cubic feet per second during the month. Runoff for the month may be expressed in cubic feet per second per square mile (line headed "Cfsm"), or in inches (line headed "In."), or in acre-feet (line headed "Ac-ft"). Values for cubic feet per second per square mile and runoff, in inches, are omitted if the drainage area includes large noncontributing areas, or if the average annual rainfall over the drainage basin is usually less than 20 inches.

In the yearly summary below the monthly summary, the values of maximum are the maximum daily discharges, not the momentary discharges when the water was at crest stage. Likewise, the minimums in this summary are the minimum daily discharges.

Peak discharges and the times of their occurrence and corresponding gage heights of most stations are listed below the table of daily and monthly discharge. All independent peaks above the selected base are given. The base discharge, which is given in parentheses, is selected so that an average of about three peaks a year will be presented. Peak discharges are not published for canals, ditches, drains, or for any stream for which the peaks are subject to substantial control by man.

Footnotes to the table of daily discharge indicate periods when discharge was computed or estimated by unusual or special methods during periods of no gage-height record and ice effect, or by other effects that reduce the degree of accuracy of the records. Days on which discharge measurements were made are indicated by asterisk and footnote unless they were made at frequent regular intervals, in which instance the general frequency of discharge measurements is given under "Remarks" in the station description.

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For most gaging stations on lakes and reservoirs the data presented comprise a description of the station and a monthly summary table of stage and contents. For some reservoirs a table showing daily contents or stage is given. A skeleton table of capacity at given stages is usually given in the first report in which data for the reservoir are published, but it is omitted from succeeding reports.

ACCURACY OF FIELD DATA AND COMPUTED RESULTS

The accuracy of streamflow data depends primarily on (1) the stability of the stage-discharge relation or, if the control is unstable, the frequency of discharge measurements, and (2) the accuracy of observations of stage, measurements of discharge, and interpretation of records.

The station description states the degree of accuracy of the records. "Excellent" indicates that, in general, the error in the daily records is believed to be less than 5 percent; "good," less than 10 percent; "fair," less than 15 percent; and "poor," probably more than 15 percent. The records of monthly and yearly mean discharge and runoff are, in general, more nearly accurate than the daily records.

Runoff at some stations, as indicated by the monthly mean, may vary widely from natural runoff, owing to diversion, consumption, regulation by storage, increase or decrease in evaporation due to artificial causes, or to other factors. For such stations, values of cubic feet per second per square mile and runoff, in inches, are not published unless storage or diversion records are included to indicate the extent of the regulation or diversion, or unless satisfactory adjustments can be made for changes in contents of reservoirs or for other changes incident to use and control. Evaporation from a reservoir is not included in the adjustments for changes in reservoir contents, unless it is so stated. Even at those stations where adjustments are made, large errors in computed runoff may occur when relatively large negative adjustments are made or when evaporation is large in comparison with the observed discharge.

Many gaging stations on streams in the irrigated areas of the United States are situated above most of the diversions from those streams, and therefore the discharge recorded does not actually show the water supply available at the stations for further development, because water must first be supplied to existing irrigation systems.

PUBLICATIONS

To facilitate publication of the annual series of reports, the area of the United States is divided into 14 parts whose boundaries coincide with certain natural drainage lines. Formerly, the results of streamflow measurements were published in 14 volumes, one for each of the 14 parts. Beginning with the reports for 1951, the records are published in 18 volumes, there being 2 volumes each for Parts 1, 2, 3, and 6. The boundaries of the various parts are indicated by the following list and the map in figure 2.

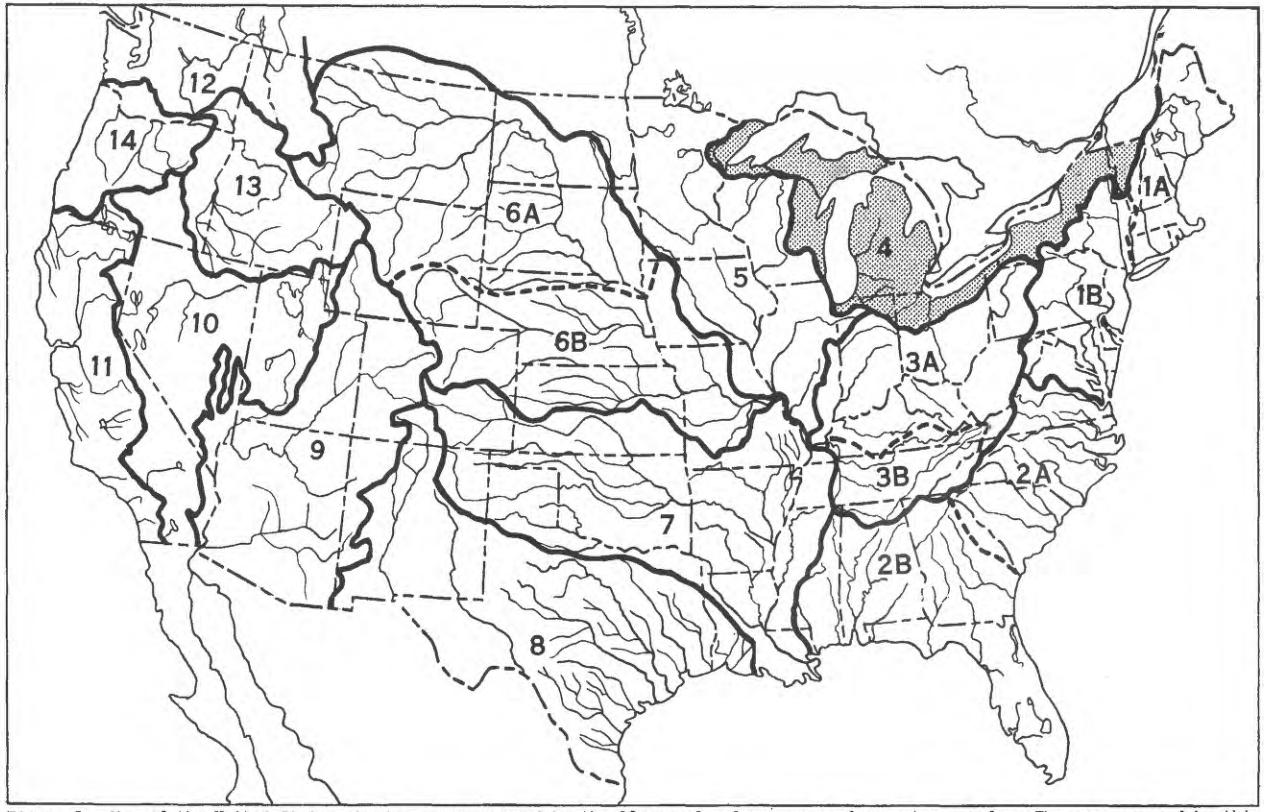

Figure 2. Map of the United States showing areas covered by the 18 annual volumes on surface water supply. The area covered by this report is shaded.

Part 1. North Atlantic slope basins, in two volumes:
A, North Atlantic slope basins, Maine to Connecticut.
B, North Atlantic slope basins, New York to York River.
2. South Atlantic slope and eastern Gulf of Mexico basins, in two volumes:
A, South Atlantic slope basins, James River to Savannah River.
B, South Atlantic slope and eastern Gulf of Mexico basins, Ogeechee River to Pearl River.
3. Ohio River basin, in two volumes:
A, Ohio River basin except Cumberland and Tennessee River basins.
B, Cumberland and Tennessee River basins.
4. St. Lawrence River basin.
5. Hudson Bay and upper Mississippi River basins.
6. Missouri River basin, in two volumes:
A, Missouri River basin above Sioux City, Iowa.
B, Missouri River basin below Sioux City, Iowa.
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. Pacific slope basins in Washington and upper Columbia River basin.
13. Snake River basin.
14. Pacific slope basins in Oregon and lower Columbia River basin.

Water-supply papers and other publications of the Geological Survey containing data on the water resources of the United States may be purchased or consulted as follows:

1. Copies may be purchased from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., who will, on application, furnish lists giving prices. A list of Geological Survey publications may also be obtained by applying to the Director, Geological Survey, Washington, D. C.

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 offices of the Water Resources Division of the Geological Survey. Addresses of the offices in the area covered by this report are given on page

Early records of the flow of streams in the United States are published in the reports listed below. In many of these reports records for years earlier than those indicated have been included for some streams.

Streamflow data for the years 1884-1901, in reports of the Geological Survey

(A = Annual Report; B = Bulletin; W = Water-Supply Paper)

Report	Character of data	Year
10th A, pt. 2	Descriptive information only.	
11th A, pt. 2	Monthly discharge and descriptive information	1884 to September 1890.
12th A, pt. 2	....do	1884 to June 30, 1891.
13th A, pt. 3	....do	1884-92.
14th A, pt. 2	Monthly discharge	1888-93.
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.	1895.
W 11	Gage heights	1896.
18th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge	1895-96.
W 15	Descriptions, measurements, and gage heights of streams east of the Mississippi River, and Missouri River and tributaries above Kansas River.	1897.
W 16	Descriptions, measurements, and gage heights of stream west of the Mississippi River, except Missouri River and tributaries above Kansas River.	1897.
19th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge.	1897.
W 27	Measurements, ratings, and gage heights of streams east of the Mississippi River, and Missouri River and tributaries.	1898.
W 28	Measurements, ratings, and gage heights of stresms west of the Mississippi River, except Missouri River and tributaries.	1898.
20th A, pt. 4	Monthly discharge	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.

Reports on surface-water supply containing records from 1899 to date for drainage basins in this report are listed below. The data for any particular gaging station will, in general, be found in the reports covering the years during which the station was maintained.

Numbers of water-supply papers containing results of stream measurements in St. Lawrence River basin, 1899-1952

Year	W.S.P.	Year	W.S.P.	Year	W.S.P.	Year	W.S.P.	Year	W.S.P.
1899	36	1911	304	1923	564	1933	744	1943	974
1900	49	1912	324	1924	584	1934	759	1944	1004
1901	65,75	1913	354	1925	604	1935	784	1945	1034
1902	a82,83	1914	384	1926	624	1936	804	1946	1054
1903	97	1915	404	1927	644	1937	824	1947	1084
1904	129	1916	434	1928	664	1938	854	1948	1114
1905	170	1917	454	1929	684	1939	874	1949	1144
1906	206	1918	474	1930	699	1940	894	1950	1174
1907-8	244	1919-20	504	1931	714	1941	924	1951	1207
1909	264	1921	524	1932	729	1942	954	1952	1237
1910	284	1922	544						

a Lake Ontario and tributaries to St. Lawrence River proper.

The records at most of the stations discussed in these reports extend over many 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. The streams and points of measurement are listed in the same order as the streams and gaging stations in the body of the report. An index of the records obtained before 1904 has been published in Water-Supply Paper 119.

Each of the reports on the surface-water supply for the year 1939 (Water-Supply Paper 874 for the St. Lawrence River basin) contains, for the area included in that report, a summary of yearly discharge at gaging stations at which 10 or more complete years of record had been collected. These summaries were reprinted separately.

Reports also have been published that are compilations of records for various areas, usually a single State or drainage basin. These reports contain records previously published (some of which may have been revised), as well as some records not contained in the annual series of water-supply papers. The only such reports for any part of the area covered by this report are Water-Supply Paper 424, "Surface waters of Vermont, 1875-1916", and Water-Supply Paper 156, "Water powers of northern Wisconsin, 1895-1905."

Records of discharge have been published also in State reports. Some of these are not contained in the publications of the Geological Survey or are revisions of records previously published in its water-supply papers. The following table contains a list of these reports for the area covered by this report.

State reports containing compilations of records of discharge

State	Period	Report	Issued by
Indiana.....	1923-27	Pub. 72, Surface water supply of Indiana...	Department of Conservation.
Do.....	1927-30	Pub. 112, Surface water supply of Indiana..	Do.
Minnesota.....	1909-12	Water-resources investigation of Minnesota.	State Drainage Commission.
Do.....	1883-1949	Surface water supplies of the Mesabi Iron Range.	Department of Conservation.
Ohio.....	1898-1921	Bull. 73, Ohio streamflow, Part 1.....	Engineering Experiment Station, Ohio State University.
Do.....	1898-1944	Bull. 127, Ohio streamflow, Part 2.....	Do.
Do.....	1902-39	Bull. 200, Compilation of streamflow.....	Department of Agriculture, Division of Conservation.
Do.....	1898-1939	Bull. 111, Ohio stream-drainage areas and flow-duration tables.	Engineering Experiment Station, Ohio State University.
Wisconsin.....	1888-1914	1st report of Railroad Commission of Wisconsin to Legislature on water powers.	Railroad Commission of Wisconsin.
Do.....	1914-23	2nd report of Railroad Commission of Wisconsin to Legislature on water powers.	Do.

Note.--In addition to the records contained in the reports listed above, annual or biennial reports in which are contained records of discharge are issued by the State of New York, New York City Board of Water Supply, and the city of Rochester.

The reports listed in the foregoing tables contain the customary records of discharge collected during the systematic operation of gaging stations. Detailed information on the stage and discharge of many streams during major floods has been included in special reports on these floods published by the Geological Survey. The more recent of these special reports also contain other pertinent hydrologic information and analyses and compilations of data relating to earlier notable floods. The following list gives the numbers and titles of these reports:

Water-Supply Paper	Title
147.....	Destructive floods in the United States in 1904.
162.....	Destructive floods in the United States in 1905.
636-C.....	The New England flood of November 1927.
771.....	Floods in the United States, magnitude and frequency.
773-E.....	The New York State flood of July 1935.
798.....	The floods of March 1936, part 1, New England rivers.
799.....	The floods of March 1936, part 2, Hudson River to Susquehannah River region.
847.....	Maximum discharges at stream-measurement stations through September 1938.
867.....	Hurricane floods of September 1938.
1137-G.....	Floods of 1950 in the Upper Mississippi River and Lake Superior Basins in Minnesota

RECORDS OF DISCHARGE COLLECTED BY AGENCIES OTHER THAN THE GEOLOGICAL SURVEY

The table below contains a list of gaging stations for the area covered by this report, at which records of discharge were collected during the water year October 1951 to September 1952 by agencies other than the Geological Survey. The records of these stations are not contained in publications of the Geological Survey, nor have they been published elsewhere.

Records of discharge collected by agencies other than the Geological Survey

Stream	Location	Period	Collected by
Cayuga Lake Outlet...	Lock 1 (Mud lock), N. Y.....	1926-52	State Department of Public Works, Syracuse, N. Y.
Clyde River.....	Clyde, N. Y.....	1924-52	Do.
Indian River.....	Theresa, N. Y.....	1934-52	Niagara Mohawk Power Corporation, Syracuse, N. Y.
New York Barge Canal a/	Brewerton, N. Y.....	1925-52	State Department of Public Works, Syracuse, N. Y.
Do.....	Bypass and Lock 30, Macedon, N. Y.	1938-52	Do.
Oneida River.....	Caughdenoy, N. Y.....	1929-52	Oswego River Watershed Corporation, Fulton, N. Y.
Oswegatchie River, East Branch.	Browns Falls, N. Y.....	1934-52	Niagara Mohawk Power Corporation, Syracuse, N. Y.
Oswego River.....	Dam O-5, Minetto, N. Y.....	1928-52	State Department of Public Works, Syracuse, N. Y.
Do.....	Lower Dam, Fulton, N. Y.....	1928-52	Oswego River Watershed Corporation, Fulton, N. Y.
Do.....	High Dam, Oswego, N. Y.....	1940-52	Niagara Mohawk Power Corporation, Syracuse, N. Y.
Raquette River.....	Colton, N. Y.....	1934-52	Do.
St. Regis River, West Branch.	Parishville, N. Y.....	1934-52	Do.
Salmon River.....	Bennetts Bridge, Altmar, N. Y...	1934-52	Do.
Saranac River.....	Kents Falls, N. Y.....	1934-52	System Properties, Inc., Cadyville, N. Y.
Seneca River.....	Baldwinsville, N. Y.....	1928-52	Oswego River Watershed Corporation, Fulton, N. Y.
Do.....	Jacks Reef, near Baldwinsville, N. Y.	1933-52	State Department of Public Works, Syracuse, N. Y.
Do.....	Seneca Falls, N. Y.....	1931-52	New York State Electric & Gas Corp., Geneva, N. Y.
Do.....	Waterloo, N. Y.....	1931-52	Do.
Skaneateles Lake Outlet.	Skaneateles, N. Y.....	1922-52	City of Syracuse, N. Y.

a/ Diversion around station on Oneida River at Caughdenoy, N. Y.

Note.--Records for the stations given in the above table are unpublished but are available at the office of the organization by which the station was operated. In addition to the records listed in the above table, the Soil Conservation Service of the U. S. Department of Agriculture (beginning in 1940) has collected records of runoff from 3 areas of less than 5 acres each near East Lansing, Mich.

HYDROLOGIC CONDITIONS

The water year 1952 was characterized by above normal runoff over most of the St. Lawrence River basin within the United States. No noteworthy floods occurred in this area during the water year. For two key gaging stations in the area covered by this report, a comparison of the monthly and yearly mean discharge during the 1952 water year with the median discharge for the 25-year period 1921-45 is shown in figure 3 below.

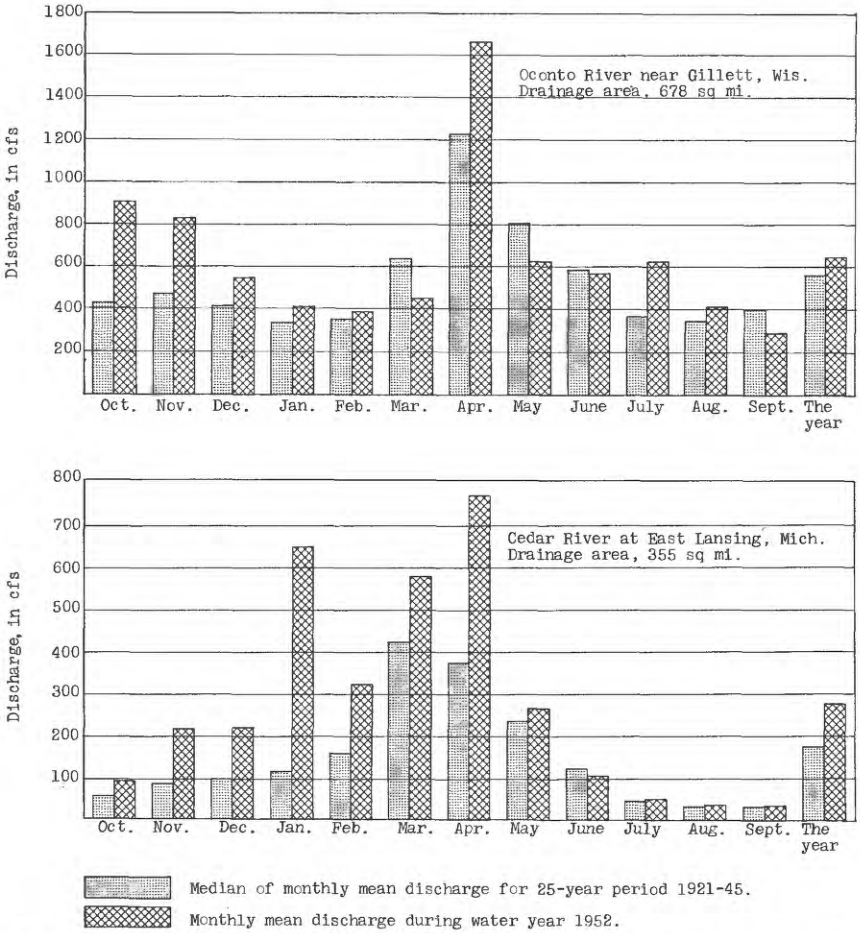

Figure 3.--Comparison of discharge at two key gaging stations during 1952 water year with median discharge for 25-year period.

STREAMS TRIBUTARY TO LAKE SUPERIOR

Pigeon River at Middle Falls, below International Bridge, Minn.

(International gaging station)

Location.--Lat 48°00'44", long. 89°36'58", in NE¼ sec. 24, T. 64 N., R. 6 E., on right bank 400 ft upstream from Middle Falls, 3½ miles upstream from mouth, and 5⅝ miles downstream from International Bridge.

Drainage area.--600 sq mi.

Records available.--April 1924 to September 1952 in reports of Geological Survey. Published as "at International Bridge" April 1924 to September 1940. October 1923 to September 1932 in House Document 92, 73d Congress, 1st session. June 1921 to September 1952 in reports of Water Resources Division, Department of Resources and Development, Canada.

Gage.--Water-stage recorder. Datum of gage is 789.58 ft above mean sea level, datum of 1929. Oct. 1, 1923, to Sept. 1, 1936, staff gage and Sept. 2, 1936, to Sept. 30, 1940, wire-weight gage, at International Bridge 5⅝ miles upstream at different datum.

Average discharge.--29 years (1923-52), 512 cfs.

Extremes.--Maximum discharge during year, 4,900 cfs Apr. 19 (gage height, 7.82 ft); maximum gage height, 8.31 ft Apr. 19 (backwater from ice); minimum daily discharge, 165 cfs Mar. 29-31; minimum gage height, 1.04 ft Sept. 30.

1923-52: Maximum discharge observed, 11,000 cfs May 5, 1934 (gage height, 7.6 ft, site and datum then in use), from rating curve extended above 7,000 cfs; minimum, 27 cfs Nov. 4, 1945 (gage height, -0.08 ft).

Remarks.--Records good except those for periods of ice effect, which are fair, and those for periods of no gage-height record, which are poor.

Cooperation.--This station is one of the international gaging stations maintained by the United States under agreement with Canada.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.9	150	2.5	622	6.0	2,920
1.2	221	3.0	817	7.0	3,920
1.5	302	4.0	1,320	8.0	5,150
2.0	452	5.0	2,010		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	947	540	600	380	290	190	175	1,300	652	378	458	340
2	856	470	590	380	280	190	215	1,230	648	340	436	346
3	1,120	440	620	360	280	190	245	1,160	686	319	427	325
4	1,220	410	690	350	270	190	255	1,110	701	296	981	305
5	1,610	390	700	330	260	190	260	*1,070	674	277	1,860	288
6	1,860	390	680	320	250	195	270	1,020	659	252	1,510	277
7	1,490	390	650	310	260	210	275	947	622	282	1,130	266
8	1,210	400	620	320	250	220	260	1,000	597	*294	938	258
9	1,040	450	600	330	260	230	*220	995	597	285	1,050	252
10	*938	540	580	320	250	240	240	995	555	277	938	250
11	856	580	580	330	260	240	275	1,580	514	334	740	247
12	780	960	540	320	250	240	320	2,070	478	504	604	239
13	713	1,110	520	320	240	235	400	1,710	465	682	524	237
14	670	1,160	510	320	250	220	520	1,400	449	693	471	252
15	629	1,150	500	320	240	190	660	1,160	399	611	436	269
16	600	1,130	500	310	240	180	960	1,080	*311	548	409	280
17	554	1,100	510	310	240	180	1,900	1,020	294	1,430	390	274
18	517	1,060	480	310	230	175	3,100	1,040	296	1,520	381	260
19	484	1,020	*440	300	230	175	3,700	1,000	280	1,170	363	247
20	471	980	440	310	230	175	4,150	962	266	919	*354	242
21	497	950	430	310	230	175	3,520	980	250	805	343	231
22	667	*880	410	310	230	175	3,550	957	237	764	325	226
23	1,140	780	380	300	220	170	*2,990	910	231	801	311	221
24	1,020	650	370	290	220	170	2,250	864	255	720	302	216
25	860	690	370	290	210	170	1,830	826	294	637	294	208
26	776	700	370	290	200	170	1,610	784	314	597	280	206
27	705	720	370	280	190	170	1,510	764	308	558	274	201
28	659	720	370	280	*195	165	1,430	760	311	537	274	194
29	629	650	370	*270	190	165	1,360	760	375	520	266	189
30	610	600	380	280	-	165	1,300	716	409	507	266	*184
31	580	-	380	290	-	*165	-	682	-	491	299	-
Total	26,708	22,010	15,550	9,740	6,945	5,915	39,750	32,872	13,127	18,348	17,624	7,530
Mean	862	734	502	314	239	191	1,325	1,060	438	592	569	251
Cfsm	1.44	1.22	0.837	0.523	0.398	0.318	2.21	1.77	0.730	0.987	0.948	0.418
In.	1.66	1.36	0.96	0.60	0.43	0.37	2.46	2.04	0.81	1.14	1.09	0.47

Calendar year 1951: Max 7,280 Min 172 Mean 817 Cfsm 1.36 In. 18.48
Water year 1951-52: Max 4,150 Min 165 Mean 590 Cfsm 0.983 In. 13.39

Peak discharge (base, 3,000 cfs).--Apr. 19 (11:30 p.m.) 4,900 cfs (7.82 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Oct. 30 to Apr. 19 (no gage-height record Nov. 15-21, Dec. 13-18; discharge estimated on basis of 2 discharge measurements and weather records).

Baptism River near Beaver Bay, Minn.

Location.--Lat 47°20', long. 91°12', in sec. 15, T. 56 N., R. 7 W., on right bank 260 ft upstream from bridge on U. S. Highway 61 and 6 miles northeast of village of Beaver Bay.

Drainage area.--140 sq mi.

Records available.--July 1928 to January 1929, March 1930 to September 1947, June 1949 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 609.97 ft above mean sea level (Corps of Engineers benchmark). Prior to Oct. 5, 1934, staff gage at same site and datum.

Average discharge.--20 years (1930-47, 1949-52), 168 cfs.

Extremes.--Maximum discharge during year, 2,790 cfs Apr. 19 (gage height, 5.42 ft); minimum, 23 cfs Aug. 27 (gage height, 2.18 ft).
1928-29, 1930-47, 1949-52: Maximum discharge, 9,350 cfs Aug. 9, 1939 (gage height, 8.11 ft), from rating curve extended above 4,000 cfs; minimum daily, 0.3 cfs Jan. 5, 6, 1940.

Remarks.--Records good except those for period of ice effect, which are fair.

Rating tables, water year 1951-52, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 18, July 18 to Sept. 30				Apr. 19 to July 17			
2.1	18	3.4	285	2.2	24	3.5	391
2.5	45	3.8	585	2.6	56	4.0	839
2.7	66	4.5	1,380	2.9	101	5.0	2,140
2.9	96	5.0	2,120	3.1	159	6.0	3,710
3.1	146						

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	374	179	81	31	28	26	120	371	58	191	67	374
2	354	150	90	32	28	26	200	323	77	168	56	252
3	760	150	105	32	28	26	84	273	113	191	79	179
4	614	143	121	33	28	26	69	239	108	156	319	135
5	750	153	154	32	29	26	62	216	96	108	408	96
6	642	146	153	32	29	25	65	*187	85	92	408	76
7	522	146	145	31	29	25	79	168	70	*389	322	64
8	431	153	139	31	29	25	95	159	62	499	303	57
9	346	172	129	31	29	25	*120	149	56	364	431	55
10	*285	161	118	31	29	26	120	227	49	250	334	52
11	241	146	109	31	30	26	130	482	42	476	216	48
12	211	220	102	32	30	26	150	532	38	695	157	43
13	183	400	96	32	29	25	200	451	35	666	114	41
14	176	600	90	33	29	25	380	343	33	523	89	87
15	183	450	83	33	29	25	550	261	29	371	71	122
16	179	370	77	34	29	25	650	205	*125	250	59	108
17	164	300	69	34	29	25	1,000	182	200	408	53	91
18	157	230	*62	34	30	26	2,020	164	173	868	46	75
19	146	190	53	33	30	27	2,550	145	132	652	43	66
20	138	180	46	32	29	28	2,280	125	97	471	39	60
21	161	170	41	31	28	28	1,900	111	74	431	*35	55
22	405	*164	37	31	28	28	1,910	99	60	360	31	49
23	567	141	35	31	28	28	*1,350	88	60	309	29	46
24	471	122	32	30	27	29	917	80	302	221	28	43
25	408	104	31	29	27	28	686	74	499	172	26	41
26	340	85	30	28	26	28	601	66	377	150	24	39
27	280	74	29	28	*26	28	540	71	244	119	23	37
28	246	70	29	*29	26	28	499	74	244	101	31	36
29	221	70	29	28	26	28	466	72	292	91	28	34
30	221	73	30	28	-	*28	421	67	250	93	127	*31
31	202	-	30	28	-	34	-	63	-	81	471	-
Total	10,378	5,712	2,375	965	822	829	20,214	6,067	4,080	9,916	4,467	2,492
Mean	335	190	76.6	31.1	28.3	26.7	674	196	136	320	144	83.1
Cfsm	2.39	1.36	0.547	0.222	0.202	0.191	4.81	1.40	0.971	2.29	1.03	0.594
In.	2.76	1.52	0.63	0.26	0.22	0.22	5.37	1.61	1.08	2.63	1.19	0.66

Calendar year 1951: Max 2,270 Min 16 Mean 230 Cfsm 1.64 In. 22.31
Water year 1951-52: Max 2,550 Min 23 Mean 187 Cfsm 1.34 In. 18.15

Peak discharge (base, 1,300 cfs).--Apr. 19 (1 a.m.) 2,790 cfs (5.42 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 12 to Apr. 3, Apr. 8-17 (no gage-height record Nov. 23 to Dec. 17; discharge estimated on basis of weather records, recorded range in stage, and records for Embarrass River at Embarrass).

Partridge River near Aurora, Minn.

Location.--Lat 47°31'00", long. 92°11'20", on line between secs. 12 and 13, T. 58 N., R. 15 W., on right bank at downstream side of highway bridge, 1 mile downstream from unnamed tributary, 1½ miles east of Aurora, and 2½ miles upstream from mouth.

Drainage area.--156 sq mi.

Records available.--August 1942 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 1,402.30 ft above mean sea level, datum of 1929. Prior to Aug. 26, 1944, staff gage at same site and datum.

Average discharge.--10 years, 148 cfs.

Extremes.--Maximum discharge during year, 1,190 cfs Apr. 22, 23 (gage height, 5.31 ft); minimum, 12 cfs Mar. 17 (gage height, 1.39 ft).
1942-52: Maximum discharge, 3,230 cfs May 10, 1950 (gage height, 7.86 ft); minimum, 3.1 cfs Sept. 22, 23, 1948 (gage height, 0.77 ft).

Remarks.--Records good.

Revisions (water years).--W 974: 1942.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 22				Apr. 23 to Sept. 30			
1.4	12	3.0	130	2.1	34	4.0	411
1.7	19	4.0	407	2.5	65	4.5	645
2.0	29	5.0	970	3.0	140	6.0	1,700
2.5	62	6.0	1,700	3.5	253		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	336	224	68	26	19	16	24	363	46	400	115	166
2	329	196	68	24	18	16	24	*327	52	360	104	261
3	300	174	76	25	19	15	22	290	52	314	118	321
4	272	154	85	25	18	14	22	264	52	278	144	317
5	260	140	95	25	17	16	22	232	53	245	162	278
6	249	125	108	25	17	15	24	212	53	212	179	227
7	237	117	116	24	17	15	*27	200	58	230	179	184
8	*218	110	110	24	18	16	36	179	62	248	197	149
9	198	100	103	24	18	15	47	162	55	256	230	133
10	176	95	94	23	18	15	43	156	52	250	284	117
11	157	91	84	22	17	14	44	160	49	224	327	102
12	144	96	76	21	16	14	51	164	46	212	333	91
13	133	110	70	21	17	14	69	175	42	200	299	81
14	128	144	64	22	17	14	90	179	36	200	245	80
15	130	181	*58	22	17	14	130	175	35	200	193	73
16	125	208	53	22	17	14	220	164	78	188	158	71
17	124	226	48	22	17	13	400	151	*107	*173	135	71
18	120	213	44	22	17	14	600	140	168	190	*117	67
19	116	*190	41	22	16	14	800	130	217	210	102	62
20	111	167	39	*22	16	14	*942	118	220	259	87	59
21	116	150	37	21	17	14	1,080	109	195	293	77	55
22	141	135	35	19	17	15	1,170	101	164	302	67	52
23	190	120	33	20	16	15	1,160	91	177	287	61	50
24	243	105	31	20	*16	14	1,080	83	350	267	54	*48
25	288	92	30	21	16	14	956	77	502	248	49	46
26	310	83	30	21	16	15	804	72	565	217	44	44
27	316	76	30	20	16	14	663	67	565	191	41	41
28	303	73	30	20	16	*14	550	60	555	171	42	37
29	278	71	28	18	16	14	467	56	512	154	39	35
30	260	69	28	18	-	15	408	52	454	137	48	34
31	252	-	28	18	-	19	-	50	-	126	110	-
Total	6,560	4,035	1,840	679	492	455	11,975	4,759	5,572	7,242	4,340	3,352
Mean	212	134	59.4	21.9	17.0	14.7	399	154	186	234	140	112
Cfsm	1.36	0.859	0.381	0.140	0.109	0.094	2.56	0.987	1.19	1.50	0.897	0.718
In.	1.56	0.96	0.44	0.16	0.12	0.11	2.85	1.13	1.33	1.73	1.03	0.80

Calendar year 1951: Max 1,320 Min 15 Mean 142 Cfsm 0.910 In. 12.39
Water year 1951-52: Max 1,170 Min 13 Mean 140 Cfsm 0.897 In. 12.22

Peak discharge (base, 500 cfs).--Apr. 22 (10 p.m.) 1,190 cfs (5.31 ft); June 26 (12 p.m.) 570 cfs (4.36 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 8-27, Apr. 14-17.

St. Lewis River near Aurora, Minn.

Location.--Lat 47°29'30", long. 92°14'20", in SW¼ sec. 22, T. 58 N., R. 15 W., on left bank at upstream side of highway bridge, three-quarters of a mile downstream from Partridge River and 1½ miles south of Aurora.

Drainage area.--312 sq mi.

Records available.--August 1942 to September 1952.

Gage.--Water-stage recorder. Prior to Aug. 26, 1944, chain gage at same site and datum.

Average discharge.--10 years, 273 cfs.

Extremes.--Maximum discharge during year, 1,640 cfs Apr. 23 (gage height, 4.55 ft); minimum daily discharge, 34 cfs Mar. 16-18, 25, 26; minimum gage height, 0.97 ft, Mar. 15-17 (backwater from ice).
1942-52: Maximum discharge, 5,380 cfs May 14, 1950 (gage height, 8.37 ft); minimum discharge, 4.0 cfs Oct. 2, 3, 1948 (gage height, 0.30 ft).

Remarks.--Records good except those for periods of ice effect, which are fair.

Rating tables, water year 1951-52, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 20				Apr. 21 to Sept. 30			
1.8	174	3.0	640	1.3	78	3.0	639
2.0	230	3.5	920	1.6	134	4.0	1,240
2.5	410	4.0	1,240	2.0	242	5.0	2,000
				2.5	419		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	615	405	185	64	47	40	44	740	113	557	267	364
2	585	370	190	62	47	39	50	*681	119	513	248	492
3	556	345	201	61	47	39	52	624	117	475	276	534
4	524	325	221	60	46	38	50	580	115	435	320	522
5	524	300	240	59	46	37	50	526	117	391	330	475
6	514	270	246	58	45	36	52	480	113	352	334	427
7	496	250	235	57	44	36	*58	451	113	383	324	375
8	*470	240	215	56	45	36	70	423	148	391	395	334
9	431	230	200	56	46	37	95	395	139	399	517	313
10	402	230	180	56	46	37	105	375	128	383	548	290
11	374	235	160	55	45	37	115	379	113	352	534	270
12	351	249	140	55	45	37	150	379	98	334	509	254
13	332	286	125	54	45	37	210	379	94	360	467	239
14	332	374	115	54	45	36	300	375	86	367	415	233
15	340	431	*105	54	44	35	480	360	78	360	356	218
16	332	444	95	54	43	34	620	341	187	334	320	209
17	318	425	90	54	42	34	760	316	*248	*327	290	204
18	300	405	82	54	42	34	998	303	313	395	*261	195
19	286	*390	76	54	41	35	1,140	283	341	415	236	179
20	276	365	73	*54	41	37	*1,230	264	330	500	218	171
21	289	335	72	52	41	37	*1,360	248	299	530	198	163
22	351	300	71	50	42	36	1,560	230	261	522	179	153
23	452	275	70	49	42	35	1,620	215	279	488	163	144
24	519	250	69	50	*43	35	1,500	204	459	451	148	*139
25	556	230	68	51	43	34	1,370	192	589	443	136	132
26	556	210	68	50	42	34	1,230	179	665	431	124	128
27	542	195	68	49	42	*35	1,080	166	665	399	115	124
28	510	185	67	47	42	35	980	151	681	364	124	113
29	478	180	65	45	41	36	884	139	665	338	115	105
30	461	180	64	45	-	37	800	130	619	306	136	102
31	440	-	63	46	-	39	-	121	-	283	254	-
Total	13,512	8,909	3,919	1,665	1,270	1,124	19,013	10,629	8,292	12,578	8,857	7,601
Mean	436	297	126	53.7	43.8	36.3	634	343	276	406	286	253
Cfsm	1.40	0.952	0.404	0.172	0.140	0.116	2.03	1.10	0.885	1.30	0.917	0.811
In.	1.61	1.06	0.47	0.20	0.15	0.13	2.27	1.27	0.99	1.50	1.06	0.91

Calendar year 1951: Max 1,840 Min 24 Mean 280 Cfsm 0.897 In. 12.19
Water year 1951-52: Max 1,620 Min 34 Mean 266 Cfsm 0.853 In. 11.62

Peak discharge (base, 600 cfs).--Apr. 23 (2 a.m.) 1,640 cfs (4.55 ft); June 28 (12:30 p.m.) 707 cfs (3.13 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Oct. 31 to Nov. 11, Nov. 17 to Dec. 1, Dec. 7 to Apr. 17.

Embarrass River at Embarrass, Minn.

Location.--Lat 47°39'30", long. 92°11'50", in NW¼ sec. 25, T. 60 N., R. 15 W., on left bank at Embarrass, 30 ft upstream from highway bridge and 100 ft upstream from railway bridge.

Drainage area.--93.8 sq mi.

Records available.--August 1942 to September 1952.

Gage.--Water-stage recorder. Prior to Aug. 28, 1944, chain gage at same site and datum.

Average discharge.--10 years, 80.0 cfs.

Extremes.--Maximum discharge during year, 803 cfs July 21 (gage height, 8.81 ft); minimum daily, 4.6 cfs Mar. 17-19.
1942-52: Maximum discharge, 1,740 cfs May 8, 9, 1950 (gage height, 10.92 ft); minimum daily, 1.9 cfs Mar. 15-22, 1949; minimum gage height, 0.67 ft Mar. 20, 21, 1949.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.8	5.2	2.0	84
.9	8.1	4.0	224
1.0	12	6.0	372
1.1	16	7.0	480
1.2	22	8.0	626
1.5	44		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	126	112	25	7.0	5.8	5.4	10	216	27	62	161	88
2	112	112	26	7.2	5.8	5.6	10	*192	30	57	127	90
3	99	85	33	7.3	5.8	5.4	7.8	169	41	59	139	83
4	90	70	48	7.4	5.8	5.2	7.8	148	42	53	210	69
5	125	61	50	7.5	5.8	5.1	8.4	130	40	42	235	58
6	147	53	50	7.6	5.8	5.0	10	115	42	34	246	52
7	134	48	47	7.6	5.8	4.9	*15	106	39	44	234	46
8	*115	44	45	7.5	5.7	4.9	32	100	43	76	248	42
9	99	42	42	7.4	5.6	4.9	66	94	44	85	267	40
10	86	41	38	7.4	5.4	4.7	52	90	36	79	284	38
11	76	41	35	7.3	5.4	4.6	50	97	31	68	281	36
12	68	47	31	7.3	5.3	4.7	61	109	27	57	264	36
13	62	80	28	7.3	5.3	4.7	110	104	24	*56	239	36
14	60	111	23	7.3	5.2	4.8	160	94	22	51	207	50
15	70	135	*19	7.3	5.2	4.8	220	85	19	42	175	53
16	70	134	16	7.3	5.2	4.7	270	76	24	36	144	46
17	63	122	13	7.3	5.3	4.6	310	71	*32	95	118	39
18	58	110	11	7.4	5.3	4.6	360	66	32	259	*99	35
19	54	90	9.7	7.4	5.3	4.6	420	62	30	473	83	34
20	50	*67	8.2	*7.6	5.3	4.7	480	58	25	711	73	34
21	56	56	7.4	7.8	5.3	4.9	*529	55	21	790	63	31
22	78	50	7.2	7.8	5.3	5.0	556	53	19	687	55	28
23	132	45	7.0	6.9	5.0	5.2	556	49	19	550	49	27
24	175	33	6.6	6.5	*4.8	5.0	506	45	36	454	44	24
25	195	28	6.5	6.2	4.8	4.8	437	41	54	392	40	*22
26	185	24	6.4	6.2	4.8	4.7	377	38	58	339	36	21
27	175	24	6.4	6.0	4.8	4.8	332	36	55	301	33	20
28	160	24	6.4	5.9	4.8	*5.2	298	34	55	274	33	19
29	146	25	6.4	5.9	4.9	5.5	268	33	70	251	33	18
30	134	25	6.5	5.8	-	6.8	241	31	70	227	33	18
31	121	-	6.6	5.8	-	6.8	-	29	-	197	66	-
Total	3,321	1,939	671.3	218.2	154.6	156.6	6,760.0	2,626	1,107	6,901	4,319	1,233
Mean	107	64.6	21.7	7.04	5.33	5.05	225	84.7	36.9	223	139	41.1
Cfsm	1.14	0.689	0.231	0.075	0.057	0.054	2.40	0.903	0.393	2.38	1.48	0.438
In.	1.32	0.77	0.27	0.09	0.06	0.06	2.68	1.04	0.44	2.74	1.71	0.49

Calendar year 1951: Max 774 Min 3.8 Mean 69.5 Cfsm 0.741 In. 10.06
Water year 1951-52: Max 790 Min 4.6 Mean 80.3 Cfsm 0.856 In. 11.67

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Oct. 31 to Mar. 27, Mar. 30 to Apr. 1, Apr. 9-14. No gage-height record Oct. 24-28, Apr. 15-20; discharge estimated on basis of weather records and records for Partridge River near Aurora.

Amnicon Lake near South Range, Wis.

Location.--Lat 46°29'00", long. 92°04'05", in sec. 12, T. 46 N., R. 14 W., in northwest corner of lake, 15 miles southwest of South Range.

Drainage area.--5 sq mi, approximately.

Records available.--August 1936 to September 1952 (fragmentary).

Gage.--Staff gage. Datum of gage is 1,188.00 ft above mean sea level (State Highway Commission levels). Gage readings have been reduced to elevation above mean sea level.

Extremes.--Maximum elevation observed during year, 1,198.52 ft July 23; minimum, 1,196.86 ft June 10.
1936-52: Maximum elevation observed, 1,199.32 ft May 9, 1950; minimum, 1,195.82 ft Oct. 28, 1948.

Remarks.--Lake has natural outlet.

Revisions (water years).--W 854: 1937.

Elevation, in feet, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-	-	-				-	7.66	-	-	-	-
2	-	-	-				-	-	-	7.34	7.57	-
3	-	7.21	7.35				-	7.54	-	-	-	6.95
4	-	-	-				-	7.48	6.94	-	-	-
5	-	-	-				-	-	-	7.26	7.45	-
6	7.35	-	-				-	-	-	-	-	6.89
7	-	-	-				7.02	-	6.90	7.32	7.39	-
8	-	-	7.31				-	7.32	-	-	-	-
9	7.31	-	-				-	-	-	7.30	7.35	6.89
10	-	7.19	-				7.10	7.30	6.86	-	-	-
11	-	-	-	7.15			-	-	-	-	-	-
12	-	7.47	-				7.18	-	-	7.24	-	-
13	7.23	-	-				-	7.34	-	-	7.17	6.87
14	-	-	-				-	-	6.92	7.22	-	-
15	-	7.43	-				7.58	-	-	-	-	-
16	-	-	-				-	-	-	7.18	7.17	-
17	7.17	-	-				-	7.26	6.94	-	-	6.91
18	-	-	-				-	-	-	7.68	-	-
19	-	-	-				8.26	-	6.92	7.78	7.06	-
20	7.13	-	-				-	-	-	-	7.01	6.89
21	-	-	-				8.26	-	6.92	-	-	-
22	-	-	-				-	-	-	-	-	-
23	-	-	-				-	-	-	8.52	6.99	6.89
24	-	-	-				-	7.14	7.00	-	-	-
25	-	-	-				-	-	-	-	6.95	-
26	-	-	-				8.03	-	7.18	8.22	6.89	-
27	7.15	-	-				-	-	-	-	6.95	6.87
28	-	7.39	-				-	7.08	7.28	-	-	-
29	-	-	-				7.82	7.04	-	7.88	-	-
30	-	-	-				-	-	-	-	6.99	-
31	-	-	-				-	7.04	-	-	-	-

Note.--Add 1,190 ft to obtain elevation above mean sea level.

Bois Brule River at Brule, Wis.

Location.--Lat 46°32'15", long. 91°35'45", in NW¼SW¼ sec. 23, T. 47 N., R. 10 W., on right bank, 1.4 miles southwest of Brule post office, 1.4 miles downstream from Nebagamon Creek, and 1.7 miles upstream from Little Brule River.

Drainage area.--113 sq mi.

Records available.--January 1943 to September 1952.

Gage.--Chain gage read once daily. Altitude of gage is 980 ft (from river-profile map).

Average discharge.--9 years, 174 cfs.

Extremes.--Maximum discharge observed during year, 1,020 cfs July 18 (gage height, 4.22 ft), from rating curve extended above 650 cfs; minimum daily discharge, 140 cfs Dec. 14, 15.

1943-52: Maximum discharge observed, 1,220 cfs May 6, 1950 (gage height, 4.62 ft); maximum gage height observed, 5.14 ft June 5, 1944; minimum discharge observed, 67 cfs Mar. 13, 1943.

Remarks.--Records good except those for periods of ice effect, which are fair.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Feb. 7-21, Feb. 26 to Apr. 6)

1.6	135	2.9	470
2.0	219	3.3	612
2.3	295	3.7	779
2.6	376	4.1	970

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	219	195	a192	150	153	*173	243	295	173	295	231	a200
2	219	185	a200	150	155	a160	243	269	173	295	219	195
3	295	170	207	150	156	152	231	256	162	282	a255	184
4	269	150	219	150	156	152	219	*243	162	243	321	173
5	269	155	219	150	156	152	219	231	152	219	321	173
6	256	*159	219	150	155	152	231	219	152	207	282	173
7	a244	170	231	149	152	152	219	219	152	231	256	162
8	231	173	a223	148	152	152	256	207	162	243	243	162
9	219	173	a215	147	152	152	282	207	152	231	308	152
10	207	173	207	144	152	152	295	231	152	219	a275	152
11	207	173	195	*142	152	162	308	a255	144	207	256	152
12	207	184	170	143	152	152	308	295	144	219	231	152
13	195	269	155	143	152	152	a400	269	195	219	219	152
14	195	470	140	143	152	162	504	243	*195	207	207	162
15	207	421	140	143	152	144	575	231	184	195	231	162
16	195	362	142	143	152	144	*651	219	219	195	207	162
17	195	334	144	143	152	152	651	195	195	504	a200	152
18	173	308	144	143	152	152	612	195	173	970	195	152
19	184	282	146	143	144	162	575	195	162	504	*184	152
20	184	230	146	143	152	162	504	184	152	a504	184	152
21	a200	210	147	144	152	162	539	184	152	692	184	152
22	243	220	147	144	150	152	612	184	152	651	173	144
23	243	215	148	144	146	a160	539	173	162	539	162	144
24	219	200	148	144	148	173	470	173	184	470	162	144
25	219	180	149	144	a150	173	437	173	437	421	162	144
26	207	195	150	144	152	195	405	162	348	348	152	144
27	207	243	150	147	152	162	362	184	308	321	152	144
28	184	195	150	150	152	173	348	173	376	308	184	144
29	184	184	150	150	152	152	321	173	362	269	173	144
30	184	184	150	151	-	162	295	173	321	256	207	144
31	219	-	150	152	-	173	-	173	-	243	a207	-
Total	6,679	6,762	5,293	4,531	4,405	4,930	11,854	6,583	6,157	10,707	6,743	4,724
Mean	215	225	171	146	152	159	395	212	205	345	218	157
Cfsm	1.90	1.99	1.51	1.29	1.35	1.41	3.50	1.88	1.81	3.05	1.93	1.39
In.	2.20	2.23	1.74	1.49	1.45	1.62	3.90	2.17	2.03	3.52	2.22	1.55

Calendar year 1951: Max 779 Min 119 Mean 227 Cfsm 2.01 In. 27.29
Water year 1951-52: Max 970 Min 140 Mean 217 Cfsm 1.92 In. 26.12

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of record for Namekagon River near Trego.
Note.--Stage-discharge relation affected by ice Nov. 2-8, 20-25, Dec. 12 to Feb. 6, Feb. 22-24.

Bad River at Mellen, Wis.

Location.--Lat 46°19'30", long. 90°39'35", in sec. 6, T. 44 N., R. 2 W., on upstream side of bridge on U. S. Highway 13 in Mellen, 0.4 mile upstream from Devils Creek and 3.1 miles downstream from Rocky Run.

Drainage area.--101 sq mi.

Records available.--May 1948 to September 1952.

Gage.--Chain gage read twice daily. Datum of gage is 1,217.49 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge observed during year, 2,230 cfs Apr. 18 (gage height, 9.44 ft); minimum daily, 23 cfs Sept. 29, 30.

1948-52: Maximum discharge observed, 4,340 cfs July 4, 1949 (gage height, 14.0 ft); minimum observed, 3.8 cfs Aug. 25-27, 1948 (gage height, 1.98 ft).

Flood of June 24, 1946, reached a stage of 18.60 ft, from floodmarks, from information by local resident (discharge not determined).

Remarks.--Records good except those for periods of ice effect, which are fair.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.4	22	5.0	478
2.6	37	6.0	810
3.0	78	7.0	1,180
3.5	161	8.0	1,610
4.0	255	10.0	2,500

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	125	108	92	34	27	28	80	198	92	275	85	61
2	108	100	170	34	27	28	120	170	92	208	85	52
3	226	85	294	33	27	26	130	143	116	170	152	48
4	246	77	334	33	27	*26	140	134	108	125	450	42
5	226	76	255	32	27	26	150	116	78	92	400	39
6	217	76	180	32	27	26	152	100	66	72	294	36
7	188	76	100	32	27	26	179	*85	57	100	236	35
8	161	*78	75	31	27	26	217	85	68	73	179	34
9	134	78	65	31	27	26	314	77	78	62	179	32
10	125	78	80	31	27	26	294	92	66	58	161	29
11	108	116	90	30	27	26	275	334	54	54	198	28
12	100	170	87	30	27	26	255	478	53	46	152	27
13	92	424	76	30	27	27	246	400	108	47	116	25
14	85	639	65	*29	27	29	246	334	188	50	92	42
15	85	540	57	29	27	31	355	294	*143	45	125	54
16	78	424	51	29	27	31	478	217	334	42	125	45
17	78	334	46	30	27	32	1,100	179	355	355	100	38
18	73	240	42	30	27	32	1,960	143	294	707	78	35
19	68	160	40	30	26	33	2,140	125	208	639	68	35
20	67	110	39	30	26	34	1,740	116	143	915	66	33
21	68	86	37	30	26	35	1,270	108	100	1,310	64	31
22	152	76	36	29	26	35	1,400	92	73	1,180	*54	31
23	161	72	36	29	26	35	1,100	85	72	1,310	48	31
24	134	73	36	28	26	36	741	116	143	606	44	31
25	116	79	35	28	26	36	508	108	314	400	41	29
26	108	85	35	28	26	37	377	92	275	294	37	29
27	92	90	35	28	26	38	334	92	217	208	35	26
28	85	98	35	28	26	40	275	116	400	161	35	26
29	78	100	35	28	26	44	246	92	450	125	35	23
30	76	100	34	28	-	50	217	100	377	108	53	23
31	92	-	34	28	-	65	-	116	-	92	71	-
Total	3,752	4,846	2,626	932	772	1,012	17,039	4,937	5,122	9,929	3,858	1,050
Mean	121	162	84.7	30.1	26.6	32.6	568	159	171	320	124	35.0
Cfsm	1.20	1.60	0.839	0.298	0.263	0.323	5.62	1.57	1.69	3.17	1.23	0.347
In.	1.38	1.78	0.97	0.34	0.28	0.37	6.27	1.82	1.89	3.66	1.42	0.39

Calendar year 1951: Max 2,990 Min 15 Mean 185 Cfsm 1.83 In. 24.91
Water year 1951-52: Max 2,140 Min 23 Mean 153 Cfsm 1.51 In. 20.57

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 4-9, 18-28, Dec. 6 to Apr. 5.

Bad River near Odanah, Wis.

Location.--Lat 46°29'15", long. 90°41'45", in SE¼ sec. 2, T. 46 N., R. 3 W., at downstream end of center pier of Elm Hoist Bridge, 5.0 miles downstream from Potato River, 8.5 miles south of Odanah, and 10.6 miles south from mouth.

Drainage area.--611 sq mi.

Records available.--July 1914 to November 1922, May 1948 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 680 ft (from river-profile map). Prior to Nov. 11, 1922, water-stage recorder at site 2 miles downstream at different datum.

Average discharge.--12 years (1914-22, 1948-52), 614 cfs.

Extremes.--Maximum discharge during year, 11,500 cfs Apr. 19 (gage height, 13.90 ft); minimum, 115 cfs Sept. 28, 30 (gage height, 2.36 ft).
1914-22, 1948-52: Maximum discharge, 16,500 cfs July 4, 1949 (gage height, 17.3 ft, from floodmark); minimum, 50 cfs Nov. 29, 1948 (gage height, 2.02 ft).
Flood of June 24, 1946, reached a stage of at least 22.2 ft (top of bridge which was submerged), from information by Indian Service.

Remarks.--Records good except those for periods of ice effect, which are fair.

Rating table, water year 1951-52, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 26 to June 15, June 18-23, July 1-16)

2.3	109	6.0	2,300
2.7	250	8.0	4,300
3.0	385	10.0	6,550
3.5	620	12.0	9,000
4.0	900	14.0	11,700
5.0	1,520		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	* July	Aug.	Sept.
1	670	680	725	240	200	172	530	930	444	1,560	394	367
2	615	620	810	240	200	*171	620	725	398	1,170	376	326
3	1,330	570	1,520	240	198	172	740	620	444	1,080	358	277
4	1,590	530	1,900	240	195	172	840	610	430	810	1,320	242
5	1,290	500	1,480	240	192	172	940	*560	372	610	1,520	208
6	1,450	475	1,230	235	190	172	1,060	506	318	480	1,230	189
7	1,200	520	1,000	235	190	173	1,200	452	263	439	930	178
8	1,020	545	750	235	190	173	1,400	426	246	498	725	170
9	870	545	540	230	189	173	1,650	408	295	439	1,140	163
10	752	615	500	230	188	174	1,800	426	318	362	960	157
11	670	698	550	230	187	175	1,800	1,930	242	313	870	140
12	605	2,540	510	*229	185	175	1,750	3,540	208	272	725	134
13	555	3,040	460	230	185	178	1,700	2,840	233	263	575	129
14	511	4,930	420	225	185	190	1,700	2,140	488	254	466	157
15	493	4,190	370	225	185	200	2,480	1,590	*493	254	434	225
16	475	2,750	340	225	184	210	*4,360	1,200	3,160	216	488	225
17	448	1,980	310	225	184	215	6,400	930	3,070	3,320	444	208
18	434	1,560	290	225	184	220	8,870	780	1,780	4,740	385	185
19	452	1,320	275	220	180	225	11,000	645	1,110	3,080	336	174
20	462	870	270	220	180	230	10,700	590	698	3,700	*308	163
21	462	650	265	220	180	235	8,110	550	506	7,530	286	154
22	780	560	260	215	180	238	7,990	498	412	7,150	263	154
23	1,140	520	255	215	179	240	6,500	448	349	5,670	233	157
24	990	530	250	215	178	245	3,990	475	649	3,240	216	150
25	840	560	250	210	178	250	2,660	506	7,530	1,900	200	150
26	725	590	250	210	177	255	1,980	452	4,520	1,290	178	137
27	620	620	245	210	176	260	1,520	412	2,230	960	167	137
28	565	640	245	210	175	275	1,290	488	2,790	725	167	126
29	525	670	245	205	174	300	1,140	457	3,860	595	163	129
30	530	698	245	205	-	340	990	416	2,310	511	216	120
31	535	-	245	205	-	400	-	444	-	444	349	-
Total	23,604	35,496	17,005	6,939	5,368	6,780	97,710	26,994	40,166	53,875	16,422	5,431
Mean	761	1,183	549	224	185	219	3,257	871	1,339	1,738	530	181
Cfsm	1.25	1.94	0.899	0.367	0.303	0.358	5.33	1.43	2.19	2.84	0.867	0.296
In.	1.44	2.16	1.04	0.42	0.33	0.41	5.95	1.64	2.44	3.28	1.00	0.33

Calendar year 1951: Max 11,700 Min 120 Mean 1,062 Cfsm 1.74 In. 23.61
Water year 1951-52: Max 11,000 Min 120 Mean 917 Cfsm 1.50 In. 20.44

Peak discharge (base, 3,000 cfs).--Nov. 12 (5:30 p.m.) 6,910 cfs (10.27 ft); Nov. 14 (7 p.m.) 5,510 cfs (9.10 ft); Apr. 19 (2 p.m.) 11,500 cfs (13.90 ft); May 12 (5 a.m.) 3,970 cfs (7.70 ft); June 16 (1 p.m.) 4,850 cfs (8.50 ft); June 25 (4 p.m.) 9,000 cfs (12.00 ft); June 29 (2 a.m.) 4,740 cfs (8.40 ft); July 17 (7 p.m.) 5,400 cfs (9.00 ft); July 21 (12:30 p.m.) 7,990 cfs (11.20 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 1-5, 20-29, Dec. 7 to Apr. 14 (no gage-height record Nov. 1-4, Jan. 13-31, Feb. 2-7, 9-18, 20-28, Mar. 1, 22-30, Apr. 1-14; discharge estimated on basis of record for station at Mellen).

White River near Ashland, Wis.

Location.--Lat 46°29'50", long. 90°54'15", in sec. 6, T. 46 N., R. 4 W., at downstream end of powerplant of Lake Superior District Power Co., 0.3 mile downstream from bridge on State highway over dam, and 4.5 miles south of Ashland city limits.

Drainage area.--269 sq mi.

Records available.--May 1948 to September 1952.

Gage.--Chain gage read twice daily or more often when plant load is changed.

Extremes.--Maximum discharge during year, 5,390 cfs June 24 (gage height, 7.10 ft); minimum, 62 cfs Mar. 24 (gage height, 0.66 ft).
1948-52: Maximum discharge that of June 24, 1952; minimum, 3.1 cfs Apr. 28-30, 1949 (gage height, 0.09 ft).

Remarks.--Records good. Diurnal fluctuation caused by powerplant at gage.

Rating table, water year 1951-52, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.9	109	2.5	835
1.0	136	3.0	1,240
1.3	243	3.5	1,680
1.6	365	4.0	2,160
2.0	542	6.0	4,220

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	282	274	324	243	236	214	324	304	313	a700	261	335
2	276	261	324	275	249	*199	798	304	309	a500	241	344
3	628	208	324	221	237	221	731	305	298	a400	258	322
4	474	224	386	231	228	209	731	220	308	a350	408	282
5	503	236	365	289	236	209	618	*226	271	a315	452	269
6	567	*263	324	289	238	178	645	226	260	a305	452	236
7	496	263	324	304	236	193	700	233	239	a305	430	230
8	430	276	316	368	233	228	1,030	233	246	311	408	230
9	386	289	303	292	234	212	1,590	226	246	344	519	224
10	365	296	222	246	230	209	1,320	259	252	327	452	217
11	304	289	202	254	247	232	1,070	995	222	285	430	217
12	297	880	168	*239	239	236	950	801	202	271	408	217
13	277	852	115	236	231	224	950	700	230	251	365	203
14	270	1,710	112	243	231	224	798	592	*285	257	338	270
15	256	1,030	141	228	239	201	1,210	452	305	263	332	344
16	257	990	165	223	201	240	1,570	408	825	240	301	344
17	252	872	192	217	217	256	2,390	344	560	449	315	408
18	240	496	195	235	224	217	1,770	326	496	798	295	365
19	246	386	202	217	214	221	1,680	278	452	567	269	252
20	252	344	195	213	217	232	1,590	304	344	1,380	*276	272
21	246	344	204	221	178	217	1,410	289	285	1,270	282	252
22	317	344	197	198	185	224	1,500	305	252	2,260	265	238
23	365	261	221	205	229	142	990	308	246	990	249	245
24	365	131	211	212	194	114	762	278	1,480	592	223	231
25	344	150	207	238	192	299	672	309	a3,500	592	256	231
26	300	324	231	233	217	304	542	310	a1,500	496	236	231
27	314	273	242	238	224	292	474	295	a1,000	344	223	224
28	248	344	242	269	224	258	408	324	3,170	344	223	217
29	281	344	242	255	214	261	365	339	a2,000	327	230	224
30	268	324	242	267	-	251	344	299	a1,100	281	243	224
31	281	-	242	281	-	282	-	306	-	274	270	-
Total	10,387	13,278	7,380	7,680	6,474	6,999	29,932	11,098	21,196	16,388	9,890	7,898
Mean	335	443	238	248	223	226	998	358	707	529	319	263
Cfsm	1.25	1.65	0.885	0.922	0.829	0.840	3.71	1.33	2.63	1.97	1.19	0.978
In.	1.44	1.84	1.02	1.06	0.90	0.97	4.14	1.53	2.93	2.27	1.37	1.09

Calendar year 1951: Max 2,100 Min 112 Mean 387 Cfsm 1.44 In. 19.53
Water year 1951-52: Max 3,500. Min 112 Mean 406 Cfsm 1.51 In. 20.56

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of record for Montreal River near Saxon.

Montreal River at Ironwood, Mich.

Location.--Lat 46°27'00", long. 90°10'40", in sec. 24, T. 46 N., R. 2 E., at downstream side of main highway bridge on State line between Hurley, Wis. and Ironwood, Mich., 8 miles upstream from West Branch of Montreal River.

Drainage area.--66 sq mi, approximately.

Records available.--April 1918 to June 1922, July 1924 to November 1925, September 1949 to September 1952.

Gage.--Chain gage read once daily. Datum of gage is 1,464.13 ft above mean sea level, datum of 1929.

Average discharge.--6 years (1918-21, 1949-52), 77.2 cfs.

Extremes.--Maximum discharge observed during year, 1,810 cfs Apr. 19 (gage height, 5.10 ft), from rating curve extended above 710 cfs; minimum daily discharge, 7.8 cfs Nov. 28 (gage height, 1.16 ft).
1918-22, 1924-25, 1949-52: Maximum discharge observed that of Apr. 19, 1952; minimum discharge observed, 0.9 cfs Mar. 20, 1950 (gage height, 0.88 ft).

Remarks.--Records fair. Diurnal fluctuation by dam upstream.

Rating table, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 29 to June 15, June 19 to July 19, July 30 to Sept. 30)

1.1	6.0	2.4	169
1.2	9.0	2.8	300
1.3	13	3.2	487
1.4	20	3.6	772
1.7	53	4.0	980
2.0	93	5.1	1,810

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	169	16	58	a14	a20	11	17	70	33	14	a76	25
2	125	56	157	11	a21	15	12	67	40	41	a70	27
3	58	47	244	33	a21	*14	13	69	37	37	145	28
4	45	42	281	16	a22	12	16	61	46	45	227	31
5	70	25	212	19	a22	16	53	58	57	16	157	29
6	58	27	145	22	a21	14	93	*56	74	39	76	32
7	212	32	93	26	a21	17	108	53	125	45	48	27
8	28	*25	57	58	a21	16	169	49	90	58	70	25
9	30	56	33	15	a21	17	157	41	93	40	53	24
10	27	16	12	22	a20	16	196	57	79	39	43	19
11	32	93	27	30	a20	18	157	49	37	33	48	19
12	45	125	23	27	a20	20	227	42	25	30	53	19
13	60	145	13	*36	a20	19	182	40	27	25	47	22
14	66	196	14	16	a20	17	182	36	21	28	43	32
15	58	244	9.8	18	a19	18	244	27	*41	26	41	29
16	51	182	33	30	a17	19	342	26	542	12	43	28
17	57	157	16	27	15	17	571	29	660	11	a50	26
18	11	82	29	32	20	16	1,110	27	125	45	69	25
19	12	86	39	16	18	14	1,810	24	74	74	42	27
20	10	56	23	16	16	16	1,570	21	45	196	51	22
21	61	13	58	18	13	19	1,180	19	39	1,250	*42	19
22	93	19	41	22	11	21	1,180	18	30	1,250	45	23
23	125	32	39	27	11	16	980	17	43	1,330	43	27
24	145	57	28	14	12	18	487	16	66	850	39	25
25	93	34	a24	13	28	24	387	14	39	660	38	24
26	182	43	19	14	21	27	262	12	41	281	41	13
27	169	11	16	12	17	30	244	33	48	227	27	18
28	93	7.8	22	14	9.8	26	169	39	45	169	40	16
29	63	32	31	16	12	29	76	37	40	125	37	19
30	52	41	20	a18	-	31	71	39	37	108	34	26
31	22	-	17	a19	-	43	-	34	-	82	32	-
Total	2,320	1,997.8	1,833.8	651	529.8	606	12,265	1,180	2,699	7,166	1,870	726
Mean	74.8	66.6	59.2	21.0	18.3	19.5	409	38.1	90.0	231	60.3	24.2
Cfsm	1.13	1.01	0.897	0.318	0.277	0.295	6.20	0.577	1.36	3.50	0.914	0.367
In.	1.31	1.13	1.03	0.37	0.30	0.34	6.91	0.66	1.52	4.04	1.05	0.41

Calendar year 1951: Max 1,110 Min 7.5 Mean 116 Cfsm 1.76 In. 23.91
Water year 1951-52: Max 1,810 Min 7.8 Mean 92.5 Cfsm 1.40 In. 19.07

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of record for station near Saxon, Wis.

Montreal River near Saxon, Wis.

Location.--Lat 46°32'45", long. 90°24'05", in NW¼ sec. 23, T. 48 N., R. 49 W., on right bank 2 miles upstream from mouth and 3.5 miles north of Saxon.

Drainage area.--281 sq mi.

Records available.--September 1938 to September 1952.

Gage.--Water-stage recorder. Altitude of gage 760 ft (from power company data).

Average discharge.--14 years, 340 cfs.

Extremes.--Maximum discharge during year, 4,650 cfs Apr. 20 (gage height, 6.25 ft from recorded range in stage); minimum, 77 cfs June 12 (gage height, 1.82 ft).
1938-52: Maximum discharge, 5,700 cfs July 18, 1942 (gage height, 6.93 ft); minimum, 2 cfs Sept. 21, Oct. 8, 1939.

Remarks.--Records good except those for periods of ice effect, which are fair. Diurnal fluctuation caused by Saxon Falls powerplant 1.5 miles upstream. Flow regulated by Gile Reservoir on West Branch Montreal River (capacity, 1.29 billion cu ft).

Revisions (water years).--W 894: 1938-39. W 924: 1939-40.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.0	121	4.0	1,520
2.3	226	4.5	2,140
2.6	357	5.0	2,870
3.0	593	5.5	3,600
3.5	990	6.1	4,500

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	382	300	326	235	230	240	352	334	234	527	247	173
2	344	310	372	235	230	240	352	290	286	502	214	156
3	1,110	310	875	235	230	*235	367	281	281	883	226	156
4	1,480	310	1,460	235	230	238	348	260	299	421	737	159
5	1,070	310	850	235	230	240	372	230	260	247	892	159
6	1,160	310	621	235	232	240	344	*214	206	206	685	159
7	700	*298	600	235	234	242	362	199	203	195	465	159
8	534	454	607	232	235	244	484	210	195	214	403	159
9	471	344	484	230	235	246	841	210	199	195	515	159
10	398	419	419	228	235	248	792	222	206	162	442	159
11	357	477	348	228	235	250	722	1,130	173	222	339	156
12	281	761	303	226	235	256	685	1,820	166	239	372	156
13	321	1,820	292	*222	235	262	693	1,300	173	230	303	156
14	260	2,080	288	226	235	280	649	972	173	218	312	149
15	303	2,140	280	230	235	348	776	678	170	180	251	159
16	277	1,700	272	230	235	339	1,360	502	*1,460	162	251	156
17	239	1,200	268	230	235	334	2,360	382	2,500	432	218	156
18	255	628	262	230	235	339	3,000	330	1,330	945	180	156
19	264	560	260	230	235	344	3,600	299	628	927	199	156
20	316	490	258	230	235	344	4,500	281	398	1,640	191	146
21	308	440	254	230	235	344	2,650	264	303	3,090	*184	152
22	431	410	252	235	235	348	3,240	268	255	3,460	180	152
23	580	390	250	235	235	326	2,580	247	230	5,820	173	152
24	465	380	250	235	235	348	1,700	344	255	2,650	166	152
25	377	370	246	235	235	344	1,060	334	2,210	1,410	162	152
26	316	360	242	232	238	334	776	268	2,280	841	166	152
27	308	340	240	230	238	326	715	255	1,100	600	173	152
28	264	320	240	230	240	260	621	303	981	448	156	152
29	268	300	238	230	240	255	490	294	1,500	398	149	152
30	281	268	238	230	-	264	382	243	761	382	180	152
31	290	-	236	230	-	312	-	281	-	303	166	-
Total	14,410	18,799	12,131	7,169	6,802	8,970	37,173	13,245	19,415	26,149	9,297	4,664
Mean	465	627	391	231	235	289	1,239	427	647	844	300	155
Cfsm	1.65	2.23	1.39	0.822	0.836	1.03	4.41	1.52	2.30	3.00	1.07	0.552
In.	1.91	2.49	1.61	0.95	0.90	1.19	4.92	1.75	2.57	3.46	1.23	0.62

Calendar year 1951: Max 4,800 Min 92 Mean 521 Cfsm 1.85 In. 25.17
Water year 1951-52: Max 4,500 Min 146 Mean 487 Cfsm 1.73 In. 23.60

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Oct. 31 to Nov. 7, Nov. 19-29, Dec. 13 to Mar. 14 (no gage-height record Dec. 24 to Jan. 2).

Presque Isle River at Marenisco, Mich.

Location.--Lat 46°22', long. 89°41', in NW¼ sec. 21, T. 46 N., R. 43 W., on left bank a quarter of a mile upstream from highway bridge in Marenisco and 2¼ miles downstream from confluence of East and West Branches of Presque Isle River.

Drainage area.--175 sq mi.

Records available.--February 1945 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 1,490 ft, corrected (by barometer). Prior to May 27, 1949, wire-weight gage at site a quarter of a mile downstream at different datum.

Average discharge.--7 years, 181 cfs.

Extremes.--Maximum discharge during year, 2,670 cfs Apr. 21 (gage height, 9.90 ft); minimum, 72 cfs Sept. 30 (gage height, 3.33 ft).
1945-52: Maximum discharge and gage height, that of Apr. 21, 1952; minimum observed, 13 cfs Sept. 30, 1948 (gage height, 2.25 ft, site and datum then in use).

Remarks.--Records good except those for the periods of ice effect, no gage-height record, or shifting control, which are fair.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used July 20-27, Aug. 5-8)

Oct. 1 to July 22				July 23 to Sept. 30			
3.5	88	6.0	678	3.3	68	6.0	678
4.0	166	8.0	1,530	4.0	180	8.0	1,530
5.0	394	10.0	2,740	5.0	402	9.0	2,100

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*289	261	260	125	110	110	170	500	210	368	342	257
2	289	240	263	120	110	100	230	446	202	*342	308	*238
3	762	220	342	115	110	96	260	407	246	330	308	216
4	550	210	420	110	110	*94	270	368	233	252	*542	182
5	780	205	394	110	110	94	265	342	198	208	678	159
6	832	215	*355	110	105	96	255	*316	164	176	745	144
7	678	*220	330	110	105	98	280	292	138	176	678	136
8	556	225	310	110	100	100	355	270	137	198	601	125
9	459	225	280	110	100	98	415	252	162	200	556	116
10	394	210	270	115	100	96	430	246	143	155	489	109
11	342	200	230	115	100	94	415	306	127	208	450	104
12	306	280	210	115	100	94	425	459	112	178	426	96
13	284	472	190	115	100	94	425	500	110	150	354	90
14	263	728	180	115	100	96	405	472	119	142	342	104
15	255	870	170	115	100	100	415	420	127	129	319	120
16	246	815	165	115	100	100	475	355	268	116	297	120
17	235	694	155	115	100	100	*480	308	355	212	271	111
18	222	571	150	115	100	100	560	277	306	459	249	103
19	220	486	145	115	105	100	1,300	250	277	486	229	109
20	216	460	140	115	105	105	2,460	239	228	601	218	114
21	212	410	135	110	105	105	2,600	224	184	910	218	109
22	308	360	135	110	105	105	2,220	208	150	1,330	208	108
23	381	320	130	110	105	105	1,700	196	127	*1,580	192	104
24	368	280	130	110	110	108	1,330	198	129	1,330	175	100
25	330	260	130	110	110	108	1,070	198	216	*1,010	162	95
26	306	255	130	110	110	110	890	184	241	766	156	90
27	277	250	130	110	105	110	762	*196	a300	616	149	87
28	250	235	*125	108	105	112	678	248	a385	542	149	79
29	241	250	125	105	105	115	601	228	459	463	141	76
30	235	255	120	*105	-	115	542	220	433	402	166	74
31	272	-	120	105	-	125	-	226	-	378	212	-
Total	11,758	10,682	6,369	3,478	3,030	3,183	22,683	9,351	6,486	14,413	10,330	3,675
Mean	379	356	205	112	104	103	756	302	216	465	333	122
Cfsm	2.17	2.03	1.17	0.640	0.594	0.589	4.32	1.73	1.23	2.66	1.90	0.697
In.	2.50	2.27	1.35	0.74	0.64	0.68	4.82	1.99	1.38	3.06	2.20	0.78

Calendar year 1951: Max 2,460 Min 40 Mean 312 Cfsm 1.78 In. 24.24
Water year 1951-52: Max 2,600 Min 74 Mean 288 Cfsm 1.65 In. 22.41

Peak discharge (base, 600 cfs).--Oct. 5 (2 a.m.) 1,010 cfs (6.88 ft); Nov. 15 (7:30 p.m.) 870 cfs (6.55 ft); Apr. 21 (10 a.m.) 2,670 cfs (9.90 ft); July 23 (8:30 a.m.) 1,640 cfs (8.65 ft); Aug. 6 (9 a.m. to 12 m.) 766 cfs (6.70 ft).
* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of adjacent record.
Note.--Stage-discharge relation affected by ice Nov. 2-11, Nov. 20 to Dec. 1, Dec. 7 to Apr. 19.

Presque Isle River near Tula, Mich.

Location.--Lat 46°33', long. 89°46', in sec. 23, T. 48 N., R. 44 W., on downstream handrail of bridge on State Highway 28, 2 miles east of Tual, 5 miles downstream from Little Presque Isle River, and 7 miles southwest of Merriweather.

Drainage area.--260 sq mi.

Records available.--February 1945 to September 1952.

Gage.--Wire-weight gage read once daily. Altitude of gage is 1,310 ft (by barometer).

Average discharge.--7 years, 280 cfs.

Extremes.--Maximum discharge observed during year, 4,130 cfs Apr. 22 (gage height, 13.63 ft); minimum observed, 81 cfs Sept. 30 (gage height, 4.82 ft).
1945-52: Maximum discharge, 4,200 cfs Apr. 30, 1951 (gage height, 13.55 ft); minimum, 22 cfs Oct. 5, 6, 1948 (gage height, 4.22 ft).

Remarks.--Records good except those for periods of ice effect and no gage-height record, which are fair.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 18				Apr. 19 to Sept. 30			
4.7	106	10.0	1,700	4.8	77	11.0	2,200
5.0	150	12.0	2,850	6.0	360	13.6	4,130
6.0	350	13.6	4,200	9.0	1,280		
8.0	900						

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	462	412	338	a185	138	120	230	675	a320	*675	390	a255
2	*462	400	a420	190	138	a120	280	600	290	540	352	268
3	1,500	312	588	185	a138	120	300	540	340	480	a460	*245
4	2,200	a320	900	180	138	120	310	a490	340	a385	600	210
5	1,800	325	900	160	130	115	310	450	295	325	900	175
6	1,450	335	*780	a160	128	*115	a310	*405	250	a275	1,020	153
7	a1,100	310	675	160	125	115	310	350	210	240	960	a140
8	900	*300	645	155	125	115	*315	328	a205	285	870	129
9	750	310	a520	150	125	a115	340	302	292	272	780	119
10	615	310	425	150	a125	115	390	298	248	228	a630	111
11	525	a315	350	145	125	115	420	a450	199	525	570	107
12	462	450	300	145	125	115	430	750	170	615	495	97
13	412	780	290	a140	125	115	a430	870	158	a450	435	93
14	a380	1,410	280	140	125	115	430	780	170	372	390	a110
15	362	1,700	260	140	120	115	460	675	a185	300	352	146
16	350	1,500	a240	140	120	a110	510	570	780	238	322	135
17	338	1,210	230	135	a120	110	660	480	1,320	420	a290	123
18	312	a1,000	220	135	120	115	1,120	a400	1,050	735	268	111
19	312	840	210	135	120	120	3,770	340	720	840	245	109
20	312	720	200	a135	120	120	a4,000	315	465	a1,300	232	121
21	a350	600	190	135	120	125	4,130	292	338	1,850	225	a130
22	412	588	190	135	120	125	*4,130	275	a250	2,380	215	135
23	550	475	a185	135	120	a125	3,200	255	218	*2,320	202	142
24	562	400	185	135	a120	125	2,320	265	230	2,100	a185	127
25	512	a390	a180	135	120	135	1,750	a260	750	1,750	172	129
26	462	375	180	135	125	150	1,400	252	810	1,360	155	117
27	425	325	175	a135	125	155	a1,200	*270	600	a960	151	113
28	a390	338	*175	135	120	155	960	360	525	810	153	a100
29	350	350	175	135	120	160	840	352	a700	630	144	89
30	a365	350	a175	*130	-	a160	750	325	780	525	170	81
31	388	-	175	138	-	170	-	352	-	450	a200	-
Total	19,770	17,450	10,756	4,548	3,620	3,905	36,005	13,326	13,208	24,635	12,533	4,120
Mean	638	582	347	147	125	126	1,200	430	440	795	404	137
Cfsm	2.45	2.24	1.33	0.565	0.481	0.485	4.62	1.65	1.69	3.06	1.55	0.527
In.	2.83	2.50	1.54	0.65	0.52	0.56	5.15	1.91	1.89	3.52	1.79	0.59

Calendar year 1951: Max 4,000 Min 50 Mean 502 Cfsm 1.93 In. 26.22
Water year 1951-52: Max 4,130 Min 81 Mean 448 Cfsm 1.72 In. 23.45

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of adjacent record and records for nearby stations.
Note.--Stage-discharge relation affected by ice Nov. 5-10, Dec. 13 to Apr. 18.

Iron River near White Pine, Mich.

Location.--Lat 46°46'25", long. 89°34'55", in SE¼NW¼ sec. 36, T. 51 N., R. 42 W., on right bank 30 ft below logging bridge, 1½ miles north of White Pine, 3 miles downstream from West Branch Iron River, and 4½ miles upstream from mouth.

Drainage area.--100 sq mi.

Records available.--April to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 730 ft above mean sea level (from topographic map).

Extremes.--Maximum discharge during period, 7,900 cfs Apr. 19 (gage height, 7.27 ft); minimum, 5.2 cfs Sept. 14 (gage height, 1.92 ft).

Remarks.--Records fair except those for the period of fragmentary gage-height record, which are poor.

Rating table, Apr. 18 to Sept. 30, 1952 (gage height, in feet, and discharge, in cubic feet per second)

1.9	4.4	3.5	470
2.0	10	4.0	880
2.4	79	5.0	2,460
2.8	172	6.0	4,400
3.2	310	7.0	7,000

Discharge, in cubic feet per second, April to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							-	110	56	*103	22	27
2							-	89	*44	74	22	20
3							-	72	56	59	25	20
4							-	*63	47	49	272	*20
5							-	56	36	34	306	13
6							-	47	29	27	164	12
7							-	*37	24	29	110	10
8							-	36	24	39	81	9.2
9							-	32	34	36	340	8.2
10							-	36	30	30	199	6.8
11							-	704	20	420	106	6.4
12							-	1,490	17	172	68	6.4
13							-	440	17	22	47	6.0
14							-	225	13	101	36	9.2
15							-	143	12	72	29	22
16							-	99	*559	51	25	18
17							-	75	368	84	24	12
18							5,400	61	126	150	20	10
19							*6,020	56	70	108	18	10
20							4,400	63	44	186	27	9.2
21							3,700	65	32	840	29	9.2
22							f3,800	51	25	505	20	10
23							f1,960	39	22	470	17	25
24							*f618	39	30	187	13	22
25							*f440	44	1,790	103	10	17
26							410	39	428	72	10	13
27							335	39	190	51	8.2	10
28							*249	77	195	42	8.2	10
29							178	63	310	36	6.8	8.2
30							138	49	167	32	17	6.8
31							-	65	-	27	39	-
Total							-	4,504	4,815	4,211	2,119.2	386.6
Mean							-	145	160	136	68.4	12.9
Cfsm							-	1.45	1.60	1.36	0.684	0.129
In.							-	1.68	1.79	1.57	0.79	0.14

Calendar year	: Max		Min	Mean	Cfsm	In.
Water year	: Max		Min	Mean	Cfsm	In.

Peak discharge (base, 500 cfs).--Apr. 19 (10 p.m.) 7,900 cfs (7.27 ft); May 12 (5 a.m.) 2,060 cfs (4.78 ft); June 16 (3:30 p.m.) 1,460 cfs (4.41 ft); June 25 (9 a.m.) 3,500 cfs (5.54 ft); July 11 (7:30 a.m.) 780 cfs (3.90 ft); July 21 (8 a.m.) 1,360 cfs (4.35 ft).

* Discharge measurement made on this day.

f Fragmentary gage-height record; discharge computed from partly estimated gage height.

Middle Branch Ontonagon River near Paulding, Mich.

Location.--Lat 46°21'30", long. 89°04'40", in sec. 29, T. 46 N., R. 38 W., on right bank 25 ft downstream from highway bridge, 2¼ miles upstream from Bond Falls Reservoir, and 5¾ miles southeast of Paulding.

Drainage area.--About 175 sq mi.

Records available.--June 1942 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 1,480 ft (by barometer).

Average discharge.--10 years, 176 cfs.

Extremes.--Maximum discharge during year, 1,480 cfs Apr. 21 (gage height, 8.84 ft); minimum, 100 cfs Sept. 29, 30 (gage height, 3.75 ft), but may have been less during period of ice effect.
1942-52: Maximum discharge, 2,050 cfs Apr. 30, 1951 (gage height, 10.0 ft, from high-water mark); minimum, 27 cfs Nov. 22, 1946; minimum gage height, 2.96 ft Nov. 26, 1942.

Remarks.--Records excellent except those for periods of ice effect, which are fair.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to July 22				July 23 to Sept. 30			
3.7	105	8.0	1,180	3.7	95	5.0	307
4.0	142	9.0	1,560	4.0	131	6.0	542
6.0	568			4.5	208	8.0	1,070

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	355	250	202	155	135	115	200	300	162	178	188	144
2	333	210	208	155	135	115	212	271	*152	162	176	*131
3	410	185	252	150	135	115	186	245	163	174	170	126
4	509	170	279	150	135	110	169	231	158	165	*329	118
5	*520	160	*252	145	135	*105	163	222	148	142	432	116
6	487	*155	222	140	*130	105	158	200	141	131	420	121
7	421	150	220	135	130	105	156	*188	131	*153	374	114
8	377	150	218	135	130	110	171	196	138	190	307	112
9	333	155	206	135	125	110	245	180	171	167	362	111
10	300	170	182	135	125	110	256	172	156	182	329	110
11	279	196	175	135	125	110	226	196	138	344	287	110
12	258	245	165	135	125	110	216	258	131	333	241	106
13	243	399	170	135	125	110	210	256	129	271	206	104
14	231	544	170	130	125	110	206	218	134	229	188	108
15	229	568	170	130	125	105	220	200	134	200	175	114
16	220	520	165	130	125	105	279	182	162	172	170	110
17	208	454	165	125	125	105	*377	171	198	190	162	107
18	204	366	170	125	125	110	593	165	167	377	152	105
19	200	355	170	125	120	115	1,040	162	142	311	143	107
20	194	344	170	130	120	115	1,400	153	134	300	140	110
21	194	344	170	130	120	120	1,480	153	128	421	139	108
22	311	290	175	135	120	120	1,240	148	126	*532	132	111
23	355	233	175	135	120	125	1,070	142	124	*800	124	118
24	311	230	170	130	120	130	880	145	138	827	119	114
25	279	240	165	130	120	135	700	158	172	695	116	111
26	258	250	165	130	120	140	568	153	182	542	113	107
27	235	230	*165	130	120	145	487	153	162	432	112	105
28	229	270	165	130	115	150	421	176	169	351	112	103
29	218	250	165	135	115	150	366	165	235	287	112	102
30	220	222	160	135	-	160	333	156	216	253	116	102
31	248	-	155	135	-	170	-	167	-	214	131	-
Total	9,169	8,305	5,761	4,190	3,625	3,740	14,228	5,880	4,641	9,725	6,277	3,365
Mean	296	277	186	135	125	121	474	190	155	314	202	112
Cfsm	1.69	1.58	1.06	0.771	0.714	0.691	2.71	1.09	0.886	1.79	1.15	0.640
In.	1.95	1.76	1.22	0.89	0.77	0.79	3.02	1.25	0.99	2.07	1.33	0.72

Calendar year 1951: Max 2,000 Min 66 Mean 261 Cfsm 1.49 In. 20.24
Water year 1951-52: Max 1,480 Min 102 Mean 216 Cfsm 1.23 In. 16.76

Peak discharge (base, 500 cfs).--Oct. 5 (3:30 p.m.) 532 cfs (5.83 ft); Nov. 15 (10 a.m.) 580 cfs (6.03 ft); Apr. 21 (8 a.m.) 1,480 cfs (8.84 ft); July 23 (6 p.m.) 854 cfs (7.17 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 3-10, 24-28, Dec. 11 to Apr. 1.

Middle Branch Ontonagon River near Trout Creek, Mich.

Location.--Lat 46°28'45", long. 89°05'25", in sec. 8, T. 47 N., R. 38 W., on right bank an eighth of a mile upstream from State Highway 28, 3¾ miles west of town of Trout Creek, and 6½ miles downstream from Bond Falls Dam.

Drainage area.--About 225 sq mi.

Records available.--June 1942 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 1,140 ft (by barometer).

Average discharge.--10 years, 91.3 cfs.

Extremes.--Maximum discharge during year, 1,750 cfs Nov. 7 (gage height, 5.05 ft); minimum, 38 cfs Mar. 23 (gage height, 1.66 ft); caused by ice jams upstream; minimum gage height, 1.60 ft Nov. 7.
1942-52: Maximum discharge, that of Nov. 7, 1952; minimum, 14 cfs sometime during period Jan. 23 to Feb. 13, 1947 (gage height, 1.14 ft, from recorded range in stage) caused by ice jams upstream.

Remarks.--Records excellent except those for periods of ice effect or above 82 cfs, which are good. Flow regulated by Bond Falls Reservoir. Diversion to South Branch Ontonagon River by Bond Falls Canal (see p. 35).

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 7		Nov. 8 to Sept. 30			
1.6	47	1.7	44	3.0	375
2.0	130	1.9	72	3.5	560
2.5	270	2.0	92	4.0	810
3.0	460	2.5	215	5.0	1,570
4.0	970				

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	368	230	53	51	50	52	62	53	62	62	60	60
2	172	114	56	b52	50	52	63	53	*63	*60	60	*56
3	*180	b56	62	*52	50	51	60	53	66	62	62	51
4	170	54	58	51	50	*51	58	52	60	60	*88	50
5	249	54	*54	51	48	50	58	52	60	58	438	50
6	333	*60	53	51	b47	b50	58	51	60	58	321	50
7	288	595	53	50	*47	b50	*58	*52	60	64	175	50
8	144	647	53	50	51	50	58	51	63	62	122	50
9	56	58	53	51	48	51	78	51	62	62	207	50
10	56	57	51	50	50	51	68	51	60	64	316	50
11	56	56	*52	50	48	51	66	57	60	*492	233	50
12	54	130	50	51	48	52	66	62	60	175	62	50
13	54	260	53	50	48	52	66	54	60	168	60	50
14	52	480	51	51	b49	52	66	53	60	112	58	50
15	52	452	b51	51	50	52	72	53	58	62	57	51
16	52	655	b51	51	50	51	90	53	76	60	57	50
17	52	403	b52	51	50	51	128	58	64	66	57	50
18	52	60	b52	48	50	52	150	58	62	68	57	50
19	52	391	b52	51	48	53	126	60	60	64	57	50
20	52	56	b52	50	48	52	94	60	58	212	58	51
21	54	56	53	50	50	52	199	60	58	386	58	51
22	73	428	53	48	48	52	870	60	58	*470	57	51
23	80	57	b53	b49	b48	54	1,000	60	60	*930	57	51
24	252	53	b53	b50	48	52	1,110	60	63	480	57	51
25	167	52	b53	b51	b50	52	965	60	66	532	57	50
26	54	53	53	52	51	52	584	60	64	382	57	50
27	54	56	53	50	51	52	361	63	62	275	57	50
28	54	54	53	b50	51	53	188	63	70	148	57	50
29	56	54	53	b50	b51	53	102	62	66	82	57	48
30	58	53	53	b50	-	53	54	62	63	62	60	50
31	121	-	53	b50	-	60	-	62	-	60	62	-
Total	3,567	5,784	1,645	1,563	1,428	1,611	6,978	1,759	1,864	5,878	3,241	1,521
Mean	115	193	53.1	50.4	49.2	52.0	233	56.7	62.1	190	105	50.7
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 1,550 Min 42 Mean 130 Cfsm - In. -
Water year 1951-52: Max 1,110 Min 47 Mean 101 Cfsm - In. -

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

East Branch Ontonagon River near Mass, Mich.

Location.--Lat 46°41'20", long. 89°04'20", on line between sections 32 and 33, T. 50 N., R. 38 W., on right bank 1,000 ft downstream from Adventure Creek, 5 miles south of Mass, and 6½ miles upstream from mouth.

Drainage area.--265 sq mi.

Records available.--July 1942 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 880 ft (by barometer). Prior to Oct. 1, 1949, wire-weight gage at bridge 700 ft upstream at same datum.

Average discharge.--10 years, 266 cfs.

Extremes.--Maximum discharge during year, 4,260 cfs Apr. 18 (gage height, 10.32 ft); minimum, 129 cfs Sept. 30 (gage height, 3.61 ft).
1942-52: Maximum discharge, that of Apr. 18, 1952; minimum, 60 cfs Aug. 25, 1948 (gage height, 3.55 ft, from graph based on gage readings, site then in use).

Remarks.--Records excellent except those for periods of ice effect, which are fair.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

3.6	127	6.0	940
4.0	210	7.0	1,470
4.5	334	8.0	2,150
5.0	497	10.0	3,930

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	386	313	295	230	175	165	320	300	270	275	166	164
2	368	270	348	*230	170	170	380	290	236	222	164	170
3	*617	258	535	210	170	170	430	263	*241	*195	166	*168
4	516	230	516	200	170	170	*450	239	234	173	587	160
5	402	*220	398	190	170	160	430	*244	210	152	868	148
6	371	215	324	190	160	155	405	227	195	142	*516	142
7	331	220	*313	180	155	*155	380	217	177	175	359	140
8	295	230	308	180	170	160	380	215	179	248	275	140
9	272	250	277	175	170	170	916	210	253	201	814	140
10	253	280	227	175	160	170	868	217	239	177	831	138
11	244	324	235	170	170	170	728	244	201	311	497	136
12	234	705	230	165	170	165	617	488	177	295	374	133
13	224	1,190	230	165	180	165	516	497	162	251	275	131
14	217	1,470	230	165	180	165	474	374	162	229	222	133
15	220	965	230	165	180	155	622	311	156	199	199	156
16	222	660	230	165	175	160	1,120	277	256	179	186	166
17	224	497	230	165	170	160	2,020	244	467	234	181	152
18	212	365	230	160	170	165	3,140	222	303	377	173	146
19	217	324	230	160	170	170	*3,170	210	220	345	166	148
20	222	295	230	160	170	175	2,490	208	181	368	164	148
21	224	342	225	165	170	175	1,870	203	162	1,190	170	146
22	448	300	225	165	170	175	1,820	192	152	844	164	142
23	596	272	220	165	165	175	1,140	186	144	1,410	154	154
24	421	263	220	160	175	195	797	188	278	916	148	160
25	337	285	215	160	175	210	596	212	530	555	146	152
26	295	334	210	165	180	220	478	215	383	392	142	148
27	263	324	200	165	175	220	402	215	326	277	138	142
28	248	337	200	170	170	220	368	303	315	236	140	138
29	248	313	205	170	165	225	345	285	470	217	138	135
30	270	290	210	170	-	230	329	253	368	192	158	131
31	303	-	210	*170	-	260	-	300	-	175	160	-
Total	9,700	12,341	8,186	5,425	4,950	5,600	28,001	8,049	7,647	11,152	8,841	4,407
Mean	313	411	264	175	171	181	933	260	255	360	285	147
Cfsm	1.18	1.55	0.996	0.660	0.645	0.683	3.52	0.981	0.962	1.36	1.08	0.555
In.	1.36	1.73	1.15	0.76	0.69	0.79	3.93	1.13	1.07	1.57	1.24	0.62

Calendar year 1951: Max 3,020 Min 125 Mean 388 Cfsm 1.46 In. 19.87
Water year 1951-52: Max 3,170 Min 131 Mean 312 Cfsm 1.18 In. 16.04

Peak discharge (base, 1,400 cfs).--Nov. 13 (11:30 p.m.) 1,760 cfs (7.47 ft); Apr. 18 (9:30 p.m.) 4,260 cfs (10.32 ft); July 23 (2:30 p.m.) 1,560 cfs (7.15 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 4-10, Dec. 11 to Apr. 8.

Middle Branch Ontonagon River near Rockland, Mich.

Location.--Lat 46°42'05", long. 89°09'40", in sec. 27, T. 50 N., R. 39 W., on downstream side of bridge on U. S. Highway 45, 300 ft downstream from East Branch and 2½ miles southeast of Rockland.

Drainage area.--670 sq mi, approximately.

Records available.--July 1942 to September 1952.

Gage.--Wire-weight gage read once daily. Datum of gage is 661.1 ft above mean sea level, datum of 1929.

Average discharge.--10 years, 556 cfs.

Extremes.--Maximum discharge observed during year, 7,560 cfs Apr. 18 (gage height, 11.08 ft); minimum observed, 220 cfs Sept. 29 (gage height, 4.87 ft).
1942-52: Maximum discharge, 27,000 cfs Aug. 22, 1942 (gage height, 21.2 ft, from floodmarks), from rating curve extended above 4,500 cfs on basis of slope-area and contracted-opening determinations of peak flow; minimum observed, 157 cfs Dec. 1, 1948; minimum gage height observed, 4.39 ft Aug. 13, 1942.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Flow regulated by Bond Falls Reservoir. Diversion to South Branch Ontonagon River by Bond Falls Canal (see p. 35).

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to July 23		July 24 to Sept. 30	
4.7	223	4.8	195
5.0	310	5.0	270
5.4	500	5.5	510
6.0	960	6.0	870
8.0	3,150	7.0	1,860
11.0	7,400	8.0	3,080
		9.0	4,450

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,030	832	500	a360	285	290	720	458	a425	415	290	a350
2	704	598	a900	*360	285	a290	a1,100	430	*390	364	282	a360
3	*2,140	520	1,430	350	a290	290	1,000	395	410	347	a1,100	*286
4	1,250	a470	1,050	a340	285	285	900	a390	390	a320	3,210	270
5	856	a430	656	330	275	280	800	*390	a360	294	*2,150	258
6	1,060	410	514	a320	a255	*280	a700	368	340	a340	969	254
7	a830	410	*514	320	*250	285	800	356	317	*381	612	a250
8	704	430	488	310	280	280	*1,170	347	a350	410	1,970	246
9	464	a460	a420	310	280	a280	3,030	340	410	340	1,540	242
10	430	476	356	315	a280	a285	2,080	347	356	340	a1,040	238
11	405	a1,100	360	310	280	290	a1,650	a540	328	1,200	742	234
12	386	1,750	a365	305	285	285	1,240	960	314	577	480	230
13	373	3,150	360	a295	a290	275	a1,000	832	314	a510	360	226
14	a360	4,450	348	280	300	270	a1,150	584	307	464	330	a250
15	364	a2,600	340	285	300	270	1,320	514	a800	351	310	274
16	364	a1,500	a340	a290	295	a270	2,910	452	1,970	325	302	262
17	a360	824	330	290	a290	275	5,290	395	848	542	a290	246
18	356	a640	330	285	295	280	*7,400	a375	476	768	282	238
19	364	556	320	285	305	290	6,170	364	368	535	278	246
20	368	563	320	a295	315	300	4,050	364	328	a1,500	262	242
21	a660	549	320	300	315	305	3,030	356	314	3,530	290	250
22	1,190	482	330	290	305	310	4,450	343	a300	*2,730	266	242
23	1,200	a450	a330	300	280	a315	2,730	332	298	4,450	262	246
24	936	420	a330	290	a300	330	2,250	347	521	1,700	a260	254
25	a700	a430	a320	290	305	355	1,970	a350	1,150	1,190	258	238
26	500	a450	a310	295	300	375	1,430	356	736	978	250	234
27	430	476	310	a295	300	385	a1,040	364	494	a715	250	234
28	a410	507	305	300	295	400	784	500	633	534	234	226
29	410	a490	310	295	295	400	640	446	a810	326	246	220
30	482	464	a330	a290	-	a430	500	420	549	314	330	223
31	a620	-	a345	290	-	520	-	500	-	294	a340	-
Total	20,706	26,887	13,781	9,470	8,415	9,775	63,304	13,515	15,606	27,084	19,785	7,569
Mean	668	896	445	305	290	315	2,110	436	520	874	638	252
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 8,210 Min 195 Mean 798 Cfsm - In. -
Water year 1951-52: Max 7,400 Min 220 Mean 645 Cfsm - In. -

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of adjacent record and records for nearby streams.
Note.--Stage-discharge relation affected by ice Nov. 3-9, Dec. 11 to Apr. 7.

West Branch Ontonagon River near Bergland, Mich.

Location.--Lat 46°35'30", long. 89°32'20", in sec. 3, T. 48 N., R. 42 W., on right bank a quarter of a mile downstream from dam at outlet of Gogebic Lake and 1¼ miles east of Bergland.

Drainage area.--160 sq mi, approximately.

Records available.--July 1942 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 1,290.81 ft above mean sea level, datum of 1929. Prior to November 1942, staff gage a quarter of a mile upstream at different datum.

Average discharge.--10 years, 178 cfs.

Extremes.--Maximum discharge during year, 1,250 cfs July 25 (gage height, 5.42 ft); minimum, 69 cfs Sept. 28, 29 (gage height, 1.78 ft).
1942-52: Maximum discharge, 1,270 cfs May 2, 3 (corrected), 1951; maximum gage height, 5.73 ft May 2, 1951; minimum daily discharge, 6 cfs Apr. 27 to May 3, 1949; minimum gage height observed, 0.48 ft Apr. 29, 1949.

Remarks.--Records excellent. Flow regulated by Gogebic Lake.

Rating tables, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to July 24				July 25 to Sept. 30			
2.0	87	4.0	565	1.8	70	3.0	253
2.5	148	5.3	1,090	2.0	87	4.0	570
3.0	253			2.5	148	5.3	1,190

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	146	143	331	134	137	146	152	820	140	*432	585	110
2	*150	145	320	131	132	227	162	780	188	408	262	106
3	416	137	326	*129	131	222	166	660	*199	415	135	*105
4	700	137	340	128	129	*183	161	354	180	351	280	103
5	720	140	326	153	128	159	159	273	162	337	588	102
6	720	140	*326	180	126	155	171	206	153	323	*690	208
7	700	140	334	176	*162	133	*211	*135	157	296	670	276
8	700	*140	328	172	203	123	209	116	176	278	650	268
9	660	140	328	170	178	153	214	116	176	268	610	157
10	660	140	323	162	140	92	225	112	152	270	610	101
11	600	185	315	150	140	160	234	116	148	318	411	188
12	582	251	312	131	140	263	236	135	145	351	273	231
13	582	291	266	119	150	256	236	162	152	363	192	152
14	530	379	222	119	153	248	236	170	143	346	142	105
15	495	554	222	122	150	239	243	168	140	343	140	169
16	495	720	218	122	150	229	253	168	288	343	131	190
17	430	700	211	122	148	222	273	170	415	366	125	134
18	373	700	207	119	145	220	301	192	395	392	114	103
19	370	680	203	119	142	222	442	184	366	402	116	144
20	243	640	186	135	140	220	680	176	354	512	116	168
21	122	620	174	162	140	211	860	150	323	820	171	155
22	166	582	176	166	137	203	1,000	152	307	1,000	276	143
23	162	565	172	164	134	214	1,070	150	299	1,040	176	121
24	126	530	170	153	128	211	1,070	152	281	1,090	112	78
25	132	495	164	152	126	203	1,040	148	331	*1,160	111	77
26	126	478	164	152	122	194	1,020	145	360	1,100	144	76
27	128	450	162	148	121	186	980	153	368	1,040	294	75
28	126	412	161	146	118	182	940	166	379	970	286	72
29	129	366	145	143	116	176	900	145	415	920	268	86
30	124	348	129	140	-	170	860	140	425	848	180	125
31	137	-	131	138	-	159	-	143	-	802	110	-
Total	11,750	11,348	7,392	4,457	4,066	5,981	14,704	6,857	7,715	17,904	8,966	4,128
Mean	379	378	238	144	140	193	490	221	257	578	289	138
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 1,270 Min 60 Mean 299 Cfsm 1.87 In. 25.34
Water year 1951-52: Max 1,160 Min 72 Mean 288 Cfsm 1.80 In. 24.47

* Discharge measurement made on this day.

Cisco Branch Ontonagon River at Cisco Lake Outlet, Mich.

Location.--Lat 46°15', long. 89°27', in sec. 32, T. 45 N., R. 4l W., on right bank 80 ft downstream from Cisco Lake Dam, 2½ miles upstream from Langford Lake Outlet, 4¼ miles upstream from U. S. Highway 2, and 13 miles southwest of Watersmeet.

Drainage area.--50 sq mi, approximately.

Records available.--October 1944 to September 1952. July 1942 to September 1944 at site 4¼ miles downstream, published as "near Watersmeet"; records not equivalent.

Gage.--Staff gage read once daily. Datum of gage is 1,676.55 ft above mean sea level, datum of 1929.

Average discharge.--8 years, 46.7 cfs.

Extremes.--Maximum discharge during year, 260 cfs July 20-23 (gage height, 2.00 ft); minimum daily, 5.8 cfs Sept. 18 (gage height, 0.34 ft).
1944-52: Maximum discharge, 288 cfs May 1-4, 1951 (gage height, 2.10 ft); minimum daily, 0.2 cfs May 29 to June 17, 1948.

Remarks.--Records good except those for periods of shifting control, which are fair. Flow regulated by Cisco Lake.

Rating tables, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to May 14		May 15 to Sept. 30			
0.7	28	0.3	5.0	1.0	65
1.1	74	.4	9.0	1.5	145
1.5	142	.5	14	2.0	260
2.0	265	.7	30		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*38	115	66	62	68	47	49	36	37	111	55	93
2	69	115	66	62	68	47	68	104	37	*109	52	*37
3	174	113	66	62	66	47	69	104	36	106	52	9.0
4	174	109	66	57	65	*47	69	101	36	40	*61	9.0
5	174	108	*66	57	65	46	69	54	36	40	109	8.6
6	164	*106	66	55	62	46	69	*32	36	40	109	8.6
7	160	102	66	55	49	46	*69	33	31	30	109	8.6
8	155	101	66	54	49	46	69	34	34	30	109	8.6
9	151	96	65	54	49	46	69	34	68	30	109	8.2
10	146	94	66	54	49	46	70	34	68	30	109	7.8
11	142	94	66	54	49	28	70	34	62	33	109	7.8
12	80	74	65	54	49	28	70	36	62	33	109	7.8
13	80	80	65	54	49	29	70	36	56	33	62	7.8
14	38	82	64	54	48	29	70	35	57	34	62	7.8
15	38	84	64	54	48	29	70	62	57	34	62	7.8
16	38	85	64	54	48	29	70	62	60	34	62	7.4
17	38	85	64	54	48	29	70	61	60	36	62	7.4
18	38	111	62	54	48	29	70	61	55	81	61	5.8
19	38	111	62	54	47	29	77	61	55	82	61	34
20	38	111	62	54	48	29	85	61	31	260	41	52
21	38	108	64	54	48	30	91	61	31	260	41	52
22	40	104	64	77	48	30	98	61	32	260	41	52
23	39	102	64	75	48	30	98	61	31	260	41	51
24	40	101	64	74	48	31	142	60	32	255	40	50
25	40	101	65	74	48	31	142	60	72	250	14	50
26	40	96	64	74	47	31	142	36	72	123	14	48
27	40	96	*64	74	47	31	138	*37	72	123	14	47
28	40	94	64	71	47	31	138	39	70	56	14	47
29	80	68	62	71	47	31	134	39	109	52	10	47
30	80	68	62	*70	-	31	62	39	112	52	12	47
31	115	-	62	69	-	31	-	37	-	52	93	-
Total	2,565	2,914	1,996	1,895	1,500	1,090	2,577	1,605	1,607	2,969	1,899	835.0
Mean	82.7	97.1	64.4	61.1	51.7	35.2	85.9	51.8	53.6	95.8	61.3	27.8
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 288 Min 14 Mean 67.5 Cfsm 1.35 In. 18.33
Water year 1951-52: Max 260 Min 5.8 Mean 64.1 Cfsm 1.28 In. 17.45

* Discharge measurement made on this day.
Note.--Shifting-control method used Oct. 1, 2, Sept. 3-30.

Bond Falls Canal near Paulding, Mich.

Location.--Lat 46°24'10", long. 89°09'00", in sec. 11, T. 46 N., R. 39 W., on right bank 40 ft upstream from intake to pipeline No. 2, 1.4 miles southeast of Paulding, and 1.5 miles downstream from Bond Falls Reservoir.

Records available.--July 1942 to September 1952.

Gage.--Staff gage and concrete control; gage read once daily. Datum of gage is 1,449 ft above mean sea level, datum of 1929 (levels by Upper Peninsula Power Co.).

Average discharge.--10 years, 120 cfs.

Extremes.--Maximum discharge during year, 304 cfs Sept. 28-30 (gage height, 2.82 ft); minimum, 12 cfs Apr. 14-20 (gage height, 0.38 ft).
1942-52: Maximum discharge, 362 cfs Aug. 27, 1947 (gage height, 3.13 ft, from graph based on gage readings); minimum, 2.5 cfs Nov. 3, 4, 11, 12, 1943; minimum gage height, -1.25 ft May 29, 1943 (two drain holes in weir open and canal gate closed).

Remarks.--Records excellent except those for the periods of ice effect, which are good, and those below 20 cfs, which are fair. Canal diverts water from Bond Falls Reservoir to South Branch Ontonagon River; water is used for power production at Victoria Dam on South Branch, near Rockland.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.3	7.8	1.5	108
.5	18	2.0	172
1.0	56	3.0	337

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	221	194	226	*43	201	248	175	300	130	168	214	182
2	219	194	226	43	201	255	175	279	128	168	164	180
3	219	194	201	62	201	242	175	237	*126	166	138	180
4	219	194	186	166	158	221	175	175	126	138	198	180
5	219	166	*186	165	130	210	175	149	126	93	245	180
6	219	*155	186	165	130	180	175	149	97	74	245	186
7	219	185	186	165	146	180	175	124	65	87	245	227
8	219	185	186	165	172	180	175	108	56	118	245	226
9	240	183	189	165	169	180	175	108	86	118	245	226
10	258	183	192	178	169	179	175	108	106	158	245	224
11	258	183	183	204	b169	179	175	152	106	204	245	265
12	258	183	b183	162	b169	179	175	189	106	204	245	296
13	258	183	b165	138	b169	178	175	189	106	204	195	296
14	234	183	b145	128	b169	178	88	189	152	204	164	296
15	216	183	b145	106	b169	178	12	189	204	161	162	295
16	216	183	b145	106	b169	175	12	189	204	115	157	295
17	189	183	b145	106	b169	178	12	131	172	158	121	295
18	172	183	b145	165	b169	178	12	99	119	213	120	295
19	172	183	b145	202	b169	178	12	108	60	242	120	295
20	172	182	105	202	b169	176	12	137	41	260	120	293
21	172	182	88	b202	b169	176	13	137	41	258	114	289
22	172	182	70	b202	169	176	14	114	41	258	110	287
23	185	180	58	142	b170	176	14	99	41	262	183	286
24	194	180	58	106	b170	176	14	99	86	260	183	286
25	194	169	74	108	180	176	14	99	135	258	183	284
26	194	155	115	113	219	176	15	99	176	258	183	282
27	194	155	135	113	b220	175	117	99	204	258	183	282
28	194	155	132	104	222	175	235	152	183	258	183	295
29	194	196	120	136	235	175	282	183	169	258	183	304
30	194	226	108	*166	-	175	300	150	168	258	182	304
31	194	-	74	189	-	175	-	131	-	258	182	-
Total	6,478	5,442	4,502	4,417	5,121	5,783	3,453	4,671	3,560	6,097	5,712	7,811
Mean	209	181	145	142	177	187	115	151	119	197	184	260
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 296 Min 5.5 Mean 141 Cfsm - In. -
Water year 1951-52: Max 304 Min 12 Mean 172 Cfsm - In. -

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

South Branch Ontonagon River at Ewen, Mich.

Location.--Lat 46°32'05", long. 89°16'30", in sec. 26, T. 48 N., R. 40 W., on left bank on piers of old State Highway M 28 bridge in Ewen.

Drainage area.--About 320 sq mi.

Records available.--April 1942 to September 1952.

Gage.--Staff gage read twice daily. Datum of gage is 1,113.04 ft above mean sea level, datum of 1929. Prior to Jan. 16, 1943, chain gage on upstream side of bridge at same site and datum.

Average discharge.--10 years, 489 cfs.

Extremes.--Maximum discharge during year, 6,710 cfs Apr. 19 (gage height, 18.70 ft, from graph based on gage readings); minimum observed, 209 cfs June 23 (gage height, 1.98 ft).

1942-52: Maximum discharge, that of Apr. 19, 1952; maximum gage height, 18.86 ft June 25, 1946; minimum observed, 76 cfs Sept. 23, 1948, June 7, Aug. 9, 22, 1949 (gage height, 0.88 ft).

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Some diversion from Middle Branch Ontonagon River by Bond Falls Canal (see p. 35).

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Rate of change in stage used as a factor Nov. 14-16, Apr. 17-23, July 21-24)

2.0	209	12.0	2,680
4.0	519	17.0	5,220
7.0	1,150	18.5	6,430

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	690	633	930	320	350	315	620	870	449	730	557	348
2	690	595	960	310	345	315	700	750	392	*614	483	362
3	*1,280	580	1,000	300	340	315	750	710	449	557	415	*370
4	1,860	580	1,220	300	330	300	*730	652	432	538	1,200	332
5	1,920	580	1,100	315	310	285	750	557	392	392	2,010	310
6	1,380	580	*830	330	290	*285	730	519	355	318	2,160	302
7	1,180	*580	770	340	*300	300	750	*449	280	302	1,480	310
8	975	580	720	340	305	310	910	378	242	378	*1,280	325
9	890	600	700	340	310	310	1,300	378	288	362	910	325
10	850	610	670	340	320	315	1,320	355	325	348	870	318
11	800	670	640	360	325	315	1,220	392	318	930	750	310
12	750	1,200	620	330	325	310	1,250	790	302	1,320	690	362
13	671	1,860	610	320	325	320	1,050	830	295	870	633	370
14	614	2,990	600	320	325	315	930	710	295	710	500	378
15	576	3,450	590	310	325	310	850	614	355	595	466	385
16	710	2,420	570	310	325	310	400	576	950	449	432	385
17	519	1,500	520	305	325	310	2,400	500	1,500	557	385	385
18	483	975	475	320	325	310	*4,370	408	1,320	810	355	370
19	449	970	445	340	320	310	6,410	392	500	1,000	348	362
20	432	870	410	345	325	320	6,060	415	355	1,450	332	362
21	449	890	390	350	325	325	4,770	400	272	2,980	325	378
22	557	830	385	350	315	340	3,550	385	235	4,440	302	415
23	1,100	850	380	340	300	360	2,940	340	216	*5,130	325	415
24	910	870	370	320	310	375	2,130	332	222	3,920	348	415
25	750	1,020	340	320	330	400	1,350	355	850	2,230	340	408
26	671	1,020	345	340	330	400	1,080	340	1,250	1,450	332	400
27	595	975	350	340	325	400	890	*332	1,050	1,150	318	392
28	557	1,020	*360	340	320	420	930	385	870	950	310	392
29	538	950	360	330	320	440	950	449	1,180	790	310	408
30	519	910	320	350	-	490	910	432	1,000	652	310	415
31	595	-	320	360	-	540	-	432	-	614	332	-
Total	24,960	32,058	18,300	10,235	9,320	10,670	53,000	15,427	16,939	37,536	19,808	11,009
Mean	805	1,069	590	330	321	344	1,767	498	565	1,211	639	367
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 5,970 Min 190 Mean 779 Cfsm - In. -
Water year 1951-52: Max 6,410 Min 216 Mean 708 Cfsm - In. -

Peak discharge (base, 2,000 cfs).--Oct. 5 (6 a.m.) 2,010 cfs (10.08 ft); Nov. 15 (4 a.m.) 3,690 cfs (14.00 ft); Apr. 19 (8 p.m.) 6,710 cfs (18.70 ft); July 23 (2 p.m.) 5,240 cfs (16.80 ft); Aug. 6 (8 a.m.) 2,200 cfs (10.72 ft).

* Discharge measurement made on this day.

Note.--No gage-height record Oct. 11, Nov. 3-6, 9-11, Dec. 1, 2, 8-12, 20-27, Mar. 18 to Apr. 2; discharge estimated on basis of discharge measurements, weather records, engineer's and observer's notes, and records for nearby stations. Stage-discharge relation affected by ice Nov. 3-10, Dec. 11 to Apr. 2.

Ontonagon River near Rockland, Mich.

Location.--Lat 46°43'15", long. 89°12'25", in sec. 20, T. 50 N., R. 39 W., on downstream side of left pier of bridge on highway between Rockland and Victoria, 1¾ miles southwest of Rockland and 2 miles downstream from confluence of Middle and South Branches.

Drainage area.--1,290 sq mi, approximately.

Records available.--June 1942 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 638.87 ft above mean sea level, datum of 1929. Prior to Nov. 23, 1943, wire-weight, chain, and staff gages on downstream side of bridge at same site and datum.

Average discharge.--10 years, 1,431 cfs.

Extremes.--Maximum discharge during year, 18,400 cfs Apr. 19 (gage height, 18.78 ft); minimum, 566 cfs Sept. 8 (gage height, 5.97 ft); minimum daily, 702 cfs Sept. 7.
1942-52: Maximum discharge, 42,000 cfs Aug. 22, 1942 (gage height, 28.6 ft, from floodmark), from rating curve extended above 9,500 cfs on basis of slope-area determination of peak flow; minimum daily, 260 cfs Sept. 6, 1948.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Flow regulated by Victoria Power Plant, on South Branch, 5 miles above station, by Bond Falls Reservoir, Gogebic and Cisco Lakes.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 19		Apr. 20 to Sept. 30	
6.4	820	6.2	680
7.0	1,200	7.0	1,110
8.0	2,040	8.0	1,940
11.0	5,630	11.0	5,630
18.1	17,200	17.0	15,200

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,140	1,720	1,620	960	1,010	870	1,600	2,260	1,040	1,880	1,560	765
2	1,850	a2,100	1,700	*980	1,000	870	2,000	2,030	*1,080	1,640	1,160	837
3	3,490	a1,700	3,300	980	950	870	2,700	1,870	989	*1,300	1,020	860
4	4,380	a1,300	4,220	960	940	870	2,350	1,580	1,120	1,230	2,870	*847
5	*3,930	*a1,070	2,900	940	930	870	1,900	*1,340	1,010	1,170	*6,000	828
6	3,880	a1,000	2,140	920	920	870	1,900	1,050	906	928	4,680	795
7	3,300	a980	*1,970	920	920	*870	2,200	1,000	872	936	3,750	702
8	2,610	a980	1,900	920	910	900	*2,900	924	791	1,080	2,650	784
9	2,150	a1,100	1,750	920	930	900	5,000	864	918	1,090	3,040	816
10	2,220	1,300	1,360	920	950	920	4,670	846	950	1,060	3,230	838
11	1,920	1,520	1,350	900	940	940	4,190	934	873	1,950	2,510	836
12	1,880	3,260	1,220	900	940	940	3,600	2,100	844	2,670	1,850	823
13	1,800	7,080	970	900	940	940	3,210	2,220	864	2,340	1,380	773
14	1,700	9,300	916	900	940	920	2,860	1,690	848	1,780	1,120	729
15	1,520	7,870	900	900	940	900	3,430	1,390	738	1,480	942	814
16	1,510	6,130	900	890	930	920	5,780	1,300	2,420	1,190	902	850
17	1,410	4,300	900	890	940	940	9,960	1,160	4,330	1,420	902	830
18	1,370	3,070	900	890	940	940	*14,400	1,010	2,440	2,400	946	838
19	1,210	2,570	900	880	920	960	17,100	1,000	1,870	2,400	883	822
20	1,340	a2,300	a900	880	900	1,000	14,900	956	1,130	2,960	876	789
21	1,120	a2,300	a920	880	900	1,040	11,700	967	958	8,860	868	724
22	2,030	2,140	a920	880	890	1,010	10,900	925	869	*7,640	846	794
23	2,920	a1,760	a920	880	880	1,000	8,240	881	898	10,400	804	806
24	2,430	a1,600	920	880	880	1,050	6,370	849	1,070	8,320	729	814
25	1,970	a1,450	900	880	880	1,100	5,190	808	3,890	5,800	814	817
26	1,570	a1,400	900	880	880	1,200	4,100	974	3,020	4,100	848	812
27	1,360	1,500	900	880	880	1,200	3,460	941	2,470	2,900	854	776
28	1,160	1,700	900	880	870	1,100	2,820	1,060	2,020	2,560	866	712
29	1,280	1,710	900	880	870	1,150	2,330	1,110	3,140	2,240	832	782
30	1,300	1,500	920	920	-	1,200	2,240	1,110	2,490	1,750	858	814
31	1,510	-	940	*1,000	-	1,300	-	1,190	-	1,790	784	-
Total	64,260	77,710	42,756	28,190	26,720	30,560	164,000	38,339	46,858	89,264	51,374	24,027
Mean	2,073	2,590	1,379	909	921	986	5,467	1,237	1,562	2,879	1,657	801
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 14,100 Min 620 Mean 2,209 Cfsm 1.71 In. 23.24
Water year 1951-52: Max 17,100 Min 702 Mean 1,869 Cfsm 1.45 In. 19.71

Peak discharge (base, 7,000 cfs).-- Nov. 14 (3 to 4 a.m.) 9,840 cfs (13.80 ft); Apr. 19 (1:30 a.m.) 18,400 cfs (18.78 ft); July 23 (6:30 a.m.) 11,300 cfs (14.67 ft).
* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of 1 discharge measurement, weather records, and records for nearby streams.
Note.--Stage-discharge relation affected by ice Nov. 27, 28, Dec. 15 to Apr. 8.

Sturgeon River near Sidnaw, Mich.

Location.--Lat 46°35', long. 88°35', in sec. 5, T. 48 N., R. 34 W., on right bank 40 ft downstream from highway bridge, 2 miles downstream from Rock River, 3½ miles northwest of Covington, 4 miles upstream from Perch River, and 9 miles northeast of Sidnaw.

Drainage area.--155 sq mi.

Records available.--October 1912 to September 1915, April 1943 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 1,214.4 ft above mean sea level, datum of 1929. October 1912 to September 1915, staff gage at site 200 ft upstream at different datum. Apr. 2, 1943, to May 21, 1946, chain gage and May 22, 1946, to Oct. 1, 1946, staff gage, at old timber bridge 20 ft upstream at present datum.

Average discharge.--11 years (1912-15, 1943-45, 1946-52), 203 cfs.

Extremes.--Maximum discharge during year, 3,260 cfs Apr. 20 (gage height, 10.03 ft); minimum, 18 cfs Sept. 30 (gage height, 3.77 ft).
1912-15, 1943-52: Maximum discharge, 3,670 cfs Apr. 30, 1951 (gage height, 10.35 ft); minimum, 4.6 cfs Oct. 8, 1948 (gage height, 3.47 ft).

Remarks.--Records excellent except those for periods of ice effect, which are fair.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to July 23				July 24 to Sept. 30			
3.8	31	7.0	980	3.7	14	5.5	296
4.3	71	9.0	2,320	4.0	35	6.0	466
5.0	180	10.0	3,260	4.5	87	7.0	900
5.5	330			5.0	169		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	670	250	*164	78	*65	54	200	410	213	264	90	43
2	590	250	180	80	68	54	300	334	176	192	80	43
3	590	230	315	78	69	52	260	288	166	80	73	47
4	530	186	474	76	69	52	220	246	158	64	145	43
5	482	180	480	74	68	52	210	246	138	51	244	40
6	450	170	434	72	66	51	190	234	122	43	230	35
7	390	165	378	72	66	50	200	204	107	36	184	33
8	338	162	330	72	66	49	200	176	122	39	158	30
9	300	160	291	72	65	49	270	160	148	36	626	28
10	267	164	250	72	64	48	360	148	125	36	626	26
11	234	174	220	72	63	47	320	162	106	160	546	26
12	210	282	180	74	63	47	320	590	91	210	394	24
13	189	*498	155	74	62	48	300	730	81	210	275	*20
14	176	710	*145	72	*62	46	309	610	73	154	206	22
15	170	730	140	74	61	44	354	474	64	112	169	30
16	168	650	130	76	61	43	510	334	90	85	143	25
17	164	550	125	78	60	*42	830	261	168	86	120	23
18	162	438	110	78	59	41	1,370	216	154	255	104	21
19	172	414	100	80	58	42	2,240	186	114	324	94	23
20	180	375	92	78	58	45	*3,160	176	88	321	82	26
21	183	330	88	*76	57	46	3,060	164	73	482	74	27
22	388	291	86	76	56	47	2,660	150	64	570	66	27
23	470	260	84	74	56	46	2,240	134	59	710	60	29
24	434	240	82	74	56	50	1,730	131	116	498	55	27
25	*370	220	80	74	58	58	1,250	137	261	374	50	26
26	309	192	78	71	56	58	955	136	366	275	44	24
27	270	185	78	70	55	56	780	136	358	213	41	30
28	243	176	78	69	55	56	670	192	312	173	38	23
29	225	166	78	67	*55	55	*590	201	362	143	*33	20
30	228	162	78	66	-	66	494	178	*327	118	32	*18
31	*267	-	*78	65	-	*95	-	*213	-	*102	36	-
Total	9,819	8,960	5,581	2,284	1,777	1,589	26,552	7,957	4,802	6,416	5,118	859
Mean	317	299	180	73.7	61.3	51.3	885	257	160	207	165	28.6
Cfsm	2.05	1.93	1.16	0.475	0.395	0.331	5.71	1.66	1.03	1.34	1.06	0.185
In.	2.36	2.15	1.34	0.55	0.43	0.38	6.37	1.91	1.15	1.54	1.23	0.21

Calendar year 1951: Max 3,460 Min 46 Mean 335 Cfsm 2.16 In. 29.30
Water year 1951-52: Max 3,160 Min 18 Mean 223 Cfsm 1.44 In. 19.61

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 1-3, 6, 7, 20, 21, 23-25, 27, Dec. 5, Dec. 10 to Apr. 13.

Sturgeon River near Alston, Mich.

Location.--Lat 46°44', long. 88°40', in E½ sec. 15, T. 50 N., R. 34 W., on right bank in powerhouse of Upper Peninsula Power Co. at Prickett Dam, 3 miles upstream from Clear Creek and 5 miles southeast of Alston.

Drainage area.--346 sq mi.

Records available.--October 1947 to September 1952.

Gage.--Water-stage recorder. Elevation of gage is 670.3 ft above mean sea level (levels by Corps of Engineers).

Average discharge.--13 years (1932-40, 1947-52), 419 cfs.

Extremes.--Maximum discharge during year, 4,460 cfs Apr. 20 (gage height, 50.47 ft); minimum, 8.8 cfs Sept. 5 (gage height, 42.76 ft), powerplant leakage.
1947-52: Maximum discharge, 5,000 cfs Apr. 29, 1951; minimum, 7.9 cfs Oct. 24, 1948.

Remarks.--Records excellent except those below 100 cfs and those for periods of shifting control, which are good. Flow regulated by powerplant at station.

Rating table, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 20, 21, Nov. 3, 10, 11)

42.9	14	45.0	465
43.1	25	46.0	940
43.4	52	48.0	2,330
43.9	126	50.1	4,100
44.4	256		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,160	445	359	272	257	180	388	690	427	498	264	129
2	1,000	460	229	272	142	88	639	617	433	436	163	173
3	1,070	407	572	250	116	212	550	527	367	436	136	196
4	929	356	771	332	290	207	460	462	367	266	426	174
5	966	396	776	287	255	203	438	507	349	203	572	208
6	834	399	759	159	235	194	381	465	319	178	571	149
7	740	405	727	104	243	202	404	408	247	315	461	160
8	680	402	580	361	213	208	445	387	281	274	448	219
9	628	412	543	236	155	157	714	391	386	253	1,210	207
10	492	363	496	240	91	257	800	348	333	248	1,340	137
11	458	336	445	240	291	235	687	416	317	310	886	123
12	*466	423	*439	240	280	271	740	994	304	483	771	152
13	429	*1,250	425	171	*270	275	646	1,220	*252	555	555	*95
14	400	1,410	369	274	218	277	637	944	159	477	417	14
15	413	1,330	333	270	185	235	698	788	128	360	401	145
16	394	1,150	146	264	123	151	1,050	578	288	340	398	149
17	401	946	301	267	86	255	1,790	487	341	373	247	150
18	404	758	300	263	256	264	2,680	439	382	*384	293	156
19	401	648	307	215	262	284	3,560	435	359	436	306	150
20	336	569	251	92	238	250	*4,100	394	322	521	305	91
21	316	490	306	264	239	197	4,100	355	160	936	273	17
22	793	613	188	243	230	189	3,740	359	148	871	268	164
23	980	524	73	277	141	140	3,060	*322	252	1,540	*213	145
24	797	421	260	213	85	204	2,060	307	261	1,050	132	138
25	736	258	119	229	224	201	2,020	310	420	733	294	140
26	616	406	252	140	242	198	1,430	324	564	584	255	148
27	486	448	261	143	243	196	1,220	378	622	568	241	98
28	474	460	268	300	216	199	980	375	635	470	224	168
29	463	457	252	259	203	186	868	403	624	407	215	149
30	473	369	162	259	-	166	828	411	619	373	142	158
31	600	-	308	241	-	248	-	442	-	290	131	-
Total	19,335	17,311	11,577	7,377	6,029	6,529	42,113	15,483	10,666	15,168	12,558	4,302
Mean	624	577	373	238	208	211	1,404	499	356	489	405	143
Cfsm	1.80	1.67	1.08	0.688	0.601	0.610	4.06	1.44	1.03	1.41	1.17	0.413
In.	2.08	1.86	1.24	0.79	0.65	0.70	4.53	1.66	1.15	1.63	1.35	0.46

Calendar year 1951: Max 4,760 Min 73 Mean 628 Cfsm 1.82 In. 24.64
Water year 1951-52: Max 4,100 Min 14 Mean 460 Cfsm 1.33 In. 18.10

* Discharge measurement made on this day.

Otter River near Elo, Mich.

Location.--Lat 46°52', long. 88°37', in sec. 34, T. 52 N., R. 34 W., on downstream side of highway bridge 1¼ miles southeast of old Elo school and 3 miles upstream from Otter Lake.

Drainage area.--175 sq mi.

Records available.--November 1942 to September 1952.

Gage.--Wire-weight gage read twice daily. Altitude of gage is 620 ft (by barometer).

Average discharge.--10 years, 223 cfs.

Extremes.--Maximum discharge observed during year, 4,540 cfs Apr. 19 (gage height, 13.52 ft); minimum, 88 cfs Mar. 12-18; minimum gage height, 2.94 ft Sept. 29, 30.
1942-52: Maximum discharge observed, that of Apr. 19, 1952; minimum, 68 cfs Nov. 18, 1947 (discharge measurement), but may have been less at other times during period of ice effect; minimum gage height, that of Sept. 29, 30, 1952.

Remarks.--Records good except those for periods of ice effect, which are fair.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 18				Apr. 19 to Sept. 30			
2.9	88	5.0	391	2.9	85	9.0	1,460
3.5	140	6.0	610	4.0	228	11.0	2,390
				6.0	610	13.2	4,240

Note.--Same as following table above 6.0 ft.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	238	198	190	120	112	95	350	294	164	212	103	121
2	211	164	235	123	116	94	540	260	143	184	103	110
3	319	157	301	122	*118	94	480	228	155	162	102	110
4	292	152	450	120	116	93	382	212	138	138	260	104
5	256	150	382	120	116	93	256	212	127	125	428	101
6	346	150	301	124	115	92	265	191	122	116	260	96
7	274	150	283	127	112	91	283	178	113	135	176	94
8	220	155	283	128	112	90	373	170	117	228	144	96
9	188	180	229	130	112	90	735	160	122	170	685	97
10	173	230	193	*129	111	90	685	153	110	133	337	*94
11	162	310	135	128	110	89	491	205	103	176	212	92
12	*157	364	*130	128	109	88	440	548	101	167	157	90
13	150	*735	125	128	108	88	410	382	*98	164	133	90
14	147	1,970	123	128	107	*88	391	277	97	159	125	93
15	146	1,420	121	129	105	88	610	212	97	140	120	112
16	141	710	120	132	104	88	*1,050	184	120	122	115	102
17	139	480	119	134	104	88	1,970	167	138	133	111	95
18	137	382	118	136	103	88	2,930	153	110	*173	107	92
19	141	328	118	138	102	90	4,240	148	101	153	103	94
20	143	256	118	136	100	93	3,740	150	97	134	103	92
21	142	260	117	130	98	93	2,640	139	97	337	103	94
22	247	240	114	128	97	93	3,270	133	96	268	97	92
23	310	220	113	126	97	96	2,020	*127	94	364	*96	92
24	238	200	112	126	97	100	1,080	126	364	244	95	93
25	195	192	112	125	97	106	835	135	515	170	90	92
26	177	184	111	122	97	108	660	125	337	147	90	92
27	163	178	110	118	96	110	515	133	220	130	93	91
28	157	172	110	114	95	110	457	191	220	120	98	90
29	158	169	110	112	95	112	382	159	382	115	103	89
30	169	168	112	110	-	120	328	146	277	111	101	89
31	202	-	118	110	-	160	-	191	-	104	138	-
Total	6,138	10,624	5,313	3,881	3,063	3,018	32,808	6,089	4,975	5,234	4,988	2,889
Mean	198	354	171	125	106	97.4	1,094	196	166	169	161	96.3
Cfsm	1.13	2.02	0.977	0.714	0.606	0.557	6.25	1.12	0.949	0.966	0.920	0.550
In.	1.30	2.26	1.13	0.82	0.65	0.64	6.97	1.29	1.06	1.11	1.06	0.61

Calendar year 1951: Max 3,640 Min 93 Mean 313 Cfsm 1.79 In. 24.30
Water year 1951-52: Max 4,240 Min 88 Mean 243 Cfsm 1.39 In. 18.90

Peak discharge (base, 1,300 cfs).--Nov. 14 (7 p.m.) 2,020 cfs (10.33 ft); Apr. 19 (8:30 a.m.) 4,540 cfs (13.52 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 4-10, Nov. 21 to Dec. 2, Dec. 11 to Apr. 3.

Sturgeon River near Arnheim, Mich.

Location.--Lat 46°56', long. 88°33', in sec. 6, T. 52 N., R. 33 W., on right bank a quarter of a mile downstream from Otter Lake, 3 miles northwest of Arnheim, and 8½ miles northeast of Pelkie.

Drainage area.--680 sq mi.

Records available.--November 1942 to September 1952.

Gage.--Staff gage read once daily. Datum of gage is 605.98 ft above mean sea level, datum of 1929 (Corps of Engineers benchmark).

Average discharge.--10 years, 825 cfs.

Extremes.--Maximum discharge during year 12,100 cfs Apr. 19; maximum gage height, 14.72 ft Apr. 19 (from graph based on gage readings); minimum discharge observed, 256 cfs Sept. 30 (gage height, 1.28 ft).
1942-52: Maximum discharge, that of Apr. 19, 1952; maximum gage height, that of Apr. 19, 1952; minimum discharge, 200 cfs Sept. 14, 1948 (gage height, 1.15 ft).

Remarks.--Records good except those above 5,000 cfs and those for periods of ice effect or shifting control, which are fair. Records do not include overflow which leaves stream about 2 miles above Otter Lake during very high stages. This flow floods the flats to the north and east of Sturgeon River; it may pass directly into Portage Lake through Sturgeon Slough or through Snake River.

Rating table, water year 1951-52, except periods of ice effect, or when shifting-control method was used (gage height, in feet, and discharge, in cubic feet per second)
(Rate of change in stage used as a factor Oct. 1-6, Nov. 14-19, Apr. 10 to May 1, May 14, 15, July 24, 25, Aug. 10-13)

1.2	240	13.0	4,940
3.0	642	13.5	5,610
7.0	1,910	14.0	7,290
11.0	3,690	14.5	10,000

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,700	960	840	520	430	420	534	1,630	810	1,260	668	417
2	1,640	900	810	540	450	410	720	1,440	840	1,200	594	384
3	1,540	840	780	520	450	410	900	1,320	810	990	546	384
4	1,600	810	960	500	450	410	1,080	1,170	780	900	498	384
5	1,550	750	1,170	500	450	410	1,110	1,050	720	780	707	384
6	1,520	750	1,260	490	430	405	1,110	960	694	642	1,110	362
7	1,500	750	1,260	490	430	400	1,110	960	655	570	1,080	362
8	1,410	735	1,260	485	430	400	1,110	870	606	510	1,020	362
9	1,260	720	1,140	480	425	400	1,350	810	570	630	1,140	362
10	1,170	735	1,050	*490	420	410	1,830	750	606	618	1,700	384
11	1,050	750	960	490	428	435	1,790	750	594	594	1,840	362
12	*960	750	*840	485	430	450	1,830	900	570	594	1,700	340
13	930	*1,020	707	490	*430	460	1,740	1,440	*522	642	1,640	*320
14	870	2,620	655	480	430	*450	1,560	1,720	534	735	1,230	320
15	780	3,320	610	490	420	450	1,670	1,580	498	780	930	300
16	780	2,890	590	500	420	450	*2,180	1,470	462	750	870	280
17	735	2,500	580	520	410	455	3,190	1,200	498	668	720	290
18	707	2,050	560	520	405	460	4,670	1,110	522	*655	655	310
19	707	1,680	550	510	405	486	9,160	990	570	681	582	300
20	707	1,530	540	500	400	522	9,740	870	582	707	546	310
21	681	1,320	530	490	400	534	*7,620	810	570	750	522	310
22	681	1,080	510	470	405	486	7,520	750	498	1,110	510	300
23	960	1,000	510	470	410	480	7,170	*707	462	1,350	*474	280
24	1,200	900	500	470	405	475	4,870	655	486	1,720	450	290
25	1,230	820	498	475	400	460	4,380	630	840	1,660	417	300
26	1,200	750	498	470	405	450	3,680	618	1,080	1,530	406	300
27	1,110	720	486	460	420	440	3,100	618	1,170	1,260	428	300
28	990	735	480	455	420	450	2,400	668	1,170	1,110	428	300
29	900	780	490	445	420	460	2,200	694	1,200	960	417	280
30	900	810	490	435	-	474	1,790	735	1,320	840	417	256
31	900	-	500	430	-	486	-	780	-	750	428	-
Total	33,868	35,975	22,614	15,070	12,228	13,888	93,114	30,655	21,239	27,946	24,673	9,833
Mean	1,093	1,199	729	486	422	448	3,104	989	708	901	796	328
Cfsm	1.61	1.76	1.07	0.715	0.621	0.659	4.56	1.45	1.04	1.32	1.17	0.482
In.	1.85	1.97	1.24	0.82	0.67	0.76	5.09	1.68	1.16	1.53	1.35	0.54

Calendar year 1951: Max 7,640 Min 320 Mean 1,176 Cfsm 1.73 In. 23.47
Water year 1951-52: Max 9,740 Min 256 Mean 932 Cfsm 1.37 In. 18.66

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 9, 23-25, Dec. 15-24, Dec. 28 to Feb. 10, Feb. 12 to Mar. 18, Mar. 23-29. Shifting-control method used June 2 to Aug. 9.

Black River near Garnet, Mich.

Location.--Lat 46°07'05", long. 85°21'55", in SE¼ sec. 13, T. 43 N., R. 9 W., on right bank 10 ft upstream from highway bridge, 15 ft downstream from unnamed tributary entering from right, 3½ miles upstream from Lake Michigan, and 4 miles southwest of Garnet.

Drainage area.--28 sq mi, approximately.

Records available.--September 1951 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 590 ft (from county map).

Extremes.--Maximum discharge during period, 171 cfs Apr. 18 (gage height, 5.19 ft); minimum, 10 cfs Mar. 8, 25 (gage height, 2.37 ft).

Remarks.--Records excellent.

Rating tables, Sept. 18, 1951, to Sept. 30, 1952 (gage height, in feet, and discharge, in cubic feet per second)

Sept. 18, 1951, to July 23, 1952		July 24, 1952, to Sept. 30, 1952	
2.4	11	2.4	13
2.8	27	2.7	25
3.5	63	3.0	40
5.0	157	4.0	97

Discharge, in cubic feet per second, 1951-52

1951

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
Sept. 1	-	Sept. 9	-	Sept.17	-	Sept.25	24
2	-	10	-	18	*17	26	40
3	-	11	-	19	17	27	111
4	-	12	-	20	15	28	93
5	-	13	-	21	15	29	73
6	-.	14	-	22	23	30	72
7	-	15	-	23	26		
8	-	16	-	24	26		

Peak discharge (base, 120 cfs).--Sept. 27 (4 a.m.) 123 cfs (4.50 ft).
* Discharge measurement made on this day.
Note.--Result of discharge measurement Aug. 21, 35 cfs.

1951-52

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	62	45	34	22	17	13	43	*38	38	19	23	40
2	54	42	36	21	17	13	46	34	32	17	21	31
3	50	36	40	20	17	13	49	30	32	18	19	26
4	50	32	40	21	17	13	54	28	27	17	38	22
5	54	28	36	19	16	13	60	30	24	15	48	21
6	48	*24	34	18	16	13	67	30	21	14	36	19
7	42	26	40	18	16	13	84	27	19	13	31	18
8	36	26	38	18	16	12	120	26	23	34	26	17
9	34	26	34	18	16	12	143	25	28	39	64	17
10	30	30	32	17	16	12	136	26	23	31	67	15
11	28	30	29	17	16	13	111	27	20	30	49	15
12	28	32	26	17	15	13	99	37	18	26	42	15
13	25	53	25	17	15	13	87	39	17	22	38	15
14	24	102	23	17	15	12	99	34	16	21	36	15
15	25	108	22	25	15	12	123	30	15	23	34	15
16	24	87	21	*24	14	12	140	28	15	20	42	15
17	*30	71	21	25	14	12	146	26	15	18	32	15
18	75	59	19	25	14	12	154	24	*14	19	30	*17
19	108	51	18	24	14	13	154	23	13	18	30	17
20	87	44	18	24	*13	*14	143	21	13	74	40	17
21	78	42	*19	23	13	14	*129	21	13	123	51	16
22	108	42	17	22	13	14	126	20	13	81	38	17
23	93	37	17	22	13	14	*105	19	13	*111	32	22
24	81	32	16	21	13	14	84	19	16	87	30	22
25	74	29	16	21	14	13	70	18	21	68	28	19
26	63	28	16	19	13	13	61	17	26	56	27	19
27	54	27	16	19	13	13	54	16	23	48	25	17
28	48	26	16	18	13	13	50	*23	21	42	22	17
29	44	28	16	18	13	14	45	21	25	36	*21	16
30	42	30	16	17	-	15	42	22	22	32	19	15
31	50	-	17	17	-	23	-	36	-	26	21	-
Total	1,649	1,273	768	624	427	413	2,824	817	616	1,198	1,060	562
Mean	53.2	42.4	24.8	20.1	14.7	13.3	94.1	26.4	20.5	38.6	34.2	18.7
Cfsm	1.90	1.51	0.886	0.718	0.525	0.475	3.36	0.943	0.732	1.38	1.22	0.668
In.	2.19	1.69	1.02	0.83	0.57	0.55	3.75	1.09	0.82	1.59	1.41	0.75

Calendar year 1951: Max - Min - Mean - Cfsm - In. -
Water year 1951-52: Max 154 Min 12 Mean 33.4 Cfsm 1.19 In. 16.26

Peak discharge (base, 120 cfs).--Apr. 10 (3 a.m.) 150 cfs (4.90 ft); Apr. 18 (6 a.m.) 171 cfs (5.19 ft); July 21 (6 a.m.) 143 cfs (4.81 ft); July 23 (11 a.m.) 140 cfs (4.73 ft).
* Discharge measurement made on this day.

Manistique River at Germfask, Mich.

Location.--Lat 46°14'00", long. 85°55'40", in SE¼ sec. 4, T. 44 N., R. 13 W., on left bank 800 ft upstream from bridge on State Highway M-77, 1 mile south of Germfask, 1½ miles upstream from Grays Creek, and at mile 62.5.

Drainage area.--341 sq mi.

Records available.--March 1938 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 662.4 ft above mean sea level (levels by Michigan Department of Conservation). Prior to Dec. 14, 1938, staff gage at site 1,000 ft downstream at different datum.

Average discharge.--14 years, 448 cfs.

Extremes.--Maximum discharge during year, 1,170 cfs Apr. 19 (gage height, 5.18 ft); minimum, 213 cfs July 7 (gage height, 1.42 ft).
1938-52: Maximum discharge observed, 2,130 cfs Apr. 1, 1938 (gage height, 8.50 ft, site and datum then in use); minimum, 144 cfs Oct. 3, 1948 (gage height, 0.95 ft).

Remarks.--Records good except those for periods of ice effect, which are fair. Some regulation during low flow caused by Manistique Lake.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Sept. 17-30)

1.4	213
2.0	324
6.0	1,400

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	720	680	520	410	490	360	510	626	599	324	354	398
2	693	652	560	420	500	350	586	599	599	294	354	398
3	680	599	599	430	520	340	612	573	599	274	354	386
4	652	573	666	440	530	350	639	548	599	256	398	375
5	652	560	680	460	530	350	693	560	573	238	472	364
6	639	*599	666	470	520	350	693	548	535	230	485	354
7	612	573	666	490	510	350	720	535	485	222	485	354
8	586	535	666	490	500	350	802	522	472	238	460	344
9	573	522	652	490	500	350	886	510	522	294	460	344
10	535	522	626	480	490	360	886	498	510	294	510	354
11	522	535	599	480	490	360	830	498	386	284	498	344
12	498	535	460	470	490	350	858	535	354	294	460	344
13	485	599	410	460	480	350	858	560	324	304	422	334
14	472	693	390	480	460	350	858	573	294	284	410	354
15	472	747	390	500	430	354	942	548	284	314	398	398
16	472	747	390	*510	440	354	1,000	522	274	304	448	410
17	*498	747	380	510	450	354	1,060	510	304	284	472	398
18	573	700	370	520	450	354	1,110	498	*514	274	448	*398
19	693	640	370	520	450	354	1,170	485	294	274	422	398
20	720	640	*370	510	*450	*364	1,140	472	274	284	435	398
21	720	640	360	510	450	364	*1,090	460	256	398	510	386
22	886	600	350	500	440	364	1,030	460	238	510	522	386
23	942	580	340	480	430	350	1,000	448	230	*498	498	398
24	942	560	340	460	430	350	942	435	238	485	448	410
25	914	540	340	450	410	350	886	435	304	448	435	398
26	886	520	340	450	400	350	830	422	364	435	410	375
27	830	510	340	470	390	350	774	422	354	422	398	364
28	774	500	340	470	380	360	720	*422	334	398	*386	354
29	720	500	340	460	380	360	693	435	334	386	375	354
30	666	500	360	460	-	380	652	435	344	375	375	344
31	666	-	380	470	-	400	-	498	-	364	375	-
Total	20,693	17,848	14,260	14,720	13,390	11,032	25,470	15,592	11,591	10,283	13,477	11,216
Mean	668	595	460	475	462	356	849	503	386	332	435	374
Cfsm	1.96	1.74	1.35	1.39	1.35	1.04	2.49	1.48	1.13	0.974	1.28	1.10
In.	2.26	1.95	1.56	1.61	1.46	1.20	2.78	1.70	1.26	1.12	1.47	1.22

Calendar year 1951: Max 1,560 Min 213 Mean 515 Cfsm 1.51 In. 20.52
Water year 1951-52: Max 1,170 Min 222 Mean 491 Cfsm 1.44 In. 19.59

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 18 to Dec. 1, Dec. 13 to Mar. 14, Mar. 23-31.

Duck Creek near Blaney, Mich.

Location.--Lat 46°06'50", long. 86°04'50", in SE¼ sec. 17, T. 43 N., R. 14 W., on right bank 3 miles upstream from mouth and 7 miles west of Blaney.

Drainage area.--92 sq mi, approximately, including area from which flow is diverted to Duck Creek from Walsh and Marsh Creeks (watershed indeterminate because of swamps).

Records available.--March 1938 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 627 ft (from river-profile map). Prior to May 1939, staff gage at site 2¾ miles downstream at different datum.

Average discharge.--14 years, 94.4 cfs.

Extremes.--Maximum discharge during year, 692 cfs Apr. 10 (gage height, 8.54 ft); minimum, 15 cfs Sept. 30 (gage height, 1.92 ft).
1938-52: Maximum discharge observed, 1,740 cfs Apr. 26, 1939 (gage height, 11.70 ft, site and datum then in use); minimum, 4.0 cfs Sept. 7, 1947 (gage height, 1.45 ft).

Remarks.--Records good except those for periods of ice effect, which are fair. Records include flow from Walsh and Marsh Creeks which originates upstream from line between R. 14 W. and R. 15 W. and is diverted to Duck Creek through drainage canal about 3 miles upstream from station.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.8	14
2.2	30
3.0	81
5.0	264
9.0	760

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	212	237	130	70	56	42	60	125	87	42	34	42
2	202	227	140	72	56	41	70	103	86	37	32	37
3	188	180	150	68	56	41	75	89	85	34	29	34
4	174	150	155	68	56	40	90	82	80	32	56	32
5	178	120	140	66	54	40	110	79	71	28	83	29
6	174	110	135	62	54	40	130	76	64	26	78	28
7	160	*105	150	60	54	39	160	70	56	25	109	26
8	147	110	150	60	54	37	200	66	60	37	76	24
9	134	110	140	60	54	38	450	63	85	36	64	24
10	125	117	130	58	54	38	679	59	72	34	57	23
11	113	115	115	58	53	38	614	61	63	42	46	21
12	103	121	100	58	50	37	640	74	56	37	40	21
13	95	160	90	58	50	36	640	75	49	34	35	20
14	89	212	80	62	50	35	562	68	46	36	32	23
15	83	253	75	*76	48	34	575	63	43	47	32	26
16	*81	292	72	80	46	34	614	59	42	39	71	24
17	99	304	70	84	46	33	575	56	*51	34	73	22
18	138	280	65	84	46	*33	538	53	45	34	59	*30
19	202	248	*82	82	46	33	490	51	40	36	49	29
20	217	180	60	80	46	33	454	48	36	87	54	27
21	242	170	64	76	*46	33	418	45	33	134	97	24
22	334	160	60	74	45	33	*382	42	31	*109	87	23
23	430	150	58	72	44	34	334	37	29	93	65	24
24	466	130	55	70	43	35	304	35	32	75	54	23
25	430	120	54	70	44	35	270	34	43	65	48	21
26	382	110	54	65	43	35	237	32	63	62	43	20
27	334	105	54	62	43	36	207	*30	57	55	*40	18
28	298	105	54	60	43	36	183	35	48	51	38	17
29	270	110	54	59	43	37	165	32	51	47	36	16
30	242	120	54	58	-	40	147	32	48	42	34	15
31	242	-	60	57	-	48	-	58	-	37	35	-
Total	6,584	4,911	2,830	2,089	1,423	1,144	10,373	1,832	1,652	1,527	1,686	743
Mean	212	164	91.3	67.4	49.1	36.9	346	59.1	55.1	49.3	54.4	24.8
Cfsm	2.30	1.78	0.992	0.733	0.534	0.401	3.76	0.642	0.599	0.536	0.591	0.270
In.	2.66	1.99	1.14	0.84	0.58	0.46	4.19	0.74	0.67	0.62	0.68	0.30

Calendar year 1951: Max 930 Min 19 Mean 116 Cfsm 1.26 In. 17.09
Water year 1951-52: Max 679 Min 15 Mean 101 Cfsm 1.10 In. 14.87

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 3-11, Nov. 20 to Apr. 9 (no gage-height record Nov. 3-7, Nov. 27 to Dec. 19; discharge estimated on basis of 2 discharge measurements and records for nearby stations).

Manistique River near Blaney, Mich.

Location.--Lat 46°05'05", long. 86°03'35", in NE¼ sec. 33, T. 43 N., R. 14 W., on left bank 40 ft downstream from logging bridge, half a mile downstream from Duck Creek, 7 miles southwest of Blaney, and at mile 34.5.

Drainage area.--704 sq mi.

Records available.--March 1938 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 613 ft (from river-profile map). Prior to July 24, 1939, chain gage on downstream side of bridge 40 ft upstream at same datum.

Average discharge.--14 years, 839 cfs.

Extremes.--Maximum discharge during year, 3,100 cfs Apr. 11 (gage height, 16.53 ft); minimum, 366 cfs July 7 (gage height, 6.71 ft).
1938-52: Maximum discharge observed, 9,300 cfs Apr. 1, 1938 (gage height, 19.42 ft); minimum, 218 cfs Sept. 28 to Oct. 5, 1948; minimum gage height, 5.53 ft Oct. 3, 4, 1948.

Remarks.--Records good except those for periods of ice effect, which are fair. Slight regulation during summer low flow by Manistique Lake.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 31		Apr. 1 to Sept. 30	
7.6	547	6.7	366
9.0	845	9.0	837
12.0	1,620	15.0	2,440
15.0	2,740	17.0	3,380

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,380	1,620	1,200	820	760	580	840	1,190	883	590	528	569
2	1,380	1,560	1,220	820	780	570	1,020	1,070	954	548	508	590
3	1,300	1,410	1,250	810	800	560	1,130	978	930	508	498	569
4	1,220	1,280	1,300	820	820	550	1,250	930	906	460	569	528
5	1,220	1,180	1,380	830	820	560	1,400	906	883	423	745	528
6	1,280	1,120	1,350	840	820	560	1,550	883	837	389	791	498
7	1,250	*1,150	1,380	830	800	560	1,900	860	768	374	883	488
8	1,200	1,120	1,410	800	780	560	2,250	837	745	397	837	478
9	1,120	1,050	1,380	800	770	570	2,600	791	814	450	745	469
10	1,050	1,030	1,320	800	760	580	3,000	768	860	469	814	460
11	1,010	1,030	1,200	800	760	580	3,050	768	791	488	791	460
12	960	1,030	1,000	800	760	560	3,050	837	677	488	722	450
13	914	1,150	930	780	750	560	2,950	883	611	488	655	450
14	891	1,410	860	780	730	560	2,850	883	569	498	611	460
15	845	1,650	820	*790	690	560	2,900	860	528	528	590	508
16	*845	1,770	800	800	660	560	3,050	814	508	528	768	508
17	868	1,770	780	800	680	570	3,100	768	*528	498	860	528
18	1,010	1,680	760	800	680	*570	3,100	745	548	469	791	*569
19	1,380	1,500	*760	800	*680	570	3,050	722	528	460	699	569
20	1,560	1,400	750	800	680	580	2,950	699	488	528	677	569
21	1,620	1,400	750	800	680	580	2,850	699	469	837	860	548
22	1,940	1,400	740	800	680	580	*2,640	677	441	*1,000	906	548
23	2,500	1,350	730	770	660	600	*2,400	655	423	1,000	837	548
24	2,700	1,300	720	730	640	600	2,220	633	423	930	745	569
25	2,660	1,300	700	720	640	600	2,040	633	488	860	699	548
26	2,500	1,280	710	720	630	600	1,860	611	611	791	633	528
27	2,300	1,250	720	730	610	600	1,690	*611	699	699	590	508
28	2,060	1,250	730	740	600	600	1,540	611	633	655	*569	488
29	1,840	1,250	740	740	600	620	1,420	611	611	611	548	478
30	1,680	1,200	780	740	-	640	1,290	633	611	569	528	460
31	1,620	-	800	740	-	710	-	699	-	528	528	-
Total	46,103	39,890	29,970	24,350	20,720	18,050	66,940	24,265	19,765	18,061	21,525	15,471
Mean	1,487	1,330	967	785	714	582	2,231	783	659	583	694	516
Cfsm	2.11	1.89	1.37	1.12	1.01	0.827	3.17	1.11	0.936	0.828	0.986	0.733
In.	2.44	2.11	1.58	1.29	1.09	0.95	3.54	1.28	1.04	0.95	1.14	0.82

Calendar year 1951: Max 4,800 Min 429 Mean 1,077 Cfsm 1.53 In. 20.76
Water year 1951-52: Max 3,100 Min 374 Mean 943 Cfsm 1.34 In. 18.23

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 19 to Dec. 3, Dec. 11 to Apr. 7.

West Branch Manistique River near Manistique, Mich.

Location.--Lat 46°05'20", long. 86°09'40", in SE¼ sec. 27, T. 43 N., R. 15 W., on left bank 300 ft downstream from Stutts Creek and 10 miles northeast of Manistique.

Drainage area.--322 sq mi.

Records available.--April 1938 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 628 ft (from river-profile map). Prior to Apr. 14, 1939, chain gage at site 500 ft upstream at different datum.

Average discharge.--14 years, 418 cfs.

Extremes.--Maximum discharge during year, 2,390 cfs Apr. 21 (gage height, 9.30 ft); minimum, 150 cfs Sept. 30; minimum gage height, 2.35 ft Sept. 13.
1938-52: Maximum discharge, 5,300 cfs Apr. 29, 1939 (gage height, 12.9 ft); minimum, 71 cfs Oct. 3, 1948.

Remarks.--Records good except those for periods of ice effect, no gage-height record, or shifting control, which are fair.

Rating tables, water year 1951-52, except periods of ice effect and shifting-control (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 6		Apr. 7 to Sept. 30	
2.6	224	2.3	145
4.0	538	3.0	272
6.0	1,110	7.0	1,450
		10.0	2,740

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	488	712	590	310	270	240	320	880	400	328	212	214
2	500	698	600	320	280	235	340	790	460	305	201	205
3	488	620	600	320	290	230	380	715	500	272	192	201
4	464	560	616	310	290	235	420	655	500	248	236	196
5	452	520	656	310	300	240	480	625	470	230	276	191
6	440	500	698	310	300	230	580	580	450	214	305	184
7	416	490	726	310	290	225	700	552	400	203	328	179
8	404	*500	754	300	285	225	790	524	390	224	294	175
9	392	470	754	290	280	225	1,000	496	400	238	268	171
10	381	430	726	290	280	230	1,180	468	410	238	254	166
11	370	390	698	290	280	240	1,240	440	390	242	250	163
12	348	370	670	280	270	240	1,300	400	360	244	238	158
13	348	538	590	280	270	240	1,370	410	330	252	208	155
14	337	642	480	*280	260	240	1,330	430	310	276	207	158
15	326	754	440	280	250	245	1,410	440	290	305	199	163
16	315	810	420	290	250	245	1,570	430	*290	294	238	171
17	326	870	400	300	250	240	1,730	410	292	290	270	*177
18	*348	870	390	310	250	235	1,930	390	290	274	316	169
19	428	800	*380	300	*250	*240	2,170	370	305	254	340	164
20	476	720	370	290	250	245	2,290	355	290	290	340	161
21	538	670	370	290	250	250	2,380	345	279	364	316	163
22	698	670	360	290	250	250	*2,390	335	268	403	328	164
23	870	660	350	280	250	255	2,210	320	256	416	340	167
24	960	640	340	260	250	255	2,010	310	246	*390	328	169
25	1,050	630	340	260	245	265	1,810	300	246	352	290	171
26	1,080	620	340	270	240	270	1,610	*290	281	328	264	171
27	1,050	620	340	280	240	270	1,370	290	305	294	*248	167
28	930	600	330	280	240	270	1,210	295	316	272	236	161
29	810	600	320	280	240	280	1,090	290	316	250	222	155
30	754	580	310	270	-	290	970	300	328	234	212	150
31	726	-	310	270	-	300	-	340	-	222	208	-
Total	17,513	18,554	15,268	9,000	7,650	7,680	39,580	13,775	10,368	8,746	8,164	5,159
Mean	565	618	493	290	264	248	1,319	444	346	282	263	172
Cfsm	1.75	1.92	1.53	0.901	0.820	0.770	4.10	1.38	1.07	0.876	0.817	0.534
In.	2.02	2.14	1.76	1.04	0.88	0.89	4.57	1.59	1.20	1.01	0.94	0.60

Calendar year 1951: Max 4,130 Min 160 Mean 548 Cfsm 1.70 In. 23.09
Water year 1951-52: Max 2,390 Min 150 Mean 441 Cfsm 1.37 In. 18.64

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 3-11, Nov. 19 to Dec. 3, Dec. 14 to Apr. 6. Shifting-control method used Oct. 1-24, Sept. 18-30. No gage-height record Apr. 21, 22, May 11 to June 16; discharge estimated on basis of 3 discharge measurements and records for nearby stations.

Manistique River near Manistique, Mich.

Location.--Lat 46°01'50", long. 86°09'40", in SE¼ sec. 15, T. 42 N., R. 15 W., on left bank 1 mile downstream from West Branch, 6 miles northeast of Manistique, and at mile 19.5.

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

Records available.--March 1938 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 608 ft (from river-profile map). Prior to July 15, 1939, chain gage at site 1,600 ft upstream at different datum.

Average discharge.--14 years, 1,356 cfs.

Extremes.--Maximum discharge during year, 5,890 cfs Apr. 20-22; maximum gage height, 10.01 ft Apr. 20; minimum discharge, 568 cfs July 7 (gage height, 2.37 ft).
1938-52: Maximum discharge, 10,600 cfs Apr. 27, 1939 (gage height, 12.59 ft, present site and datum); minimum, 288 cfs Oct. 4, 1948; minimum gage height, 1.01 ft Aug. 23, 1941.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Slight regulation during summer low flow by Manistique Lake.

Revisions (water years).--W 1114: 1939(M).

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to July 21				July 22 to Sept. 30	
2.4	584	9.0	4,520	2.4	635
5.0	1,670	10.0	5,890	5.0	1,670
7.0	2,850				

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,260	2,640	2,000	1,200	1,120	840	1,150	2,260	1,280	980	810	862
2	2,260	2,570	2,000	1,200	1,130	820	1,400	2,020	1,520	920	792	900
3	2,200	2,380	2,100	1,200	1,190	810	1,600	1,820	1,570	842	758	862
4	2,080	2,140	2,200	1,200	1,200	800	1,800	1,670	1,570	766	845	828
5	2,020	1,970	2,200	1,200	1,200	800	2,100	1,620	1,470	692	1,160	792
6	1,970	1,820	2,260	1,220	1,200	800	2,400	1,570	1,370	638	1,240	775
7	1,970	*1,750	2,320	1,220	1,180	800	3,000	1,470	1,280	584	1,360	722
8	1,920	1,700	2,320	1,200	1,150	800	3,600	1,420	1,200	620	1,320	705
9	1,770	1,670	2,320	1,180	1,120	810	4,020	1,370	1,240	692	1,200	688
10	1,670	1,600	2,260	1,180	1,120	820	4,520	1,280	1,280	747	1,200	670
11	1,570	1,570	2,000	1,180	1,120	840	a5,200	1,240	1,240	785	1,200	670
12	1,470	1,570	1,700	1,180	1,100	820	a5,300	1,280	1,120	823	1,120	652
13	1,420	1,670	1,500	1,180	1,100	820	5,140	1,370	1,000	804	1,040	635
14	1,370	2,020	1,400	1,180	1,050	820	5,000	1,370	940	842	940	652
15	1,280	2,440	1,350	*1,180	1,000	820	5,000	1,370	861	900	880	705
16	*1,240	2,780	1,300	1,180	980	810	5,140	1,320	842	920	1,040	758
17	1,280	2,920	1,250	1,180	980	800	5,420	1,240	*842	880	1,240	775
18	1,420	2,850	1,220	1,180	*980	800	5,570	1,200	880	823	1,280	*792
19	1,870	2,600	1,200	1,180	980	*800	5,720	1,160	861	785	1,200	828
20	2,200	2,300	*1,200	1,170	980	810	5,890	1,120	823	861	1,160	810
21	2,440	2,200	1,180	1,100	980	820	5,890	1,080	766	1,370	1,240	792
22	2,850	2,250	1,160	1,150	960	820	5,890	1,040	710	*1,670	1,320	792
23	3,360	2,200	1,150	1,100	950	850	*5,570	1,000	674	1,670	1,320	810
24	3,840	2,100	1,130	1,080	930	850	5,000	960	674	1,570	1,200	810
25	4,020	2,100	1,100	1,050	910	850	4,520	940	728	1,440	1,120	810
26	4,020	2,100	1,110	1,050	900	850	4,110	920	920	1,320	1,000	810
27	3,840	2,050	1,120	1,020	880	850	3,680	*900	1,080	1,200	*940	775
28	3,600	2,000	1,150	1,070	860	850	3,200	920	1,080	1,120	880	740
29	3,200	2,000	1,170	1,070	850	880	2,850	900	1,000	1,000	845	705
30	2,850	1,900	1,200	1,090	-	920	2,570	940	1,000	940	810	670
31	2,710	-	1,200	1,100	-	1,020	-	1,040	-	862	792	-
Total	71,970	63,860	48,770	35,670	30,100	25,800	122,250	39,810	31,821	30,066	33,252	22,795
Mean	2,322	2,129	1,573	1,151	1,038	832	4,075	1,284	1,061	970	1,073	760
Cfsm	2.11	1.94	1.43	1.05	0.944	0.756	3.70	1.17	0.965	0.882	0.975	0.691
In.	2.43	2.16	1.65	1.21	1.02	0.87	4.13	1.35	1.08	1.02	1.12	0.77

Calendar year 1951: Max 9,980 Min 600 Mean 1,779 Cfsm 1.62 In. 21.96
Water year 1951-52: Max 5,890 Min 584 Mean 1,520 Cfsm 1.38 In. 18.81

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of records for nearby stations.
Note.--Stage-discharge relation affected by ice Nov. 7-10, Nov. 18 to Dec. 3, Dec. 11 to Apr. 7 (no gage-height record Dec. 16-19, Jan. 24 to Feb. 10, Feb. 19 to Mar. 18, Apr. 11, 12; discharge estimated on basis of weather records and records for nearby stations).

Indian River near Manistique, Mich.

Location.--Lat 45°59'30", long. 86°17'15", in NE¼ sec. 34, T. 42 N., R. 16 W., on shore of Indian Lake 20 ft south and 5 ft west of bridge on county road over outlet of Indian Lake.

Drainage area.--302 sq mi.

Records available.--March 1938 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 608.66 ft above mean sea level (levels by Michigan Department of Conservation). Prior to July 1942, chain gage on highway bridge 30 ft downstream at same datum. Auxiliary staff gage on right bank 1½ miles downstream read twice daily.

Average discharge.--14 years, 381 cfs.

Extremes.--Maximum discharge during year, 796 cfs Apr. 22-24 (gage height, 5.60 ft); minimum daily, 287 cfs July 7; minimum gage height, 3.58 ft Sept. 25.
1938-52: Maximum discharge, 1,550 cfs June 24, 1943 (gage height, 7.79 ft), from rating curve extended above 660 cfs on basis of computation of peak flow over dam; minimum daily, about 20 cfs Nov. 23, 1946 (caused by ice jams at outlet of Indian Lake); minimum gage height, 2.53 ft Nov. 13, 1950 (ice jam at outlet of Indian Lake above gage).

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Indian Lake regulated by needles in gate section of rock-filled timber dam 1½ miles below gage.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	449	629	526	431	390	334	350	700	423	376	415	420
2	461	612	514	435	400	334	350	686	427	376	404	412
3	465	594	526	438	400	334	360	661	442	343	390	412
4	477	b580	531	427	400	334	370	665	438	304	408	404
5	477	b570	526	427	390	337	390	651	442	303	423	397
6	500	b570	526	427	390	337	400	643	442	301	438	383
7	518	b560	543	412	390	329	400	604	431	287	438	374
8	518	b560	539	412	380	321	425	591	438	296	438	370
9	514	b560	b540	412	380	318	453	582	473	303	442	370
10	514	b560	b550	415	380	318	505	563	454	296	442	364
11	518	557	b550	412	380	318	522	551	442	317	438	364
12	501	562	b545	412	380	318	548	541	431	319	442	355
13	489	560	b535	400	380	318	573	524	435	314	438	355
14	489	597	522	400	370	318	601	507	427	318	427	355
15	485	597	509	415	360	321	599	512	423	315	427	364
16	477	597	514	412	350	324	607	500	*412	313	446	352
17	473	641	505	*408	350	*321	634	496	412	328	442	343
18	*485	622	497	410	340	321	673	484	393	318	425	*343
19	501	616	493	410	*340	329	700	468	397	320	435	338
20	496	616	*489	410	340	326	734	472	386	331	431	338
21	492	602	493	410	340	330	*761	457	376	392	442	338
22	536	607	493	400	343	330	796	446	367	422	427	329
23	553	602	477	390	343	330	796	435	367	458	431	327
24	596	583	477	380	346	320	796	438	364	*462	435	327
25	620	565	462	380	349	320	789	427	376	466	435	327
26	654	565	462	380	346	320	761	*412	373	462	*423	319
27	654	548	450	380	346	320	768	408	376	466	423	321
28	654	539	450	380	334	330	768	412	373	458	427	321
29	654	539	450	380	337	330	734	401	376	442	412	310
30	640	522	450	370	-	340	727	394	376	442	397	313
31	654	-	431	380	-	340	-	412	-	431	393	-
Total	16,514	17,432	15,575	12,555	10,574	10,120	17,890	16,043	12,292	11,279	13,244	10,645
Mean	533	581	502	405	365	326	596	518	410	364	427	355
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 979 Min 286 Mean 483 Cfsm 1.60 In. 21.70
Water year 1951-52: Max 796 Min 287 Mean 449 Cfsm 1.49 In. 20.22

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.
Note.--No gage-height record Jan. 18 to Feb. 18, Mar. 21 to Apr. 8; discharge estimated on basis of weather records, observer's notes, and records for nearby stations.

Escanaba River at Cornell, Mich.

Location.--Lat 45°54'40", long. 87°12'50", in sec. 32, T. 41 N., R. 24 W., on right bank 50 ft downstream from highway bridge, three-quarters of a mile northeast of Cornell, half a mile downstream from Bobs' Creek, and 15 miles upstream from mouth.

Drainage area.--870 sq mi.

Records available.--August 1903 to November 1912 (fragmentary), January 1913 to November 1915 (gage heights only), October 1950 to September 1952. Published as "near Escanaba" 1903-15.

Gage.--Water-stage recorder. Altitude of gage is 760 ft (by barometer). August 1903 to November 1915 chain gage at site 11 miles downstream at different datum.

Extremes.--Maximum discharge during year, 10,000 cfs Apr. 19 (gage height, 4.78 ft); minimum gage height, 5.19 ft Apr. 15 (ice jam); minimum discharge, 110 cfs Sept. 21 (gage height, 1.20 ft).

1950-52: Maximum discharge, that of Apr. 19, 1952; maximum gage height, that of Apr. 15, 1952; minimum discharge, 94 cfs Nov. 12, 1950 (gage height, 1.16 ft), but may have been less during period Oct. 1 to Nov. 10, 1950.

Remarks.--Records good except those for period of ice effect, which are fair. Diurnal fluctuation caused by Boney Falls powerplant 8 miles upstream from gage.

Rating table, water year 1951-52, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.3	160	3.0	3,000
1.6	370	4.0	6,400
1.9	700	4.8	10,000
2.5	1,700		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,250	1,710	790	520	460	420	1,000	1,740	769	1,520	540	322
2	1,930	1,440	829	510	470	360	1,400	1,600	1,010	1,230	578	374
3	1,890	1,420	858	510	460	410	1,500	1,490	1,110	989	397	*426
4	1,730	1,240	1,440	520	420	410	1,500	1,210	994	768	962	375
5	1,620	*1,090	1,510	520	470	400	1,450	1,260	749	715	1,790	368
6	1,540	912	1,370	490	460	400	1,380	1,150	723	395	1,740	418
7	1,420	921	1,330	490	460	400	1,320	804	666	504	1,640	245
8	1,320	921	1,330	500	440	400	1,500	700	439	784	1,440	285
9	1,230	948	1,080	500	450	360	2,100	784	621	1,120	1,390	339
10	1,080	877	980	490	450	390	2,500	728	850	1,360	809	302
11	1,080	792	940	470	440	390	2,700	728	688	1,990	938	310
12	1,040	639	740	470	430	380	2,900	1,030	402	2,480	882	316
13	908	1,470	680	470	450	380	3,000	2,060	434	2,200	848	300
14	706	2,200	680	490	450	380	3,000	2,180	444	2,190	626	238
15	*704	2,810	800	480	440	350	3,700	2,000	520	2,190	629	354
16	1,020	2,800	600	470	400	320	4,020	1,720	459	1,780	1,230	368
17	985	2,440	570	*470	380	350	4,360	1,450	1,340	1,450	825	*328
18	919	2,260	*590	*470	400	330	6,300	1,190	1,580	1,220	828	316
19	1,030	1,890	580	470	430	350	8,860	1,110	*1,310	1,130	822	310
20	1,080	1,550	570	460	430	330	*9,570	974	1,030	739	771	322
21	1,160	1,550	560	490	430	*330	8,320	912	754	*1,370	1,000	191
22	1,700	1,320	600	500	*430	340	7,180	813	530	2,380	1,080	338
23	2,610	1,200	630	490	430	310	6,420	767	661	2,690	1,060	326
24	2,510	879	580	480	440	350	5,220	717	506	2,250	601	366
25	2,200	829	560	480	400	370	4,320	510	468	1,700	460	376
26	1,800	997	510	480	440	380	3,300	516	1,080	1,630	*442	306
27	1,570	971	530	480	420	380	2,870	832	1,260	1,060	395	392
28	1,360	985	560	470	400	380	2,390	737	1,310	959	454	258
29	1,300	950	520	490	380	380	1,930	*805	1,250	1,010	415	248
30	1,220	962	520	500	-	370	1,920	748	1,420	876	631	318
31	1,350	-	530	460	-	600	-	985	-	618	478	-
Total	44,262	40,973	24,367	15,090	12,560	11,700	107,930	34,250	25,377	43,297	26,701	9,735
Mean	1,428	1,366	786	487	433	377	3,598	1,105	846	1,397	861	324
Cfsm	1.64	1.57	0.903	0.560	0.498	0.433	4.14	1.27	0.972	1.61	0.990	0.372
In.	1.89	1.75	1.04	0.65	0.54	0.50	4.61	1.46	1.08	1.85	1.14	0.42

Calendar year 1951: Max 8,760 Min 270 Mean 1,414 Cfsm 1.63 In. 22.07
Water year 1951-52: Max 9,570 Min 191 Mean 1,083 Cfsm 1.24 In. 16.93

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 10 to Apr. 15.

Iron River at Caspian, Mich.

Location.--Lat 46°03'31", long. 88°37'38", on line between SE¼ and SW¼ sec. 1, T. 42 N., R. 35 W., on downstream side of highway bridge in Caspian, 5¼ miles upstream from mouth.

Drainage area.--84 sq mi, approximately.

Records available.--March 1948 to September 1952.

Gage.--Wire-weight gage read twice daily. Altitude of gage is 1,450 ft (from topographic map).

Extremes.--Maximum discharge observed during year, 695 cfs July 23 (gage height, 8.59 ft); minimum observed, 50 cfs Mar. 8 (gage height, 3.81 ft).
1948-52: Maximum discharge observed, 695 cfs Apr. 8, 1951, July 23, 1952; maximum gage height observed, 8.59 ft July 23, 1952; minimum observed, 32 cfs June 12, 1949 (gage height, 3.47 ft).

Remarks.--Records good except those for periods of ice effect and shifting control, which are fair. Some ground water pumped from mines.

Rating tables, water year 1951-52, except periods of ice effect and shifting control (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 13		Nov. 14 to Sept. 30			
4.3	82	3.8	49	7.0	420
5.0	140	5.0	153	8.1	710
6.0	255	6.0	267		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	118	*103	92	79	b78	75	143	130	86	103	108	73
2	*114	101	90	b74	79	75	*125	120	81	*89	105	75
3	170	100	100	*b73	80	76	110	116	105	100	103	73
4	180	91	*105	b72	79	*76	102	112	94	87	168	*69
5	170	90	99	b72	*77	75	108	108	82	81	*153	67
6	140	87	97	b72	b74	76	112	*104	79	78	138	65
7	118	84	100	b72	75	75	125	100	77	86	125	62
8	110	87	96	b72	76	65	173	97	86	87	111	68
9	104	86	93	b72	75	75	315	98	94	79	111	62
10	101	85	81	76	77	78	231	99	84	84	106	62
11	96	85	85	81	74	70	189	109	77	173	100	56
12	96	93	82	81	75	69	168	109	75	148	96	60
13	93	118	93	79	75	75	153	102	78	116	93	63
14	90	173	87	79	75	68	153	97	79	102	91	67
15	90	173	83	83	b73	70	173	94	81	98	86	65
16	92	143	90	82	b72	67	255	91	111	90	86	63
17	93	130	86	84	b72	91	e410	87	109	99	87	63
18	91	112	76	82	b72	71	e590	87	88	94	79	64
19	92	114	75	82	b71	87	e650	87	81	138	79	63
20	90	112	72	79	71	75	*e565	83	76	163	79	65
21	96	102	b72	b76	71	75	e360	81	76	e330	78	63
22	135	102	b72	b75	73	68	303	81	76	e635	76	69
23	160	102	b72	b75	77	75	261	81	73	e695	75	73
24	122	102	b72	b74	75	75	219	84	70	*e465	75	70
25	106	94	b72	b74	78	70	189	86	75	e255	70	66
26	100	92	b72	b74	79	73	173	78	103	183	70	65
27	93	93	b72	b74	77	70	163	81	94	158	70	65
28	92	93	b72	b74	77	75	153	*84	94	134	67	63
29	91	93	79	b74	79	79	148	83	153	116	68	62
30	90	91	81	b74	-	79	138	86	116	116	73	59
31	106	-	83	b74	-	125	-	94	-	110	74	-
Total	3,438	3,131	2,601	2,364	2,186	2,353	6,957	2,949	2,653	5,292	2,900	1,960
Mean	111	104	83.9	76.3	75.4	75.9	232	95.1	88.4	171	93.5	65.3
Cfsm	1.32	1.24	0.999	0.908	0.898	0.904	2.76	1.13	1.05	2.04	1.11	0.777
In.	1.52	1.39	1.15	1.05	0.97	1.04	3.08	1.31	1.17	2.34	1.28	0.87

Calendar year 1951: Max 680 Min 50 Mean 112 Cfsm 1.33 In. 18.03
Water year 1951-52: Max 695 Min 56 Mean 106 Cfsm 1.26 In. 17.17

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.
e Shifting-control method used.

Brule River near Florence, Wis.

Location.--Lat 45°57'30", long. 88°15'55", in SE¼ sec. 11, T. 41 N., R. 32 W., Michigan meridian, on left bank 40 ft upstream from highway bridge, 1 mile upstream from Paint River, 3½ miles north of Florence, and 6 miles upstream from confluence with Michigamme River.

Drainage area.--380 sq mi.

Records available.--January 1914 to February 1916, June 1944 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 1,200 ft (from topographic map). Prior to Aug. 29, 1944 , wire-weight or chain gages at bridge 40 ft downstream.

Average discharge.--9 years (1914-15, 1944-52), 342 cfs.

Extremes.--Maximum discharge during year, 2,110 cfs July 24 (gage height, 4.66 ft); maximum gage height, 7.1 ft Nov. 19 or 20 (ice jam); minimum, 247 cfs Sept. 30 (gage height, 2.11 ft).
1914-16, 1944-52: Maximum discharge, 2,480 cfs June 26, 1946 (gage height, 4.93 ft); maximum gage height, 7.25 ft Mar. 20, 1945 (ice jam); minimum discharge, 155 cfs Aug. 16, 22, 1949; minimum gage height, 1.86 ft Aug. 27, Sept. 13, 1948.

Remarks.--Records excellent except those for periods of ice effect or no gage-height record, which are good. Some ground water pumped from mines at Iron River.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.1	243
2.5	420
3.0	725
4.0	1,470
5.0	2,550

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*571	499	400	315	320	295	580	541	453	487	470	319
2	535	430	400	320	310	300	*559	499	410	426	464	314
3	680	390	400	320	305	*305	481	475	547	*420	442	*297
4	930	360	*430	325	*305	305	431	453	559	405	764	297
5	916	370	500	325	300	295	436	*436	464	351	*965	284
6	784	390	365	325	290	295	431	426	415	328	853	280
7	673	390	365	325	290	295	464	415	375	365	770	280
8	583	390	365	*325	300	300	602	405	370	464	640	276
9	529	390	351	320	300	305	846	405	442	395	577	276
10	493	390	370	320	290	310	874	400	410	505	517	269
11	458	400	360	315	285	310	758	448	365	738	470	269
12	436	410	350	320	290	310	680	499	346	660	436	265
13	420	500	320	310	300	310	628	487	328	511	405	262
14	405	692	330	310	290	310	571	442	346	481	385	265
15	415	692	330	320	300	310	640	420	365	453	370	269
16	405	602	310	315	300	310	832	410	442	415	365	265
17	415	541	320	320	290	310	1,150	390	523	390	356	258
18	410	520	320	310	290	300	1,430	370	458	390	342	258
19	415	500	310	310	280	300	*1,740	365	395	410	332	258
20	410	470	300	310	290	305	1,940	361	351	589	332	258
21	420	480	310	300	300	310	1,890	356	342	1,040	342	258
22	565	480	310	310	300	300	1,560	351	328	1,430	337	262
23	666	450	320	315	295	280	1,270	351	319	2,000	328	276
24	595	420	310	320	290	310	1,040	351	310	*2,110	314	273
25	523	430	300	325	300	320	888	356	375	1,700	302	269
26	487	430	300	325	300	325	777	356	415	1,150	297	262
27	453	420	300	325	300	330	706	361	395	846	297	250
28	436	430	300	310	295	330	660	*395	380	699	297	250
29	426	440	300	305	290	350	621	390	595	595	302	250
30	431	430	300	305	-	400	583	395	577	547	310	247
31	517	-	310	315	-	500	-	470	-	499	319	-
Total	16,402	13,736	10,556	9,815	8,595	9,835	26,068	12,779	12,400	21,799	13,700	8,116
Mean	529	458	341	317	296	317	869	412	413	703	442	271
Cfsm	1.39	1.21	0.897	0.834	0.779	0.834	2.29	1.08	1.09	1.85	1.16	0.713
In.	1.61	1.34	1.03	0.96	0.84	0.96	2.55	1.25	1.21	2.13	1.34	0.79

Calendar year 1951: Max 2,290 Min 160 Mean 480 Cfsm 1.26 In. 17.14
Water year 1951-52: Max 2,110 Min 247 Mean 448 Cfsm 1.18 In. 16.01

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 2-13, Nov. 18 to Dec. 5, Dec. 11 to Apr. 1 (no gage-height record Nov. 19 to Dec. 3, Dec. 19-25).

Paint River at Crystal Falls, Mich.

Location.--Lat 46°06'20", long. 88°20'05", in SE¼ sec. 20, T. 43 N., R. 32 W., on right bank 150 ft downstream from municipal powerplant at Crystal Falls and 13 miles upstream from mouth.

Drainage area.--616 sq mi.

Records available.--August 1944 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 1,306.1 ft above mean sea level (Wisconsin-Michigan Power Co. benchmark).

Average discharge.--8 years, 563 cfs.

Extremes.--Maximum discharge during year, 5,960 cfs Apr. 20 (gage height, 7.21 ft); minimum, 19 cfs May 30 (gage height, 1.12 ft); minimum daily, 234 cfs Sept. 13.
1944-52: Maximum discharge, 7,400 cfs May 7, 1950 (gage height, 8.10 ft); minimum, 7.7 cfs Sept. 17, 1950 (gage height, 0.89 ft); minimum daily, 81 cfs Nov. 1, 1947.

Remarks.--Records excellent. Diurnal fluctuation caused by powerplant immediately above station.

Rating table, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)

2.0	202	4.0	1,630
2.5	416	5.0	2,760
3.0	750	8.0	7,230

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,780	*848	619	422	411	346	*675	972	585	802	545	336
2	1,580	678	619	422	380	350	788	885	551	*705	498	*311
3	1,580	585	*654	*416	385	337	728	802	551	626	487	310
4	1,730	592	870	411	395	*350	661	735	545	558	*647	305
5	1,630	626	916	400	*395	345	633	682	493	487	1,020	301
6	1,380	626	848	390	374	339	612	*654	462	439	996	301
7	1,200	626	810	390	380	332	640	619	428	416	862	289
8	1,050	640	795	395	369	335	742	572	416	433	720	289
9	956	619	750	390	380	337	956	551	480	462	690	284
10	848	640	626	400	380	334	1,130	558	462	598	765	280
11	780	647	633	406	380	332	1,090	532	428	807	742	268
12	735	690	457	395	364	346	1,060	565	406	915	720	246
13	682	926	457	395	374	336	980	578	380	765	675	234
14	668	1,460	487	395	380	346	940	578	355	661	605	246
15	654	1,830	474	390	360	336	1,000	551	390	599	545	249
16	661	1,680	451	395	385	323	1,380	578	433	538	462	249
17	698	1,400	433	400	375	346	2,330	532	647	532	457	249
18	705	1,110	433	400	374	318	4,160	519	619	558	416	238
19	675	952	433	406	367	336	*5,210	487	506	458	400	242
20	661	832	428	400	366	327	5,810	468	451	640	374	242
21	675	892	428	390	365	341	5,360	462	411	1,100	359	265
22	870	892	433	395	365	341	4,760	462	385	1,530	350	284
23	1,240	674	433	411	374	332	4,010	428	355	2,350	331	310
24	1,240	585	439	406	355	305	2,760	439	341	2,510	305	289
25	1,110	605	422	406	368	332	2,100	457	406	1,900	297	293
26	988	654	422	406	361	346	1,730	439	619	1,400	310	276
27	900	578	406	406	364	359	1,530	428	661	1,070	293	265
28	832	585	411	411	359	341	1,330	*488	690	869	289	257
29	758	633	411	411	364	359	1,200	512	980	720	283	257
30	728	612	411	416	-	359	1,080	477	956	661	293	246
31	832	-	416	411	-	492	-	605	-	592	317	-
Total	30,826	24,717	16,825	12,487	10,849	10,658	57,385	17,615	15,392	26,701	16,053	8,218
Mean	994	824	543	403	374	344	1,913	568	513	861	518	274
Cfsm	1.61	1.34	0.881	0.654	0.607	0.558	3.11	0.922	0.833	1.40	0.841	0.445
In.	1.86	1.49	1.02	0.75	0.65	0.64	3.46	1.06	0.93	1.61	0.97	0.50

Calendar year 1951: Max 5,300 Min 250 Mean 906 Cfsm 1.47 In. 19.94
Water year 1951-52: Max 5,810 Min 234 Mean 677 Cfsm 1.10 In. 14.94

* Discharge measurement made on this day.

Michigamme River near Crystal Falls, Mich.

Location.--Lat 46°06'50", long. 88°12'55", in NW¼ sec. 20, T. 43 N., R. 31 W., on right bank 400 ft upstream from highway bridge, 4½ miles downstream from Way Dam, 6 miles east of Crystal Falls, and 16 miles upstream from confluence with Brule River.

Drainage area.--670 sq mi.

Records available.--August 1944 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 1,300 ft (from topographic map).

Average discharge.--8 years, 695 cfs.

Extremes.--Maximum discharge during year, 2,230 cfs Oct. 3 (gage height, 6.49 ft); minimum, 82 cfs Sept. 27 (gage height, 1.62 ft); minimum daily, 119 cfs Sept. 4.
1944-52: Maximum discharge, 5,590 cfs May 13, 1950, May 5, 1951; maximum gage height, 9.45 ft May 5, 1951; minimum discharge, 69 cfs Jan. 14, 1950 (gage height, 1.31 ft); minimum daily, 71 cfs Nov. 26, 1950.

Remarks.--Records excellent. Flow regulated by Way Reservoir and by powerplant at Way Dam since December 1949.

Rating table, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)

2.0	107	4.0	635
2.5	179	5.0	1,170
3.0	290	6.0	1,830
3.5	434	7.0	2,660

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,030	*1,170	1,080	1,050	1,070	830	714	363	645	730	730	445
2	1,870	987	1,080	1,050	730	855	679	343	755	*730	730	466
3	*1,970	780	*1,080	*1,050	705	930	334	354	755	730	730	174
4	2,030	780	805	1,050	680	905	151	372	730	635	755	*119
5	1,580	780	805	1,050	*730	905	143	433	730	530	780	335
6	1,650	755	805	1,050	730	880	145	*467	705	510	705	705
7	1,410	755	805	1,050	730	880	136	780	567	607	730	705
8	1,220	755	855	1,050	730	880	128	780	486	730	730	705
9	1,080	755	1,080	1,080	730	855	136	780	620	660	730	705
10	1,080	755	1,080	1,200	730	855	317	780	705	708	730	705
11	970	755	1,080	1,200	705	855	334	780	705	855	730	705
12	840	755	1,080	1,200	705	855	335	805	705	1,050	705	705
13	1,020	780	1,080	1,200	705	830	159	805	705	805	705	705
14	855	1,100	1,080	1,150	705	830	445	780	705	780	705	705
15	755	1,890	1,080	1,200	865	830	730	780	705	755	705	705
16	830	1,530	1,080	1,200	1,050	805	780	780	730	755	705	680
17	1,020	1,380	1,080	1,200	1,050	805	830	780	730	730	576	680
18	1,200	1,380	1,080	1,200	1,050	780	855	830	730	730	580	680
19	1,200	1,380	1,080	1,200	1,050	666	880	1,050	730	755	705	705
20	1,100	1,380	1,080	1,200	1,050	654	855	1,020	705	652	705	680
21	780	1,350	1,080	1,170	1,020	730	1,320	1,020	641	722	680	680
22	1,100	1,110	1,080	1,170	1,020	705	2,030	990	510	1,030	680	680
23	1,350	1,110	1,080	1,170	1,020	658	1,820	765	621	1,230	672	670
24	1,260	1,080	1,080	1,170	1,020	570	1,350	1,020	705	*1,170	452	405
25	1,140	948	1,080	1,170	1,020	473	1,150	1,020	705	1,200	565	399
26	1,140	849	1,080	1,170	988	550	805	990	730	1,200	680	382
27	1,140	990	1,080	1,170	830	555	805	990	730	1,140	680	395
28	1,080	990	1,080	1,170	830	498	805	*990	661	755	680	400
29	990	960	1,050	1,140	830	502	708	930	550	755	680	402
30	990	1,020	1,050	1,140	-	502	377	755	441	730	622	391
31	1,140	-	1,020	1,140	-	498	-	755	-	730	466	-
Total	37,820	31,009	32,035	35,410	25,078	22,926	20,256	24,087	20,142	25,099	21,028	16,818
Mean	1,220	1,034	1,033	1,142	865	740	675	777	671	810	678	561
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 5,590 Min 441 Mean 1,045 Cfsm 1.56 In. 21.18
Water year 1951-52: Max 2,030 Min 119 Mean 852 Cfsm 1.27 In. 17.30

* Discharge measurement made on this day.

Menominee River near Florence, Wis.

Location.--Lat 45°57'04", long. 88°11'13", in NE¼ sec. 16, T. 41 N., R. 31 W., on left bank half a mile downstream from confluence of Brule and Michigamme Rivers and 3½ miles northeast of Florence.

Records available.--July 1950 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 1,120 ft (from topographic map).

Extremes.--Maximum discharge during year, 10,400 cfs Apr. 21 (gage height, 9.77 ft); minimum, 58 cfs Sept. 15 (gage height, 1.28 ft); minimum daily, 394 cfs Sept. 14.
1950-52: Maximum discharge, 12,100 cfs Apr. 13, 1951 (gage height, 10.46 ft); minimum, 57 cfs Sept. 18, 1950 (gage height, 1.28 ft); minimum daily, 220 cfs Feb. 4, 1951.

Remarks.--Records excellent except those for period Dec. 13 to Mar. 31, which are good. Diurnal fluctuation caused by powerplants upstream.

Rating table, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)

2.3	390	6.0	3,790
3.0	775	8.0	6,840
4.0	1,580	10.0	10,860

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*4,410	3,220	2,180	1,800	2,190	1,890	*2,420	1,850	1,250	2,270	2,080	448
2	4,060	*2,700	1,590	*1,960	1,090	1,110	2,470	1,500	2,160	2,340	2,010	1,330
3	4,590	2,000	2,170	2,200	940	*1,830	2,100	1,370	2,320	*2,580	807	1,210
4	4,940	1,220	*2,290	2,280	*2,120	1,870	1,730	1,360	2,180	1,380	*2,450	*1,560
5	5,050	1,830	2,480	2,310	2,160	1,740	1,560	*1,460	1,740	1,280	3,710	1,580
6	4,680	2,250	2,780	1,350	2,220	1,730	1,380	1,830	1,710	968	3,200	1,550
7	3,680	2,230	2,640	2,110	2,370	1,910	1,860	2,080	1,420	1,920	3,230	556
8	2,980	2,270	2,350	2,190	2,490	1,820	2,110	1,400	1,170	2,060	2,270	1,380
9	2,740	2,030	1,480	2,330	1,260	630	2,210	1,660	2,000	1,950	2,070	1,470
10	2,560	1,500	2,270	2,140	968	1,840	2,360	1,670	1,980	2,180	1,400	1,470
11	2,420	1,380	2,270	2,130	2,470	2,210	2,570	984	1,680	2,910	2,190	1,410
12	2,520	2,430	2,200	2,160	2,530	1,990	2,210	1,810	1,720	4,070	2,460	1,330
13	2,440	2,770	2,150	1,710	2,300	1,840	1,920	1,740	1,720	2,870	2,150	773
14	1,520	3,510	1,730	1,890	2,360	1,700	2,570	1,890	1,120	2,450	2,050	394
15	1,950	4,230	2,160	2,130	2,150	1,650	2,450	1,720	865	2,290	2,000	1,080
16	2,590	4,640	1,550	2,000	2,160	675	2,650	1,860	1,910	2,020	1,940	1,080
17	2,500	3,850	2,000	2,220	1,430	1,890	3,830	1,540	1,960	2,060	790	1,410
18	2,620	2,620	1,880	2,010	2,380	1,970	6,890	679	1,970	1,960	1,790	1,460
19	2,460	2,740	2,000	1,980	2,200	2,190	*8,290	1,700	1,920	2,030	2,130	1,340
20	2,240	2,840	2,170	1,630	2,190	1,760	8,260	1,790	2,030	1,670	1,830	1,290
21	1,620	3,240	2,190	1,980	2,180	2,010	9,520	1,740	1,290	2,940	1,820	570
22	3,150	2,260	2,090	2,100	2,040	1,420	8,530	1,700	1,050	4,640	1,810	1,280
23	3,270	2,450	1,550	2,200	2,270	941	7,220	1,870	1,510	6,510	1,630	1,240
24	3,320	2,750	1,980	2,200	1,030	1,550	5,880	1,270	1,560	6,880	649	1,150
25	3,070	1,660	1,610	2,110	1,890	1,420	3,850	961	1,780	5,580	1,620	1,160
26	2,940	2,060	1,980	2,140	1,950	1,600	3,450	1,560	1,560	4,220	1,660	975
27	2,630	2,290	2,030	1,690	1,850	1,790	2,400	1,740	1,760	3,490	1,570	803
28	1,650	1,800	2,110	2,180	1,750	1,680	2,870	1,350	1,550	3,280	1,620	413
29	2,560	2,250	2,150	2,340	1,590	1,430	3,060	*1,780	1,710	2,460	1,580	1,210
30	2,520	2,270	1,720	2,300	-	1,110	2,390	1,080	2,420	2,050	1,420	1,200
31	2,760	-	1,780	2,180	-	2,440	-	2,090	-	2,300	651	-
Total	92,440	75,290	63,530	63,950	56,528	51,636	111,010	49,034	51,015	87,608	58,587	34,122
Mean	2,982	2,510	2,049	2,063	1,949	1,666	3,700	1,582	1,700	2,826	1,890	1,137
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 11,300 Min 220 Mean 2,673 Cfsm - In. -
Water year 1951-52: Max 9,520 Min 394 Mean 2,171 Cfsm - In. -

* Discharge measurement made on this day.

Menominee River at Twin Falls, near Iron Mountain, Mich.

Location.--Lat 45°52'20", long. 88°04'10", in sec. 12, T. 40 N., R. 31 W., Michigan meridian at powerplant of Wisconsin-Michigan Power Co., 3½ miles north of city of Iron Mountain, 4 miles upstream from Pine River, and at mile 106.6.

Drainage area.--1,790 sq mi, approximately.

Records available.--January 1914 to September 1952.

Gage.--Head and tail gages and generation data entered hourly in daily log sheet by company employees.

Average discharge.--38 years, 1,798 cfs.

Extremes.--Maximum daily discharge during year, 10,300 cfs Apr. 21; minimum daily, 966 cfs Sept. 28.
1914-52: Maximum daily discharge, 16,700 cfs Apr. 23, 24, 1916; minimum daily, 154 cfs Aug. 9, 1925.

Remarks.--Records good. Discharge determined from powerhouse records computed on basis of load-discharge rating of hydroelectric units as developed by Geological Survey in 1932-33 and taintor-gate ratings based on theoretical formulas. Flow regulated by powerplant at which station is located and also by plants on Brule and Michigamme Rivers and by Michigamme Reservoir on Michigamme River (capacity, 5.225 billion cu ft).

Cooperation.--Records of daily discharge furnished by Wisconsin-Michigan Power Co.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4,350	3,420	2,220	1,950	1,940	1,780	2,290	2,120	1,580	2,740	2,320	1,100
2	5,080	2,450	2,080	2,170	1,740	1,450	2,310	2,030	2,060	2,660	1,970	1,330
3	5,470	2,200	2,190	2,170	1,350	1,880	2,500	1,420	2,480	2,710	1,810	1,390
4	5,220	1,540	2,370	2,210	1,410	2,030	2,080	1,360	2,490	1,910	2,410	1,400
5	5,340	2,080	2,520	2,190	2,100	1,790	1,670	1,540	2,260	1,460	3,580	1,400
6	4,300	2,260	2,940	1,700	2,370	1,840	1,520	1,560	1,950	1,400	3,590	1,340
7	3,550	2,300	2,840	2,050	2,430	1,640	2,070	1,750	1,610	1,600	3,250	1,220
8	2,690	2,250	2,240	2,230	2,420	1,630	2,200	1,690	1,440	2,360	2,600	1,430
9	2,920	2,150	2,000	2,220	1,780	1,250	2,410	1,740	1,830	2,230	2,230	1,430
10	2,570	1,820	2,350	2,350	1,410	1,690	2,430	1,610	1,980	2,280	1,570	1,400
11	1,980	1,520	2,340	2,260	1,950	1,780	2,470	1,490	1,920	3,010	2,360	1,370
12	1,910	2,180	2,350	2,240	2,390	2,020	2,350	1,870	1,910	4,510	2,400	1,260
13	1,600	3,020	2,330	1,880	2,410	1,750	2,330	1,720	1,810	3,660	2,590	1,240
14	1,480	3,770	2,220	2,160	2,450	1,850	2,440	1,760	1,440	2,540	2,280	1,240
15	1,670	4,640	1,820	2,220	2,300	1,450	2,470	1,710	1,250	2,560	2,180	1,300
16	2,180	4,780	1,630	2,150	2,060	1,480	2,460	1,800	1,500	2,410	1,960	1,200
17	2,140	4,240	1,910	2,160	1,710	1,860	3,880	1,650	1,950	2,220	1,650	1,180
18	2,190	2,830	2,100	2,180	2,260	1,760	7,290	1,240	2,200	2,190	1,780	1,120
19	2,420	2,700	2,100	2,100	2,360	1,900	9,190	1,550	2,210	2,100	1,990	1,210
20	2,360	2,810	2,130	1,730	2,260	2,030	9,170	1,740	2,150	2,060	1,900	1,200
21	2,310	3,440	2,200	2,080	2,300	1,980	10,300	1,740	1,630	3,020	1,830	1,070
22	2,390	2,170	2,160	2,290	2,230	1,700	8,890	1,760	1,290	5,280	1,740	1,180
23	2,990	2,740	1,840	2,190	2,200	1,570	7,440	1,730	1,540	6,890	1,720	1,160
24	3,320	2,980	1,830	2,210	1,690	1,610	6,280	1,590	1,500	7,360	1,400	1,210
25	3,140	2,060	1,700	2,160	2,020	1,460	3,830	1,390	1,960	5,950	1,620	1,220
26	2,940	2,050	2,050	2,100	1,890	1,510	3,680	1,400	1,910	4,330	1,640	1,220
27	2,710	2,290	2,190	1,790	1,730	1,470	2,670	1,530	1,840	3,600	1,650	1,150
28	2,230	2,160	2,290	2,190	1,590	1,730	2,410	1,650	1,450	3,410	1,680	966
29	2,490	2,150	2,050	2,310	1,680	1,650	3,080	1,620	1,840	2,620	1,760	1,030
30	2,590	2,410	1,820	2,270	-	1,530	2,860	1,440	2,420	2,520	1,590	1,080
31	2,930	-	1,970	2,210	-	2,090	-	2,240	-	2,350	1,130	-
Total	91,460	79,410	66,780	66,120	58,430	53,160	116,970	51,440	55,400	95,940	64,180	37,046
Mean	2,950	2,647	2,154	2,133	2,015	1,715	3,899	1,659	1,847	3,095	2,070	1,235
Cfsm	1.65	1.48	1.20	1.19	1.13	0.958	2.18	0.927	1.03	1.73	1.16	0.690
In.	1.90	1.65	1.38	1.37	1.22	1.10	2.43	1.07	1.15	1.99	1.34	0.77

Calendar year 1951: Max 10,800 Min 754 Mean 2,724 Cfsm 1.52 In. 20.65
Water year 1951-52: Max 10,300 Min 966 Mean 2,285 Cfsm 1.28 In. 17.37

Pine River at Pine River powerplant, near Florence, Wis

Location.--Lat 45°49'40", long. 88°14'55", in sec. 28, T. 39 N., R. 18 E., at powerplant of Wisconsin-Michigan Power Co., 5.0 miles downstream from Popple River and 6.5 miles south of Florence.

Drainage area.--528 sq mi, revised.

Records available.--October 1923 to September 1952.

Gage.--Powerplant equipment consists of 2 water wheels, 7 taintor gates each 14 ft wide, 1 log chute 7.5 ft wide, operation head 93 ft.

Average discharge.--29 years (1923-52), 425 cfs.

Extremes.--Maximum daily discharge during year, 2,440 cfs Apr. 21, minimum daily, 123 cfs Feb. 24.
1923-52: Maximum daily discharge, 4,380 cfs Apr. 9, 1929; no flow at times in 1924, 1926, 1927, 1930, 1931, 1933, 1940.

Remarks.--Records good except those above 700 cfs, which are fair. Daily discharge determined from powerplant records. Flow regulated by powerplant at station, but pondage is small and monthly discharge is very nearly natural flow.

Cooperation.--Records of daily discharge computed by Wisconsin-Michigan Power Co. on basis of load-discharge rating of hydroelectric units as developed by Geological Survey and gate ratings based on theoretical formulas.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	949	624	364	208	208	208	377	924	772	481	420	312
2	724	416	364	312	208	174	551	804	714	416	390	312
3	819	312	560	235	273	265	559	624	679	416	312	312
4	1,020	377	569	208	208	182	529	624	744	390	569	312
5	984	305	468	208	208	208	464	624	670	426	1,120	208
6	1,060	403	520	208	312	208	519	624	598	312	1,080	312
7	944	338	520	208	208	208	507	624	494	312	975	208
8	829	424	520	208	208	208	580	624	511	520	855	208
9	724	338	442	312	312	195	899	520	520	624	744	296
10	624	312	364	208	169	182	847	520	624	624	606	195
11	624	364	364	208	208	208	785	520	534	624	624	208
12	520	494	312	312	290	208	845	674	416	624	522	182
13	494	520	312	195	208	208	667	864	443	624	443	208
14	416	774	208	208	208	219	602	784	442	624	437	169
15	442	864	208	312	208	208	766	729	455	624	364	208
16	448	784	156	208	208	182	1,080	624	699	624	364	208
17	440	624	156	208	272	208	1,440	624	858	495	377	182
18	440	546	208	312	208	247	1,750	624	771	393	468	182
19	520	494	208	208	282	208	2,100	602	676	378	312	169
20	468	416	208	303	182	208	2,360	494	611	520	312	175
21	520	494	208	208	208	208	2,440	455	396	1,080	312	182
22	759	560	312	260	208	208	2,360	481	416	2,150	331	179
23	864	364	208	195	208	208	2,140	429	364	1,660	312	195
24	864	312	208	208	123	182	1,820	403	416	1,730	312	208
25	750	312	282	208	303	208	1,670	481	488	1,410	208	208
26	624	364	208	303	208	208	1,500	448	520	1,270	208	208
27	624	312	296	208	208	277	1,340	448	624	977	312	208
28	607	335	208	208	272	208	1,280	448	520	695	208	130
29	589	361	208	303	208	208	1,190	494	572	624	208	208
30	520	390	208	208	-	295	944	520	537	611	208	182
31	520	-	312	208	-	282	-	624	-	490	312	-
Total	20,739	13,533	9,689	7,306	6,534	6,634	34,911	18,282	17,084	22,748	14,225	6,474
Mean	669	451	313	236	225	214	1,164	590	569	734	459	216
Cfsm	1.27	0.854	0.593	0.447	0.426	0.405	2.20	1.12	1.08	1.39	0.869	0.409
In.	1.46	0.95	0.68	0.51	0.46	0.47	2.46	1.29	1.20	1.60	1.00	0.46

Calendar year 1951: Max 3,440 Min 52 Mean 589 Cfsm 1.12 In. 15.13
Water year 1951-52: Max 2,440 Min 123 Mean 487 Cfsm 0.922 In. 12.54

Menominee River near Pembine, Wis.

Location.--Lat 45°35'25", long. 87°46'35", in sec. 21, T. 37 N., R. 28 W., Michigan meridian, on left bank 700 ft upstream from Pemene Creek, 4 miles west of Nathan, Mich., 15 miles southeast of Pembine, and at mile 65.3.

Drainage area.--3,240 sq mi, approximately.

Records available.--November 1949 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 745 ft (from river-profile map).

Extremes.--Maximum discharge during year, 17,100 cfs Apr. 22 (gage height, 10.50 ft); maximum gage height, 11.52 ft Dec. 23 (backwater from ice); minimum discharge, 994 cfs Sept. 14 (gage height, 1.88 ft).
1949-52: Maximum discharge, 21,100 cfs Apr. 14, 1951 (gage height, 11.84 ft); minimum that of Sept. 14, 1952.

Remarks.--Records good except those for period of ice effect or no gage-height record, which are fair. Flow partially regulated by 10 powerplants and Michigamme Reservoir (capacity, 5.225 billion cu ft) above station.

Rating table, water year 1951-52, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.4	1,470	7.0	8,460
3.0	2,110	8.0	10,500
4.0	3,380	9.0	12,800
5.0	4,900	11.0	18,600
6.0	6,550		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7,300	4,740	6,920	2,620	2,900	2,300	3,050	5,060	3,520	3,950	3,800	2,060
2	6,730	4,900	5,220	2,660	2,900	2,260	3,600	4,100	a3,800	3,730	3,520	2,450
3	*7,680	4,260	3,730	2,680	2,850	2,240	3,700	3,590	a4,500	3,800	3,030	2,570
4	7,880	2,960	3,380	2,700	2,500	2,220	3,760	3,100	a3,900	3,520	3,310	2,280
5	8,260	2,960	4,020	2,700	2,450	2,220	3,800	2,830	a3,500	2,900	5,380	2,330
6	7,680	2,960	3,950	2,700	2,480	2,220	3,800	2,900	a3,300	2,160	6,730	2,110
7	6,730	3,030	4,580	2,720	2,560	2,220	3,950	3,450	a2,900	2,220	6,920	2,000
8	4,800	3,380	4,020	2,750	2,660	2,200	4,900	3,240	a3,100	2,830	5,700	1,940
9	5,240	3,380	*3,450	2,780	2,700	2,100	5,540	2,960	2,830	3,100	5,220	1,730
10	4,900	3,310	3,310	2,800	2,660	2,020	6,550	2,960	2,700	3,520	3,880	2,160
11	4,420	2,900	3,240	2,800	2,550	2,180	6,200	3,100	2,900	4,420	3,450	2,110
12	3,660	2,450	3,150	2,800	2,520	2,400	5,700	3,100	3,030	6,550	3,950	2,220
13	3,170	4,100	3,050	2,800	2,520	2,440	5,540	3,030	2,900	8,850	4,260	2,160
14	3,170	5,380	2,900	2,800	2,680	2,400	5,540	3,450	2,900	7,150	3,520	1,780
15	2,900	7,300	2,700	2,800	2,800	2,250	5,700	3,520	2,450	6,200	3,520	1,620
16	2,960	7,490	2,560	2,800	2,800	2,140	6,030	3,310	2,060	5,220	3,240	2,000
17	3,030	7,300	2,520	2,800	2,760	2,100	6,920	2,900	3,030	5,220	3,310	1,510
18	3,730	6,200	2,540	2,800	2,640	2,160	10,700	2,760	3,590	4,020	2,900	2,060
19	3,880	3,800	2,600	2,800	2,560	2,340	14,400	2,900	3,590	3,880	2,830	1,940
20	4,100	4,580	2,650	2,750	2,700	2,380	15,600	*2,830	3,240	3,520	2,830	1,890
21	3,380	4,900	2,700	2,700	2,860	2,380	15,600	2,760	3,170	5,380	2,900	1,620
22	5,060	4,740	2,780	2,600	2,840	2,380	16,800	2,700	2,640	9,080	3,030	1,780
23	5,540	3,800	2,820	2,520	2,780	2,340	15,000	2,700	2,390	13,900	*2,700	1,730
24	6,030	5,080	2,800	2,560	2,650	2,300	12,000	2,700	2,330	14,700	2,450	1,890
25	6,200	6,550	2,500	2,600	2,500	2,260	10,000	2,570	2,390	13,600	2,510	1,840
26	5,540	7,300	2,500	2,660	2,450	2,220	8,400	2,510	3,100	10,300	2,220	1,730
27	5,380	9,190	2,520	2,680	2,400	2,180	7,300	2,450	*3,240	7,680	2,160	1,620
28	4,330	9,050	2,550	2,560	2,380	2,220	5,700	2,330	2,900	6,370	2,280	1,680
29	3,590	8,850	2,580	2,520	2,360	2,500	5,380	2,390	2,760	5,540	2,330	1,730
30	4,740	8,070	2,600	2,650	-	2,660	5,540	2,570	3,100	4,580	2,390	1,780
31	3,730	-	2,600	2,850	-	2,800	-	3,030	-	3,730	2,390	-
Total	155,740	154,910	99,440	83,960	76,410	71,030	226,780	93,800	91,760	181,620	108,660	58,320
Mean	5,024	5,164	3,208	2,708	2,635	2,291	7,559	3,026	3,059	5,859	3,505	1,944
Cfsm	1.55	1.59	0.990	0.836	0.813	0.707	2.33	0.934	0.944	1.81	1.08	0.600
In.	1.79	1.77	1.14	0.96	0.88	0.82	2.60	1.08	1.05	2.09	1.24	0.67

Calendar year 1951: Max 20,800 Min 1,250 Mean 4,517 Cfsm 1.39 In. 18.92
Water year 1951-52: Max 16,800 Min 1,510 Mean 3,832 Cfsm 1.18 In. 16.09

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of Chalk Hill powerplant records 8.5 miles downstream.
Note.--Stage-discharge relation affected by ice Dec. 12 to Apr. 6 (no gage-height record during most of period; discharge estimated on same basis as "a" above).

Pike River at Amberg, Wis.

Location.--Lat 45°29'50", long. 87°59'40", in SW¼ sec. 15, T. 35 N., R. 20 E., on left bank 500 ft upstream from Chicago, Milwaukee, St. Paul & Pacific Railroad bridge, 0.2 mile south of Amberg, and 1.2 miles downstream from confluence of North and South Branches.

Drainage area.--253 sq mi.

Records available.--February 1914 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 865 ft above mean sea level (from survey level line along railroad). Prior to May 23, 1931, chain gage at railway bridge at datum 1 ft higher. May 23, 1931, to Aug. 5, 1934, chain gage at highway bridge three-quarters of a mile downstream at different datum.

Average discharge.--38 years, 225 cfs.

Extremes.--Maximum discharge during year, 1,080 cfs July 22 (gage height, 4.77 ft); minimum, 96 cfs Sept. 27 (gage height, 1.74 ft).
1914-52: Maximum discharge observed, 2,730 cfs Apr. 10, 1922 (gage height, 7.68 ft, site and datum then in use), from rating curve extended above 1,100 cfs; minimum observed, 26 cfs Dec. 27, 1925 (gage height, 1.30 ft, site and datum then in use).

Remarks.--Records good except those for period of ice effect, which are fair.

Revisions (water years).--W 699: 1927. W 804: Drainage area.

Rating table, water year 1951-52, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.7	90	3.5	588
2.0	144	4.0	760
2.5	279	5.0	1,200
3.0	432		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	297	246	201	167	144	143	327	312	315	163	170	131
2	267	234	201	167	145	142	420	297	273	154	168	125
3	*279	232	217	166	146	141	463	282	255	178	163	121
4	306	226	243	166	146	140	463	270	229	196	223	121
5	297	217	243	165	147	140	463	258	201	170	282	118
6	270	237	229	164	147	139	494	a250	196	149	261	116
7	246	243	232	164	147	138	572	a246	180	140	249	112
8	229	212	240	163	147	*136	653	a240	173	166	226	112
9	217	226	234	162	147	136	800	a238	178	186	215	116
10	209	193	209	161	147	136	780	a238	173	163	201	121
11	201	215	215	160	147	137	653	a250	158	151	183	118
12	196	229	201	160	147	137	604	333	151	149	170	123
13	193	342	190	159	147	137	525	330	156	158	161	119
14	190	525	170	157	147	138	448	297	170	201	156	118
15	190	604	150	156	147	138	540	279	170	217	156	118
16	190	525	150	155	147	139	706	261	183	a215	161	129
17	193	423	150	154	147	140	860	243	178	a200	156	127
18	212	364	150	153	147	140	966	229	166	a180	146	119
19	234	358	150	153	146	140	1,040	217	151	170	138	110
20	240	318	155	153	146	141	988	*212	146	209	144	102
21	261	306	160	151	146	142	860	204	136	382	156	99
22	423	267	166	150	146	143	760	198	136	740	142	105
23	540	300	170	148	145	145	670	196	136	800	140	118
24	478	345	170	146	145	146	588	193	140	723	*131	116
25	395	376	170	144	145	148	510	193	186	540	125	112
26	336	351	169	143	145	150	448	190	*276	423	121	107
27	291	333	168	142	145	154	401	186	282	345	123	100
28	261	273	168	*142	145	160	373	193	229	291	116	109
29	246	258	168	142	144	170	351	193	201	234	118	107
30	240	255	167	143	-	190	327	206	176	204	119	105
31	246	-	167	143	-	232	-	297	-	188	131	-
Total	8,373	9,233	5,773	4,799	4,237	4,558	18,053	7,531	5,700	8,385	5,151	3,454
Mean	270	308	186	155	146	147	602	243	190	270	166	115
Cfsm	1.07	1.22	0.735	0.613	0.577	0.581	2.38	0.960	0.751	1.07	0.656	0.455
In.	1.23	1.36	0.85	0.71	0.62	0.67	2.65	1.11	0.84	1.23	0.76	0.51

Calendar year 1951: Max 1,870 Min 93 Mean 273 Cfsm 1.08 In. 14.69
Water year 1951-52: Max 1,040 Min 99 Mean 233 Cfsm 0.921 In. 12.54

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of record for Pine River near Florence.
Note.--Stage-discharge relation affected by ice Dec. 13 to Mar. 30.

Menominee River below Koss, Mich.

Location.--Lat 45°21'50", long. 87°39'20", in sec. 9, T. 34 N., R. 27 W., Michigan meridian, on left bank at powerplant of Wisconsin Public Service Corp., 0.5 mile upstream from Little Cedar River, 3.6 miles southeast from Koss, and at mile 24.7.

Drainage area.--3,790 sq mi, approximately.

Records available.--July 1913 to September 1952.

Gage.--Head and tail gages and generation data entered hourly in daily log sheet by company employees.

Average discharge.--39 years, 3,162 cfs.

Extremes.--Maximum daily discharge, 14,700 cfs Apr. 21, minimum daily, 1,600 cfs Sept. 22. 1913-52: Maximum daily discharge, 23,200 cfs Apr. 23, 25, 1916; minimum daily, 162 cfs Sept. 15, 1931.

Remarks.--Records fair. Daily discharge computed on basis of average daily load and load-discharge rating of combined hydroelectric units. Flow regulated by 13 powerplants and Michigamme Reservoir (capacity, 5.225 billion cu ft) above station.

Cooperation.--Records of daily discharge furnished by Wisconsin Public Service Corp.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7,930	3,610	3,650	2,880	2,580	2,290	3,190	5,600	3,780	3,440	3,530	2,380
2	6,340	4,690	3,680	2,600	2,590	2,160	3,730	4,440	3,160	3,720	3,660	2,040
3	6,380	4,450	3,680	2,500	2,690	1,750	4,400	4,590	3,980	3,750	3,410	2,190
4	7,010	3,420	4,250	2,760	2,710	2,790	4,720	3,980	4,690	3,690	3,100	2,670
5	7,260	2,790	3,810	2,590	2,700	2,160	5,160	3,520	3,820	3,420	4,460	2,500
6	7,260	2,810	4,630	2,580	2,620	2,520	5,180	3,280	3,710	2,840	5,150	2,850
7	6,720	3,140	4,170	2,600	2,590	2,520	4,900	3,120	3,610	2,010	5,570	2,200
8	5,680	3,210	4,370	2,790	2,690	2,310	5,450	3,420	2,810	2,220	5,720	1,820
9	4,540	3,330	4,190	2,680	2,690	2,230	8,070	3,390	2,730	2,980	5,030	2,460
10	5,630	3,500	3,630	2,530	2,690	2,490	7,070	3,290	2,800	3,370	4,930	2,020
11	4,790	3,350	3,240	2,800	2,690	1,940	7,260	2,970	2,870	3,590	3,610	1,730
12	4,800	2,980	2,480	2,790	2,780	1,940	6,860	3,360	2,880	4,060	3,480	2,540
13	3,370	3,090	2,280	2,880	2,800	2,610	6,260	3,590	3,110	6,740	3,950	2,020
14	3,130	4,990	2,640	2,880	2,640	2,600	6,580	3,300	3,020	6,020	3,770	2,210
15	3,260	6,000	2,960	2,520	2,600	2,540	6,600	3,480	2,780	5,760	3,400	2,400
16	3,190	7,520	2,410	2,520	2,720	2,310	6,540	3,760	2,500	5,320	3,480	1,870
17	3,030	6,920	2,510	2,840	2,840	2,200	7,210	3,770	2,450	4,480	3,240	1,660
18	3,450	6,470	2,400	2,810	2,760	2,280	8,450	2,910	3,160	4,730	3,280	1,680
19	4,040	5,690	2,500	2,920	2,720	2,170	10,900	3,140	3,640	3,660	2,870	1,780
20	4,140	4,350	2,660	2,920	2,760	2,720	13,800	3,090	3,550	3,770	2,840	2,050
21	4,790	4,730	2,680	2,880	2,690	2,480	14,700	2,940	3,130	3,820	3,000	2,090
22	4,650	5,270	2,610	2,880	2,690	2,320	14,500	2,690	3,250	5,370	3,210	1,600
23	6,250	4,280	2,820	2,800	2,830	2,210	14,500	2,920	2,690	9,490	3,050	1,820
24	6,080	3,410	2,720	2,590	2,880	2,290	13,000	2,870	2,260	12,800	2,590	2,050
25	6,280	3,150	2,720	2,690	2,690	2,160	11,000	2,690	2,650	13,400	2,300	2,400
26	6,180	3,150	2,320	2,780	2,470	2,320	8,900	2,860	2,690	12,100	2,590	1,820
27	5,540	3,400	2,400	2,780	2,500	2,240	7,470	2,690	3,500	9,720	2,300	1,800
28	5,460	3,450	2,590	2,580	2,460	2,160	6,240	2,590	3,600	6,820	1,950	1,650
29	4,510	3,370	2,690	2,630	2,300	2,470	5,030	2,590	3,230	5,740	2,100	1,860
30	4,240	3,600	2,730	2,510	-	2,670	4,650	2,400	2,920	4,980	2,340	1,940
31	5,240	-	2,760	2,580	-	2,890	-	3,660	-	4,050	2,220	-
Total	161,170	124,120	95,180	84,090	77,370	72,720	232,320	102,900	94,970	167,860	106,130	62,100
Mean	5,199	4,137	3,070	2,713	2,668	2,346	7,744	3,319	3,166	5,415	3,424	2,070
Cfsm	1.37	1.09	0.810	0.716	0.704	0.619	2.04	0.876	0.835	1.43	0.903	0.546
In.	1.58	1.22	0.93	0.83	0.76	0.71	2.28	1.01	0.93	1.65	1.04	0.61

Calendar year 1951: Max 19,000 Min 1,240 Mean 4,329 Cfsm 1.14 In. 15.50
Water year 1951-52: Max 14,700 Min 1,600 Mean 3,773 Cfsm 0.996 In. 13.55

Menominee River near McAllister, Wis.

Location.--Lat 45°19'20", long. 87°39'40", in sec. 17, T. 33 N., R. 23 E., on right bank 400 ft above highway bridge, 2¼ miles downstream from Little Cedar River, 2.9 miles east of McAllister, 14.5 miles east of Wausaukee, and at mile 22.3.

Drainage area.--4,020 sq mi, approximately.

Records available.--March 1945 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 630 ft (from river-profile map).

Average discharge.--7 years, 3,328 cfs.

Extremes.--Maximum discharge observed during year, 19,300 cfs Apr. 23 (gage height, 15.98 ft) and July 25 (gage height, 15.96 ft); minimum discharge, 1,330 cfs Aug. 24 (gage height, 8.13 ft); minimum daily, 1,580 cfs Sept. 28.
1945-52: Maximum discharge, 25,700 cfs Apr. 15, 1951 (gage height, 17.83 ft); minimum observed, 538 cfs Oct. 6, 1946 (gage height, 7.29 ft).

Remarks.--Records good. Flow is partly regulated by 14 powerplants and Michigamme Reservoir (capacity, 5.225 billion cu ft) above station.

Rating table, water year 1951-52, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

8.4	1,580	12.0	7,750
8.7	1,910	13.0	10,000
9.0	2,270	14.0	12,800
10.0	3,820	16.0	19,300
11.0	5,680		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10,000	4,720	4,090	3,050	2,900	2,550	3,700	6,480	3,000	3,480	4,090	2,550
2	*8,190	5,200	4,180	2,950	2,950	2,500	4,400	5,470	3,820	4,000	4,360	2,340
3	8,190	4,700	4,270	2,950	3,000	2,500	4,900	4,720	4,000	4,090	4,000	2,340
4	9,070	3,700	4,270	2,950	3,000	2,550	5,300	4,180	4,910	4,000	3,650	2,700
5	8,850	3,200	4,450	2,950	3,000	2,700	5,600	3,820	4,540	3,740	4,540	2,410
6	9,520	3,250	4,540	2,950	3,000	2,750	5,700	3,480	4,000	2,920	6,080	2,700
7	8,410	3,500	5,480	3,000	3,000	2,750	5,800	3,400	4,000	2,080	7,750	2,080
8	7,310	3,650	4,270	3,000	3,000	2,650	7,750	3,820	3,160	2,140	7,750	1,740
9	4,910	3,800	*4,630	3,000	3,000	2,600	12,200	3,820	3,650	3,160	6,680	2,410
10	5,880	4,000	4,540	3,050	3,000	2,500	10,000	3,650	2,850	3,400	5,880	2,020
11	4,910	3,910	3,600	3,080	3,000	2,500	9,520	3,320	2,920	3,820	4,450	1,860
12	4,910	2,850	2,900	3,100	3,000	2,500	9,070	3,650	3,160	4,270	4,000	2,140
13	3,910	3,400	2,500	3,150	3,000	2,700	8,190	4,000	3,650	7,880	4,270	2,020
14	3,400	5,750	2,900	3,050	3,000	2,800	8,190	3,650	3,650	9,070	4,540	2,200
15	3,320	7,970	3,300	3,000	3,000	2,750	7,750	3,910	3,160	7,100	4,000	2,410
16	2,020	9,760	2,800	3,050	3,000	2,650	8,850	4,180	2,550	6,680	4,000	1,960
17	3,240	8,400	2,700	3,100	3,050	2,600	9,290	4,090	2,550	5,480	4,000	1,740
18	3,740	7,400	2,750	3,150	3,100	2,550	10,400	3,400	3,480	5,580	4,360	1,740
19	4,450	6,300	2,800	3,200	3,100	2,650	14,000	2,850	3,820	4,540	3,480	1,800
20	4,820	4,450	2,900	3,200	3,050	2,800	17,600	*3,400	4,180	4,090	3,400	1,960
21	5,200	5,290	3,000	3,200	3,050	2,800	18,600	3,400	3,240	4,720	3,320	2,080
22	5,100	5,380	3,000	3,150	3,050	2,700	18,900	2,920	3,320	7,130	3,480	1,690
23	7,100	3,560	3,050	3,100	3,000	2,600	18,900	3,080	3,000	12,000	*3,320	1,860
24	7,750	4,090	3,050	3,050	3,000	2,550	17,100	a3,120	2,410	17,300	2,800	1,960
25	8,190	4,720	2,950	3,050	2,950	2,550	14,200	a3,100	2,620	18,900	2,620	2,140
26	7,750	3,400	2,700	3,000	2,850	2,500	11,100	a3,100	2,920	18,600	3,080	1,860
27	6,890	4,540	2,700	3,000	2,750	2,500	8,810	a3,000	*3,820	a13,000	2,620	1,800
28	6,680	4,360	2,850	2,950	2,700	2,550	7,730	a2,900	3,820	a9,800	2,140	1,580
29	5,100	4,450	3,000	2,900	2,650	2,700	6,740	2,920	3,560	7,750	2,200	1,910
30	4,720	4,090	3,050	2,900	-	3,000	6,480	3,080	2,920	6,480	2,480	1,960
31	5,480	-	3,100	2,900	-	3,300	-	4,180	-	5,100	2,410	-
Total	189,010	143,790	106,320	94,130	86,150	82,300	296,770	114,090	102,680	212,300	125,750	61,960
Mean	6,097	4,793	3,430	3,036	2,971	2,655	9,892	3,680	3,423	6,848	4,056	2,065
Cfsm	1.52	1.19	0.853	0.755	0.739	0.660	2.46	0.915	0.851	1.70	1.01	0.514
In.	1.75	1.33	0.98	0.87	0.80	0.76	2.74	1.05	0.95	1.96	1.16	0.57

Calendar year 1951: Max 25,700 Min 1,500 Mean 5,265 Cfsm 1.31 In. 17.77
Water year 1951-52: Max 18,900 Min 1,580 Mean 4,413 Cfsm 1.10 In. 14.92

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of record for Meneminee River below Koss, Mich.

Note.--Discharge computed from once-daily wire-weight gage readings Nov. 7-13, Nov. 20 to Apr. 16, May 29 to June 27. Stage-discharge relation affected by ice Nov. 3-9, 17-19, Dec. 11 to Apr. 7.

Wheeler Lake near Lakewood, Wis.

Location.--Lat 45°19', long. 88°29', in sec. 27, T. 33 N., R. 16 E., on southwest shore of lake at Berglund's Resort, 3½ miles east of Lakewood.

Drainage area.--2 sq mi, approximately.

Records available.--August 1936 to September 1952 (fragmentary).

Gage.--Staff gage. Prior to Apr. 19, 1939, gage was located at Chas. J. Vogts' across the lake.

Extremes.--Maximum elevation observed during year, 95.95 ft Mar. 9; minimum observed, 95.28 ft Dec. 10.
1936-52: Maximum elevation observed, 96.50 ft Oct. 5, Nov. 9, 1943; minimum observed, 93.45 ft Feb. 5, 1950.

Remarks.--Gage heights have been reduced to elevations above datum assumed for this lake by Public Service Commission of Wisconsin. No outlet.

Elevation in feet, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-	-	-					-	5.75	5.72	5.70	5.68
2	5.31	5.38	-					-	5.75	5.73	5.70	5.66
3	-	-	-					-	5.74	5.74	5.70	5.64
4	-	-	-					-	5.74	5.76	5.71	5.63
5	-	-	-					-	-	5.75	5.73	5.61
6	-	-	-					-	5.73	5.74	5.72	5.60
7	-	-	5.32					-	5.73	5.73	5.72	5.58
8	-	-	-					-	5.72	5.72	5.71	5.56
9	-	5.32	-			5.95		-	5.72	5.72	5.70	5.56
10	-	-	5.28					-	5.71	5.71	5.69	5.55
11	-	-	-					-	5.70	5.70	5.68	5.55
12	5.30	-	-					-	5.70	5.69	5.67	5.54
13	-	-	-					-	5.69	5.67	5.66	5.53
14	-	-	-					-	5.68	5.65	5.66	5.51
15	-	-	-					-	5.68	5.65	5.66	5.50
16	-	5.40	-					-	5.68	5.64	5.78	5.49
17	-	-	-					-	5.67	5.63	5.84	5.48
18	-	-	-					-	5.67	5.63	5.82	5.47
19	5.38	-	-					5.80	5.65	5.65	5.82	5.45
20	-	-	-					5.78	5.64	5.65	5.84	5.44
21	-	-	-					5.78	5.64	5.66	5.82	5.42
22	-	-	-					5.77	5.63	5.77	5.80	5.41
23	-	5.36	-					5.77	5.65	5.75	5.79	5.40
24	-	-	-					5.77	5.66	5.73	5.77	5.40
25	-	-	-					5.77	5.68	5.75	5.76	5.39
26	5.40	-	-					5.75	5.70	5.77	5.74	5.38
27	-	-	-					5.75	5.70	5.78	5.73	5.37
28	-	-	-					5.74	5.70	5.76	5.72	5.36
29	-	-	-					5.74	5.72	5.75	5.71	5.35
30	-	5.32	-					5.75	5.71	5.74	5.70	5.34
31	-	-	-					5.75	-	5.72	5.70	-

Note.--Add 90 ft to obtain elevation above datum assumed for this lake by the Public Service Commission of Wisconsin.

Boot Lake near Townsend, Wis.

Location.--Lat 45°15', long. 88°39', in sec. 9, T. 32 N., R. 15 E., on pier of Pine Ridge Lodge at north end of Lake, 5½ miles southwest of Townsend and 6 miles southwest of Lakewood.

Drainage area.--1.5 sq mi, approximately.

Records available.--August 1936 to September 1952 (fragmentary).

Gage.--Staff gage.

Extremes.--Maximum elevation observed during year, 96.27 ft Apr. 18; minimum observed, 95.44 ft Oct. 2.
1936-52: Maximum elevation observed, 98.25 ft June 28, 1943; minimum observed, 93.82 ft Oct. 6, 1949.

Remarks.--Gage heights have been reduced to elevations above datum assumed for this lake by Public Service Commission of Wisconsin. No outlet.

Elevation, in feet, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-							6.23	-	-	-	-
2	5.44							-	6.19	-	-	-
3	-							-	-	-	-	-
4	5.56							-	-	-	-	-
5	-							-	6.15	-	-	-
6	-							-	-	-	6.00	5.85
7	-							6.17	-	-	-	-
8	-							-	-	-	-	5.79
9	-	5.52						-	-	-	-	-
10	-		5.70					-	-	-	-	-
11	-							-	-	-	-	-
12	-							-	-	-	5.98	-
13	-							6.15	-	-	-	-
14	-							6.17	6.12	-	-	-
15	-							-	-	-	6.10	-
16	-							-	-	-	-	-
17	-							-	-	-	-	-
18	5.59						6.27	-	-	-	-	-
19	5.60							6.13	-	-	-	-
20	-							6.12	6.02	6.02	-	-
21	-							-	-	-	6.07	-
22	-							-	-	-	-	-
23	5.54							-	-	-	-	-
24	-							-	-	-	-	-
25	-							-	-	-	-	-
26	-							-	-	-	-	5.58
27	5.52							-	-	5.97	-	-
28	-							-	-	-	6.03	-
29	-							-	-	-	-	-
30	-							6.09	-	-	-	-
31	5.56						-	-	-	-	5.95	-

Note.--Add 90 ft to obtain datum assumed for this lake by the Public Service Commission of Wisconsin.

Oconto River near Gillett, Wis.

Location.--Lat 44°52', long. 88°18', in sec. 34, T. 28 N., R. 18 E., on left bank just upstream from highway bridge, 2 miles upstream from Christy Brook, 2 miles south of Gillett, and at mile 29.

Drainage area.--678 sq mi.

Records available.--June 1906 to March 1909, January 1914 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 735 ft (from river-profile map). Prior to March 1909, chain gage on bridge at datum 4.0 ft lower. Jan. 6, 1914, to Aug. 24, 1938, chain gage on bridge at present datum.

Average discharge.--39 years (1908, 1914-52), 583 cfs.

Extremes.--Maximum daily discharge during year, 2,500 cfs Apr. 3; maximum gage height, 9.95 ft Apr. 2 (backwater from ice); minimum, 268 cfs Sept. 21, 22, 30 (gage height, 0.83 ft).

1906-9, 1914-52: Maximum discharge observed, 8,400 cfs Apr. 10, 1922 (gage height, 11.2 ft), caused by failure of dam at Pulcifer, 4 miles above station; minimum, 93 cfs Nov. 26, 1941 (gage height, 0.13 ft); flow retarded by anchor ice above station.

Remarks.--Records excellent except those for periods of ice effect, which are fair.

Revisions (water years).--W 384: Drainage area. W 1207: 1922.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.8	257
1.4	510
2.0	820
3.0	1,440
5.0	3,110

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*684	765	740	410	390	360	1,050	904	684	710	443	338
2	684	738	770	410	390	360	1,500	875	738	684	429	334
3	820	684	780	400	400	360	2,500	792	684	710	411	334
4	1,140	660	790	400	400	350	2,200	765	608	710	402	326
5	1,260	650	792	400	410	350	2,000	738	534	738	424	319
6	1,170	640	765	400	410	350	1,900	684	515	765	447	311
7	1,110	640	765	390	410	*351	1,870	658	486	658	438	300
8	1,020	650	*738	390	410	350	1,710	658	486	633	443	300
9	932	660	738	390	410	350	1,710	658	530	608	438	300
10	820	700	710	390	410	360	1,790	633	534	584	424	292
11	710	770	633	400	400	370	1,830	608	500	544	406	285
12	658	820	600	400	400	370	1,830	633	490	520	384	282
13	633	792	550	410	400	380	1,750	658	490	500	367	274
14	608	961	510	420	400	390	1,670	658	486	490	359	274
15	584	1,080	470	440	390	390	1,630	684	510	510	363	271
16	584	1,200	450	470	390	400	1,590	710	608	481	433	271
17	584	1,260	430	490	380	410	1,630	684	658	452	495	271
18	633	1,260	420	490	380	430	1,710	633	608	433	584	271
19	684	1,200	410	480	380	450	1,790	608	520	429	539	271
20	738	1,100	410	470	370	480	1,870	584	466	490	471	271
21	820	1,000	410	450	370	540	1,910	*554	447	554	471	268
22	1,020	860	410	430	370	580	1,870	539	443	658	*466	274
23	1,140	790	410	400	370	540	1,790	505	424	765	443	278
24	1,340	760	410	400	370	520	1,670	481	402	875	411	285
25	1,440	740	410	400	370	500	1,510	510	495	932	389	292
26	1,370	730	410	400	370	500	1,370	530	*684	932	371	288
27	1,230	720	410	400	370	500	1,260	505	738	848	350	278
28	1,080	710	410	390	360	520	1,170	471	765	658	334	278
29	961	720	410	*388	360	580	1,080	452	792	559	330	274
30	875	730	410	390	-	700	990	490	765	495	326	271
31	820	-	410	390	-	840	-	584	-	466	330	-
Total	28,152	24,990	16,981	12,888	11,240	13,931	50,150	19,446	17,090	19,391	12,921	8,681
Mean	908	833	548	416	388	449	1,672	627	570	626	417	289
Cfsm	1.34	1.23	0.808	0.614	0.572	0.662	2.47	0.925	0.841	0.923	0.615	0.426
In.	1.54	1.37	0.93	0.71	0.62	0.76	2.76	1.07	0.94	1.06	0.71	0.48

Calendar year 1951: Max 4,050 Min 255 Mean 714 Cfsm 1.05 In. 14.30
Water year 1951-52: Max 2,500 Min 268 Mean 644 Cfsm 0.950 In. 12.95

Peak discharge (base, 1,500 cfs).--Apr. 2 (4:30 p.m.) discharge unknown (9.95 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 4-11, Nov. 19 to Dec. 4, Dec. 12 to Apr. 6.

Suamico River at Suamico, Wis.

Location.--Lat 44°38', long. 88°04', in NW¼ sec. 22, T. 25 N., R. 20 E., at highway bridge, 0.5 mile west of Suamico, 3.0 miles upstream from mouth, and 7.5 miles north of Green Bay.

Drainage area.--62 sq mi, approximately.

Records available.--June 1951 to July 1952 (discontinued).

Gage.--Staff gage. Altitude of gage is 585 ft (from Lake Michigan stage).

Extremes.--Maximum discharge observed during period, 2,340 cfs Mar. 31 (gage height, 6.10 ft); maximum gage height, 7.10 ft Mar. 22 (backwater from ice); minimum, 1.4 cfs July 29-31 (gage height, 0.80 ft).
June 1951 to July 1952: Maximums those of 1952; minimum discharge, 1.4 cfs Aug. 2-5, 1951, and July 29-31, 1952.
Maximum stage known since at least 1920, 12 ft (discharge not determined), from road flooding as indicated by local resident.

Remarks.--Records good except those for periods of ice effect, which are fair.

Rating table, Oct. 1, 1951, to July 31, 1952, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.7	0.8	1.4	36	3.0	476
.8	2.3	1.7	78	4.0	1,000
.9	4.0	2.0	134	6.0	2,270
1.0	6.5	2.3	204		
1.2	18	2.6	302		

Discharge, in cubic feet per second, period October 1951 to July 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.6	15	18	10	10	6.6	2,000	6.2	9.8	9.8		
2	6.5	15	17	10	10	6.5	*670	6.0	7.6	9.8		
3	26	15	114	10	10	6.3	*218	5.8	6.5	13		
4	89	15	78	10	10	6.2	155	5.5	6.0	41		
5	105	15	44	10	10	6.1	105	5.2	5.5	21		
6	60	15	35	10	10	6.1	92	5.2	5.0	14		
7	44	15	144	10	9.8	*6.1	78	5.0	4.8	9.8		
8	33	15	*66	10	9.8	6.1	75	5.8	4.0	5.8		
9	24	17	60	10	9.8	6.2	66	5.8	3.0	4.2		
10	18	18	43	10	9.7	6.4	96	6.2	2.6	3.7		
11	16	26	34	10	9.6	7.0	78	7.6	2.5	3.7		
12	13	46	22	10	9.4	7.4	78	8.7	3.0	3.0		
13	11	233	17	10	9.3	8.2	134	12	3.2	2.6		
14	9.8	178	15	10	9.2	9.0	570	14	3.0	2.6		
15	9.2	124	14	11	9.0	10	233	13	2.6	8.7		
16	8.2	92	13	11	8.8	11	114	11	2.3	6.5		
17	7.0	64	12	11	8.5	13	75	9.8	2.3	4.5		
18	43	48	11	11	8.3	15	43	8.7	2.2	3.8		
19	144	41	11	11	8.2	19	36	8.7	2.0	3.0		
20	134	33	11	11	8.0	33	31	7.6	1.7	8.7		
21	204	29	10	11	7.8	58	24	*6.5	2.6	41		
22	522	26	10	11	7.6	100	23	6.0	2.0	21		
23	178	23	10	11	7.4	88	18	6.0	2.3	8.7		
24	124	21	10	11	7.3	74	16	5.5	2.3	4.8		
25	105	20	10	10	7.1	62	14	6.2	3.0	3.7		
26	60	19	10	10	7.0	52	13	5.2	*17	2.6		
27	43	18	10	10	6.8	42	11	5.2	14	2.3		
28	29	18	10	10	6.8	35	9.8	5.0	14	1.8		
29	23	18	10	*10	6.7	54	7.6	5.0	26	1.4		
30	20	18	10	10	-	100	6.5	5.0	21	1.4		
31	17	-	10	10	-	1,300	-	6.5	-	1.4		
Total	2,133.3	1,250	889	320	251.9	2,160.2	5,089.9	219.9	183.8	269.3		
Mean	68.8	41.7	28.7	10.3	8.69	69.7	170	7.09	6.13	8.69		
Cfsm	1.11	0.673	0.463	0.166	0.140	1.12	2.74	0.114	0.099	0.140		
In.	1.28	0.75	0.53	0.19	0.15	1.30	3.05	0.13	0.11	0.16		

Calendar year	: Max	Min	Mean	Cfsm In.
Water year	: Max	Min	Mean	Cfsm In.

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 20 to Dec. 1, Dec. 12 to Mar. 31.

Silver Lake at Portage, Wis.

Location.--Lat 43°33', long. 89°29', in sec. 6, T. 12 N., R. 9 E., in southeast end of lake at outlet culvert on Silver Lake Street, in Portage.

Drainage area.--1 sq mi, approximately.

Records available.--August 1936 to September 1952 (fragmentary).

Gage.--Staff gage.

Extremes.--Maximum elevation observed during year, 93.68 ft Apr. 13; minimum observed, 92.80 ft May 17.
1936-52: Maximum elevation observed, that of Apr. 13, 1952; minimum observed, 90.85 ft Aug. 22, 24, 1937.

Remarks.--Gage heights have been reduced to elevations above datum assumed for this lake by Public Service Commission of Wisconsin. Outlet flows intermittently.

Elevations, in feet, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-		-				-	-	-	-	-	-
2	-		-				-	8.35	-	-	-	-
3	-		-				-	-	-	-	8.34	-
4	-		-				-	-	-	8.22	-	-
5	8.10		-				-	8.32	-	-	-	-
6	-		-				8.50	-	-	-	-	8.06
7	-		8.20				-	-	-	-	-	-
8	-		-				-	-	8.20	-	-	-
9	-		-				-	-	-	-	-	-
10	-	8.25	8.26				-	-	-	-	8.50	-
11	-		-				-	-	-	-	-	-
12	-		-				-	-	-	-	-	8.02
13	-		-				8.68	-	-	8.10	-	-
14	8.08		-				-	-	-	-	-	-
15	-		-				-	-	8.44	-	-	-
16	-		-				-	-	-	-	-	-
17	-		-				-	7.80	-	-	-	-
18	-		-				-	-	-	-	-	-
19	-		-				-	-	-	-	-	-
20	-		-				-	-	-	8.23	-	-
21	-		-	8.40			-	-	-	8.60	-	-
22	-		-				-	-	8.36	-	-	-
23	8.33		-				-	-	-	-	-	-
24	-		-				-	-	-	-	8.20	-
25	-		-		8.41		-	8.25	-	-	-	-
26	-		-				-	-	-	-	-	7.96
27	8.35		-				-	-	-	-	-	-
28	-		-				8.38	-	-	-	-	-
29	-		-				-	-	8.31	-	-	-
30	-		-		-		-	8.26	-	-	-	-
31	-		-		-		-	-	-	-	8.15	-

Note.--Add 85 ft to obtain elevation above datum assumed for this lake by Public Service Commission of Wisconsin.

Little Green Lake near Markesan, Wis.

Location.--Lat 43°44', long. 88°58', in sec. 32, T. 15 N., R. 13 E., half a mile north of lake outlet and 2 miles north of Markesan.

Drainage area.--5 sq mi, approximately.

Records available.--August 1936 to September 1952 (fragmentary).

Gage.--Staff gage. Prior to Apr. 28, 1949, gage was at site 0.5 mile to south at same datum.

Extremes.--Maximum elevation observed during year, 96.32 ft Mar. 19, 22, 23, 26, 29, 30, Apr. 1, 3, 5, 6; minimum observed, 95.10 ft Oct. 12, 14.
1936-52: Maximum elevation observed, 96.74 ft June 23, 24, 1940; minimum observed, 94.28 ft Sept. 10, 11, 1936.

Remarks.--Gage heights have been reduced to elevations above datum assumed for this lake by Public Service Commission of Wisconsin. Outlet flows intermittently.

Elevation, in feet, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.46	-	5.56	5.58	-	-	6.32	-	5.82	-	-	-
2	-	-	-	-	5.74	-	-	-	-	5.64	5.44	5.38
3	-	5.50	5.56	-	5.74	-	6.32	6.04	-	-	5.44	-
4	5.46	5.50	-	5.58	-	-	-	6.04	5.80	-	-	-
5	-	-	5.56	-	5.74	-	6.32	-	-	5.66	5.40	-
6	5.46	-	-	-	-	-	6.32	-	-	5.66	-	5.36
7	5.44	5.40	-	5.58	-	-	-	6.04	5.80	-	5.44	5.36
8	-	-	5.56	-	-	-	-	-	5.80	-	-	-
9	-	-	-	-	5.72	-	6.30	-	-	5.64	5.52	5.36
10	-	5.30	-	-	5.74	-	-	6.02	-	-	5.52	-
11	-	5.30	-	5.64	-	-	-	6.02	5.76	-	-	-
12	5.10	-	-	-	-	-	6.30	-	-	5.64	-	-
13	-	-	-	-	5.74	-	6.30	-	-	5.64	5.52	5.36
14	5.10	5.30	-	5.68	-	-	-	6.00	5.76	-	-	5.26
15	-	-	-	-	-	-	-	-	5.76	-	-	-
16	-	-	5.56	5.70	5.74	-	6.30	-	-	5.62	5.50	-
17	-	5.30	-	-	-	-	-	5.88	-	-	5.50	5.16
18	-	5.30	-	-	5.74	-	-	5.86	5.72	-	-	-
19	5.36	-	5.54	5.70	-	6.32	6.30	-	-	5.66	5.50	-
20	-	-	-	5.70	-	-	6.26	-	-	5.62	5.51	5.16
21	5.66	5.40	-	-	5.74	-	-	5.82	5.70	-	-	5.16
22	-	-	5.54	-	-	6.32	-	-	5.70	-	-	-
23	-	-	5.54	5.72	5.74	6.32	6.20	5.84	5.66	5.58	5.50	5.14
24	5.70	5.50	-	-	-	-	-	5.84	-	-	5.50	-
25	-	5.50	-	-	-	-	-	5.82	5.66	-	-	-
26	-	-	-	5.72	-	6.32	6.16	-	-	5.54	5.46	-
27	5.70	-	5.54	5.72	-	-	6.10	-	-	5.50	-	5.12
28	5.70	5.56	-	-	-	-	-	5.82	5.66	-	-	5.12
29	-	-	5.54	-	-	6.32	-	-	-	-	-	5.12
30	-	-	5.54	5.74	-	6.32	6.06	-	5.66	5.46	5.46	-
31	5.60	-	-	-	-	-	-	5.82	-	-	5.42	-

Note.--Add 90 ft to obtain elevation above datum assumed for this lake by the Public Service Commission of Wisconsin.

Fox River at Berlin, Wis.

Location.--Lat 43°57'05", long. 88°57'30", in sec. 16, T. 17 N., R. 13 E., on left side at downstream end of Government lock and dam, 1.1 mile south of bridge in Berlin, 2½ miles upstream from Barnes Creek, and at mile 33.0.

Drainage area.--1,430 sq mi.

Records available.--January 1898 to September 1952.

Gage.--Staff gage read once daily. Datum of gage is 744.52 ft above mean tide New York City (by Corps of Engineers).

Average discharge.--54 years, 1,115 cfs.

Extremes.--Maximum daily discharge during year, 4,900 cfs Apr. 4-6 (gage height, 14.1 ft); minimum daily, 512 cfs Sept. 20, 21, 27 (gage height, 7.2 ft).
1898-1952: Maximum discharge observed, 6,900 cfs Mar. 17, 18, 1946 (gage height, 15.5 ft), minimum observed, 248 cfs Sept. 16, 1948 (gage height, 6.1 ft).

Remarks.--Records good except those for periods of ice effect, which are fair.

Cooperation.--Gage-height record furnished by Corps of Engineers.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Nov. 20, Nov. 29 to Dec. 15, Apr. 2 to May 10)

7.2	512	10.0	1,630
8.0	740	12.0	2,880
9.0	1,130	15.0	5,360

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	809	1,750	1,810	820	840	810	4,500	2,390	1,180	845	774	707
2	809	1,690	1,750	820	840	810	4,810	2,170	1,180	845	774	707
3	845	1,630	1,580	820	830	*806	4,810	1,990	1,180	809	707	707
4	882	1,580	1,530	820	830	810	4,900	1,870	1,130	809	676	676
5	882	1,280	1,480	820	*829	810	*4,900	1,750	1,080	809	707	646
6	920	1,430	*1,430	820	830	800	4,900	1,580	1,080	809	740	676
7	920	1,430	1,380	820	830	800	4,810	1,430	1,040	774	676	646
8	920	1,480	1,430	820	830	800	4,720	1,330	1,000	740	707	617
9	1,000	1,530	1,430	820	820	800	4,450	1,280	960	707	740	617
10	1,000	1,530	1,430	820	820	860	4,360	1,230	882	707	809	617
11	1,000	1,530	1,280	820	820	900	4,270	1,130	809	707	845	562
12	1,000	1,380	1,530	830	820	930	4,180	1,130	809	707	845	589
13	1,000	1,430	1,380	830	820	960	4,100	1,080	809	707	882	617
14	1,000	1,580	1,380	830	820	990	4,270	1,040	882	676	882	589
15	1,000	1,690	1,230	840	820	1,020	4,270	1,130	920	676	882	617
16	960	1,750	1,150	850	820	1,070	4,180	1,080	882	707	882	562
17	960	1,750	1,100	880	820	1,160	4,100	1,040	920	707	845	562
18	1,000	1,810	1,060	920	820	1,250	4,020	960	920	740	809	562
19	1,080	1,810	1,020	950	820	1,400	3,940	882	882	882	809	562
20	1,180	1,750	990	960	820	1,600	3,860	882	845	920	*845	512
21	1,230	1,600	950	960	810	1,900	3,700	845	809	960	882	512
22	1,380	1,540	920	960	810	2,200	3,620	882	809	960	882	562
23	1,380	1,500	880	950	810	2,500	3,460	*920	*809	960	845	562
24	1,530	1,500	860	940	810	2,700	3,300	1,000	960	960	845	562
25	1,630	1,500	850	920	810	2,800	3,090	1,040	920	960	845	562
26	1,690	1,500	840	910	810	2,900	2,880	1,040	920	920	809	589
27	1,750	1,520	830	890	810	3,000	2,740	1,040	920	920	740	512
28	1,750	1,580	830	880	810	3,100	2,670	1,080	920	920	774	536
29	1,750	1,690	820	870	810	3,400	2,530	1,080	920	809	707	562
30	1,810	1,750	820	860	-	3,600	2,470	1,130	920	774	676	536
31	1,750	-	820	850	-	4,100	-	1,180	-	774	676	-
Total	36,817	47,490	36,790	26,900	23,789	51,586	118,810	38,511	28,297	25,200	24,517	17,845
Mean	1,188	1,583	1,187	868	820	1,664	3,960	1,242	943	813	791	595
Cfsm	0.831	1.11	0.830	0.607	0.573	1.16	2.77	0.869	0.659	0.569	0.553	0.416
In.	0.96	1.24	0.96	0.70	0.62	1.34	3.09	1.00	0.74	0.66	0.64	0.46

Calendar year 1951: Max 4,020 Min 500 Mean 1,387 Cfsm 0.970 In. 13.17
Water year 1951-52: Max 4,900 Min 512 Mean 1,302 Cfsm 0.910 In. 12.41

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 21-28, Dec. 16 to Apr. 1.

Wolf River above West Branch of Wolf River, Wis.

Location.--Lat 44°55', long. 88°39', in E½ sec. 3, T. 28 N., R. 15 E., near center of span on downstream side of highway bridge, half a mile upstream from West Branch Wolf River, 4 miles north of Keshena and at mile 140.1.

Drainage area.--633 sq mi.

Records available.--March 1928 to September 1952.

Gage.--Chain gage read once daily. Datum of gage is 856.57 ft above mean sea level (levels by Wisconsin Power & Light Co.).

Average discharge.--24 years, 572 cfs.

Extremes.--Maximum daily discharge during year, 1,580 cfs Apr. 19-22 (gage height, 4.40 ft); minimum observed, 357 cfs Sept. 21 (gage height, 1.88 ft).
1928-52: Maximum discharge observed, 2,580 cfs Apr. 8, 1929 (gage height, 6.10 ft); minimum observed, 199 cfs Feb. 20, 1936.

Remarks.--Records good except those for periods of ice effect, which are fair.

Rating tables, water year 1951-52, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 6				Apr. 7 to Sept. 30			
1.8	350	3.0	812	1.9	363	3.0	794
2.1	445	4.0	1,340	2.2	464	3.5	1,040
2.5	595			2.5	578	5.0	1,950

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*766	555	600	420	425	390	910	1,040	704	841	841	500
2	636	480	570	420	425	390	1,020	988	704	794	748	500
3	766	412	555	420	430	385	1,100	938	748	1,040	704	464
4	860	555	555	420	430	385	800	938	748	889	661	464
5	860	721	790	420	430	380	750	938	748	794	619	500
6	860	721	760	420	425	*371	730	841	704	661	619	500
7	812	678	740	420	420	370	710	794	619	619	578	500
8	909	636	*731	420	*418	375	800	794	619	578	578	464
9	812	636	720	420	420	375	910	748	578	578	578	430
10	812	595	710	420	420	375	970	704	538	538	578	396
11	812	721	670	420	420	375	1,020	661	538	538	578	380
12	766	860	620	430	420	375	1,040	704	538	538	578	380
13	721	1,170	570	435	415	380	1,160	748	538	578	578	363
14	721	1,120	530	450	410	380	988	794	578	578	538	363
15	721	1,060	490	455	410	385	1,280	794	619	578	500	363
16	721	1,010	470	460	410	400	1,220	794	578	578	704	363
17	595	909	455	460	410	415	1,340	748	538	578	578	396
18	636	812	445	460	410	430	1,460	748	538	578	500	396
19	636	750	440	450	410	435	1,580	704	538	578	464	380
20	636	730	430	450	410	435	1,580	661	578	578	464	363
21	721	710	430	440	405	435	1,580	619	500	889	464	363
22	1,120	700	430	430	405	430	1,580	*619	464	1,040	*500	363
23	1,060	680	430	430	400	425	1,520	578	464	1,040	500	430
24	960	680	425	425	400	420	1,460	578	464	1,100	464	363
25	860	680	425	425	400	420	1,340	578	*578	1,100	464	363
26	812	680	425	420	395	420	1,340	538	578	1,160	430	363
27	766	670	425	420	390	425	1,220	538	578	1,040	396	363
28	721	660	425	420	390	440	1,160	538	578	988	396	363
29	678	650	425	420	390	500	1,100	538	938	938	430	380
30	678	630	425	425	-	700	1,100	538	938	889	464	380
31	595	-	425	425	-	820	-	661	-	841	500	-
Total	24,029	21,871	16,541	13,350	11,943	13,241	34,768	22,402	18,371	24,057	16,994	12,196
Mean	775	729	534	431	412	427	1,159	723	612	776	548	407
Cfsm	1.22	1.15	0.844	0.681	0.651	0.675	1.83	1.14	0.967	1.23	0.866	0.643
In.	1.41	1.28	0.97	0.78	0.70	0.78	2.04	1.32	1.08	1.41	1.00	0.72

Calendar year 1951: Max 2,340 Min 320 Mean 674 Cfsm 1.06 In. 14.44
Water year 1951-52 : Max 1,580 Min 363 Mean 628 Cfsm 0.992 In. 13.49

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 19 to Dec. 2, Dec. 5 to Apr. 11 (no gage heights Feb. 3-7, 9).

Wolf River at Keshena Falls, Wis.

Location.--Lat 44°53', long. 88°39', in E½ sec. 22, T. 28 N., R. 15 E., on right bank 500 ft downstream from Keshena Falls, 1.7 miles upstream from Keshena, 3.1 miles downstream from West Branch Wolf River, and at mile 130.4.

Drainage area.--812 sq mi.

Records available.--May 1907 to March 1909, February 1911 to September 1952. Published as "at Keshena" 1907-9 and 1911 to March 1928.

Gage.--Water-stage recorder. Datum of gage is 820.00 ft above mean sea level (levels by Wisconsin Power & Light Co.). May 1907 to March 1909 staff gage and February 1911 to March 1928 chain gage, at bridge in Keshena 1.7 miles downstream at datum 4.03 ft lower.

Average discharge.--42 years (1907-8, 1911-52), 779 cfs.

Extremes.--Maximum discharge during year, 2,080 cfs Apr. 20 (gage height, 7.46 ft); minimum discharge, 360 cfs Sept. 27 (gage height, 5.32 ft).
1907-9, 1911-52: Maximum discharge observed, 4,390 cfs Apr. 10, 1922, from rating curve extended above 2,100 cfs; maximum gage height, 13.83 ft Nov. 17, 1943 (backwater from ice), minimum discharge, 91 cfs Dec. 22, 1939 (gage height, 4.67 ft), result of ice storage.

Remarks.--Records good except those for period of ice effect and periods of no gage-height record, which are fair. Diurnal fluctuation by one powerplant upstream.

Revisions.--W 664: Drainage area (site at Keshena).

Rating table, water year 1951-52, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

5.3	370	6.5	1,230
5.6	546	7.0	1,650
6.0	840	8.0	2,670

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	825	802	740	520	510	495	1,100	1,210	978	1,140	901	638
2	772	727	720	520	510	500	1,210	1,160	939	1,020	870	623
3	886	540	700	520	510	500	1,300	1,120	901	1,280	817	588
4	1,010	772	700	520	510	500	980	1,080	855	1,520	810	574
5	1,180	893	990	520	510	510	930	1,030	817	1,280	779	588
6	1,080	840	960	520	510	*513	920	986	787	1,050	727	602
7	1,030	720	*971	520	*504	510	900	947	720	870	720	567
8	1,000	727	986	520	510	510	980	947	787	720	712	553
9	947	742	963	520	500	510	1,050	939	794	742	720	540
10	908	749	878	520	500	510	1,100	886	683	727	705	527
11	870	802	727	520	500	510	1,160	832	653	727	690	508
12	840	901	700	520	500	510	1,200	802	697	749	697	465
13	764	1,080	660	530	500	510	1,230	825	721	742	690	447
14	734	1,360	630	540	500	510	1,230	908	749	712	646	424
15	757	1,480	610	550	500	510	1,440	1,020	802	727	742	453
16	742	1,300	580	560	500	520	1,520	971	924	734	1,100	459
17	794	1,160	560	560	500	520	1,650	939	863	764	994	514
18	832	1,000	550	560	500	520	1,880	924	772	772	787	508
19	840	a840	540	560	495	530	1,980	916	757	749	675	413
20	810	a850	540	560	495	540	2,080	863	683	742	690	447
21	932	870	530	540	495	540	2,030	*794	660	924	705	470
22	1,200	880	530	540	495	540	1,930	772	646	1,140	*690	459
23	1,400	870	530	520	490	530	1,830	742	631	1,400	646	465
24	1,360	860	530	520	490	530	1,740	734	602	1,360	609	470
25	1,190	825	530	510	490	520	1,560	779	*690	1,210	588	459
26	1,030	830	520	520	490	530	1,480	772	832	1,230	567	459
27	955	820	520	520	490	540	1,400	712	901	1,200	514	453
28	978	810	520	510	490	560	1,360	779	855	1,130	488	441
29	908	790	520	510	490	610	1,320	727	1,140	1,060	520	430
30	878	760	520	510	-	740	1,280	734	1,280	986	567	459
31	863	-	520	510	-	940	-	924	-	932	646	-
Total	29,315	26,600	20,475	16,370	14,484	16,818	41,770	27,774	24,110	30,339	22,012	15,003
Mean	946	887	660	528	499	543	1,392	896	804	979	710	500
Cfsm	1.16	1.09	0.813	0.650	0.615	0.669	1.71	1.10	0.990	1.21	0.874	0.616
In.	1.34	1.22	0.94	0.75	0.66	0.77	1.91	1.27	1.10	1.39	1.01	0.69

Calendar year 1951: Max 3,470 Min 425 Mean 846 Cfsm 1.04 In. 14.15
Water year 1951-52: Max 2,080 Min 413 Mean 779 Cfsm 0.959 In. 13.05

Peak discharge (base, 1,500 cfs).--Nov. 15 (9 a.m.) 1,520 cfs (6.83 ft); Apr. 20 (9 a.m. to 12 m.) 2,080 cfs (7.46 ft); July 4 (6 to 9 a.m.) 1,600 cfs (6.99 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 12 to Apr. 13. No gage-height record Nov. 16-24, Nov. 26 to Dec. 6, Dec. 14-24, Dec. 26 to Jan. 2, Jan. 25, 27, Feb. 3, 4, 13-18, 26, Feb. 29 to Mar. 4; discharge estimated on basis of record for station above West Branch of Wolf River and generation at Shawano powerplant.

Embarrass River near Embarrass, Wis.

Location.--Lat 44°43', long. 88°44', in sec. 18, T. 26 N., R. 15 E., on left bank 10 ft downstream from bridge, three-quarters of a mile downstream from Mill Creek, and 4 miles northwest of Embarrass.

Drainage area.--395 sq mi.

Records available.--June 1919 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 800 ft (from survey level line in vicinity). Prior to Aug. 23, 1938, chain gage on downstream side of bridge at same datum.

Average discharge.--33 years, 296 cfs.

Extremes.--Maximum discharge during year, 4,170 cfs Apr. 2 (gage height, 9.02 ft); minimum discharge, 78 cfs Sept. 17 (gage height, 2.71 ft).
1919-52: Maximum discharge observed, 6,760 cfs Apr. 10, 1922 (gage height, 11.5 ft), from rating curve extended above 2,800 cfs; minimum observed, 23 cfs Aug. 3, 6 7, 1931.

Remarks.--Records good except those for periods of ice effect, which are fair. Slight diurnal fluctuation caused by powerplants above station.

Rating table, water year 1951-52, except for ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.7	85	5.0	1,110
3.0	158	7.0	2,420
3.5	345	9.0	4,170
4.0	585		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	235	324	240	144	162	142	2,590	290	408	625	142	155
2	206	290	242	144	160	135	3,970	269	391	590	150	137
3	265	246	311	142	145	140	3,080	290	286	1,190	150	145
4	450	224	460	138	142	150	2,120	277	261	2,580	155	137
5	706	250	539	136	147	*137	1,520	269	242	2,660	167	118
6	732	610	484	134	147	148	1,250	254	174	1,710	170	122
7	595	554	*435	130	*148	158	1,250	228	167	1,080	186	122
8	455	261	417	130	153	135	1,220	254	192	660	164	118
9	368	217	412	135	156	120	1,280	250	217	504	174	125
10	311	210	381	140	157	120	1,280	273	186	422	164	122
11	290	200	294	146	158	123	1,160	273	189	350	153	110
12	273	332	290	152	159	127	1,020	298	220	282	164	110
13	231	484	270	156	160	130	892	302	246	294	155	113
14	254	773	150	165	158	137	783	332	273	286	150	122
15	200	918	105	170	155	142	840	417	290	306	170	118
16	239	819	98	176	145	147	918	345	417	319	345	103
17	217	671	96	178	140	153	968	354	358	290	350	96
18	220	519	94	175	136	164	1,000	302	328	257	246	127
19	282	445	93	170	138	180	1,020	273	261	261	214	115
20	298	445	92	164	142	200	1,000	250	206	319	192	118
21	363	368	92	154	145	212	918	224	217	479	*214	108
22	773	328	92	148	146	230	824	*177	210	514	200	125
23	1,000	311	94	148	147	245	732	183	183	455	196	125
24	968	305	98	148	148	250	590	214	200	354	167	127
25	866	290	102	148	148	257	575	210	*235	294	161	127
26	671	260	106	149	148	257	450	224	469	277	167	161
27	534	250	113	150	148	257	435	250	479	254	142	132
28	426	240	120	152	147	265	417	242	386	246	127	122
29	332	240	130	154	147	277	386	231	455	210	120	130
30	324	240	135	158	-	315	417	177	625	142	127	122
31	345	-	140	160	-	1,030	-	273	-	137	125	-
Total	13,429	11,624	6,725	4,694	4,332	6,483	34,905	8,205	8,761	18,347	5,507	3,712
Mean	433	387	217	151	149	209	1,164	265	292	592	178	124
Cfsm	1.10	0.980	0.549	0.382	0.377	0.529	2.95	0.671	0.739	1.50	0.451	0.314
In.	1.26	1.09	0.63	0.44	0.41	0.61	3.29	0.77	0.82	1.73	0.52	0.35

Calendar year 1951: Max 2,980 Min 60 Mean 340 Cfsm 0.861 In. 11.67
Water year 1951-52: Max 3,970 Min 92 Mean 346 Cfsm 0.876 In. 11.92

Peak discharge (base, 1,500 cfs).--Apr. 2 (2 a.m.) 4,170 cfs (9.02 ft); July 4 (11 p.m.) 3,150 cfs (7.90 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 24 to Dec. 1, Dec. 13 to Mar. 25.

Wolf River at New London, Wis.

Location.--Lat 44°23', long. 88°44', in sec. 12, T. 22 N., R. 14 E., on right bank 15 ft downstream from Pearl Street bridge in New London, 0.2 mile downstream from Embarrass River, and at mile 56.3.

Drainage area.--2,240 sq mi, approximately.

Records available.--October 1913 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 749.37 ft above mean sea level (levels by Corps of Engineers). Prior to Oct. 4, 1951, staff gage at same site and datum.

Average discharge.--39 years, 1,799 cfs.

Extremes.--Maximum discharge during year, 15,200 cfs Apr. 5 (gage height, 11.00 ft); minimum, 672 cfs Sept. 23 (gage height, 0.61 ft).
1913-52: Maximum discharge observed, 15,500 cfs Apr. 13, 1922 (gage height, 11.4 ft); minimum, 261 cfs Sept. 6, 1933.
Maximum stage known, 11.6 ft Apr. 16, 1888, from information by Corps of Engineers.

Remarks.--Records good except those for periods of ice effect, which are fair.

Cooperation.--Gage-height record furnished by Corps of Engineers.

Revisions (water years).--W 1114: 1943(M).

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.6	672	6.0	3,480
1.0	800	8.0	5,500
2.0	1,180	9.0	7,560
4.0	2,170	11.0	15,200

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,470	2,850	2,050	1,030	1,050	1,000	4,000	3,800	1,620	2,050	1,670	923
2	1,420	2,720	2,170	1,030	1,040	1,000	8,870	3,560	1,820	2,170	1,570	1,100
3	1,420	2,410	2,230	1,030	1,040	1,000	12,800	3,330	1,930	2,590	1,470	1,100
4	1,520	1,990	2,350	1,030	1,040	990	*14,800	3,120	1,930	2,850	1,420	1,020
5	1,770	1,620	2,470	1,030	1,040	*983	15,200	2,920	1,820	3,050	1,380	980
6	2,050	1,620	*2,530	1,030	*1,040	990	14,400	2,790	1,720	3,120	1,340	942
7	2,230	1,570	2,660	1,040	1,030	1,000	13,200	2,590	1,620	3,190	1,300	923
8	2,350	1,670	2,660	1,040	1,030	1,000	11,600	2,470	1,470	3,330	1,260	923
9	2,410	1,720	2,660	1,040	1,030	1,000	9,610	2,290	1,380	3,560	1,340	904
10	2,290	1,670	2,530	1,040	1,030	1,000	8,520	2,170	1,340	3,800	1,340	886
11	2,230	1,670	2,410	1,040	1,030	1,000	7,560	1,990	1,340	3,800	1,260	834
12	2,050	1,720	2,290	1,040	1,030	1,000	7,020	1,930	1,340	3,720	1,220	817
13	1,930	1,930	2,050	1,040	1,030	1,010	6,560	1,930	1,340	3,480	1,180	817
14	1,820	2,530	1,820	1,040	1,020	1,030	6,560	1,930	1,380	3,190	1,180	800
15	1,670	2,850	1,600	1,050	1,020	1,040	6,560	1,930	1,380	2,920	1,100	817
16	1,570	2,980	1,500	1,070	1,020	1,070	6,350	2,050	1,420	2,590	1,100	784
17	1,520	3,120	1,400	1,100	1,020	1,120	6,160	2,110	1,470	2,350	1,220	736
18	1,520	3,120	1,350	1,150	1,010	1,200	5,810	2,050	1,520	2,110	1,470	720
19	1,620	3,000	1,300	1,180	1,010	1,300	5,500	2,050	1,570	1,880	1,570	736
20	1,720	2,800	1,250	1,200	1,000	1,400	5,360	1,930	1,470	1,770	1,620	752
21	1,930	2,500	1,200	1,200	1,000	1,450	5,100	1,880	1,380	1,820	*1,570	736
22	2,290	2,200	1,170	1,200	1,000	1,550	5,100	*1,720	1,340	1,930	1,470	704
23	2,530	2,100	1,130	1,190	1,000	1,650	4,980	1,620	1,300	2,110	1,340	688
24	2,850	2,000	1,100	1,180	1,000	1,750	4,980	1,620	*1,300	2,170	1,300	784
25	2,920	2,000	1,080	1,150	1,000	1,800	4,860	1,520	1,300	2,110	1,220	784
26	3,050	2,000	1,070	1,120	1,000	1,840	4,750	1,520	1,340	2,050	1,140	768
27	3,050	2,000	1,060	1,100	1,000	1,880	4,530	1,470	1,470	1,990	1,060	768
28	3,120	2,000	1,050	1,090	1,000	1,950	4,430	1,470	1,720	1,930	1,060	768
29	3,190	2,000	1,050	1,080	1,000	2,050	4,150	1,380	1,880	1,930	1,020	720
30	3,120	2,000	1,040	1,070	-	2,400	3,970	1,380	1,930	1,820	942	704
31	2,980	-	1,040	1,060	-	3,000	-	1,520	-	1,820	904	-
Total	67,610	66,360	53,270	33,690	29,560	42,453	223,290	66,040	45,840	79,200	40,036	24,938
Mean	2,181	2,212	1,718	1,087	1,019	1,369	7,443	2,130	1,528	2,555	1,291	831
Cfsm	0.974	0.988	0.767	0.485	0.455	0.611	3.32	0.951	0.682	1.14	0.576	0.371
In.	1.12	1.10	0.88	0.56	0.49	0.70	3.71	1.10	0.76	1.31	0.66	0.41

Calendar year 1951: Max 10,400 Min 620 Mean 2,032 Cfsm 0.907 In. 12.32
Water year 1951-52: Max 15,200 Min 688 Mean 2,110 Cfsm 0.942 In. 12.80

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 19-30, Dec. 15 to Apr. 1.

Little Wolf River at Royalton, Wis.

Location.--Lat 44°24', long. 88°51', in sec. 1, T. 22 N., R. 13 E., on right bank 50 ft upstream from highway bridge in Royalton and 4 miles upstream from mouth.

Drainage area.--485 sq mi.

Records available.--January 1914 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 774.00 ft above mean sea level, datum of 1929. Prior to Aug. 20, 1915, chain gage at highway bridge at datum 0.75 ft lower. Aug. 20, 1915, to Apr. 23, 1934, staff gage on left bank at same datum.

Average discharge.--38 years, 423 cfs.

Extremes.--Maximum discharge during year, 5,690 cfs Apr. 2 (gage height, 7.00 ft); minimum, 113 cfs Sept. 11 (gage height, 0.93 ft).
1914-52: Maximum discharge, 6,950 cfs Mar. 30, 1943 (gage height, 8.00 ft), from rating curve extended above 3,500 cfs; maximum gage height, 11.95 ft Mar. 28, 1950 (backwater from ice); minimum discharge, 57 cfs Feb. 10, 1934.

Remarks.--Records good except those for period of ice effect, which are fair. Diurnal fluctuation caused by powerplant 6 miles above station.

Rating table, water year 1951-52, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.0	126	2.0	591
1.2	179	3.0	1,310
1.4	251	4.0	2,230
1.7	407	7.0	5,690

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	288	386	330	200	300	225	4,130	373	430	388	164	220
2	263	295	384	295	205	210	5,570	407	479	298	184	192
3	290	288	413	210	220	190	4,360	328	350	452	205	228
4	360	256	454	250	275	*279	3,440	339	301	478	232	176
5	527	388	503	275	200	265	2,530	312	262	647	181	167
6	576	358	466	215	280	190	1,930	350	278	664	241	173
7	519	283	*418	250	*258	230	1,520	292	266	585	195	164
8	440	286	386	295	320	235	1,520	345	172	484	178	164
9	367	268	408	235	200	195	1,520	356	262	472	264	170
10	370	314	431	215	220	230	1,570	292	186	367	193	164
11	316	274	376	240	300	250	1,520	361	254	279	234	140
12	244	330	309	270	180	240	1,350	396	206	238	183	162
13	302	548	213	235	230	220	1,260	339	256	334	178	164
14	279	776	210	225	210	225	1,100	407	225	258	183	164
15	238	881	228	260	250	250	1,390	407	242	278	184	159
16	316	867	238	255	240	245	1,390	460	249	365	184	162
17	294	812	235	280	245	245	1,260	472	232	278	194	167
18	328	750	175	250	260	260	1,140	384	171	289	180	162
19	335	402	170	275	220	295	1,070	361	234	262	226	162
20	345	588	175	285	200	340	1,030	268	212	282	193	159
21	505	658	200	240	240	400	998	330	179	363	*272	156
22	604	442	235	260	225	490	901	290	247	396	300	156
23	846	467	200	285	250	460	798	*330	248	407	234	209
24	821	372	230	250	210	430	716	376	*238	288	181	182
25	761	380	200	230	230	450	604	280	248	270	238	176
26	646	407	230	245	238	460	533	304	357	238	176	173
27	570	407	205	220	240	490	515	260	414	191	170	173
28	515	340	250	295	240	520	515	306	406	248	170	167
29	368	414	250	215	235	570	490	272	346	166	173	164
30	404	336	200	250	-	700	454	251	376	230	170	162
31	418	-	290	260	-	2,190	-	406	-	191	167	-
Total	13,455	13,573	9,012	7,765	6,921	11,979	47,124	10,654	8,326	10,686	6,227	5,137
Mean	434	452	291	250	239	386	1,571	344	278	345	201	171
Cfsm	0.895	0.932	0.600	0.515	0.493	0.796	3.24	0.709	0.573	0.711	0.414	0.353
In.	1.03	1.04	0.69	0.60	0.53	0.92	3.61	0.82	0.64	0.82	0.48	0.39

Calendar year 1951: Max 2,860 Min 128 Mean 398 Cfsm 0.821 In. 11.13
Water year 1951-52: Max 5,570 Min 140 Mean 412 Cfsm 0.850 In. 11.57

Peak discharge (base, 1,600 cfs).--Apr. 2 (1:30 p.m.) 5,690 cfs (7.00 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 13 to Mar. 30.

Waupaca River near Waupaca, Wis.

Location.--Lat 44°21', long. 88°59', near north line of sec. 1, T. 21 N., R. 12 E., on right bank 10 ft downstream from highway bridge, 1½ miles downstream from Crystal River, and 4 miles downstream from Waupaca.

Drainage area.--305 sq mi.

Records available.--June 1916 to September 1952. Published as "near Weyauwega" June 1916 to October 1917.

Gage.--Water-stage recorder. Altitude of gage is 780 ft (from survey level line along railroad). Prior to Oct. 18, 1917, chain gage at site 1 mile downstream at different datum. Oct. 18, 1917, to Nov. 23, 1938, chain gage on bridge at present site and datum.

Average discharge.--36 years, 249 cfs.

Extremes.--Maximum discharge during year, 1,440 cfs Apr. 2 (gage height, 4.67 ft); minimum discharge, 97 cfs Sept. 9, 10, 17, 18 (gage height, 1.08 ft).
1916-52: Maximum discharge, 2,520 cfs Mar. 20, 1948 (gage height, 6.90 ft); maximum gage height, 8.06 ft Mar. 28, 1950 (backwater from ice); minimum daily discharge, 50 cfs Jan. 22, 28, 1926.

Remarks.--Records good except those for periods of ice effect, which are fair. Considerable diurnal fluctuation caused by powerplants above station.

Revisions (water years).--W 1054: 1926(m). W 1084: 1919, 1922-24, 1938, 1940, 1942(M), 1944-46(M).

Rating table, water year 1951-52, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.2	130	2.5	560
1.5	202	5.0	1,570
2.0	367		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	202	219	258	202	230	220	990	239	266	228	179	170
2	204	208	225	200	235	214	1,400	237	240	215	173	176
3	243	200	232	198	235	210	1,280	231	233	257	177	172
4	278	190	237	198	230	*206	780	229	224	234	185	157
5	282	190	227	198	220	204	588	216	216	217	198	158
6	256	200	*234	200	*210	200	495	231	213	213	190	153
7	248	260	235	200	210	200	456	222	204	208	189	150
8	237	278	219	200	218	200	452	236	199	232	184	161
9	231	255	216	200	222	210	415	229	198	224	202	152
10	222	223	218	200	224	220	462	227	195	205	208	152
11	213	221	180	200	220	225	402	234	188	202	185	141
12	213	222	160	200	210	228	382	237	194	201	186	158
13	203	291	158	215	200	226	385	242	202	195	181	143
14	199	348	158	256	190	224	446	236	224	202	178	147
15	201	325	158	260	180	220	495	251	214	224	173	162
16	210	297	160	256	174	210	432	249	207	212	166	153
17	209	265	168	248	170	204	387	237	205	203	167	150
18	223	220	172	236	168	208	352	233	195	202	171	142
19	233	260	178	220	166	225	336	225	191	211	173	155
20	232	350	180	204	166	239	318	228	188	217	*202	150
21	252	309	180	190	166	255	304	217	196	235	229	149
22	314	190	180	180	168	271	306	*215	206	220	212	157
23	333	170	180	178	170	247	286	228	203	217	182	163
24	290	166	180	186	190	286	273	235	*215	205	174	160
25	281	172	182	200	220	265	268	229	224	203	178	160
26	264	200	186	204	230	233	264	221	272	187	177	152
27	255	250	194	206	230	233	258	224	262	184	170	152
28	241	350	200	208	226	243	247	220	238	196	162	144
29	228	340	208	210	224	274	251	214	245	184	170	152
30	230	310	208	214	-	324	241	219	243	172	157	166
31	219	-	206	222	-	515	-	254	-	182	164	-
Total	7,446	7,479	6,077	6,489	5,902	7,439	13,951	7,145	6,500	6,487	5,642	4,657
Mean	240	249	196	209	204	240	465	230	217	209	182	155
Cfsm	0.787	0.816	0.643	0.685	0.669	0.787	1.52	0.754	0.711	0.685	0.597	0.508
In.	0.91	0.91	0.74	0.79	0.72	0.91	1.70	0.87	0.79	0.79	0.69	0.57

Calendar year 1951: Max 663 Min 130 Mean 232 Cfsm 0.761 In. 10.30
Water year 1951-52: Max 1,400 Min 141 Mean 233 Cfsm 0.764 In. 10.39

Peak discharge (base, 670 cfs).--Apr. 2 (10 p.m.) 1,440 cfs (4.67 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 3-9, 18-20, 22-30, Dec. 11 to Mar. 16.

Lake Winnebago at Oshkosh, Wis.

Location.--Lat 44°00'40", long. 88°32'00", in sec. 24, T. 18 N., R. 17 E., in mouth of upper Fox River at Chicago & Northwestern Railroad bridge, 0.2 mile downstream from Main Street bridge in Oshkosh and 18 miles up the lake from Menasha Dam and outlet.

Drainage area.--6,030 sq mi at lake outlet at Menasha Dam.

Records available.--October 1938 to September 1952 in reports of Geological Survey. Records from 1857 to 1938 in files of Corps of Engineers. A report on Fox River by Corps of Engineers, published as House Document No. 146, 67th Congress, 2nd session, contains semimonthly records of inflow to Lake Winnebago for the period 1896-1917.

Gage.--Staff gage read once daily. Datum of gage is 745.05 ft above mean tide at New York City (levels of Corps of Engineers). Prior to 1882, lake levels were referred to Deuchman gage at lake outlet of Menasha Dam. Datum of Deuchman gage, which is still in existence, is 745.00 ft above mean tide at New York City.

Extremes.--Maximum gage height observed during year, 3.42 ft Apr. 13; minimum observed, 0.69 ft Mar. 18.
1857-1952: Maximum gage height observed, 5.33 ft (Deuchman gage) Nov. 8, 1881; minimum observed, -2.00 ft (Deuchman gage) Nov. 28, 1891.

Remarks.--Lake elevations controlled by dams at Menasha and Neenah which are operated in the interest of navigation. Crests of both dams are at elevation 746.73 ft. Present limits of regulation are from 21¼ inches above the crest of Menasha Dam down to the crest during navigation season, plus additional 18 to 24 inches below crest during winter. Oshkosh staff gage gives true level to lake while Deuchman gage readings are affected by loss of head in the channel between lake and dam.

Cooperation.--Records furnished by Corps of Engineers.

Gage height, in feet, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.71	3.14	3.00	2.42	1.89	0.98	1.71	2.92	3.00	2.89	2.94	2.75
2	2.73	3.12	3.00	2.40	1.87	.94	1.85	2.98	3.02	2.83	2.96	2.67
3	2.81	3.10	3.00	2.38	1.85	.89	1.96	2.96	2.98	2.87	2.92	2.67
4	2.90	3.06	2.98	2.33	1.83	.85	2.10	3.00	3.02	2.98	2.89	2.65
5	2.81	3.04	3.02	2.31	1.79	.83	2.19	3.04	3.00	3.02	2.94	2.63
6	2.83	3.12	3.00	2.27	1.77	.81	2.33	2.98	3.00	3.04	2.89	2.58
7	2.71	3.08	2.96	2.23	1.75	.77	2.48	3.02	3.02	3.00	2.92	2.63
8	2.77	3.00	3.02	2.21	1.73	.73	2.63	3.04	3.00	3.02	2.89	2.54
9	2.83	3.00	3.00	2.23	1.69	.75	2.75	3.13	3.00	3.06	3.02	2.50
10	2.83	2.98	2.98	2.23	1.67	.77	2.92	3.06	2.98	3.02	3.00	2.52
11	2.81	2.96	2.96	2.21	1.65	.79	3.00	3.04	3.00	3.00	2.98	2.52
12	2.85	2.94	2.94	2.19	1.60	.81	3.04	3.13	2.83	3.06	2.92	2.50
13	2.83	3.00	2.92	2.17	1.56	.83	3.42	3.13	2.77	3.08	2.89	2.50
14	2.75	2.60	2.88	2.17	1.52	.83	3.38	3.08	2.79	3.10	2.87	2.48
15	2.67	3.00	2.83	2.21	1.48	.79	3.31	3.15	2.89	3.19	2.87	2.50
16	2.67	3.06	2.79	2.19	1.48	.75	3.35	3.13	2.92	3.13	2.85	2.48
17	2.67	3.00	2.75	2.21	1.42	.73	3.35	3.10	2.96	3.15	2.85	2.46
18	2.77	3.04	2.71	2.17	1.38	.69	3.38	3.08	2.87	3.19	2.83	2.42
19	3.00	3.02	2.69	2.13	1.33	.77	3.35	3.08	2.94	3.33	2.81	2.42
20	2.75	2.98	2.71	2.15	1.29	.85	3.35	3.06	2.87	3.29	2.79	2.40
21	2.92	3.00	2.67	2.15	1.25	.92	3.31	3.02	2.81	3.29	2.83	2.40
22	2.90	3.02	2.65	2.08	1.23	1.02	3.23	3.06	2.79	3.33	2.85	2.38
23	3.10	3.08	2.60	2.08	1.19	1.15	3.23	3.13	2.77	3.13	2.83	2.38
24	3.10	3.04	2.58	2.06	1.15	1.17	3.17	3.06	2.79	3.23	2.81	2.35
25	3.08	3.08	2.56	2.04	1.10	1.19	3.13	3.10	2.87	3.10	2.79	2.33
26	3.10	3.04	2.54	2.02	1.06	1.21	3.10	3.08	2.79	3.13	2.77	2.33
27	3.17	3.06	2.52	2.00	1.04	1.25	3.00	3.02	2.92	3.10	2.75	2.31
28	3.12	3.06	2.48	1.98	1.02	1.29	2.96	2.98	2.87	3.08	2.73	2.31
29	3.08	3.00	2.46	1.96	1.00	1.33	2.94	3.04	2.89	3.06	2.75	2.29
30	3.14	3.00	2.44	1.94	-	1.42	2.85	2.87	2.92	3.04	2.71	2.29
31	3.17	-	2.42	1.92	-	1.56	-	2.98	-	3.02	2.69	-

West Branch Fond du Lac River at Fond du Lac, Wis.

Location.--Lat 43°45'45", long. 88°29'00", on line between secs. 17 and 20, T. 15 N., R. 17 E., on left bank 25 ft upstream from highway bridge, 0.7 mile west of Fond du Lac, and 2.5 miles upstream from confluence with East Branch.

Drainage area.--88 sq mi, approximately.

Records available.--March 1939 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 766.78 ft above mean sea level (Corps of Engineers benchmark).

Average discharge.--13 years, 34.0 cfs.

Extremes.--Maximum discharge during year, 894 cfs Mar. 24 (gage height, 4.58 ft); maximum gage height, 5.60 ft Mar. 21 (backwater from ice); no flow Sept. 13-30.
1939-52: Maximum daily discharge, 1,390 cfs Mar. 27, 1943; no flow for many days.

Remarks.--Records fair except those below 1 cfs and those for periods of ice effect, which are poor.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 19				Mar. 20 to Sept. 30			
0.3	2.9	1.0	57	0.0	0	1.0	60
.4	6.8	1.5	127	.2	3.1	1.5	131
.5	12	2.0	211	.4	10	2.0	215
.7	27	3.0	411	.6	22	3.0	445
				.8	38	5.0	1,010

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.7	20	32	20	16	8.6	*734	40	14	3.4	44	2.7
2	3.7	16	32	20	16	8.3	*792	35	14	3.4	38	2.7
3	7.3	14	41	18	17	8.1	734	31	12	3.4	34	2.7
4	8.4	12	45	15	17	7.9	622	28	12	3.1	32	2.7
5	8.4	12	46	12	17	7.7	525	25	12	2.9	31	1.8
6	8.4	12	45	10	17	7.5	432	22	10	2.9	31	1.7
7	13	12	43	9.2	17	7.4	332	20	9.2	2.7	30	.8
8	13	12	38	8.4	16	7.4	264	19	8.3	*2.6	30	.6
9	11	12	30	7.9	16	7.5	228	17	6.6	1.5	387	.5
10	11	12	18	7.5	16	30	224	16	5.8	1.0	228	.5
11	10	13	11	7.5	15	140	178	15	5.3	.9	141	.3
12	10	18	7.0	7.6	15	180	157	15	5.0	.8	107	.1
13	10	40	7.3	8.3	15	180	332	14	5.0	.4	83	0
14	10	75	7.5	*10	15	170	244	14	4.4	3.6	76	0
15	11	100	7.7	22	15	160	206	14	4.4	5.5	65	0
16	13	65	7.7	50	15	140	228	14	4.4	4.4	61	0
17	14	35	7.7	88	14	140	228	12	4.2	5.3	50	0
18	30	25	7.7	95	*14	180	211	12	4.4	70	42	*0
19	37	24	7.6	100	13	300	188	11	4.4	54	32	0
20	29	26	7.6	85	13	450	165	10	4.4	301	30	0
21	58	31	7.5	70	12	540	141	9.6	4.2	65	24	0
22	55	*52	7.5	57	12	612	125	9.6	4.2	34	21	0
23	44	45	7.4	42	11	644	107	13	3.6	28	16	0
24	148	44	7.3	32	11	778	101	14	3.6	23	14	0
25	95	43	7.2	25	10	664	83	12	3.6	21	9.6	0
26	85	45	7.1	21	9.8	*591	73	12	3.6	22	8.3	0
27	70	44	7.1	18	9.3	566	63	14	3.4	41	5.5	0
28	55	39	7.1	15	9.1	471	56	18	3.4	56	5.3	0
29	42	35	8.2	12	8.9	432	50	14	3.4	58	3.9	0
30	30	33	12	13	-	432	*44	14	3.4	54	3.9	0
31	24	-	18	14	-	594	-	15	-	47	3.9	-
Total	987.9	966	545.2	920.4	402.1	8,464.4	7,867	529.2	186.2	921.8	1,687.4	17.1
Mean	31.2	32.2	17.6	29.7	13.9	273	262	17.1	6.21	29.7	54.4	0.57
Cfsm	0.355	0.366	0.200	0.338	0.158	3.10	2.98	0.194	0.071	0.338	0.618	0.0065
In.	0.41	0.41	0.23	0.39	0.17	3.58	3.32	0.22	0.08	0.39	0.71	0.007

Calendar year 1951 : Max 563 Min 0.1 Mean 53.9 Cfsm 0.613 In. 8.30
Water year 1951-52 : Max 792 Min 0 Mean 64.1 Cfsm 0.728 In. 9.92

Peak discharge (base, 350 cfs).--Mar. 24 (9 a.m. to 1 p.m.) 894 cfs (4.58 ft); Apr. 2 (1 to 3 p.m.) 792 cfs (4.24 ft); Apr. 13 (10:30 a.m.) 484 cfs (3.14 ft); July 20 (2 a.m.) 822 cfs (4.35 ft); Aug. 9 (5:30 a.m.) 664 cfs (3.79 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Oct. 27 to Nov. 21, Dec. 7 to Mar. 21 (no gage-height record Nov. 14-21).

East Branch Fond du Lac River at Fond du Lac, Wis.

Location.--Lat 43°45'15", long. 88°27'10", in sec. 22, T. 15 N., R. 17 E., on left bank at highway bridge, 0.1 mile west of U. S. Highway 41, 0.5 miles south of Fond du Lac, and 2.5 miles upstream from confluence with West Branch.

Drainage area.--75 sq mi, approximately.

Records available.--March 1939 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 762.82 ft above mean sea level (Corps of Engineers benchmark).

Average discharge.--13 years, 33.9 cfs.

Extremes.--Maximum discharge during year, 964 cfs Mar. 21 (gage height, 4.21 ft); maximum gage height, 5.85 ft Mar. 19 (backwater from ice); minimum daily discharge, 5.1 cfs Sept. 29, 30.

1939-52: Maximum discharge, 2,140 cfs June 23, 1940 (gage height, 5.87 ft); maximum gage height, 10.74 ft Mar. 16, 1943 (ice jam), from floodmarks; no flow Jan. 17-29, 1940; Jan. 3, 1949.

Remarks.--Records good except those for periods of ice effect or periods of no gage-height record, which are poor.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 23 to June 30)

1.0	2.8	1.7	61
1.1	5.8	2.0	127
1.2	10	2.5	273
1.3	16	3.0	453
1.5	34	4.0	878

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10	29	35	29	17	a12	399	22	a17	6.7	14	a6.1
2	11	22	42	30	21	a12	309	20	a16	6.7	12	a6.0
3	10	19	55	27	25	a11	244	19	a16	13	10	a6.0
4	12	17	60	22	27	a11	196	18	a15	10	9.1	a5.9
5	14	16	52	18	27	a11	157	17	a14	8.2	8.6	a5.8
6	14	16	46	15	26	11	130	16	13	7.2	7.7	a5.8
7	18	16	38	13	23	a11	102	15	12	*5.8	7.2	a5.7
8	25	16	46	12	21	a11	80	18	10	6.3	8.6	a5.7
9	22	16	46	11	19	a11	72	18	9.6	6.3	493	a5.7
10	18	16	22	10	19	50	122	18	9.1	6.7	241	a5.6
11	16	17	15	10	23	150	93	19	8.6	6.3	100	a5.6
12	15	28	8.0	10	26	210	74	24	8.6	5.8	78	a5.6
13	14	65	8.8	11	26	250	471	25	9.1	5.5	63	a5.6
14	13	127	9.2	13	25	230	576	24	a9.2	7.2	50	a5.6
15	12	100	9.4	25	24	190	347	31	a9.1	13	34	a5.5
16	14	67	9.6	70	22	160	306	28	8.6	9.1	24	a5.5
17	18	44	9.7	120	21	150	223	24	8.2	a10	18	a5.5
18	32	42	9.8	135	*20	200	168	22	7.7	a60	15	*5.5
19	67	39	9.9	150	19	380	132	19	6.7	74	a13	5.5
20	41	32	10	130	18	745	107	16	6.7	576	a11	5.5
21	80	22	10	105	17	810	70	15	7.2	290	a10	5.5
22	114	*18	10	80	16	681	60	14	7.2	112	a9.1	5.8
23	74	15	10	60	a15	296	58	16	7.2	72	a8.5	5.8
24	171	14	10	45	a14	229	60	22	a7.5	52	a8.0	5.8
25	182	13	10	33	a13	168	56	19	8.2	42	a7.5	5.5
26	104	14	10	26	13	*151	49	17	7.7	27	a7.0	a5.3
27	78	14	10	21	a13	171	35	18	7.2	a45	a6.8	a5.2
28	60	15	11	15	a12	205	29	30	7.2	a50	a6.5	a5.2
29	48	21	12	10	a12	214	25	22	9.6	28	a6.4	a5.1
30	38	a27	19	11	-	238	*22	18	8.6	19	a6.3	a5.1
31	34	-	26	15	-	330	-	a17	-	17	a6.2	-
Total	1,379	917	679.4	1,282	574	6,309	4,772	621	291.8	1,597.8	1,299.5	168.0
Mean	44.5	30.6	21.9	41.4	19.8	204	159	20.0	9.73	51.5	41.9	5.60
Cfsm	0.593	0.408	0.292	0.552	0.264	2.72	2.12	0.267	0.130	0.687	0.559	0.075
In.	0.68	0.45	0.34	0.64	0.28	3.13	2.37	0.31	0.14	0.79	0.64	0.08

Calendar year 1951: Max 810 Min 1.8 Mean 60.2 Cfsm 0.803 In. 10.90
Water year 1951-52: Max 810 Min 5.1 Mean 54.3 Cfsm 0.724 In. 9.85

Peak discharge (base, 240 cfs).--Mar. 21 (4 to 7 p.m.) 964 cfs (4.21 ft); Apr. 1 (4 to 7 a.m.) 422 cfs (3.04 ft); Apr. 14 (2 a.m.) 681 cfs (3.39 ft); July 20 (3 a.m.) 899 cfs (4.05 ft); Aug. 9 (5 a.m.) 631 cfs (3.43 ft).

* Discharge measurements made on this day.

a No gage-height record; discharge estimated on basis of records for West Branch Fond du Lac River at Fond du Lac and Cedar Creek near Cedarburg, Wis.

Note.--Stage-discharge relation affected by ice Nov. 3-11, 18-24, Dec. 11 to Feb. 22, Mar. 10-19.

Lake de Neveu near Fond du Lac, Wis.

Location.--Lat 43°44', long. 88°24', in sec. 30, T. 15 N., R. 18 E., at boathouse at north end of lake on farm of Nick Giebel, 4 miles southeast of Fond du Lac.

Drainage area.--2 sq mi, approximately.

Records available.--August 1936 to September 1952 (fragmentary).

Gage.--Staff gage and reference point in lake bed.

Extremes.--Maximum elevation observed during year, 97.85 ft Mar. 25; minimum, 97.30 ft Sept. 19.
1936-52: Maximum elevation observed, 98.32 ft Mar. 27, 1950; minimum, 96.90 ft Aug. 15, 1936.

Remarks.--Gage heights have been reduced to elevation above datum assumed for this lake by Public Service Commission of Wisconsin. Natural outlet.

Elevation, in feet, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-	-	-	7.50	7.55	-	7.74	-	-	7.48	7.45	-
2	7.65	7.55	-	-	-	-	-	7.55	-	-	-	7.35
3	-	-	-	-	-	-	-	-	7.50	-	-	-
4	-	-	7.50	7.50	-	7.50	7.76	-	-	7.46	-	-
5	7.67	-	-	-	7.50	-	-	-	-	-	7.42	7.35
6	-	7.50	-	-	-	-	-	7.51	7.45	-	-	-
7	-	-	7.51	-	-	7.50	-	-	-	-	-	-
8	-	-	-	7.50	7.50	-	7.68	-	-	7.48	7.50	-
9	7.70	7.46	-	-	-	-	-	7.47	-	-	-	7.35
10	-	-	-	-	-	-	-	-	7.40	-	-	-
11	-	-	7.51	7.49	-	7.60	7.65	-	-	7.44	-	-
12	7.70	-	-	-	7.50	-	-	-	-	-	7.57	7.33
13	-	7.50	-	-	-	-	-	7.47	7.40	-	-	-
14	-	-	7.50	-	-	7.65	-	-	-	-	-	-
15	-	-	-	7.57	7.49	-	7.78	-	-	7.48	7.49	-
16	7.73	7.53	-	-	-	-	-	7.50	-	-	-	7.31
17	-	-	-	-	-	-	-	-	7.43	-	-	7.31
18	-	-	7.50	7.60	-	7.65	7.74	-	-	7.70	-	-
19	7.76	-	-	-	7.50	-	-	-	-	-	7.45	7.30
20	-	7.51	-	-	-	-	-	7.47	7.45	-	-	-
21	-	-	7.54	-	-	7.72	-	-	-	-	-	-
22	-	7.50	-	7.59	7.50	-	7.70	-	-	7.82	7.44	-
23	7.76	7.49	-	-	-	-	-	7.49	-	-	-	7.32
24	-	-	-	-	-	-	-	-	7.43	-	-	-
25	-	-	7.52	7.59	-	7.85	7.65	-	-	7.68	-	-
26	7.73	-	-	-	7.50	-	-	-	-	-	7.40	7.32
27	-	7.48	-	-	-	-	-	7.50	7.45	-	-	-
28	-	-	7.52	-	-	7.78	-	-	-	-	-	-
29	-	-	-	7.59	7.49	-	7.60	-	-	7.57	7.36	-
30	7.64	7.48	-	-	-	-	7.61	7.52	-	-	-	7.32
31	-	-	-	-	-	-	-	-	-	-	-	-

Note.--Add 90 ft to obtain elevation above datum assumed for this lake by Public Service Commission of Wisconsin.

Fox River at Rapide Croche Dam, near Wrightstown, Wis.

Location.--Lat 44°19', long. 88°12', in sec. 4, T. 21 N., R. 19 E., at Rapide Croche Dam, 2 miles upstream from Wrightstown and 18 miles upstream from mouth.

Drainage area.--6,150 sq mi, approximately.

Records available.--March 1896 to September 1952.

Gage.--Recording head and tail water gages and electric generation data taken each half hour are used to compute discharge records.

Average discharge.--56 years, 4,261 cfs.

Extremes.--Maximum daily discharge during year, 24,000 cfs Apr. 18, minimum daily, 1,730 cfs Sept. 28.
1918-52: Maximum daily discharge, that of Apr. 18, 1952; minimum daily, 138 cfs Aug. 2, 1936.

Remarks.--Records good. Flow regulated by storage in Lake Winnebago (see p. 74). Daily discharge determined from records of flow through turbines, head, gate openings, and lockages through navigation canal.

Cooperation.--Figures of daily discharge furnished by Corps of Engineers. Records reviewed by Geological Survey.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,390	5,430	5,080	4,590	5,480	4,970	7,620	5,070	3,880	3,960	3,300	2,660
2	2,370	4,510	4,940	4,900	5,540	4,600	7,650	2,990	4,440	2,850	2,840	2,240
3	2,780	5,280	4,800	4,440	5,530	5,050	7,920	3,820	3,160	5,350	2,100	2,480
4	3,030	4,530	5,200	3,860	5,550	4,950	9,620	3,490	3,230	2,780	2,600	2,350
5	3,320	4,780	5,720	4,310	5,440	5,060	10,100	4,480	3,370	2,790	2,720	2,520
6	3,060	4,920	5,640	4,310	5,430	4,940	10,600	4,060	3,260	2,880	3,000	2,260
7	2,630	4,210	5,820	4,370	5,470	4,800	11,400	4,160	3,200	3,240	2,970	2,010
8	3,120	4,890	5,670	4,540	5,380	4,910	12,100	4,120	3,020	2,350	2,760	2,330
9	3,230	5,220	5,180	4,510	5,260	4,670	14,900	4,110	3,140	2,850	3,320	2,490
10	3,170	5,190	6,290	4,370	5,290	4,870	13,900	3,720	2,900	3,170	3,450	2,330
11	3,360	4,880	6,350	4,500	5,180	4,800	15,000	4,030	3,140	3,310	4,030	2,180
12	3,140	5,370	7,270	4,370	5,240	4,860	15,600	4,350	3,230	2,900	2,860	2,410
13	3,340	5,640	6,780	4,340	5,320	4,710	15,500	4,150	3,070	2,880	2,860	2,370
14	3,220	6,290	6,790	4,230	5,290	4,980	22,900	4,470	3,220	3,310	2,960	2,230
15	2,880	5,560	6,250	4,370	5,440	4,940	21,800	4,220	2,320	3,330	2,890	1,980
16	3,450	5,020	5,900	4,320	5,710	5,240	23,500	4,320	3,330	3,650	2,610	2,070
17	3,070	5,090	6,060	4,640	5,620	4,920	23,300	4,350	2,560	3,480	2,190	2,210
18	3,170	4,370	6,320	4,890	5,640	4,940	24,000	3,900	3,140	3,820	2,890	2,060
19	3,500	4,810	6,000	5,210	5,160	6,620	23,700	3,820	2,860	4,210	2,890	1,910
20	3,750	5,320	6,300	4,780	5,110	6,500	23,700	4,070	2,790	3,310	3,070	1,980
21	4,000	5,370	6,560	4,580	5,770	6,640	23,400	4,090	2,720	5,630	2,740	2,000
22	3,900	5,220	6,570	5,170	5,660	6,440	23,600	4,140	2,100	6,340	2,560	1,860
23	3,810	5,260	6,200	4,980	5,510	5,410	23,300	4,240	2,830	6,650	2,840	1,980
24	4,270	5,120	5,590	5,090	5,370	6,100	23,000	4,450	2,850	6,180	2,410	1,920
25	4,880	5,040	6,280	5,340	5,690	5,750	21,100	3,300	2,930	6,620	2,680	2,000
26	5,030	5,050	6,290	5,330	5,380	6,420	22,100	4,370	2,770	5,310	2,560	1,930
27	5,190	5,220	5,020	5,120	5,430	5,870	21,800	4,300	2,750	3,570	2,740	2,000
28	5,790	5,060	4,960	4,800	5,260	6,470	16,800	4,220	2,870	5,650	2,810	1,730
29	5,540	5,120	4,540	4,840	5,080	7,560	14,800	4,460	2,670	3,600	2,290	1,740
30	5,130	5,220	4,670	4,850	-	7,430	12,300	4,510	2,870	3,110	2,400	1,940
31	5,220	-	4,440	5,180	-	7,900	-	4,680	-	2,860	1,970	-
Total	114,740	152,990	179,480	145,130	157,230	173,320	517,010	128,460	90,620	121,940	86,310	64,170
Mean	3,701	5,100	5,790	4,682	5,422	5,591	17,230	4,144	3,021	3,934	2,784	2,139
Cfsm	0.602	0.829	0.941	0.761	0.882	0.909	2.80	0.674	0.491	0.640	0.453	0.348
In.	0.69	0.93	1.09	0.88	0.95	1.05	3.13	0.78	0.55	0.74	0.52	0.39

Calendar year 1951: Max 20,400 Min 1,900 Mean 4,823 Cfsm 0.784 In. 10.65
Water year 1951-52: Max 24,000 Min 1,730 Mean 5,277 Cfsm 0.858 In. 11.70

Sheboygan River at Sheboygan, Wis.

Location.--Lat 43°44', long. 87°46', in E½ sec. 29, T. 15 N., R. 23 E., on left bank near State Highway 28, 0.7 mile west of bridge over Sheboygan River on State Highway 28, and 4 miles upstream from mouth.

Drainage area.--403 sq mi.

Records available.--June 1916 to June 1924, November 1950 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 584.00 ft above mean sea level, datum of 1929. June 1916 to June 1924 chain gage at site 0.7 mile downstream at different datum. November 1950 to June 1951 staff gage at site 0.3 mile downstream at datum 3.15 ft lower.

Average discharge.--8 years (1916-23, 1952), 262 cfs.

Extremes.--Maximum discharge observed for year, 3,100 cfs July 20 (gage height, 8.61 ft); minimum, 31 cfs Sept. 16, 17 (gage height, 1.64 ft).
1916-24, 1950-52: Maximum discharge observed, 7,140 cfs Mar. 26, 1920 (gage height, 9.40 ft, datum then in use); minimum observed, about 1 cfs Aug. 27, 1922 (gage height, 1.48 ft, datum then in use), caused by shutdown of powerplants.

Remarks.--Records good except those for periods of ice effect, which are fair. Diurnal fluctuation caused by numerous powerplants above station.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.6	27	3.0	266
1.9	60	4.0	614
2.2	104	6.0	1,660
2.5	155	8.0	2,770

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	70	344	182	143	159	153	1,940	*115	110	70	308	109
2	72	313	235	151	258	139	1,720	90	117	68	256	96
3	84	223	269	153	379	132	*1,550	101	112	68	192	82
4	112	176	338	151	402	137	1,440	112	115	65	180	76
5	112	178	299	144	356	128	1,330	122	107	59	180	70
6	104	178	263	139	313	137	1,220	118	98	52	163	57
7	122	163	299	142	266	127	1,100	115	88	57	151	60
8	132	163	305	115	216	117	990	123	80	*88	139	63
9	139	184	285	112	190	123	910	132	78	76	207	54
10	123	184	238	117	184	301	960	122	69	76	230	52
11	110	198	248	127	245	1,040	885	117	65	60	201	48
12	104	452	157	106	263	1,280	760	120	76	47	184	51
13	98	1,630	135	106	296	1,330	1,990	123	78	57	159	39
14	93	2,050	126	115	269	785	2,220	125	69	64	146	40
15	94	1,440	124	*266	212	662	1,550	137	73	93	142	36
16	94	885	123	418	194	548	1,140	144	73	96	141	36
17	109	569	123	764	209	488	935	125	57	91	201	35
18	148	392	123	868	209	901	860	120	47	405	182	*38
19	240	299	122	662	*205	2,570	785	114	42	885	146	44
20	263	379	120	614	168	2,770	711	104	44	2,110	135	38
21	478	302	120	592	168	2,550	638	104	46	1,770	139	38
22	860	280	120	350	170	2,220	569	99	52	1,330	125	44
23	711	*200	120	296	155	1,680	508	109	64	1,020	106	39
24	1,370	165	120	266	146	1,490	452	125	63	760	85	40
25	1,490	156	120	205	142	1,440	385	122	60	686	86	54
26	1,020	154	120	185	137	*1,490	341	120	57	592	76	44
27	686	158	120	176	157	1,550	274	118	52	527	78	44
28	527	163	121	164	174	1,550	269	120	48	527	69	42
29	452	168	124	154	168	1,440	235	117	90	470	68	47
30	418	176	130	150	-	1,550	144	104	86	411	63	42
31	388	-	135	152	-	1,880	-	106	-	353	98	-
Total	10,823	12,322	5,464	8,103	6,410	32,688	28,811	3,623	2,216	13,033	4,636	1,558
Mean	349	411	176	261	221	1,054	960	117	73.9	420	150	51.9
Cfsm	0.866	1.02	0.437	0.648	0.548	2.62	2.38	0.290	0.183	1.04	0.372	0.129
In.	1.00	1.14	0.50	0.75	0.59	3.02	2.66	0.33	0.20	1.20	0.43	0.14

Calendar year 1951: Max 3,610 Min 19 Mean 371 Cfsm 0.921 In. 12.53
Water year 1951-52: Max 2,770 Min 35 Mean 354 Cfsm 0.878 In. 11.96

Peak discharge (base, 2,200 cfs).--Nov. 13 (9 p.m.) 2,550 cfs (7.57 ft); Mar. 19 (3:30 p.m.) 2,880 cfs (8.21 ft); Apr. 13 (3:30 p.m.) 2,680 cfs (7.84 ft); July 20 (6 p.m.) 3,100 cfs (8.61 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 23-29, Dec. 14 to Jan. 5, Jan. 11-13, 24, 26-31, Feb. 7, 9-12, 14-18, 22, 23, 25, Mar. 1, 2, 5-7, 14-17.

Cedar Lake near Kiel, Wis.

Location.--Lat 43°55', long. 87°56', in sec. 24, T. 17 N., R. 21 E., at Cedar Lake Resort on narrows of lake, 5 miles east of Kiel.

Drainage area.--3 sq mi, approximately.

Records available.--August 1936 to September 1942, April 1945 to September 1952 (fragmentary).

Gage.--Staff gage.

Extremes.--Maximum elevation observed during year, 98.26 ft Apr. 26; minimum, 96.74 ft Oct. 6.
1936-42, 1945-52: Maximum elevation observed, 98.72 ft Mar. 9, 1946; minimum, 94.95 ft Aug. 14, 1936.
An elevation of 99.22 ft was observed Mar. 31, 1943.

Remarks.--Gage heights reduced to elevations above datum assumed for this lake by Public Service Commission of Wisconsin. Outlet rarely flows.

Elevation, in feet, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-	-	7.10	-	-	7.68	-	8.20	-	-	-	-
2	-	-	-	-	7.40	-	-	-	-	-	8.14	-
3	-	7.04	-	-	-	-	-	8.20	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	7.30	-	-	8.00	-	-	8.00	-	-
6	6.74	-	-	-	-	-	-	-	-	-	-	7.98
7	-	-	-	-	-	-	-	-	8.14	-	-	-
8	-	-	7.12	-	-	7.66	-	-	-	7.97	-	-
9	-	-	-	-	7.42	-	-	-	-	-	8.12	-
10	-	7.06	-	-	-	-	-	8.16	-	-	-	-
11	-	-	-	-	-	-	-	-	-	-	-	-
12	-	-	-	7.30	-	-	8.20	-	-	8.00	-	-
13	6.76	-	-	-	-	-	-	-	-	-	-	7.88
14	-	-	-	-	-	-	-	-	8.10	-	-	-
15	-	-	7.20	7.32	-	7.68	-	-	-	-	-	-
16	-	-	-	-	7.46	-	-	-	-	-	8.10	-
17	-	7.10	-	-	-	-	-	8.14	-	-	-	-
18	-	-	-	-	-	-	-	-	-	-	-	7.74
19	-	-	-	7.32	-	-	8.24	-	-	8.08	-	-
20	6.80	-	-	-	-	-	-	-	-	-	-	7.76
21	-	-	-	-	-	-	-	-	8.08	-	-	-
22	-	-	7.24	-	-	7.78	-	-	-	-	-	-
23	-	7.08	-	-	7.48	-	-	-	-	-	8.04	-
24	-	7.08	-	-	-	-	-	8.12	-	-	-	-
25	-	-	-	-	-	-	-	-	-	-	-	-
26	-	-	-	7.32	-	-	8.26	-	-	8.18	-	-
27	7.02	-	-	-	-	-	-	-	-	-	-	7.72
28	-	-	-	-	-	-	-	-	8.00	-	-	-
29	-	-	7.30	-	-	7.80	-	-	-	-	-	-
30	-	-	-	-	-	-	-	-	8.00	-	8.00	7.72
31	-	-	7.30	-	-	7.82	-	8.14	-	-	-	-

Note.--Add 90 ft to obtain elevation above datum assumed for this lake by Public Service Commission of Wisconsin.

Cedar Creek near Cedarburg, Wis.

Location.--Lat 43°19'25", long. 87°58'50", on line between secs. 14 and 23, T. 10 N., R. 21 E., on upstream side of highway bridge, 2 miles north of Cedarburg and 6 miles upstream from mouth.

Drainage area.--113 sq mi.

Records available.--August 1930 to September 1952.

Gage.--Chain gage read once daily. Altitude of gage is 790 ft (from topographic map).

Average discharge.--22 years, 62.0 cfs.

Extremes.--Maximum discharge observed during year, 3,500 cfs Mar. 20 (gage height, 11.40 ft); minimum observed, 23 cfs June 11 (gage height, 5.42 ft), and Sept. 19 by discharge measurement.

1930-52: Maximum discharge observed, that of Mar. 20, 1952; maximum gage height observed, 12.00 ft Feb. 7, 1938 (backwater from ice); minimum discharge observed, 0.2 cfs Aug. 9-12, 1936.

Remarks.--Records good except those for periods of ice effect, which are fair.

Revisions.--W 804: Drainage area.

Rating table, water year 1951-52, except for periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

5.4	20	7.0	500
5.5	33	8.0	1,000
5.7	72	10.0	2,320
6.0	152	11.2	3,320

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	28	208	86	66	72	72	542	*54	43	59	86	33
2	28	96	91	72	98	70	422	47	36	68	82	33
3	25	63	96	77	115	67	350	47	36	113	72	33
4	25	54	107	77	120	62	350	43	33	107	86	30
5	25	82	118	76	120	58	332	40	30	107	82	30
6	28	77	113	74	117	56	307	40	28	91	77	30
7	33	77	107	70	110	53	280	36	28	50	68	30
8	47	77	107	67	104	56	240	47	28	59	68	30
9	43	82	91	66	96	64	188	50	25	*82	77	28
10	43	82	63	64	98	100	214	54	25	77	82	28
11	33	86	47	63	112	160	240	59	23	63	77	25
12	30	82	28	62	120	350	266	59	28	40	77	25
13	28	460	33	70	122	465	782	54	30	36	72	25
14	28	1,470	36	84	116	430	1,110	54	72	33	68	25
15	25	836	40	120	104	360	680	54	59	113	63	25
16	25	422	41	170	92	300	480	50	50	146	72	28
17	50	280	41	260	80	230	294	50	43	176	77	28
18	102	240	41	340	72	300	233	50	36	632	68	28
19	130	220	42	370	*67	1,300	152	50	36	1,890	63	*25
20	146	214	42	400	66	3,320	146	50	33	1,470	63	25
21	164	201	43	350	64	1,000	135	47	33	1,060	59	28
22	350	152	45	230	63	944	130	47	33	836	54	25
23	480	*91	46	160	63	632	118	50	40	542	54	25
24	500	80	47	130	63	460	107	59	36	404	50	25
25	632	70	49	112	64	368	96	68	36	280	50	25
26	632	72	50	100	66	307	91	63	33	152	43	28
27	586	74	51	95	69	386	91	59	28	141	43	25
28	500	76	52	90	70	460	86	50	30	118	43	28
29	480	79	54	83	72	500	68	50	36	107	40	25
30	386	86	56	76	-	632	59	47	54	96	40	28
31	294	-	60	72	-	680	-	47	-	91	40	-
Total	5,926	6,189	1,923	4,146	2,595	14,242	8,589	1,575	1,081	9,239	1,996	826
Mean	191	206	62.0	134	89.5	459	286	50.8	36.0	298	64.4	27.5
Cfsm	1.69	1.82	0.549	1.19	0.792	4.06	2.53	0.450	0.319	2.64	0.570	0.243
In.	1.95	2.04	0.63	1.36	0.85	4.69	2.83	0.52	0.36	3.04	0.66	0.27

Calendar year 1951: Max 1,470 Min 10 Mean 115 Cfsm 1.02 In. 13.87
Water year 1951-52: Max 3,320 Min 23 Mean 159 Cfsm 1.41 In. 19.20

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 24-29, Dec. 14 to Mar. 19.

Milwaukee River at Milwaukee, Wis.

Location.--Lat 43°06'00", long. 87°54'30", in NE¼ sec. 5, T. 7 N., R. 22 E., on left bank near north limits of Milwaukee, 2,000 ft downstream from Port Washington Road Bridge and 6 miles upstream from mouth.

Drainage area.--661 sq mi.

Records available.--April 1914 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 607.3 ft above mean sea level, adjustment of 1912. Prior to Apr. 6, 1929, staff or chain gage near present site at different datum. Apr. 6, 1929, to Jan 8, 1934, chain gage at bridge half a mile upstream at different datum.

Average discharge.--38 years, 395 cfs.

Extremes.--Maximum discharge during year, 7,010 cfs Mar. 22 (gage height, 7.13 ft); minimum, 2.6 cfs Oct. 15 (gage height, 1.54 ft).
1914-52: Maximum discharge, 15,100 cfs Mar. 20, 1918 (gage height, 9.00 ft, datum then in use, from floodmark); no flow Sept. 8, 1943.

Remarks.--Records good. Occasional regulation caused by dams above station.

Revisions (water years).--W 564: 1918(M). W 924: 1940. W 1207: 1936(M).

Rating table, water year, 1951-52, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.5	1.0	2.7	410
1.6	5.0	3.0	603
1.7	15	3.5	986
1.8	29	4.0	1,500
2.0	68	5.0	2,920
2.2	134	7.0	6,800
2.4	234		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	257	596	410	304	380	374	3,240	315	321	251	453	212
2	212	522	459	398	503	362	3,320	*280	315	207	428	223
3	*196	440	555	368	617	321	3,000	362	309	171	431	304
4	196	251	596	368	646	315	2,450	286	304	350	470	257
5	191	292	682	362	617	292	1,800	229	196	392	422	202
6	166	321	653	338	549	246	1,490	263	251	292	392	207
7	275	398	689	333	503	275	1,280	344	229	202	368	207
8	240	398	674	298	465	263	1,090	518	191	333	309	191
9	286	362	589	327	428	298	986	251	171	*304	304	185
10	257	380	549	315	447	490	1,140	148	152	292	549	143
11	240	398	484	304	583	1,270	1,280	263	152	223	555	157
12	234	674	350	275	589	2,150	1,290	162	157	175	453	185
13	207	2,060	240	321	603	2,300	3,240	246	516	152	404	143
14	427	4,060	229	410	555	2,080	3,680	356	122	404	362	120
15	138	3,410	269	610	490	1,620	3,080	374	304	526	333	116
16	3.8	2,300	257	*872	434	1,280	1,940	484	309	660	321	112
17	355	1,500	212	1,500	410	1,060	1,450	410	246	589	380	152
18	380	896	175	1,870	428	1,340	1,170	368	152	4,260	535	130
19	343	689	191	1,940	422	4,350	945	362	127	5,040	576	*116
20	569	559	212	1,940	*392	5,950	864	344	152	4,750	682	116
21	833	696	202	1,560	362	6,370	749	321	143	4,350	674	112
22	1,340	610	196	1,040	350	6,580	689	356	143	3,630	617	116
23	1,620	490	246	757	350	5,140	660	779	171	2,450	471	116
24	2,010	*333	218	638	321	3,320	575	344	148	1,620	440	120
25	2,380	251	223	576	321	2,600	490	453	162	1,190	382	120
26	2,080	374	234	465	333	2,300	503	434	166	986	333	123
27	1,680	344	240	447	362	1,870	465	386	139	795	362	116
28	1,240	368	240	440	380	1,800	416	362	134	726	275	109
29	986	380	269	380	368	1,740	356	350	175	660	269	112
30	864	374	269	344	-	1,870	398	333	196	624	234	112
31	632	-	304	338	-	2,450	-	327	-	*589	275	-
Total	20,837.8	24,726	11,116	20,438	13,208	62,676	44,036	10,810	6,253	37,193	13,039	4,634
Mean	672	824	359	659	455	2,022	1,468	349	208	1,200	421	154
Cfsm	1.02	1.25	0.543	0.997	0.688	3.06	2.22	0.528	0.315	1.82	0.637	0.233
In.	1.17	1.39	0.63	1.15	0.74	3.53	2.48	0.61	0.35	2.09	0.73	0.26

Calendar year 1951: Max 4,550 Min 3.8 Mean 605 Cfsm 0.915 In. 12.41
Water year 1951-52: Max 6,580 Min 3.8 Mean 735 Cfsm 1.11 In. 15.13

Peak discharge (base, 2,000 cfs).--Oct. 24 (9 a.m.) 2,450 cfs (4.70 ft); Nov. 14 (9 a.m.) 4,350 cfs (5.80 ft); Jan. 19 (9:30 p.m.) 2,680 cfs (4.85 ft); Mar. 12 (3:30 p.m.) 2,760 cfs (4.90 ft); Mar. 22 (12.15 a.m.) 7,010 cfs (7.13 ft); Apr. 2 (1 p.m.) 3,590 cfs (5.39 ft); Apr. 13 (12 m.) 4,350 cfs (5.79 ft); May 8 (5 p.m.) 3,000 cfs (5.06 ft); June 13 (3 p.m.) 2,150 cfs (4.51 ft); July 18 (9:30 a.m.) 5,440 cfs (6.35 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Jan. 27-31, Feb. 8, 9, 14, 16, 17, 21-23, 25, Mar. 1, 4-7.

Skokie River at Lake Forest, Ill.

Location.--Lat 42°13'57", long. 87°50'41", in NW¼SW¼ sec. 4, T. 43 N., R. 12 E., on left bank at downstream side of bridge on State Highway 59A at Lake Forest, 12 miles upstream from mouth.

Drainage area.--12.8 sq mi.

Records available.--October 1951 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 650 ft (from topographic map).

Extremes.--Maximum discharge during year, 321 cfs Nov. 13 (gage height, 7.16 ft); minimum, 0.6 cfs Sept. 28.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second) (Shifting-control method used Jan. 20 to Mar. 9, Apr. 29, May 8 to July 21)

1.1	0.8	3.0	55
1.2	1.6	4.0	102
1.4	4.0	6.0	229
2.0	17	7.0	305

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.5	7.2	18	72	14	4.2	25	12	3.2	3.6	2.2	5.7
2	3.2	6.2	18	41	13	3.6	23	11	2.5	4.0	1.9	2.3
3	3.0	5.4	18	28	15	3.7	21	11	2.5	4.0	3.2	1.6
4	2.7	5.0	17	21	33	b3.7	19	10	2.0	3.6	9.9	1.6
5	*2.6	b4.2	15	17	16	b4.0	21	10	2.0	3.0	3.4	1.5
6	3.0	4.0	16	15	13	b4.0	22	9.6	1.9	2.8	2.6	1.4
7	52	5.4	20	14	b11	b4.0	20	11	1.5	5.7	2.5	1.1
8	24	5.4	16	13	*11	b4.0	18	9.8	1.4	16	2.3	1.5
9	14	6.0	14	*12	8.8	8.8	18	8.8	1.5	3.7	2.3	1.5
10	11	11	13	9.8	8.8	50	39	8.0	1.4	2.0	1.8	1.6
11	8.4	19	13	9.6	11	131	29	5.8	1.2	2.0	1.8	1.4
12	6.6	49	*12	8.4	9.4	125	76	5.4	15	1.7	1.8	1.4
13	5.0	142	11	8.2	8.8	104	243	a5.0	27	1.5	2.0	1.3
14	a4.3	*241	b10	18	7.4	65	124	a4.5	36	2.2	1.9	1.0
15	3.9	*110	b7.5	92	6.4	49	*55	a5.0	14	4.4	2.4	1.0
16	a3.5	*55	b7.0	59	5.6	39	38	a4.2	18	*5.1	3.0	*1.3
17	a3.1	38	b7.0	116	5.0	35	31	a3.5	189	3.5	1.6	1.5
18	a4.0	31	b7.0	72	b4.5	70	26	a2.9	*47	30	1.5	1.4
19	a6.0	25	b7.0	70	4.6	116	23	a2.5	17	34	*2.0	1.4
20	a7.5	23	b7.5	78	4.8	61	21	*2.2	12	14	3.3	1.2
21	6.2	22	b7.0	37	4.4	45	20	2.3	11	8.4	2.4	1.0
22	8.0	38	b6.6	27	b4.5	69	20	5.4	7.4	5.4	2.0	1.1
23	20	47	b6.2	21	b5.0	84	19	12	18	6.8	1.6	1.2
24	67	31	b6.0	18	5.4	42	18	6.0	47	3.2	1.4	1.2
25	38	25	b6.0	16	6.2	33	16	4.0	12	2.8	1.4	1.2
26	24	22	b6.5	15	6.4	29	15	3.0	8.0	3.0	1.7	1.2
27	19	21	b6.0	15	6.2	27	15	2.4	6.8	1.7	1.8	1.2
28	15	19	b5.8	13	b5.8	25	14	3.1	4.8	6.8	1.9	.9
29	12	18	b6.2	b11	5.0	23	13	1.7	3.9	3.4	1.8	.9
30	9.8	18	b7.0	b8.0	-	23	13	1.5	3.4	2.8	1.7	1.2
31	8.2	-	42	9.0	-	25	-	5.5	-	2.3	1.5	-
Total	398.5	1,053.8	359.3	964.0	260.0	1,310.0	1,055	189.1	518.4	193.4	72.6	43.8
Mean	12.9	35.1	11.6	31.1	8.97	42.3	35.2	6.10	17.3	6.24	2.34	1.46
Cfsm	1.01	2.74	0.906	2.43	0.701	3.30	2.75	0.477	1.35	0.488	0.183	0.114
In.	1.16	3.06	1.04	2.80	0.76	3.81	3.07	0.55	1.51	0.56	0.21	0.13

Calendar year 1951: Max - Min - Mean - Cfsm - In. -
Water year 1951-52: Max 243 Min 0.9 Mean 17.5 Cfsm 1.37 In. 18.66

Peak discharge (base, 140 cfs).--Nov. 13 (11:30 p.m.) 321 cfs (7.16 ft); Jan. 17 (3 p.m.) 149 cfs (4.80 ft); Mar. 11 (6 p.m.) 201 cfs (5.62 ft); Mar. 18 (12 p.m.) 161 cfs (4.95 ft); Apr. 13 (6 a.m.) 273 cfs (6.62 ft); June 17 (1:30 a.m.) 257 cfs (6.62 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of weather records and records for North Branch Chicago River at Niles and Willow Creek near Park Ridge.

b Stage-discharge relation affected by ice.

Note.--A discharge measurement of 8.75 cfs was made Sept. 28, 1951.

North Branch Chicago River at Niles, Ill.

Location.--Lat 42°00'44", long. 87°47'45", in SW¼SE¼ sec. 30, T. 41 N., R. 13 E., on right bank at downstream side of bridge on Touhy Avenue in Niles, 3.6 miles downstream from West Fork of North Branch, 7.9 miles upstream from North Shore Channel, and 15.2 miles upstream from mouth.

Drainage area.--102 sq mi.

Records available.--October 1950 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 601.99 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 870 cfs Apr. 14 (gage height, 7.89 ft); minimum daily, 1.5 cfs Sept. 14.
1950-52: Maximum discharge, 952 cfs May 11, 1951; maximum gage height, that of Apr. 14, 1952; minimum discharge, 0.1 cfs Dec. 25, 1950.

Remarks.--Records good except those below 10 cfs, which are fair, and those for periods of ice effect or no gage-height record, which are poor. Occasional regulation at low flow.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	22	54	66	402	58	34	87	24	29	18	6.4	a35
2	20	46	65	a250	106	31	78	22	27	14	3.4	a30
3	*15	37	65	a160	98	30	58	20	26	12	9.8	a10
4	12	39	61	a120	162	b30	45	17	21	10	48	a5.0
5	14	39	55	a95	178	b30	56	16	18	7.0	22	a4.5
6	15	30	53	a86	119	29	69	16	18	4.4	21	4.7
7	162	49	193	a79	83	26	62	16	13	15	14	4.7
8	188	b60	223	a74	73	25	47	24	9.2	161	8.1	4.7
9	161	56	145	64	55	36	37	24	14	94	25	3.9
10	93	88	99	56	55	178	106	26	14	50	14	5.0
11	54	178	*73	b54	61	617	166	24	8.1	24	8.8	7.0
12	36	295	60	44	63	666	235	22	73	16	*7.8	6.7
13	28	483	52	b40	*56	700	700	22	129	10	a6.0	5.2
14	23	*666	38	69	50	601	811	20	301	14	a4.5	1.5
15	22	666	b35	511	42	455	601	22	241	20	6.4	5.0
16	20	585	b34	585	39	376	*428	20	156	13	28	5.5
17	16	455	b33	*617	37	313	337	18	496	11	11	a5.0
18	26	325	b32	683	34	337	277	16	441	53	7.8	a6.0
19	48	241	b31	601	34	601	211	16	376	455	5.2	a6.0
20	59	178	b30	683	36	570	150	15	235	376	a16	5.5
21	51	130	b32	a550	35	402	107	14	178	235	a10	a4.0
22	44	139	b30	a300	31	376	81	32	150	135	a7.5	a4.5
23	82	295	b30	a200	32	483	51	50	145	276	a6.2	a5.0
24	313	277	30	a120	36	402	45	57	194	194	a5.5	5.5
25	376	183	b30	a80	36	*289	39	46	*156	98	6.0	6.0
26	283	135	b30	a75	36	223	31	33	94	39	3.9	4.7
27	200	96	b32	a70	37	166	29	*26	61	33	a4.5	3.9
28	150	74	34	b58	37	130	27	34	44	28	a5.0	3.7
29	111	68	39	b50	36	101	26	30	30	*20	a5.0	2.9
30	88	64	36	b44	-	78	23	24	22	14	a4.0	3.4
31	75	-	96	40	-	80	-	25	-	9.5	a3.0	-
Total	2,807	6,031	1,862	6,860	1,755	8,415	5,020	771	3,719.3	2,458.9	333.8	204.5
Mean	90.5	201	60.1	221	60.5	271	167	24.9	124	79.3	10.8	6.82
Cfsm	0.887	1.97	0.589	2.17	0.593	2.66	1.64	0.244	1.22	0.777	0.106	0.067
In.	1.02	2.20	0.68	2.50	0.64	3.07	1.83	0.28	1.36	0.90	0.12	0.07

Calendar year 1951: Max 875 Min 2.0 Mean 124 Cfsm 1.22 In. 16.43
Water year 1951-52: Max 811 Min 1.5 Mean 110 Cfsm 1.08 In. 14.67

Peak discharge (base, 500 cfs).--Nov. 15 (5 a.m.) 683 cfs (6.90 ft); Jan. 20 (7 a.m.) 683 cfs (6.93 ft); Mar. 13 (4:30 a.m.) 718 cfs (7.31 ft); Mar. 19 (11 p.m.) 633 cfs (6.85 ft); Apr. 14 (3 a.m.) 870 cfs (7.89 ft); June 17 (7 p.m.) 617 cfs (6.48 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of weather records, recorded range in stage when available, and records for Skokie River at Lake Forest and Des Plaines River at Des Plaines.

b Stage-discharge relation affected by ice.

Hart ditch at Munster, Ind.

Location.--Lat 41°33'35", long. 87°28'50", in N½ sec. 20, T. 36 N., R. 9 W., on left bank at city limit of Munster, a quarter of a mile downstream from U. S. Highway 6 and 0.4 mile upstream from mouth.

Drainage area.--68 sq mi, approximately.

Records available.--September 1942 to September 1952.

Gage.--Water-stage recorder and concrete control.

Average discharge.--10 years, 64.3 cfs.

Extremes.--Maximum discharge during year, 1,190 cfs June 14 (gage height, 4.39 ft); minimum, 3.8 cfs Sept. 28, 29; minimum gage height, 0.51 ft Sept. 17, 18.
1942-52: Maximum discharge, 2,490 cfs Apr. 6, 1947; maximum gage height, 7.23 ft Mar. 15, 1944; minimum discharge, 1.2 cfs July 29, 1946; minimum gage height, 0.47 ft July 29, 1946, Sept. 2, 1948.

Remarks.--Records good except those for periods of ice effect, which are fair. Flow from this ditch discharges into Little Calumet River near Munster, practically all of this flow discharging into the Calumet Sag Channel or Grand Calumet River.

Revisions.--W 1084: Drainage area.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 14				Nov. 15 to Sept. 30			
0.5	5.8	1.0	64	0.4	2.5	1.1	88
.6	12	1.3	128	.5	5.8	1.6	212
.7	22	4.0	1,030	.6	12	4.0	1,030
				.7	23		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	16	59	628	44	21	53	29	34	12	5.4	9.6
2	11	14	56	374	41	20	46	26	28	11	5.4	7.8
3	10	14	58	250	41	20	38	23	32	10	5.8	6.8
4	9.0	12	67	175	88	41	40	21	36	9.6	6.3	5.4
5	8.4	12	56	100	77	34	112	18	24	9.0	6.8	5.0
6	10	12	52	70	55	30	197	18	21	8.4	6.3	5.4
7	91	14	48	55	42	29	110	18	17	7.8	5.8	4.2
8	74	20	42	52	46	32	77	21	13	9.6	5.4	4.6
9	41	23	41	50	42	60	63	24	28	9.6	6.8	5.0
10	30	37	36	42	46	161	*82	41	28	8.4	5.8	5.0
11	24	79	36	36	50	333	86	30	17	7.3	5.8	5.0
12	20	239	30	35	46	174	172	26	133	7.3	6.3	4.6
13	16	448	*24	35	44	124	662	23	195	7.8	*6.3	4.2
14	14	*873	22	101	41	99	426	21	937	13	7.3	4.6
15	12	470	20	333	35	75	224	28	662	11	7.8	4.6
16	12	206	b18	177	34	59	140	29	184	9.0	7.8	*4.6
17	11	159	b17	166	32	52	101	36	*122	9.0	6.3	4.6
18	10	117	b16	135	28	101	77	40	78	9.0	5.4	5.4
19	10	86	b15	253	32	488	66	*32	58	9.0	5.4	5.4
20	10	69	b15	466	32	269	53	29	55	9.0	5.4	5.4
21	10	66	b15	177	29	144	50	26	86	8.4	5.8	5.4
22	*10	101	b15	112	23	191	46	34	66	*7.8	5.8	5.4
23	16	239	b15	*67	*26	245	91	41	50	7.8	5.8	5.4
24	54	138	b15	55	26	122	*90	73	41	7.3	5.8	5.0
25	44	90	b15	47	23	95	63	97	32	6.3	5.4	5.0
26	32	77	b15	75	21	78	52	69	24	6.3	5.4	4.6
27	25	66	b15	90	23	66	42	50	22	6.3	5.4	4.2
28	24	63	b15	59	23	58	38	95	17	6.3	5.8	4.2
29	20	59	b15	55	23	52	35	69	14	6.3	6.3	4.2
30	18	59	b20	50	-	47	30	47	13	6.3	6.8	4.6
31	16	-	125	47	-	47	-	36	-	6.8	6.8	-
Total	704.4	3,878	1,008	4,367	1,113	3,367	3,362	1,170	3,067	262.7	188.7	155.2
Mean	22.7	129	32.5	141	38.4	109	112	37.7	102	8.47	6.09	5.17
Cfsm	0.334	1.90	0.478	2.07	0.565	1.60	1.65	0.554	1.50	0.125	0.090	0.076
In.	0.39	2.12	0.55	2.39	0.61	1.84	1.84	0.64	1.68	0.14	0.10	0.08

Calendar year 1951: Max 1,350 Min 7.3 Mean 70.2 Cfsm 1.03 In. 14.01
Water year 1951-52: Max 937 Min 4.2 Mean 61.9 Cfsm 0.910 In. 12.38

Peak discharge (base, 800 cfs).--Nov. 14 (4 p.m.) 960 cfs (3.81 ft); June 14 (9 p.m.) 1,190 cfs (4.39 ft).
* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

Thorn Creek at Glenwood, Ill.

Location.--Lat 41°31'50", long. 87°36'20", in SW¼SE¼ sec. 9, T. 35 N., R. 14 E., on right bank 20 ft downstream from Baltimore & Ohio Chicago Terminal Railroad bridge, 0.7 mile north of Chicago Heights, 0.8 mile south of Glenwood, and 1 mile upstream from Deer Creek.

Drainage area.--25.4 sq mi.

Records available.--May 1949 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 610.97 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 780 cfs June 14 (gage height, 9.12 ft), from rating curve extended above 350 cfs by logarithmic plotting; minimum daily, 9.5 cfs Sept. 28.

1949-52: Maximum discharge, 831 cfs May 10, 1951 (gage height, 9.35 ft), from rating curve extended above 350 cfs by logarithmic plotting; minimum daily, 6.0 cfs July 4, Aug. 21, Sept. 5, 11, 25, 1949.

Remarks.--Records good. Figures of discharge include about 6 cfs pumped from ground-water sources for municipal supply of Chicago Heights and undetermined amount of ground-water pumpage for industrial use above station. Undetermined amount of pumpage diverted by commercial livestock feeding pens above station.

Revisions.--W 1207: Drainage area.

Rating table, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)

2.8	9.3	4.0	69
3.0	14	5.0	159
3.3	26	6.0	278
3.6	43	8.0	593

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*13	12	21	323	20	16	30	17	14	14	13	42
2	14	12	19	87	19	15	26	17	16	16	12	18
3	14	12	21	*46	20	19	24	15	21	15	11	15
4	14	10	22	36	37	28	29	13	19	12	13	14
5	14	12	21	31	29	23	47	16	16	12	14	13
6	20	13	24	26	25	20	51	16	16	11	14	12
7	56	15	39	25	22	19	36	18	14	13	13	10
8	24	14	28	26	22	19	31	17	14	16	13	13
9	17	14	24	23	18	36	26	29	16	14	13	14
10	16	17	25	21	17	76	52	20	16	13	10	14
11	15	22	24	21	19	144	39	15	14	13	13	15
12	14	150	23	17	21	67	159	16	83	12	14	15
13	13	285	20	19	21	52	327	17	177	11	13	13
14	11	352	19	41	20	44	115	19	513	16	28	11
15	12	91	17	138	*19	32	75	18	114	*14	13	12
16	13	52	16	61	17	26	49	19	56	14	13	15
17	13	41	15	67	15	27	37	17	42	14	10	14
18	13	31	19	50	17	58	33	15	30	14	12	15
19	13	29	19	187	19	257	26	16	23	28	12	14
20	12	27	19	173	19	*79	22	17	37	13	13	12
21	10	*25	19	55	18	51	24	*17	35	14	14	9.8
22	11	50	17	42	17	116	25	24	22	15	12	14
23	25	93	16	31	16	119	26	19	21	16	11	14
24	19	45	15	27	14	51	23	40	20	14	9.8	13
25	15	30	15	28	16	41	23	25	18	13	11	13
26	14	29	17	33	17	36	18	24	16	12	12	13
27	13	26	17	31	18	32	16	24	21	11	12	11
28	11	24	18	28	18	29	18	36	15	13	13	9.5
29	13	22	18	22	17	23	18	24	12	14	12	12
30	14	22	17	17	-	20	17	16	15	14	11	13
31	13	-	149	19	-	26	-	16	-	14	9.6	-
Total	489	1,577	753	1,751	567	1,601	1,442	612	1,446	435	394.4	423.3
Mean	15.8	52.6	24.3	56.5	19.6	51.6	48.1	19.7	48.2	14.0	12.7	14.1
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 524 Min 10 Mean 33.4 Cfsm - In. -
Water year 1951-52: Max 513 Min 9.5 Mean 31.4 Cfsm - In. -

Peak discharge (base, 240 cfs).--Nov. 14 (2:30 a.m.) 661 cfs (8.44 ft); Dec. 31 (12 p.m.) 528 cfs (7.62 ft); Jan. 19 (9:30 p.m.) 400 cfs (6.78 ft); Mar. 19 (2:30 a.m.) 392 cfs (6.77 ft); Apr. 13 (4:30 a.m.) 464 cfs (7.17 ft); June 14 (4:30 a.m.) 780 cfs (9.12 ft).

* Discharge measurement made on this day.

Deer Creek near Chicago Heights, Ill.

Location.--Lat 41°31'15", long. 87°35'25", 0.1 mile west of center of sec. 14, T. 35 N., R. 14 E., on left bank at downstream side of bridge on Joe Orr Road, 0.4 mile east of Cottage Grove Avenue, 1 mile north of U. S. Highway 30, 1.5 miles northeast of Chicago Heights, and 1.6 miles west of Torrence Avenue.

Drainage area.--24.4 sq mi.

Records available.--May 1948 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 615.95 ft above mean sea level, datum of 1929. Prior to Jan. 11, 1949, wire-weight gage at same site and datum.

Extremes.--Maximum discharge during year, 419 cfs Nov. 14 (gage height, 10.21 ft); minimum, 0.4 cfs Sept. 16.
1948-52: Maximum discharge, 663 cfs May 10 or 11, 1948 (gage height, 11.52 ft, from floodmark); no flow Sept. 21 to Oct. 3, 1949.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Undetermined amount of flow diverted for irrigation.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 19-22, Sept. 26-30)

1.6	0.5	4.0	44
1.8	1.3	6.0	110
2.0	2.9	8.0	201
2.5	10	9.0	283
3.0	19	10.0	405

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*1.0	1.4	12	a190	8.1	3.6	15	6.8	7.4	3.9	1.6	1.4
2	1.1	1.2	12	a80	8.4	3.4	14	6.0	6.2	3.7	1.5	1.4
3	1.2	1.1	12	*37	9.2	3.6	12	5.3	9.0	3.7	1.5	.8
4	1.3	b1.1	11	25	23	6.9	11	5.1	9.2	3.4	1.6	1.0
5	1.6	1.0	9.8	18	20	b6.0	26	4.8	7.2	3.3	1.5	.8
6	2.4	1.0	9.8	14	13	b5.8	48	4.4	5.7	3.2	1.4	.7
7	8.4	1.9	16	13	9.4	5.8	29	4.6	4.8	3.1	1.4	1.2
8	3.9	1.9	12	12	9.0	6.8	20	4.7	4.6	3.2	1.3	1.3
9	3.0	1.9	12	11	8.0	15	16	5.3	4.7	3.1	1.4	1.2
10	2.8	2.8	10	8.4	8.0	62	24	7.8	4.1	2.8	1.2	1.0
11	2.4	8.3	9.4	7.6	8.1	96	26	6.9	3.9	2.6	1.2	.9
12	1.9	64	8.0	7.2	6.9	52	47	a6.4	28	2.4	1.2	.9
13	1.6	162	6.4	7.0	6.9	37	208	a6.0	53	2.4	1.2	.7
14	1.4	332	6.0	20	6.2	30	92	a5.6	284	2.9	1.6	.7
15	1.5	111	b5.6	106	*5.7	23	55	a5.4	108	2.6	1.4	.8
16	1.2	56	b5.2	55	5.4	19	35	a6.4	44	*2.4	1.3	.5
17	1.3	40	b5.1	49	5.4	15	25	a6.4	32	2.2	1.1	.6
18	1.4	29	b5.0	44	4.8	32	19	a6.4	22	2.2	1.0	.8
19	1.4	19	b5.0	71	4.7	163	15	6.2	15	2.5	1.2	1.0
20	1.5	16	b5.2	157	4.8	*77	14	5.8	14	2.3	*1.4	1.0
21	1.5	*14	b5.5	50	4.7	42	12	*5.4	25	1.9	1.4	.8
22	1.5	22	b5.0	32	4.1	63	12	6.0	19	1.9	1.2	1.0
23	1.9	56	b4.7	19	3.9	95	14	6.6	14	2.0	1.1	1.0
24	5.8	32	b4.3	15	3.8	41	14	20	12	1.9	1.0	.9
25	5.6	20	b4.2	13	3.9	29	12	22	9.4	1.8	.9	.8
26	3.8	17	b4.1	18	3.8	23	11	15	6.9	1.7	.8	.7
27	2.9	14	b4.0	23	3.7	18	9.5	11	6.2	1.8	.7	.8
28	2.6	13	b4.2	15	3.6	16	8.7	15	5.8	1.9	.7	1.0
29	1.9	12	b4.5	b10	3.7	14	8.0	13	5.1	1.8	.7	.7
30	1.9	13	b5.0	8.6	-	14	7.2	9.7	4.3	1.8	.7	.6
31	1.8	-	41	7.8	-	14	-	8.0	-	1.7	.6	-
Total	73.3	1,065.6	264.0	1,143.6	210.4	1,031.9	859.4	248.0	774.5	78.1	36.8	27.0
Mean	2.36	35.5	8.52	36.9	7.26	33.3	28.6	8.00	25.8	2.52	1.19	0.90
Cfsm	0.097	1.45	0.349	1.51	0.298	1.36	1.17	0.328	1.06	0.103	0.049	0.037
In.	0.11	1.62	0.40	1.74	0.32	1.57	1.31	0.38	1.18	0.12	0.06	0.04

Calendar year 1951: Max 436 Min 0.6 Mean 20.3 Cfsm 0.832 In. 11.26
Water year 1951-52: Max 332 Min 0.5 Mean 15.9 Cfsm 0.652 In. 8.85

Peak discharge (base, 250 cfs).--Nov. 14 (7 a.m.) 419 cfs (10.21 ft); Jan. 1 (3 a.m.) 264 cfs (8.78 ft); Apr. 13 (9 a.m.) 264 cfs (8.76 ft); June 14 (9 a.m.) 377 cfs (9.75 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of weather records and records for North Creek near Lansing and Thorn Creek at Thornton.

b Stage-discharge relation affected by ice.

Butterfield Creek at Flossmoor, Ill.

Location.--Lat 41°32'25", long. 87°38'55", in NE¼NW¼ sec. 8, T. 35 N., R. 14 E., on left bank at downstream side of Riegle Road Bridge at Homewood city limits, 0.1 mile north of Holbrook Road and three-quarters of a mile east of Flossmoor.

Drainage area.--22.9 sq mi.

Records available.--May 1948 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 616.80 ft above mean sea level, datum of 1929. Prior to Sept. 9, 1948, wire-weight gage at same site and datum.

Extremes.--Maximum discharge during year, 339 cfs Nov. 13 (gage height, 8.04 ft); minimum, 0.1 cfs Sept. 13, 14.
1948-52: Maximum discharge, 683 cfs Mar. 19, 1948, May 10 or 11, 1948 (gage heights, 10.29 and 10.28 ft, from floodmarks); no flow at times in 1948.

Remarks.--Records good except those for periods of ice effect, which are fair, and those for period of no gage-height record, which are poor.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Aug. 23 to Sept. 30)

3.6	0.1	4.8	29
3.7	.4	5.0	39
3.8	.9	5.5	68
3.9	1.8	6.0	105
4.0	3.1	7.0	198
4.2	6.6	8.0	332
4.4	12		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*3.9	4.2	16	a220	15	4.7	20	6.8	4.5	2.8	0.3	3.5
2	3.1	4.1	15	a95	14	4.7	17	6.6	3.9	2.4	.2	1.9
3	2.8	b4.0	14	*a55	13	4.7	14	6.2	4.2	2.3	.5	.6
4	2.4	b4.5	13	37	35	b8.0	14	6.2	4.4	2.1	1.0	.4
5	2.3	b4.5	11	28	24	b7.0	25	5.8	3.7	1.7	.6	.3
6	3.6	5.3	11	22	18	6.8	31	5.8	3.4	1.6	.5	.2
7	46	6.2	27	18	13	7.3	23	5.6	3.1	1.5	.3	.3
8	30	5.8	22	17	12	9.0	19	5.8	3.0	1.9	.3	.2
9	16	6.0	18	16	11	31	16	7.6	3.4	1.8	.4	.2
10	11	8.5	15	12	11	86	33	8.3	2.7	1.5	.4	.2
11	8.0	23	14	b10	11	109	30	6.2	2.3	1.3	.3	.2
12	6.2	106	12	10	9.3	62	72	5.5	25	1.1	.4	.2
13	5.1	179	b10	10	9.3	49	195	4.7	57	.8	.5	.1
14	4.4	225	8.3	33	*8.3	39	91	4.5	238	1.2	.6	.1
15	4.4	88	9.0	95	8.3	30	62	5.6	78	1.3	.8	.4
16	4.1	62	a8.5	54	7.6	24	44	5.3	44	*1.1	.9	.3
17	3.6	48	a8.5	59	7.3	20	35	5.5	34	1.1	.7	.2
18	3.4	38	a8.5	48	6.8	56	28	5.3	22	.9	.6	.4
19	3.4	30	a8.0	125	6.6	176	24	4.7	14	2.3	.3	.3
20	3.3	24	a8.0	b190	6.8	84	20	4.5	14	2.3	.5	.3
21	3.4	*21	a8.5	b74	6.0	*54	17	4.5	17	1.4	.7	.2
22	3.4	29	a8.0	b50	6.0	93	15	*6.6	13	.9	.6	.3
23	4.5	68	a7.5	36	5.6	116	14	7.1	9.9	1.4	.6	.6
24	12	44	a7.5	b30	5.6	55	12	8.0	7.6	.8	.6	.3
25	9.6	34	a7.0	26	5.3	43	11	8.8	5.8	.6	.4	.2
26	7.3	30	a7.0	b31	5.3	36	9.9	6.6	4.7	.6	.4	.2
27	6.0	22	a7.0	b36	5.3	30	9.0	5.3	5.1	.6	.3	.2
28	5.8	19	a7.2	b23	5.3	26	8.5	7.6	4.4	.6	.2	.2
29	5.1	17	a7.5	b19	5.1	22	7.8	5.6	3.6	.6	.2	.2
30	4.5	16	a8.0	15	-	19	7.3	4.7	3.0	.5	.2	**.2
31	4.4	-	a55	14	-	20	-	4.5	-	.5	.2	-
Total	233.0	1,176.1	387.0	1,508	296.8	1,332.2	924.5	185.8	638.7	41.5	14.5	12.9
Mean	7.52	39.2	12.5	48.6	10.2	43.0	30.8	5.99	21.3	1.34	0.47	0.43
Cfsm	0.328	1.71	0.546	2.12	0.445	1.88	1.34	0.262	0.930	0.059	0.021	0.019
In.	0.38	1.91	0.63	2.45	0.48	2.16	1.50	0.30	1.04	0.07	0.02	0.02

Calendar year 1951: Max 405 Min 0.8 Mean 21.4 Cfsm 0.934 In. 12.66
Water year 1951-52: Max 238 Min 0.1 Mean 18.4 Cfsm 0.803 In. 10.96

Peak discharge (base, 240 cfs).--Nov. 13 (12 p.m.) 339 cfs (8.04 ft); Jan. 20 (6 a.m.) 283 cfs (7.66 ft); Apr. 13 (8 a.m.) 248 cfs (7.39 ft); June 14 (12 m.) 325 cfs (8.00 ft).

* Discharge measurement made on this day.

** Field estimate made on this day.

a No gage-height record; discharge estimated on basis of weather records, 1 discharge measurement, recorded range in stage, and records for Midlothian Creek at Oak Forest and Tinley Creek near Palos Park.

b Stage-discharge relation affected by ice.

Lansing ditch near Lansing, Ill.

Location.--Lat 41°31'40", long. 87°31'45", at north boundary of sec. 17, T. 35 N., R. 15 E., on right bank at upstream side of bridge on farm road, 0.2 mile west of Indiana State line, 0.5 mile east of Burnham Avenue, and 2 miles south of Lansing.

Drainage area.--8.3 sq mi, approximately.

Records available.--May 1948 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 607.16 ft above mean sea level, datum of 1929. Prior to Sept. 20, 1948, wire-weight gage at same site and datum.

Extremes.--Maximum discharge during year, 323 cfs Jan. 1 (gage height, 8.42 ft); no flow Sept. 23-29.
1948-52: Maximum discharge, 461 cfs May 10 or 11, 1948 (gage height, 9.24 ft, from floodmark); no flow at times.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Undetermined amount of flow diverted for irrigation above station.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 11-18, Sept. 17-30)

2.3	0	3.5	16
2.4	.4	4.0	29
2.6	1.6	5.0	64
2.8	3.3	7.0	176
3.0	6.0	8.0	269

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*0.9	1.3	7.0	216	5.7	a2.0	a7	2.5	3.0	1.6	0.4	1.4
2	.9	1.2	6.2	46	a6.0	a2.0	a6	2.3	2.7	1.5	.3	.9
3	.8	b1.1	6.2	*21	a6.4	a2.2	a5	2.1	4.9	1.4	.6	.7
4	.7	b1.1	6.8	13	a13	a4.0	a5	2.2	3.3	1.2	.7	.5
5	.7	b1.0	5.4	9.2	a12	a3.5	a17	1.8	2.8	1.0	.6	.3
6	1.0	b1.5	5.1	7.3	a8.5	a3.5	a40	1.8	2.8	1.0	.6	.2
7	12	b2.3	5.1	6.5	a6.4	a3.7	a17	1.8	2.6	.9	.5	.3
8	5.7	b3.2	4.0	6.0	a6.0	a4.0	a12	2.2	2.7	1.2	.5	.2
9	3.1	3.3	3.8	5.2	a5.8	a9.0	a9	3.1	2.8	1.1	.3	.2
10	2.2	3.5	3.3	b4.5	a5.5	a36	a11	3.5	2.5	1.0	.5	.2
11	1.8	13	3.3	b4.0	a5.3	a60	a13	2.7	2.3	.9	.5	.1
12	1.5	63	3.0	a3.4	a5.0	a30	a35	2.4	19	.8	.5	.1
13	1.3	116	b2.8	3.9	a4.7	a21	a170	2.3	28	.9	.5	.1
14	1.2	223	b2.6	20	a4.3	a16	a60	2.3	136	1.3	.8	.1
15	1.2	73	b2.5	55	*3.8	a13	a31	2.6	39	*1.0	.7	.1
16	1.1	34	b2.4	25	3.5	a11	a20	2.4	15	.7	.6	.3
17	1.1	23	b2.4	30	3.2	a8.5	14	2.5	10	.7	.5	.3
18	1.1	17	b2.4	18	2.8	*30	9.7	2.4	6.5	1.0	.4	.2
19	1.1	12	b2.4	65	2.8	102	8.0	2.2	4.3	1.4	.4	.2
20	1.0	8.7	b2.5	74	2.9	36	6.5	2.2	5.0	1.2	.5	.1
21	1.0	*7.8	b2.7	25	b2.7	a20	5.4	*2.1	7.4	1.0	*.4	.1
22	1.0	22	b2.5	15	a2.4	a30	5.4	a2.8	6.3	1.1	.3	.1
23	1.8	52	b2.5	b10	a2.3	a36	5.7	a3.4	4.6	1.2	.2	0
24	6.6	22	b2.4	b8.0	a2.3	a18	5.1	a14	3.8	1.2	.2	0
25	3.7	13	b2.4	7.8	a2.2	a13	4.1	a16	3.1	1.1	.2	0
26	2.6	9.2	b2.3	9.2	a2.2	a11	3.7	a9.5	2.6	1.0	.2	0
27	2.2	7.4	b2.3	10	a2.2	a9	3.3	a6.4	2.3	1.0	.2	0
28	2.1	7.0	b2.7	b8.0	a2.2	a8	3.1	8.8	2.0	.9	.2	0
29	1.7	6.5	b3.2	7.0	a2.2	a7	2.9	5.8	1.8	.8	.2	0
30	1.6	7.3	b4.0	6.3	-	a6	2.7	3.9	1.7	.6	.2	*.1
31	1.5	-	b45	6.0	-	a6	-	3.4	-	.5	.2	-
Total	66.2	756.4	151.2	747.3	134.3	561.4	537.6	123.4	330.8	32.2	12.9	6.8
Mean	2.14	25.2	4.88	24.1	4.63	18.1	17.9	3.98	11.0	1.04	0.42	0.23
Cfsm	0.258	3.04	0.588	2.90	0.558	2.18	2.16	0.480	1.33	0.125	0.051	0.028
In.	0.30	3.39	0.68	3.35	0.60	2.52	2.41	0.55	1.48	0.14	0.06	0.03

Calendar year 1951: Max 377 Min 0.3 Mean 13.1 Cfsm 1.58 In. 21.47
Water year 1951-52: Max 223 Min 0 Mean 9.45 Cfsm 1.14 In. 15.51

Peak discharge (base, 140 cfs).--Nov. 14 (3 a.m.) 275 cfs (8.07 ft); Jan. 1 (3 a.m.) 323 cfs (8.42 ft); Jan. 19 (8 p.m.) 157 cfs (6.69 ft); Apr. 13 (about 6 a.m.) 212 cfs (7.44 ft); June 14 (9 a.m.) 157 cfs (6.69 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of weather records, recorded range in stage, and records for North Creek near Lansing and Deer Creek near Chicago Heights.

b Stage-discharge relation affected by ice.

North Creek near Lansing, Ill.

Location.--Lat 41°32'45", long. 87°33'30", in SE¼SE¼ sec. 1, T. 35 N., R. 14 E., on right bank at downstream side of Torrence Avenue Bridge, 1.1 miles south of Lansing and 2.7 miles north of U. S. Highway 30.

Drainage area.--18.2 sq mi.

Records available.--May 1948 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 599.29 ft above mean sea level, datum of 1929. Prior to Dec. 16, 1948, wire-weight gage at same site and datum.

Extremes.--Maximum discharge during year, 435 cfs Jan. 1 (gage height, 7.85 ft); minimum, 0.2 cfs on many days.
1948-52: Maximum discharge observed, 649 cfs May 11, 1948, and May 11, 1951 (gage height, 8.35 ft); no flow at times.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor.

Revisions (water years).--W 1144: 1948(M).

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.6	0.1	4.7	35
2.7	.3	5.4	63
2.8	.8	6.2	115
2.9	1.5	6.9	208
3.1	3.5	7.6	360
3.4	7.6	8.0	490
4.0	19		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*1.6	3.5	30	360	a12	4.2	14	6.8	7.2	2.5	0.4	2.1
2	1.4	3.2	27	a120	a13	4.2	12	6.6	6.0	2.2	.3	.8
3	1.2	3.0	25	*49	a14	4.5	10	5.8	5.8	2.2	.3	.5
4	.9	2.8	35	36	a29	6.8	9.6	5.5	6.1	1.9	.7	.4
5	.7	2.6	31	28	a26	6.1	33	5.4	5.1	1.6	.7	.3
6	.9	2.2	27	23	a19	6.1	66	5.1	4.5	1.6	.7	.3
7	46	2.5	31	20	a14	6.4	35	4.8	4.1	1.4	.7	.3
8	33	4.8	29	18	a13	7.3	24	4.8	3.7	1.6	.6	.3
9	17	7.0	24	16	a13	15	18	5.3	3.6	1.6	.6	.3
10	9.6	18	b18	13	a12	52	23	6.8	3.3	1.6	.6	.3
11	6.7	52	b14	11	a11	98	27	6.6	3.1	1.4	.6	.2
12	5.1	133	b11	8.4	a11	52	72	6.0	17	1.5	.7	.2
13	4.2	235	9.0	9.6	a10	36	300	5.4	37	1.4	.6	.2
14	3.5	351	7.2	a43	a9.5	28	127	5.1	202	1.8	.8	.2
15	3.3	154	6.4	a93	*8.4	21	*69	5.1	75	1.8	.9	.2
16	3.1	87	b6.0	a70	7.8	17	41	5.0	24	1.4	.8	.2
17	2.8	b65	b5.6	a64	7.3	14	29	5.0	19	1.2	.4	.2
18	2.5	b50	b5.5	a50	6.4	25	22	4.8	13	1.3	.4	.2
19	2.4	b40	b5.5	a140	6.2	153	17	4.7	*8.2	1.4	.6	.3
20	2.4	b33	b5.6	a160	6.4	72	16	4.6	8.2	1.0	.6	.3
21	2.3	b30	b5.8	a55	6.4	38	12	5.0	13	1.2	*.6	.3
22	2.2	b40	b5.8	a33	5.0	54	12	6.4	10	1.2	.5	.3
23	5.8	111	b5.6	a22	5.0	70	12	7.8	8.1	1.2	.5	.3
24	29	72	b5.4	a18	5.0	34	11	31	6.7	1.0	.4	.3
25	21	46	b5.2	a17	4.7	26	9.7	37	5.5	1.0	.4	.3
26	14	42	b5.0	a20	4.8	21	9.0	22	4.7	.8	.4	.2
27	10	b38	b5.0	a23	4.7	18	8.4	13	3.9	.9	.4	.2
28	8.2	36	b5.2	a18	4.8	16	7.8	19	3.5	.8	.4	.2
29	6.1	33	b5.6	a15	4.7	13	7.2	18	3.0	.7	.3	.2
30	5.3	34	b6.5	a14	-	12	7.0	11	2.5	.6	.3	**.3
31	4.5	-	47	a13	-	12	-	8.2	-	.5	.3	-
Total	256.7	1,731.6	454.9	1,580.0	294.1	942.6	1,060.7	287.6	516.8	42.3	16.5	10.4
Mean	8.28	57.7	14.7	51.0	10.1	30.4	35.4	9.28	17.2	1.36	0.53	0.35
Cfsm	0.455	3.17	0.808	2.80	0.555	1.67	1.94	0.510	0.945	0.075	0.029	0.019
In.	0.52	3.54	0.93	3.23	0.60	1.93	2.17	0.59	1.06	0.09	0.03	0.02

Calendar year 1951: Max 623 Min 0.4 Mean 23.8 Cfsm 1.31 In. 17.75
Water year 1951-52: Max 360 Min 0.2 Mean 19.7 Cfsm 1.08 In. 14.71

Peak discharge (base, 210 cfs).--Nov. 14 (1:30 a.m.) 418 cfs (7.82 ft); Jan. 1 (7 a.m.) 435 cfs (7.85 ft); Jan. 19 (about 10 p.m.) 279 cfs (7.26 ft); Apr. 13 (9 a.m.) 360 cfs (7.60 ft); June 14 (9 a.m.) 245 cfs (7.10 ft).

* Discharge measurement made on this day.

** Field estimate made on this day.

a No gage-height record; discharge estimated on basis of weather records and records for Lansing ditch near Lansing, Deer Creek near Chicago Heights, and Thorn Creek at Thornton.

b Stage-discharge relation affected by ice.

Thorn Creek at Thornton, Ill.

Location.--Lat 41°34'05", long. 87°36'30", near center of N½ sec. 34, T. 36 N., R. 14 E., on right bank at downstream side of Ridge Road Bridge in Thornton, 1 mile downstream from North Creek and 1½ miles upstream from Grand Trunk Railway.

Drainage area.--106 sq mi.

Records available.--May 1948 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 586.43 ft above mean sea level, datum of 1929. Prior to Dec. 18, 1948, wire-weight gage at same site and datum.

Extremes.--Maximum discharge during year, 1,570 cfs Nov. 14 (gage height, 10.53 ft); minimum daily, 11 cfs Sept. 21, 28.
1948-52: Maximum discharge, 4,040 cfs Mar. 20, 1948 (gage height, 14.08 ft, from floodmark); minimum daily, 4.4 cfs Sept. 11, 1949.
Flood of Apr. 5, 1947, reached a stage of 14.34 ft, from floodmark (discharge, 4,200 cfs).

Remarks.--Records good except those for periods of no gage-height record, which are poor. Some diurnal fluctuation caused by pumping operations above station. Figures of discharge include about 6 cfs pumped from ground-water sources for municipal supply of Chicago Heights and undetermined amount of ground-water pumpage for industrial use above station.

Revisions.--W 1207: Drainage area.

Rating table, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 20 to Apr. 17)

2.4	10	5.0	386
2.5	16	7.0	655
2.7	36	9.0	1,020
3.0	87	10.0	1,350
3.5	187	11.0	1,840
4.0	263		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*28	31	75	955	a60	36	57	44	49	26	18	45
2	29	30	69	a700	a60	34	49	43	44	26	17	30
3	28	32	67	a350	a60	36	42	39	52	26	15	19
4	26	34	79	182	a130	67	42	34	55	23	19	16
5	26	32	73	133	a120	58	95	36	43	21	19	16
6	31	36	67	103	a80	53	233	39	35	19	18	15
7	303	46	137	85	a70	53	141	40	32	20	18	14
8	330	47	114	81	a65	57	81	43	26	26	18	15
9	198	53	94	73	a55	104	60	60	32	24	19	17
10	105	78	83	64	a55	362	114	60	29	22	15	15
11	55	182	77	55	a60	550	118	44	26	22	17	15
12	40	458	67	58	a60	386	217	42	162	20	20	15
13	35	794	55	53	a55	270	934	40	286	18	20	14
14	32	1,430	53	100	a56	195	656	39	1,020	25	30	12
15	31	791	47	477	*55	135	*362	47	723	*23	20	13
16	34	374	44	410	52	103	214	47	270	22	20	16
17	34	263	42	340	47	87	143	47	160	21	14	15
18	34	189	44	318	47	176	116	44	114	21	15	15
19	34	139	44	407	47	761	98	42	*81	35	16	15
20	32	112	46	928	47	459	87	43	77	24	17	14
21	29	*96	47	a400	44	*248	*81	42	108	21	18	11
22	28	128	43	a200	42	301	79	58	83	20	16	14
23	56	398	42	a120	40	492	81	62	65	24	14	15
24	135	297	39	a110	36	285	75	124	55	21	12	14
25	129	159	36	a90	37	160	67	157	46	18	12	14
26	60	120	37	a100	39	110	58	112	40	18	15	14
27	44	89	39	a120	40	79	52	81	42	15	15	13
28	39	87	39	a96	40	67	52	112	37	16	16	11
29	37	83	42	a82	40	53	50	96	29	18	15	12
30	36	77	47	a75	-	46	46	67	28	19	15	*15
31	34	-	181	a65	-	49	-	55	-	18	12	-
Total	2,092	6,685	1,969	7,330	1,639	5,872	4,500	1,839	3,849	672	525	479
Mean	67.5	223	63.5	236	56.5	189	150	59.3	128	21.7	16.9	16.0
Cfsm	0.637	2.10	0.599	2.23	0.533	1.78	1.42	0.559	1.21	0.205	0.159	0.151
In.	0.73	2.35	0.69	2.57	0.58	2.06	1.58	0.65	1.35	0.24	0.18	0.17

Calendar year 1951: Max 2,420 Min 14 Mean 119 Cfsm 1.12 In. 15.24
Water year 1951-52: Max 1,430 Min 11 Mean 102 Cfsm 0.962 In. 13.15

Peak discharge (base, 520 cfs).--Nov. 14 (1:30 p.m.) 1,570 cfs (10.53 ft); Jan. 1 (10 p.m.) 1,100 cfs (9.28 ft); Jan. 15 (8 p.m.) 550 cfs (6.33 ft); Jan. 20 (11 a.m.) 1,000 cfs (8.92 ft); Mar. 11 (12 m.) 595 cfs (6.56 ft); Mar. 19 (4 p.m.) 830 cfs (8.14 ft); Apr. 13 (5 p.m.) 1,080 cfs (9.34 ft); June 14 (8 p.m.) 1,270 cfs (9.77 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of weather records and records for Thorn Creek at Glenwood and Little Calumet River at South Holland.

Little Calumet River at South Holland, Ill.

Location.--Lat 41°36'05", long. 87°34'38", in SW¼SW¼ sec. 13, T. 36 N., R. 14 E., on right bank at downstream side of bridge on U. S. Highway 6, 0.6 mile downstream from Thorn Creek, 1.6 miles east of South Holland, and 4.1 miles upstream from former gaging station at Harvey.

Records available.--October 1947 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 575.00 ft above mean sea level.

Average discharge.--5 years, 183 cfs.

Extremes.--Maximum discharge during year, 2,480 cfs Nov. 14 (gage height, 13.91 ft); minimum daily, 23 cfs Oct. 3, 4; minimum gage height, 5.57 ft Nov. 3.
1947-52: Maximum discharge, 3,810 cfs May 11, 1948 (gage height, 17.33 ft); minimum daily, 7.9 cfs Oct. 6, 1950; minimum gage height, 3.99 ft Sept. 26, 1949.
Flood of Apr. 6, 1947, reached a stage of 19.24 ft, from floodmark (discharge, 4,760 cfs).

Remarks.--Records good except those for period July 1 to Aug. 18, which are fair, and those for periods of no auxiliary gage-height record, which are poor.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	32	86	171	2,010	137	101	154	74	77	79	59	a110
2	26	86	160	1,520	141	89	140	84	68	72	71	a100
3	23	75	158	790	133	102	121	66	80	78	77	a90
4	23	91	183	420	254	155	113	74	67	76	83	70
5	26	87	164	284	262	141	216	74	85	75	83	53
6	*41	102	152	209	187	124	442	75	63	64	83	53
7	407	140	226	199	164	119	311	63	69	60	81	77
8	365	116	179	170	158	121	201	62	81	76	83	58
9	198	95	160	157	144	171	150	96	68	63	83	41
10	143	123	165	149	155	509	234	102	69	59	93	46
11	127	229	144	151	154	908	247	78	69	70	69	47
12	98	678	125	129	137	691	339	77	193	62	78	55
13	91	1,670	121	117	121	415	1,620	69	386	59	75	39
14	85	2,260	120	224	*133	336	*1,420	66	1,220	69	94	41
15	74	2,050	130	864	130	261	767	69	1,370	70	100	48
16	75	900	121	736	124	210	372	78	551	*67	117	44
17	88	562	114	561	118	181	249	88	273	60	100	48
18	82	424	115	527	106	210	183	101	176	63	128	58
19	95	300	125	702	106	*1,120	148	97	*120	67	a110	62
20	76	*242	127	1,730	125	1,000	121	90	130	71	*a105	59
21	74	217	157	969	123	485	115	*68	151	71	a115	49
22	75	219	120	469	105	463	105	72	132	67	a130	37
23	106	645	126	284	109	932	124	89	117	76	a120	66
24	193	541	118	257	109	482	143	147	93	72	a115	64
25	174	314	114	214	111	280	114	183	81	69	117	48
26	127	247	122	219	100	236	95	139	82	74	98	55
27	113	196	135	277	112	197	88	100	82	70	a100	62
28	113	191	137	220	115	165	82	141	72	73	a90	26
29	94	177	135	187	114	137	76	123	72	69	a95	41
30	92	178	145	176	-	123	69	97	77	65	a105	55
31	92	-	331	145	-	128	-	87	-	72	a100	-
Total	3,428	13,241	4,600	15,066	3,987	10,592	8,559	2,829	6,174	2,138	2,957	1,702
Mean	111	441	148	468	137	342	285	91.3	206	69.0	95.4	56.7
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 3,110 Min 17 Mean 235 Cfsm - In. -
Water year 1951-52: Max 2,260 Min 23 Mean 206 Cfsm - In. -

* Discharge measurement made on this day.
a No auxiliary gage-height record; discharge estimated on basis of 1 discharge measurement, gage heights, weather records, and records for Thorn Creek at Thornton.

Midlothian Creek at Oak Forest, Ill.

Location.--Lat 41°36'51", long. 87°43'46", in SE¼NW¼ sec. 15, T. 36 N., R. 13 E., on right bank at downstream side of highway bridge in Oak Forest, 4.4 miles upstream from mouth.

Drainage area.--12.7 sq mi.

Records available.--October 1950 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 625 ft (from topographic map).

Extremes.--Maximum discharge during year, 328 cfs Nov. 14 (gage height, 4.91 ft), from rating curve extended above 150 cfs by logarithmic plotting; no flow part of Aug. 13. 1950-52: Maximum discharge, 570 cfs Sept. 26, 1951 (gage height, 6.32 ft), from rating curve extended above 150 cfs by logarithmic plotting; no flow at times each year.

Remarks.--Records good except those for periods of ice effect, which are fair. Occasional diurnal fluctuation at low flow.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 19, July 6-22)

1.6	0.1	2.3	31
1.7	.9	3.0	94
1.8	2.6	4.0	203
1.9	5.2	5.0	343
2.0	9.2		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	31	9.8	12	178	12	3.1	13	3.9	4.2	1.8	0.2	2.7
2	*24	8.8	12	62	13	3.1	11	3.6	3.6	1.4	.1	.7
3	18	8.8	11	37	12	3.4	9.2	3.4	5.6	1.8	.3	.4
4	14	10	9.8	25	33	b5.5	8.8	3.1	4.4	.7	1.2	.3
5	11	8.0	9.2	18	19	b4.0	12	3.4	3.9	.6	.8	.1
6	13	8.0	8.0	17	13	b3.8	13	3.1	3.6	.5	.7	.1
7	95	9.2	8.4	12	10	b4.2	10	3.4	3.6	.6	.4	.1
8	56	b9.2	7.2	10	9.2	5.2	9.2	3.9	3.9	1.9	.4	.1
9	36	9.2	7.2	8.8	8.4	32	8.4	4.7	4.7	1.2	3.0	.1
10	25	15	6.8	7.2	8.4	92	26	4.4	4.2	.9	3.1	.1
11	21	b30	6.4	b7.0	8.0	87	20	3.4	3.6	.8	.9	.2
12	17	142	5.6	b6.4	7.6	47	68	2.9	21	.7	.5	.2
13	14	192	b4.7	6.4	6.8	38	140	2.6	66	.7	.2	.3
14	13	209	4.2	40	*6.0	29	68	3.1	135	.7	.3	.2
15	12	89	b4.4	128	5.6	23	48	3.9	55	.8	.3	.1
16	10	61	b4.2	55	5.2	17	34	3.4	31	*.8	.3	.1
17	9.2	45	b4.2	61	b5.0	14	*25	3.9	74	.9	.2	.2
18	8.0	36	b4.2	41	4.7	57	19	3.4	31	.9	.1	.3
19	8.4	27	b4.0	96	4.7	*118	14	2.9	*17	1.2	.1	.3
20	8.8	21	b3.9	131	4.9	63	11	*3.1	14	1.4	.1	.2
21	8.0	17	b4.1	53	4.2	44	9.2	2.9	14	.9	*.6	.1
22	9.8	*23	b4.0	38	b3.9	80	8.8	5.2	11	1.0	.3	.2
23	16	44	b3.9	30	b3.6	79	8.4	5.6	8.8	1.2	.1	.5
24	36	28	b3.7	b27	3.6	39	7.6	11	7.2	.7	.1	.2
25	28	20	b3.5	b20	3.6	30	6.4	9.2	4.9	.5	.1	.1
26	21	17	b3.5	21	3.6	25	5.6	6.8	4.2	.4	.3	.1
27	17	14	b3.5	24	3.6	21	5.2	6.0	4.7	.3	.1	.1
28	17	13	b3.7	b20	3.9	18	4.7	8.0	3.9	.2	.1	.1
29	14	13	b3.9	b17	3.6	14	4.4	4.7	2.9	.2	.1	**.1
30	13	13	b4.2	b13	-	13	4.2	4.2	2.3	.2	.2	.1
31	11	-	b28	b10	-	13	-	4.2	-	.2	.1	-
Total	635.2	1,150.0	204.2	1,219.8	230.1	1,025.3	630.1	137.3	553.2	26.1	15.3	8.4
Mean	20.5	38.3	6.59	39.3	7.93	33.1	21.0	4.43	18.4	0.84	0.49	0.28
Cfsm	1.61	3.02	0.519	3.09	0.624	2.61	1.65	0.349	1.45	0.066	0.039	0.022
In.	1.86	3.37	0.60	3.57	0.67	3.00	1.85	0.40	1.62	0.08	0.04	0.02

Calendar year 1951: Max 310 Min 0 Mean 20.5 Cfsm 1.61 In. 21.89
Water year 1951-52: Max 209 Min 0.1 Mean 15.9 Cfsm 1.25 In. 17.08

Peak discharge (base, 220 cfs).--Nov. 14 (4 a.m.) 328 cfs (4.91 ft); Jan. 1 (7 a.m.) 249 cfs (4.34 ft); Jan. 20 (1 a.m.) 229 cfs (4.20 ft); June 14 (3 a.m.) 229 cfs (4.15 ft).

* Discharge measurement made on this day.
** Field estimate made on this day.
b Stage-discharge relation affected by ice.

Tinley Creek near Palos Park, Ill.

Location.--Lat 41°38'48", long. 87°45'59", in SW¼SE¼ sec. 32, T. 37 N., R. 13 E., on left bank at downstream side of 135th Street Bridge, 1.5 miles west of U. S. Highway 50, 1.5 miles upstream from mouth, and 3 miles southeast of Palos Park.
Drainage area.--11.3 sq mi.
Records available.--July 1951 to September 1952.
Gage.--Water-stage recorder. Altitude of gage is 610 ft (from topographic map).
Extremes.--1951: Maximum discharge during period July to September, 505 cfs Sept. 26 (gage height, 7.99 ft), from rating curve extended above 220 cfs; minimum, 0.2 cfs on several days in September.
1951-52: Maximum discharge during water year, 405 cfs Nov. 13 (gage height, 6.92 ft), from rating curve extended above 220 cfs; no flow Sept. 29.
Remarks.--Records good except for those for periods of ice effect, which are fair.

Rating table, July 11, 1951, to Sept. 30, 1952, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.1	0	2.7	17
2.2	.3	3.0	35
2.3	1.0	5.0	215
2.4	4.0	6.0	315

Discharge, in cubic feet per second, 1951-52

1951

Day	July	Aug.	Sept.	Day	July	Aug.	Sept.	Day	July	Aug.	Sept.	Day	July	Aug.	Sept.
1	-	2.4	0.3	9	-	12	0.2	17	1.2	0.8	0.3	25	2.8	0.4	*3.6
2	-	1.3	.3	10	-	7.2	.3	18	.9	.7	.2	26	1.2	.4	222
3	-	1.0	.3	11	17	4.8	*.2	19	.7	.7	.2	27	*2.7	.5	74
4	-	.7	.3	12	12	3.2	.3	20	.5	.8	.3	28	30	.6	36
5	-	.6	.3	13	8.0	1.7	.9	21	1.1	2.8	*.5	29	13	.5	26
6	-	*97	.3	14	5.2	1.0	.5	22	48	1.0	45	30	8.0	.4	20
7	-	27	.3	15	3.2	1.0	.4	23	14	.7	11	31	4.8	.4	-
8	-	16	.2	16	1.7	.9	.3	24	*7.2	.5	5.2				
Total													-	189.0	449.7
Mean													-	6.10	15.0
Cfsm													-	0.540	1.33
In.													-	0.62	1.48

Peak discharge (base, 230 cfs).--Sept. 26 (12 m.) 505 cfs (7.99 ft).
* Discharge measurement made on this day.

1951-52

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	17	3.6	8.4	b150	7.2	1.7	10	4.8	1.0	0.7	0.1	0.3
2	*13	3.2	7.6	b60	8.4	1.7	8.4	4.4	.8	.6	.1	.5
3	10	2.4	7.2	b32	7.6	2.0	7.6	4.4	.9	.6	.1	.3
4	6.4	2.8	6.4	*b14	22	4.0	7.5	4.0	.8	.6	.3	.2
5	4.0	2.0	6.0	b10	11	3.2	11	4.0	.7	.4	.2	.2
6	4.0	2.0	5.6	b8.5	8.4	2.0	11	3.6	.6	.3	.1	.2
7	85	4.0	6.8	b7.5	b7.0	b2.4	8.9	3.2	.5	.3	.1	.2
8	31	3.6	5.6	b6.7	6.4	2.8	8.0	4.4	.4	.3	.1	.2
9	19	4.0	5.6	b6.0	b6.0	35	7.2	4.8	.4	.4	7.4	.2
10	13	6.4	5.2	b5.4	6.0	106	22	4.8	.4	.4	2.0	.2
11	9.8	21	5.2	b4.8	6.0	76	15	3.6	.4	.3	.6	.1
12	7.2	142	4.0	b4.4	5.2	38	92	3.2	6.0	.3	.4	.1
13	5.6	188	2.8	b4.5	4.8	32	128	2.8	57	.2	.3	.1
14	4.4	143	2.8	b25	*4.4	22	56	2.4	84	.2	.4	.1
15	4.0	44	b3.5	218	4.0	17	35	3.6	32	.2	.4	.1
16	3.2	34	b3.5	60	4.0	14	26	2.8	21	**.2	.3	.1
17	2.4	27	b3.3	85	3.6	11	*18	3.2	22	.2	.3	.1
18	2.4	22	b3.3	45	3.2	76	15	2.8	14	.2	.2	.1
19	3.2	18	b3.2	96	2.8	*110	12	2.0	*11	.3	.2	.1
20	2.8	15	b3.3	80	3.2	43	10	*1.7	10	.3	.2	.1
21	2.8	12	b3.1	b32	2.4	30	8.4	1.7	9.4	.2	*.3	.1
22	2.8	*18	b3.0	23	2.0	80	7.6	5.6	6.4	.2	.2	.1
23	6.8	31	b3.0	b16	2.0	52	7.6	4.8	5.2	.2	.2	.1
24	18	17	b2.8	b13	2.0	26	6.8	4.4	4.0	.2	.2	.1
25	11	13	b2.8	11	2.0	20	6.0	4.0	3.2	.2	.2	.1
26	8.0	12	b2.8	15	2.0	17	5.6	2.4	1.3	.1	.2	.1
27	7.2	9.8	b2.7	15	2.0	15	5.6	1.4	1.2	.1	.2	.1
28	6.8	9.4	b2.7	b11	2.0	12	5.2	1.7	1.2	.1	.2	.1
29	5.6	8.4	b3.0	b6.4	2.0	11	4.8	1.3	.9	.1	.2	*0
30	4.8	9.4	b3.5	4.4	-	9.8	4.8	1.0	.8	.1	.2	.1
31	4.4	-	b20	3.6	-	10	-	.9	-	.1	.2	-
Total	325.6	828.0	148.7	1,073.2	149.6	882.6	571.1	99.7	297.5	8.6	16.1	4.4
Mean	10.5	27.6	4.80	34.6	5.16	28.5	19.0	3.22	9.92	0.28	0.52	0.15
Cfsm	0.929	2.44	0.425	3.06	0.456	2.52	1.68	0.285	0.878	0.025	0.046	0.013
In.	1.07	2.73	0.49	3.53	0.49	2.90	1.88	0.33	0.98	0.03	0.05	0.01

Calendar year 1951: Max - Min - Mean - Cfsm - In. -
Water year 1951-52: Max 218 Min 0 Mean 12.0 Cfsm 1.06 In. 14.49

Peak discharge (base, 230 cfs).--Nov. 13 (11 p.m.) 405 cfs (6.92 ft); Jan 15 (5 a.m.) 365 cfs (6.46 ft); Apr. 12 (9 p.m.) 255 cfs (5.41 ft); June 14 (1 p.m.) 240 cfs (5.27 ft).
* Discharge measurement made on this day.
** Field estimate made on this day.
b Stage-discharge relation affected by ice.

Wolf Lake at Chicago, Ill.

Location.--Lat 41°40'00", long. 87°32'15", in SW¼ sec. 29, T. 37 N., R. 15 E., at outlet on west shore in Chicago.

Records available.--December 1939 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 580.45 ft above mean sea level, datum of 1929 (Cook County Highway Department benchmark). Prior to Apr. 6, 1941, staff gage at same site and datum.

Extremes.--Maximum mean hourly gage height during year, 2.32 ft June 27; minimum mean hourly, 1.53 ft Feb. 26.
1939-52: Maximum mean hourly gage height, that of June 27, 1952; minimum gage height observed, 0.76 ft Aug. 3, 1940.

Remarks.--Mean hourly values used to determine extremes in order to dampen effects of wind action.

Gage height, in feet, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.96	1.91	1.92	a1.78	1.73	1.55	1.85	2.03	2.07	2.24	2.01	2.16
2	1.95	1.90	1.89	1.76	1.72	1.54	1.83	2.03	2.06	2.23	2.00	2.20
3	1.94	1.86	1.87	1.76	a1.71	1.54	1.82	2.00	2.05	2.21	2.00	2.21
4	1.93	1.86	1.87	1.76	a1.70	1.57	1.83	1.95	2.07	2.20	2.01	2.20
5	1.94	1.85	1.90	1.75	a1.69	1.61	1.87	1.93	2.08	2.17	2.02	2.19
6	1.95	a1.85	1.88	1.74	a1.68	1.63	1.88	1.92	2.07	2.13	2.02	2.18
7	2.07	a1.85	1.86	1.73	a1.67	1.64	1.90	1.92	2.06	2.10	2.01	2.19
8	2.06	a1.85	1.88	1.73	a1.65	1.64	1.91	1.93	2.02	2.10	1.99	2.17
9	2.08	a1.85	1.84	1.73	a1.63	1.64	1.92	1.94	2.02	2.15	2.02	2.16
10	2.07	a1.85	1.81	1.73	a1.62	1.65	1.94	1.96	2.00	2.16	2.05	2.15
11	2.07	a1.85	1.80	1.74	a1.63	1.69	1.96	1.97	2.02	2.15	2.06	2.14
12	2.06	a1.95	1.81	1.71	a1.65	1.72	1.98	1.96	2.12	2.14	2.08	2.13
13	2.03	a2.10	1.81	1.69	1.67	1.75	2.02	1.96	2.16	2.12	2.07	2.12
14	1.98	a2.25	1.81	1.68	1.69	1.77	2.06	1.95	2.22	2.11	2.06	2.09
15	1.96	a2.25	a1.80	1.69	1.68	1.77	2.09	1.96	2.23	2.14	2.06	2.04
16	1.94	a2.23	a1.80	1.70	1.68	1.75	2.12	1.98	2.20	2.16	2.08	2.03
17	1.94	a2.21	a1.79	1.71	1.66	1.74	2.14	1.99	2.28	2.17	2.06	2.02
18	1.93	a2.19	a1.79	1.71	1.64	1.80	2.15	1.99	2.26	2.17	2.07	2.01
19	1.93	a2.17	a1.78	1.72	1.64	1.84	2.15	1.99	2.27	2.19	2.07	2.01
20	1.92	2.15	a1.78	1.73	1.63	1.86	2.13	1.98	2.28	2.17	2.08	2.00
21	1.88	2.14	a1.77	1.74	1.62	1.88	2.10	1.99	2.30	2.15	2.14	1.98
22	1.86	2.14	a1.77	1.75	1.63	1.94	2.09	2.03	2.29	2.15	2.16	1.96
23	1.96	2.13	a1.76	1.75	1.61	1.82	2.12	2.08	2.29	2.14	2.14	1.99
24	1.97	2.09	a1.76	1.76	1.59	1.92	2.13	2.10	2.29	2.15	2.12	1.99
25	1.99	2.03	a1.75	1.77	1.58	1.95	2.13	2.13	2.28	2.12	2.11	1.96
26	1.98	2.00	a1.75	1.77	1.54	1.95	2.12	2.13	2.29	2.10	2.10	1.96
27	1.98	1.99	a1.74	1.77	1.54	1.95	2.09	2.10	2.30	2.10	2.10	1.94
28	1.94	1.98	a1.74	1.75	1.55	1.94	2.06	2.11	2.27	2.07	2.11	1.91
29	1.92	1.97	a1.75	1.75	1.56	1.92	2.06	2.12	2.25	2.08	2.12	1.90
30	1.91	1.94	a1.78	1.75	-	1.88	2.05	2.11	2.24	2.04	2.13	1.90
31	1.92	-	a1.80	1.74	-	1.88	-	2.07	-	2.03	2.11	-

a Computed on basis of recorded range in stage, weather records, and records for Des Plaines River at Riverside.

Burns ditch at Gary, Ind.

Location.--Lat 41°34'25", long. 87°17'15", in N½ sec. 13, T. 36 N., R. 8 W., near center of span on downstream side of bridge on Central Avenue, 0.5 mile east of Gary and 1¼ miles downstream from Deep River.

Drainage area.--174 sq mi.

Records available.--October 1943 to September 1952 (high-water records only since October 1950).

Gage.--Wire-weight gage read twice daily.

Average discharge.--7 years (1943-50), 139 cfs.

Extremes.--Maximum discharge during year, 1,420 cfs Nov. 15 (gage height, 10.52 ft). 1943-52: Maximum discharge, 2,660 cfs May 11, 1948; maximum gage height, 10.44 ft Mar. 16, 1944, from graph based on gage readings.

Remarks.--Records good. Burns ditch is an artificial channel which reverses the direction of flow of part of Little Calumet River and flows into Lake Michigan at Wickliffe.

Revisions (water years).--W 1034: 1944.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-	-		995		-	-		-			
2	-	-		922		-	-		-			
3	-	-		665		-	-		-			
4	-	-		-		-	-		-			
5	-	-		-		-	-		-			
6	-	-		-		-	-		-			
7	-	-		-		-	-		-			
8	-	-		-		-	-		-			
9	-	-		-		-	-		-			
10	-	-		-		-	-		-			
11	-	-		-		-	-		-			
12	-	-		-		-	-		-			
13	-	755		-		-	-		-			
14	-	1,270		-		-	922		995			
15	-	1,360		-		-	874		1,220			
16	-	970		-		-	644		1,100			
17	-	755		-		-	-		874			
18	-	564		-		-	-		*687			
19	-	-		-		-	-		583			
20	-	†331		623		665	-		-			
21	-	-		778		623	-		-			
22	-	-		644	†80	-	-		-			
23	†48	-		†376		-	-		-			
24	†137	-		-		-	†243		-			
25	-	-		-		-	-		-			
26	-	-		-		-	-		-			
27	-	-		-		-	-		-			
28	-	-		-		-	-		-			
29	-	-		-		-	-		-			
30	-	-		-	-	-	-		-			
31	-	-		-	-	-	-		-			

Peak discharge (base, 900 cfs).--Nov. 15 (11:30 a.m.) 1,420 cfs (10.52 ft); Jan. 2 (7 a.m.) 1,020 cfs (8.95 ft); Apr. 14 (5 p.m.) 970 cfs (8.82 ft); June 15 (7 a.m.) 1,270 cfs (9.98 ft).

* Discharge measurement made on this day.

† Result of discharge measurement made on this day.

Deep River at Lake George Outlet at Hobart, Ind.

Location.--Lat 41°32'03", long. 87°15'22", in NW¼NW¼ sec. 32, T. 36 N., R. 7 W., at northeast end of Lake George in Hobart, an eighth of a mile upstream from Duck Creek.

Drainage area.--124 sq mi.

Records available.--April 1947 to September 1952.

Gage.--Water-stage recorder above concrete dam. Datum of gage is 600.00 ft above mean sea level, datum of 1929. Prior to July 30, 1952, staff gage at same site and datum.

Extremes.--Maximum discharge during year, 1,340 cfs Nov. 14 (gage height, 4.41 ft); minimum, 6.0 cfs Aug. 28, 29, Sept. 17 (gage height, 1.90 ft).
1947-52: Maximum discharge, 2,740 cfs May 11, 1948 (gage height, 5.86 ft); minimum, 4.2 cfs Sept. 14, 1948; minimum gage height, that of Aug. 28, 29, Sept. 17, 1952.

Remarks.--Records good except those for periods of no gage-height record or ice effect, which are fair.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.9	6.0	3.0	335
2.0	21	4.0	990
2.2	63	5.0	1,960
2.4	112		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	40	42	107	475	85	45	102	73	87	45	12	16
2	40	36	107	902	92	45	97	68	77	40	11	19
3	36	36	110	590	92	45	85	63	73	36	12	16
4	32	36	132	380	138	58	94	56	63	32	16	14
5	25	36	115	266	188	58	125	49	54	29	14	14
6	32	32	107	185	158	58	210	49	45	25	12	11
7	102	32	135	158	138	58	224	49	40	25	12	9.5
8	152	36	122	142	110	58	182	49	47	25	12	9.5
9	122	40	87	125	107	77	162	58	80	32	17	9.5
10	92	54	87	102	107	112	*145	77	115	29	17	9.5
11	65	94	82	85	102	278	142	75	145	23	19	9.5
12	52	218	77	82	102	402	165	63	145	17	17	9.5
13	40	668	*63	82	97	326	448	63	220	19	*16	9.5
14	36	1,300	61	119	87	239	a900	58	a600	23	16	9.5
15	36	998	52	278	77	188	560	58	a1,200	27	16	9.5
16	32	648	45	390	73	155	380	58	a800	27	16	8.2
17	32	424	40	317	68	132	270	63	a600	21	14	*7.1
18	29	312	b40	246	63	162	213	63	*458	21	11	9.5
19	29	254	b40	290	63	326	178	*63	326	21	11	9.5
20	25	210	b40	669	58	a600	152	58	243	25	11	9.5
21	25	*168	b40	648	58	412	132	58	213	25	11	9.5
22	25	158	b40	440	58	308	122	58	188	21	9.5	9.5
23	*35	210	b40	206	*54	304	119	63	168	*21	9.5	9.5
24	110	274	b40	155	54	262	*162	63	135	17	9.5	11
25	155	262	b40	152	54	213	142	63	104	17	9.5	12
26	119	185	b40	145	49	178	128	63	85	14	9.5	8.2
27	102	162	b40	152	49	148	110	63	68	a12	8.2	9.5
28	85	135	b40	148	49	122	94	92	58	a11	7.1	11
29	75	122	b45	125	49	112	82	97	56	a11	7.1	9.5
30	61	110	124	87	-	107	75	100	49	11	8.2	9.5
31	52	-	282	82	-	102	-	92	-	11	9.5	-
Total	1,893	7,292	2,420	8,223	2,479	5,690	6,000	2,025	6,542	713	380.6	318.5
Mean	61.1	243	78.1	265	85.5	184	200	65.3	218	23.0	12.3	10.6
Cfsm	0.493	1.96	0.630	2.14	0.690	1.48	1.61	0.527	1.76	0.185	0.099	0.085
In.	0.57	2.19	0.73	2.47	0.74	1.71	1.80	0.61	1.96	0.21	0.11	0.09

Calendar year 1951: Max 1,300 Min 14 Mean 126 Cfsm 1.02 In. 13.76
Water year 1951-52: Max 1,300 Min 7.1 Mean 120 Cfsm 0.968 In. 14.06

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of 1 discharge measurement, weather records, and records for stations on nearby streams including Hart ditch at Munster.
b Stage-discharge relation affected by ice.

Little Calumet River at Porter, Ind.

Location.--Lat 41°37'18", long. 87°05'13", in NE¼ sec. 34, T. 37 N., R. 6 W., near center of span on downstream side of highway bridge, three-quarters of a mile northwest of Porter and 4.5 miles upstream from Salt Creek.

Drainage area.--62 sq mi, approximately.

Records available.--May 1945 to September 1952.

Gage.--Water-stage recorder. Prior to June 26, 1952, wire-weight gage at same site and datum.

Average discharge.--7 years, 77.0 cfs.

Extremes.--Maximum discharge during year, 1,060 cfs Nov. 14 (gage height, 7.92 ft); minimum, 25 cfs Sept. 28-30; minimum gage height, 2.33 ft Sept. 13.
1945-52: Maximum discharge, 2,440 cfs June 28, 1945 (gage height, 9.88 ft, from graph based on gage readings); minimum, 18 cfs Aug. 10, 11, Oct. 9, 1946; minimum gage height, 2.14 ft Aug. 22, 1949.

Remarks.--Records poor.

Revisions (water years).--W 1084: 1945, drainage area.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	72	54	77	398	76	47	68	53	58	36	31	33
2	67	51	77	605	72	45	62	49	50	35	31	33
3	64	50	76	286	86	50	55	50	50	34	31	31
4	56	48	164	166	150	65	60	46	47	34	34	31
5	52	48	193	126	180	49	86	48	46	33	32	30
6	56	50	129	97	125	54	155	51	43	33	32	29
7	141	62	106	88	99	52	148	48	41	32	32	30
8	258	70	87	85	81	55	96	50	39	35	31	29
9	196	76	84	80	75	66	81	59	44	38	40	29
10	113	90	75	75	53	106	*86	80	40	34	35	28
11	79	130	72	70	75	153	86	58	38	33	33	28
12	67	216	64	68	68	112	122	57	76	32	34	28
13	60	362	*48	68	68	146	184	72	91	32	32	29
14	54	885	59	106	60	84	249	60	116	33	*32	32
15	49	451	55	280	54	75	172	88	145	33	32	29
16	45	213	60	278	52	74	126	59	125	33	40	28
17	42	163	72	174	52	60	96	62	142	33	34	*27
18	41	133	74	134	52	68	81	60	*117	34	35	28
19	43	102	73	152	52	136	72	*56	68	40	33	29
20	43	87	72	291	54	205	70	56	62	35	32	28
21	42	*80	75	223	55	130	64	58	74	33	33	27
22	41	81	72	127	*52	107	65	76	62	*33	32	29
23	*58	138	75	*99	46	84	111	99	58	34	32	29
24	242	149	68	66	49	75	*133	82	56	33	31	27
25	240	102	72	78	48	72	96	94	44	32	31	27
26	137	90	86	99	48	65	77	79	44	32	31	26
27	96	91	75	111	52	67	68	74	42	32	30	26
28	80	82	80	90	54	64	62	119	41	32	30	25
29	68	78	74	87	48	60	62	104	36	32	30	25
30	65	81	82	87	-	56	58	72	36	32	30	25
31	56	-	108	68	-	60	-	62	-	32	30	-
Total	2,723	4,313	2,584	4,762	2,036	2,542	2,951	2,081	1,931	1,039	1,006	855
Mean	87.8	144	83.4	154	70.2	82.0	98.4	67.1	64.4	33.5	32.5	28.5
Cfsm	1.42	2.32	1.35	2.48	1.13	1.32	1.59	1.08	1.04	0.540	0.524	0.460
In.	1.63	2.59	1.55	2.86	1.22	1.52	1.77	1.25	1.16	0.62	0.60	0.51

Calendar year 1951: Max 1,300 Min 33 Mean 95.3 Cfsm 1.54 In. 20.85
Water year 1951-52: Max 885 Min 25 Mean 78.8 Cfsm 1.27 In. 17.28

Peak discharge (base, 700 cfs).--Nov. 14 (6 p.m.) 1,060 cfs (7.92 ft); Jan. 2 (5 a.m.) 795 cfs (7.35 ft).
* Discharge measurement made on this day.

Salt Creek near McCool, Ind.

Location.--Lat 41°35'48", long. 87°08'40", in SE¼ sec. 6, T. 36 N., R. 6 W., near center of span on downstream side of highway bridge, just downstream from Michigan Central Railroad bridge, 1¼ miles north of McCool and 1.5 miles upstream from Little Calumet River.

Drainage area.--73 sq mi, approximately.

Records available.--May 1945 to September 1952.

Gage.--Wire-weight gage read twice daily.

Average discharge.--7 years, 77.0 cfs.

Extremes.--Maximum discharge during year, 912 cfs Nov. 14 (gage height, 10.63 ft); minimum daily, 27 cfs Sept. 27-30; minimum gage height, 3.13 ft Sept. 17.
1945-52: Maximum discharge, 2,520 cfs May 11, 1948 (gage height, 12.3 ft); minimum daily, 20 cfs Feb. 28, 1947, Aug. 21-27, 1949; minimum gage height, 3.10 ft Sept. 6, 1948.

Remarks.--Records fair except those for periods of ice effect, which are poor.

Revisions.--W 1084: Drainage area.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 21-23, May 19-27, July 17 to Sept. 21)

3.2	26	9.0	572
4.5	94	10.0	730
6.0	211	11.0	1,050

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	64	62	79	594	79	56	85	66	54	40	33	40
2	59	60	76	607	82	54	82	63	50	38	32	44
3	56	58	81	255	82	56	72	61	50	36	32	35
4	50	58	158	136	168	79	74	58	50	34	39	33
5	49	57	172	115	156	74	118	58	44	33	35	32
6	54	56	112	98	126	68	216	56	44	32	34	32
7	187	69	98	85	101	68	148	54	43	31	33	33
8	260	75	85	82	91	66	104	60	41	36	33	31
9	129	79	82	79	94	75	88	68	63	45	46	30
10	91	94	79	73	88	132	*101	91	48	36	41	30
11	76	144	72	67	91	275	104	66	42	34	38	30
12	66	243	60	67	82	230	108	61	98	34	42	30
13	59	418	*42	66	79	132	330	68	94	33	36	29
14	54	750	40	99	71	115	370	62	313	34	*35	30
15	52	572	40	279	66	94	206	62	436	36	36	33
16	50	260	40	286	63	85	136	60	214	38	46	30
17	47	160	40	188	60	76	112	66	140	36	37	*29
18	48	126	40	140	59	94	98	64	*98	39	34	30
19	48	101	40	148	60	322	88	*54	68	54	33	32
20	46	88	40	385	60	313	82	54	71	44	33	30
21	44	*82	40	279	59	160	76	54	94	39	38	30
22	42	91	40	140	*54	132	79	66	76	*37	35	30
23	*65	180	40	*104	55	136	153	70	66	42	34	33
24	290	140	40	79	56	104	*216	66	76	38	32	30
25	331	98	40	82	56	94	129	72	58	36	30	28
26	158	88	40	104	56	88	98	61	50	35	30	28
27	104	82	40	126	54	82	82	54	46	36	30	27
28	88	82	40	98	56	79	73	116	44	34	30	27
29	79	76	60	68	56	75	69	85	41	36	30	27
30	71	79	80	79	-	71	71	63	38	34	31	27
31	66	-	133	68	-	72	-	56	-	34	31	-
Total	2,881	4,528	2,059	5,076	2,260	3,557	3,768	2,014	2,650	1,144	1,079	930
Mean	92.9	151	66.4	164	77.9	115	126	65.0	88.3	36.9	34.8	31.0
Cfsm	1.27	2.07	0.910	2.25	1.07	1.57	1.73	0.890	1.21	0.505	0.477	0.425
In.	1.46	2.31	1.05	2.59	1.15	1.81	1.93	1.03	1.35	0.58	0.55	0.47

Calendar year 1951: Max 895 Min 29 Mean 96.3 Cfsm 1.32 In. 17.91
Water year 1951-52: Max 750 Min 27 Mean 87.5 Cfsm 1.20 In. 16.28

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 13-30.

East Branch Coldwater River at Coldwater, Mich.

Location.--Lat 41°56'25", long. 85°01'00", in NW¼ sec. 21, T. 6 S., R. 6 W., on downstream side of right abutment of Jay Street Bridge at Coldwater, 1 mile upstream from mouth.

Drainage area.--About 60 sq mi.

Records available.--December 1937 to September 1952.

Gage.--Staff gage read twice daily. Datum of gage is 930.72 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation). Prior to May 2, 1947, at site 400 ft downstream at same datum.

Average discharge.--14 years (1938-52), 51.9 cfs.

Extremes.--Maximum discharge observed during year, 428 cfs Nov. 14; maximum gage height observed, 6.07 ft Jan. 20; minimum discharge, 3.1 cfs Sept. 29, 30 (gage height, 3.98 ft).

1937-52: Maximum discharge, 735 cfs Apr. 24, 1950 (gage height, 6.60 ft); minimum observed, 0.1 cfs Dec. 13, 15-18, 1946.

Remarks.--Records good except those for periods of ice effect and those below 8 cfs, which are fair. Drainage area indeterminate due to infrequent contribution to or from Coldwater Lake.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.4	35	68	211	169	78	108	141	121	20	11	7.1
2	6.9	37	64	165	163	73	102	131	110	19	9.9	13
3	6.4	37	*50	153	169	70	99	121	106	21	9.1	*7.5
4	6.4	35	145	137	181	84	99	113	97	20	9.1	6.7
5	6.0	31	145	133	197	92	106	106	86	19	9.1	6.4
6	7.4	30	121	b130	179	88	121	99	83	18	9.1	6.1
7	15	34	119	b120	173	84	121	92	73	17	*9.1	6.1
8	9.6	45	115	b110	169	84	141	84	66	17	8.7	6.4
9	8.7	43	111	b100	159	90	137	86	64	17	9.5	6.1
10	7.8	44	108	b90	161	110	135	86	60	16	9.1	5.8
11	6.9	45	b100	81	165	141	133	83	55	15	9.1	5.8
12	6.0	51	b90	86	157	119	133	83	52	14	9.1	5.5
13	6.9	*128	b85	102	*149	117	177	*70	*48	13	8.7	5.2
14	7.8	235	b75	121	133	125	255	63	43	13	8.3	4.9
15	7.4	93	b70	181	123	129	225	67	40	*13	9.1	4.6
16	6.9	89	b65	169	121	123	*203	62	38	14	9.1	4.3
17	*6.4	87	b60	175	117	117	195	59	36	13	8.3	4.3
18	6.0	82	b55	179	113	115	189	57	34	25	8.3	5.2
19	6.0	80	b53	179	108	147	181	54	31	20	7.9	4.9
20	6.0	76	b50	258	110	159	185	58	28	19	7.5	5.5
21	6.0	75	b49	201	110	141	179	58	28	18	6.7	4.9
22	6.9	76	b48	191	108	149	189	67	27	19	6.7	4.9
23	26	78	47	171	102	147	205	104	31	19	6.1	4.3
24	54	75	46	*171	95	139	187	183	30	18	6.1	4.3
25	41	75	46	183	92	137	171	220	27	16	5.5	3.7
26	33	76	b46	191	88	129	167	151	26	15	5.5	3.7
27	34	73	b47	197	86	129	163	143	25	14	5.5	3.4
28	37	71	48	171	84	125	157	143	23	13	5.5	3.4
29	35	68	51	143	81	125	153	139	22	13	5.5	3.1
30	35	71	60	143	-	121	149	135	21	12	5.2	3.1
31	39	-	66	163	-	115	-	129	-	12	12	-
Total	493.8	2,074	2,303	4,805	3,862	3,602	4,765	3,187	1,531	512	249.4	160.2
Mean	15.9	69.1	74.3	155	133	116	159	103	51.0	16.5	8.05	5.34
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 268 Min 6.0 Mean 73.9 Cfsm - In. -
Water year 1951-52: Max 258 Min 3.1 Mean 75.3 Cfsm - In. -

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

St. Joseph River at Mottville, Mich.

Location.--Lat 41°48'05", long. 85°45'15", in SW¼ sec. 6, T. 8 S., R. 12 W., Michigan meridian, on right bank 500 ft upstream from bridge on U. S. Highway 112 at Mottville, 0.4 mile downstream from Michigan Gas and Electric Co. hydroelectric plant, 4 miles upstream from Pigeon River, and at mile 96.

Drainage area.--1,860 sq mi, approximately.

Records available.--December 1923 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 755.3 ft above mean sea level (Michigan Gas and Electric Co. benchmark). Prior to Oct. 1, 1951, at site 0.4 mile upstream at datum 4.22 ft higher.

Average discharge.--28 years (1924-52), 1,573 cfs.

Extremes.--Maximum discharge during year, 5,470 cfs May 27, 28; maximum gage height, 7.14 ft May 28; minimum daily discharge, 488 cfs Sept. 20.
1924-52: Maximum discharge, 10,700 cfs Apr. 27, 1950 (gage height, 6.56 ft, site and datum then in use); minimum daily, 44 cfs Oct. 17, 1937.

Remarks.--Records excellent except those for periods of ice effect, doubtful or no gage-height record, or shifting control, which are good. Flow regulated by powerplant above station.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Dec. 2, Dec. 26-31				Dec. 3-25, Jan. 1 to Sept. 30			
4.1	6.0	4.7	56	3.9	0.9	4.6	34
4.2	10	5.0	110	4.0	3.7	4.9	64
4.3	16	5.5	250	4.1	6.7	5.5	175
4.5	34			4.3	16	5.9	265

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,070	2,310	2,120	3,000	4,140	2,460	2,960	2,860	4,140	1,570	1,270	924
2	1,130	2,050	2,110	3,360	4,140	2,460	2,860	2,860	3,460	1,510	1,060	1,380
3	1,050	1,860	2,040	3,680	4,020	2,510	2,660	2,660	3,260	1,400	928	*849
4	1,120	1,830	2,250	d3,700	4,140	2,560	2,760	2,420	3,260	1,300	1,320	1,040
5	1,030	1,880	2,560	d3,700	4,140	2,580	2,760	2,500	3,160	1,210	1,100	1,160
6	1,130	1,760	2,760	d3,600	4,260	2,860	2,860	2,320	2,860	1,160	1,060	992
7	911	1,680	2,760	d3,600	4,380	2,660	2,960	2,160	2,760	1,330	1,150	916
8	1,260	1,720	2,860	d3,500	4,260	2,660	2,960	2,150	2,560	1,500	*1,170	1,140
9	1,340	1,660	2,860	d3,400	4,020	2,660	3,160	2,250	2,310	1,580	875	930
10	1,410	1,700	2,860	d3,300	3,900	2,660	3,360	2,270	2,410	1,470	1,140	938
11	1,320	1,640	*2,760	d3,200	3,680	2,860	3,360	2,180	2,170	1,380	1,200	895
12	1,320	2,030	2,660	d3,100	*3,680	2,960	3,570	2,340	*2,150	1,190	773	976
13	1,320	2,050	2,510	d3,000	3,570	3,380	3,570	2,160	2,170	1,030	840	898
14	1,070	2,660	2,460	3,260	3,260	3,570	3,900	*2,200	2,460	1,320	1,050	924
15	1,170	3,060	1,990	3,460	3,260	3,360	4,380	1,850	2,350	*1,160	1,140	1,110
16	*1,200	3,160	1,700	4,260	2,960	3,360	*4,740	1,850	2,340	1,290	1,190	954
17	1,210	3,160	1,600	4,620	3,160	3,160	4,740	1,810	1,800	1,240	952	970
18	1,130	3,160	1,700	4,860	2,980	3,160	4,620	1,770	1,670	1,410	1,100	890
19	1,150	3,060	1,900	4,860	2,980	3,280	4,500	2,200	2,070	1,400	1,150	841
20	1,090	*2,860	2,000	5,100	2,960	3,570	4,260	2,210	1,980	1,400	1,250	488
21	883	2,660	2,100	5,340	2,860	3,680	3,900	2,210	1,880	1,650	1,020	662
22	1,190	2,560	2,100	5,100	2,660	3,790	3,900	2,260	1,750	1,620	1,090	1,030
23	1,360	2,560	2,200	*a4,800	2,660	3,790	3,900	2,530	1,910	1,600	873	956
24	1,750	2,560	2,200	a4,600	2,660	3,680	3,570	3,160	1,950	1,600	959	891
25	2,040	2,510	2,200	a4,400	2,680	*3,680	3,360	4,260	1,930	1,430	1,290	1,070
26	2,560	2,510	2,300	a4,500	2,660	3,460	3,460	5,220	1,830	1,450	1,070	993
27	2,760	2,460	2,300	a4,800	2,660	3,360	3,360	5,470	1,630	1,290	1,190	910
28	2,760	2,370	2,300	a4,900	2,660	3,360	3,360	5,470	1,400	1,440	1,050	909
29	2,760	2,040	2,200	a4,700	2,560	3,260	3,260	5,100	1,400	1,340	1,010	904
30	2,660	2,160	2,200	a4,300	-	3,180	2,960	4,740	1,570	1,330	921	865
31	2,510	-	2,500	a4,000	-	2,860	-	4,380	-	1,210	851	-
Total	46,664	69,680	71,060	126,000	97,890	96,550	105,970	89,820	68,590	42,810	33,042	28,205
Mean	1,505	2,323	2,292	4,065	3,376	3,114	3,532	2,897	2,286	1,381	1,066	940
Cfsm	0.809	1.25	1.23	2.19	1.82	1.67	1.90	1.56	1.23	0.742	0.573	0.505
In.	0.93	1.39	1.42	2.52	1.96	1.93	2.12	1.80	1.37	0.86	0.66	0.56

Calendar year 1951: Max 4,280 Min 808 Mean 2,115 Cfsm 1.14 In. 15.44
Water year 1951-52: Max 5,470 Min 488 Mean 2,394 Cfsm 1.29 In. 17.52

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records and records for nearby stations, including stations at Niles and at Berrien Springs.
d Doubtful gage-height record; discharge estimated on same basis as "a" above.
Note.--Stage-discharge relation affected by ice Dec. 16 to Jan. 1; shifting-control method used Oct. 1 to Dec. 15, June 22 to Sept. 30.

Pigeon Creek at Hogback Lake Outlet, near Angola, Ind.

Location.--Lat 41°37'30", long. 85°05'46", in NE¼NW¼ sec. 36, T. 37 N., R. 12 E., on downstream side of right wingwall at farm bridge 800 ft north of lake outlet, 2 miles southeast of Flint, and 5.1 miles west of Angola.

Drainage area.--106 sq mi.

Records available.--October 1945 to September 1952. Prior to October 1947, published as Pigeon Creek near Flint.

Gage.--Staff gage read once daily. Datum of gage is 940.00 ft above mean sea level, datum of 1929. Prior to Oct. 1, 1947, wire-weight gage at site 1⅘ miles downstream at different datum.

Average discharge.--7 years, 93.6 cfs.

Extremes.--Maximum discharge during year, 370 cfs Jan. 21, 22; maximum gage height, 11.85 ft Jan. 21; minimum discharge, 17 cfs Sept. 30 (gage height, 7.50 ft).
1945-52: Maximum discharge, 744 cfs Apr. 8, 1950 (gage height, 14.95 ft); minimum, 11 cfs Oct. 14-16, 1946, and Sept. 16-20, 1948; minimum gage height, 7.34 ft Aug. 26-29, Sept. 3, 4, 1949.

Remarks.--Records good.

Revisions (water years).--W 1144: 1948.

Rating table, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Dec. 16, June 22 to Sept. 30)

7.2	15
7.7	32
8.6	78
10.0	193
12.0	390

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	22	58	61	92	211	96	144	106	260	43	28	27
2	22	56	60	130	193	96	134	99	220	42	27	28
3	22	52	60	188	188	96	126	96	193	40	26	28
4	22	49	67	235	202	96	122	91	166	40	27	27
5	22	44	80	250	245	99	126	90	130	39	26	26
6	22	43	96	245	260	106	144	86	114	38	26	26
7	24	44	114	225	270	114	162	*82	110	38	26	26
8	26	46	118	206	270	110	188	79	102	37	26	26
9	*27	46	122	188	*250	110	202	77	96	36	26	*25
10	27	48	118	170	250	106	198	78	90	34	26	25
11	28	52	110	152	225	110	188	78	85	33	26	24
12	28	60	102	139	202	152	193	76	82	33	*26	23
13	28	71	92	126	188	202	202	74	78	32	27	22
14	27	92	84	122	175	245	220	73	78	31	27	22
15	27	106	78	134	166	250	260	73	79	30	28	22
16	27	126	75	188	157	280	*310	72	77	*31	30	22
17	27	130	74	250	152	220	320	71	75	30	30	22
18	27	126	74	320	144	202	310	71	*69	30	31	21
19	26	114	73	340	130	*202	280	70	67	30	31	21
20	26	106	72	360	118	220	250	70	64	30	31	21
21	26	*96	71	370	114	245	225	71	58	31	31	20
22	26	86	71	370	110	250	206	74	56	31	31	20
23	30	82	70	350	106	260	193	79	55	31	30	20
24	38	79	70	320	106	260	180	88	54	32	28	20
25	48	77	70	290	102	250	170	139	52	32	30	19
26	61	77	70	260	102	235	166	230	50	32	29	19
27	68	74	70	260	99	216	152	300	48	32	28	19
28	70	71	71	270	99	198	144	330	46	31	28	18
29	67	67	72	270	99	184	130	340	44	30	28	18
30	66	63	72	260	-	170	118	330	43	29	27	17
31	61	-	74	230	-	157	-	300	-	28	27	-
Total	1,068	2,241	2,511	7,310	4,933	5,537	5,763	3,893	2,741	1,036	868	674
Mean	34.5	74.7	81.0	236	170	179	192	126	91.4	33.4	28.0	22.5
Cfsm	0.325	0.705	0.764	2.23	1.60	1.69	1.81	1.19	0.862	0.315	0.264	0.212
In.	0.37	0.79	0.88	2.56	1.73	1.94	2.02	1.37	0.96	0.36	0.30	0.24

Calendar year 1951: Max 448 Min 21 Mean 115 Cfsm 1.08 In. 14.76
Water year 1951-52: Max 370 Min 17 Mean 106 Cfsm 1.00 In. 13.52

* Discharge measurement made on this day.

Christiana Creek at Elkhart, Ind.

Location.--Lat 41°41'45", long. 85°58'35", in NE¼ sec. 5, T. 37 N., R. 5 E., on right bank at Elkhart Water Works pumping plant, three-eighths of a mile upstream from mouth.

Drainage area.--111 sq mi.

Records available.--December 1946 to June 1952 (discontinued).

Gage.--Staff gage read twice daily. Datum of gage is 730.00 ft above mean sea level, datum of 1929. Prior to Oct. 1, 1948, wire-weight gage at site 700 ft downstream at same datum.

Extremes.--Maximum discharge during period October to June, 278 cfs Jan. 23 (gage height, 9.25 ft); minimum, 94 cfs Oct. 21.
1946-52: Maximum discharge, 452 cfs Apr. 8, 1947 (gage height, 2.19 ft, site then in use); minimum, 40 cfs Jan. 22, 1947.

Remarks.--Records good. Water is diverted down an old millrace about a quarter of a mile upstream, entering into St. Joseph River about 1 mile downstream. Diurnal fluctuation caused by small powerplant about 6 miles above station.

Rating table, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)

8.4	90
8.9	190
9.3	290

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	119	163	146	165	188	137	146	122	222			
2	115	152	140	185	195	137	152	122	208			
3	115	142	148	198	218	142	148	112	190			
4	110	130	161	200	215	148	152	108	190			
5	108	133	161	185	215	148	163	110	170			
6	108	131	161	182	215	148	170	113	154			
7	122	131	161	182	208	148	180	110	142			
8	130	130	163	178	200	140	175	*110	135			
9	139	130	157	182	188	142	175	113	135			
10	137	133	154	175	182	154	178	115	144			
11	140	130	152	172	185	175	172	119	126			
12	137	142	152	165	178	180	168	124	139			
13	133	161	150	152	172	180	178	122	131			
14	122	185	142	175	172	185	195	121	148			
15	121	205	133	190	163	175	210	126	159			
16	119	215	122	208	152	170	202	124	168			
17	115	212	131	225	144	172	*198	126	170			
18	112	200	140	230	144	*168	198	121	*168			†77
19	110	208	150	238	140	180	170	126	154		†147	
20	104	182	*150	242	142	188	161	133	150			
21	95	172	152	260	144	192	159	130	144			
22	101	163	148	*260	142	190	148	137	140			
23	119	178	146	270	159	180	159	144	152			
24	161	175	140	238	180	182	150	185	148	†126		
25	*185	185	144	225	140	180	148	218	154			
26	205	175	140	230	140	178	137	245	152			
27	208	163	150	225	*140	168	133	258	146			
28	202	157	161	230	140	161	135	258	139			
29	195	*150	140	222	140	148	128	250	131			
30	180	161	140	222	-	142	126	245	126			
31	175	-	146	190	-	146	-	232	-			-
Total	4,242	4,894	4,581	6,401	4,941	5,084	4,914	4,679	4,635	-	-	-
Mean	137	163	148	206	170	164	164	151	154	-	-	-
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 224 Min 74 Mean 136 Cfsm - In. -
Water year 1951-52: Max - Min - Mean - Cfsm - In. -

* Discharge measurement made on this day.
† Result of discharge measurement made on this day.

Elkhart River at Goshen, Ind.

Location.--Lat 41°35', long. 85°50', near line between secs. 8 and 9, T. 36 N., R. 6 E., on right bank 20 ft downstream from River Avenue Bridge at Goshen and half a mile upstream from Rock Run.

Drainage area.--573 sq mi.

Records available.--April 1931 to September 1952 in reports of Geological Survey. September 1924 to September 1927 in reports of Indiana Department of Conservation.

Gage.--Water-stage recorder. Prior to Nov. 20, 1931, chain gage at same site and datum.

Average discharge.--24 years (1924-27, 1931-52), 501 cfs.

Extremes.--Maximum discharge during year, 2,310 cfs Jan. 2 (gage height, 6.40 ft); minimum, 66 cfs Sept. 28; minimum daily, 112 cfs Sept. 28.
1931-52: Maximum discharge, 5,440 cfs Apr. 4, 1950 (gage height, 10.15 ft); minimum, 28 cfs Sept. 5, 6, 1941; minimum daily, 35 cfs Sept. 26, 1941; minimum gage height, 1.27 ft May 25, 30, 1932.

Remarks.--Records good except those for period of ice effect, which are fair. Flow regulated by three powerplants above station.

Revisions.--W 824: Drainage area.

Rating table, water year 1951-52, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second) (Shifting-control method used Oct. 1 to Nov. 8, June 22 to Sept. 30)

1.7	105
2.4	315
5.0	1,560
7.0	2,820

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	158	555	564	1,780	1,320	663	872	802	896	363	252	209
2	191	496	564	2,240	1,320	640	802	755	872	319	245	273
3	239	470	550	1,720	1,320	640	755	732	849	323	256	298
4	236	470	966	1,440	1,660	708	732	686	732	327	259	266
5	224	412	1,440	1,320	2,120	778	826	640	755	347	256	245
6	236	404	1,090	1,240	1,780	732	920	618	802	319	252	230
7	290	425	943	1,220	1,560	708	966	560	686	298	259	236
8	371	456	826	1,190	1,390	686	966	*550	640	391	239	224
9	375	474	826	1,140	1,390	686	920	596	596	573	270	215
10	262	474	826	1,090	1,340	755	896	596	573	429	312	218
11	259	618	778	1,020	1,390	1,040	920	596	501	367	294	218
12	280	802	755	990	1,290	1,340	896	573	564	339	301	218
13	262	1,020	708	943	1,240	1,120	1,060	555	640	301	280	206
14	266	1,320	596	1,060	1,160	1,090	1,560	550	943	280	276	122
15	252	1,360	596	1,660	1,020	1,090	1,660	456	1,020	245	280	233
16	236	990	b500	1,720	1,040	1,060	1,390	510	778	239	331	259
17	224	872	b450	1,500	1,020	1,040	*1,240	596	596	262	351	*245
18	224	802	b450	1,610	943	*1,020	1,220	555	*573	239	315	230
19	236	778	b450	1,500	920	1,390	1,160	537	537	404	*294	197
20	227	755	b450	2,000	896	1,560	1,140	532	528	575	276	206
21	150	732	b500	1,940	872	1,290	1,090	528	506	465	239	135
22	252	708	b500	1,560	849	1,220	1,060	537	492	425	230	215
23	383	732	b500	*1,340	849	1,220	1,120	573	474	*488	239	209
24	1,090	802	b550	1,320	802	1,160	1,160	920	470	501	236	197
25	*1,360	708	b550	1,240	778	1,120	1,120	1,340	438	429	239	191
26	990	686	573	1,360	*755	1,090	1,020	1,220	391	359	221	173
27	802	618	*573	1,720	732	1,040	943	1,040	399	367	215	167
28	732	596	596	1,720	708	990	896	990	387	404	221	112
29	686	*618	596	1,360	686	966	872	966	379	363	230	182
30	640	573	686	1,390	-	920	826	943	363	319	206	158
31	596	-	849	1,260	-	872	-	920	-	301	191	-
Total	12,729	20,726	20,801	44,593	33,150	30,634	31,008	21,972	18,380	11,361	8,065	6,287
Mean	411	691	671	1,438	1,143	988	1,034	709	613	366	260	210
Cfsm	0.717	1.21	1.17	2.51	1.99	1.72	1.80	1.24	1.07	0.639	0.454	0.366
In.	0.83	1.35	1.35	2.89	2.15	1.99	2.01	1.43	1.19	0.74	0.52	0.41

Calendar year 1951: Max 4,420 Min 150 Mean 759 Cfsm 1.32 In. 18.00
Water year 1951-52: Max 2,240 Min 112 Mean 710 Cfsm 1.24 In. 16.86

Peak discharge (base, 2,000 cfs).--Jan. 2 (7 a.m.) 2,310 cfs (6.40 ft); Jan. 20 (11 a.m.) 2,240 cfs (6.15 ft); Feb. 5 (8 a.m.) 2,300 cfs (6.26 ft).

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

St. Joseph River at Elkhart, Ind.

Location.--Lat 41°41'30", long. 85°58'25", in NE¼ sec. 5, T. 37 N., R. 5 E., on left bank 100 ft downstream from mouth of Elkhart River, 200 ft upstream from Main Street Bridge, and 1,900 ft downstream from Christiana Creek.

Drainage area.--3,350 sq mi, approximately.

Records available.--August 1947 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 700.00 ft above mean sea level, datum of 1929.

Average discharge.--5 years, 3,807 cfs.

Extremes.--Maximum discharge during year, 9,920 cfs Jan. 21 (gage height, 23.52 ft); minimum, 590 cfs Oct. 18 (gage height, 17.58 ft); minimum daily, 1,290 cfs Sept. 20.
1947-52: Maximum discharge, 18,400 cfs Apr. 5, 1950 (gage height, 27.82 ft); minimum, 335 cfs Oct. 11, 1948 (gage height, 17.24 ft); minimum daily, 870 cfs Oct. 10, 1948.

Remarks.--Records good. Flow regulated by Elkhart Hydro Plant, 2,400 ft upstream, and by hydroelectric plant on Elkhart River at Goshen.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,750	3,910	3,590	6,320	7,040	4,080	4,920	4,610	6,500	2,630	2,220	1,760
2	1,790	3,560	3,630	7,040	7,220	4,020	4,870	4,460	5,960	2,530	2,040	2,240
3	1,810	3,200	3,550	6,500	6,860	4,050	4,480	4,310	5,470	2,410	1,840	2,060
4	1,880	3,220	4,720	6,140	7,400	4,300	4,520	3,980	5,360	2,310	2,170	2,190
5	1,830	3,230	5,570	6,320	8,300	4,370	4,720	3,890	5,090	2,160	2,230	2,060
6	1,710	3,030	5,400	6,320	8,120	4,340	5,040	3,760	4,920	2,120	1,960	1,930
7	1,940	3,050	5,170	6,320	7,580	4,350	5,200	3,410	4,460	2,140	2,020	1,880
8	2,260	2,960	5,030	6,140	7,400	4,190	5,150	*3,450	4,220	2,980	2,080	1,940
9	2,470	3,030	4,980	5,960	7,220	4,250	5,300	3,660	4,060	3,280	1,780	1,860
10	2,460	3,050	4,780	5,780	6,860	4,450	5,390	3,780	3,890	2,890	2,120	1,820
11	2,220	3,280	4,680	5,420	6,860	5,240	5,460	3,760	3,430	2,620	2,280	1,760
12	2,300	3,850	4,520	5,420	6,500	5,780	5,780	3,720	3,780	2,360	1,930	1,750
13	2,310	4,690	4,300	5,060	6,320	5,780	6,140	3,590	3,790	2,090	1,680	1,720
14	1,990	5,560	4,030	5,420	5,960	5,960	7,040	3,570	4,800	2,240	2,360	1,860
15	2,160	5,800	3,290	6,860	5,420	5,780	7,760	3,520	4,410	2,190	2,510	1,970
16	2,040	5,740	2,500	7,220	5,320	5,570	7,760	3,550	4,070	2,220	3,020	1,890
17	1,980	5,400	2,700	7,040	5,320	5,420	*7,580	3,620	3,740	2,230	2,760	*1,910
18	1,930	5,330	3,000	8,300	5,160	*5,340	7,580	3,560	*3,500	2,300	2,580	1,810
19	1,940	5,100	3,340	8,480	5,080	6,140	7,040	3,580	3,440	2,800	2,630	1,560
20	1,760	4,840	3,520	9,380	4,870	6,680	6,860	3,650	3,290	3,170	*2,420	1,290
21	1,640	4,540	3,790	9,380	4,840	6,680	6,500	3,610	3,210	3,190	2,260	1,370
22	1,900	4,380	4,220	*8,660	4,530	6,500	6,320	3,690	3,140	2,950	2,200	1,720
23	2,600	4,500	3,750	*8,300	4,550	6,500	6,500	4,160	3,230	3,140	1,970	1,910
24	4,640	4,570	3,750	7,400	4,450	6,140	6,320	5,960	3,180	*3,070	1,910	1,810
25	*5,310	4,380	3,930	7,220	4,340	6,140	5,780	7,940	3,240	2,850	2,120	1,820
26	5,240	4,340	3,770	8,300	4,360	5,960	5,780	8,300	3,040	2,770	1,920	1,840
27	5,060	4,110	3,560	9,020	*4,320	5,600	5,580	8,480	2,890	2,480	1,860	1,690
28	4,880	3,960	3,540	8,660	4,300	5,600	5,450	8,300	2,500	2,530	1,840	1,620
29	4,750	*3,570	3,510	7,940	4,230	5,390	5,230	7,760	2,380	2,560	1,630	1,660
30	4,530	3,740	3,710	6,680	-	5,220	4,840	7,220	2,620	2,450	1,810	1,680
31	4,300	-	4,310	6,680	-	4,920	-	6,860	-	2,320	1,700	-
Total	85,380	123,920	124,140	219,680	170,730	164,740	176,890	147,710	117,610	79,980	65,850	54,380
Mean	2,754	4,131	4,005	7,086	5,887	5,314	5,896	4,765	3,920	2,580	2,124	1,813
Cfsm	0.822	1.23	1.20	2.12	1.76	1.59	1.76	1.42	1.17	0.770	0.634	0.541
In.	0.95	1.38	1.38	2.44	1.90	1.83	1.96	1.64	1.31	0.89	0.73	0.60

Calendar year 1951: Max 9,020 Min 1,640 Mean 3,974 Cfsm 1.19 In. 16.11
Water year 1951-52: Max 9,380 Min 1,290 Mean 4,183 Cfsm 1.25 In. 17.00

* Discharge measurement made on this day.

St. Joseph River at Niles, Mich.

Location.--Lat 41°49'45", long. 86°15'35", in SW¼ sec. 26, T. 7 S., R. 17 W., on right bank 100 ft upstream from Main Street Bridge at Niles, 1 mile upstream from Dowagiac River (corrected), 0.6 mile downstream from dam at French Paper Co., and at mile 44.

Drainage area.--3,620 sq mi, approximately.

Records available.--October 1930 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 635.02 ft above mean sea level, datum of 1929. Oct. 1, 1930, to Feb. 11, 1931, tape gage on Main Street Bridge, and Feb. 12, 1931, to June 30, 1931, staff gage 50 ft upstream from present site, gage heights referred to mean sea level. Since Oct. 1, 1943, auxiliary gage is headwater gage at hydroelectric plant at Buchanan Dam, 8 miles downstream.

Average discharge.--20 years (1930-37, 1938-39, 1940-52), 3,205 cfs.

Extremes.--Maximum discharge during year, 11,800 cfs Jan. 21 (gage height, 9.00 ft); minimum daily, 556 cfs Sept. 21.
1930-52: Maximum discharge, 20,200 cfs Apr. 5, 1950 (gage height, 13.10 ft); minimum daily, 407 cfs Aug. 2, 1936.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Flow regulated by powerplants above station.

Cooperation.--Gage-height record at the auxiliary gage furnished by Indiana and Michigan Electric Co.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,350	4,460	4,590	6,510	7,230	4,550	5,290	4,980	7,010	2,920	2,300	2,100
2	2,200	4,090	3,970	9,640	7,230	4,570	5,140	4,910	6,860	2,790	2,430	2,200
3	1,700	3,500	4,370	7,650	7,600	4,660	5,120	4,410	5,630	2,790	1,880	2,500
4	1,440	3,600	4,960	6,970	8,190	4,860	4,700	4,500	5,660	2,480	2,420	*2,400
5	2,310	3,700	6,640	7,190	9,480	4,810	5,020	4,200	5,410	2,440	2,460	2,280
6	3,080	3,800	6,340	6,850	9,000	4,880	5,320	4,180	4,920	2,290	2,180	2,000
7	2,860	3,700	5,870	6,820	8,350	4,910	5,890	4,090	4,740	2,200	2,120	1,750
8	2,600	3,500	5,450	6,670	8,040	4,800	5,850	3,520	4,420	2,590	2,180	2,000
9	3,090	3,400	5,340	6,630	7,740	4,650	5,700	3,860	4,410	3,780	2,340	1,830
10	2,740	3,600	5,480	6,350	7,600	5,040	6,070	4,380	4,110	3,700	1,920	1,570
11	2,970	3,500	5,110	6,280	*7,450	4,850	5,670	3,950	4,200	3,300	2,420	1,710
12	2,790	4,000	*5,040	5,750	7,230	6,620	5,970	4,340	*4,300	3,000	*2,290	1,760
13	2,560	6,500	4,800	5,670	6,740	6,390	6,860	4,050	4,470	2,800	1,680	1,550
14	3,110	*7,000	4,790	5,780	6,660	6,580	7,650	*3,980	5,320	2,700	2,130	2,040
15	*3,120	7,760	4,080	7,960	6,000	6,340	*9,000	3,970	5,780	2,700	2,900	2,410
16	2,720	6,580	2,940	9,480	5,680	6,360	8,680	3,850	4,440	*2,600	3,510	2,120
17	2,470	6,200	3,100	9,320	5,860	6,360	8,680	3,890	4,210	2,590	3,490	1,960
18	2,260	6,000	3,300	9,160	5,860	6,020	7,570	3,960	3,930	2,660	3,080	1,830
19	2,280	5,800	3,550	9,800	5,360	6,850	7,430	4,010	3,940	3,380	2,640	2,030
20	2,360	5,500	4,070	11,100	5,540	7,280	7,530	3,970	3,420	3,840	2,500	2,040
21	1,850	5,200	3,960	11,600	5,460	7,220	7,180	4,040	3,470	4,020	2,630	556
22	2,090	5,000	3,990	*10,400	5,240	7,220	7,010	4,200	3,490	3,810	2,160	1,850
23	2,990	5,200	4,240	9,480	5,130	6,940	7,220	4,380	3,690	3,320	2,220	1,780
24	6,210	5,200	4,110	8,190	4,880	6,720	7,360	5,710	4,020	4,010	1,850	1,660
25	7,270	4,950	4,220	8,520	5,140	*6,580	6,510	7,130	3,750	3,280	2,180	1,700
26	6,150	4,990	4,400	8,840	4,900	6,790	6,210	9,480	3,060	3,080	2,130	1,650
27	5,670	5,160	4,120	9,800	4,950	6,040	6,180	9,160	2,720	2,790	1,840	1,450
28	5,520	4,720	4,020	9,960	4,650	5,940	5,770	9,480	3,100	2,800	1,840	1,930
29	5,490	4,700	4,050	9,000	4,970	5,910	5,760	8,520	2,550	2,900	1,720	1,360
30	5,120	4,250	4,000	7,500	-	5,680	5,450	7,950	3,030	2,700	1,180	1,620
31	4,700	-	4,880	7,000	-	5,520	-	7,230	-	2,350	1,750	-
Total	104,070	145,560	139,780	251,870	188,160	181,940	193,790	160,280	130,060	92,610	70,350	55,636
Mean	3,357	4,852	4,509	8,125	6,488	5,869	6,460	5,170	4,335	2,987	2,269	1,855
Cfsm	0.927	1.34	1.25	2.24	1.79	1.62	1.78	1.43	1.20	0.825	0.627	0.512
In.	1.07	1.50	1.44	2.59	1.93	1.87	1.99	1.65	1.34	0.95	0.72	0.57

Calendar year 1951: Max 9,960 Min 1,440 Mean 4,514 Cfsm 1.25 In. 16.93
Water year 1951-52: Max 11,600 Min 556 Mean 4,683 Cfsm 1.29 In. 17.62

* Discharge measurement made on this day.

Note.--No gage-height record Nov. 8-14, Jan 29-31, June 11, 12, July 10-16, Sept. 1-4; no auxiliary gage-height record Nov. 3-10, 17-24, July 28, 29; discharge estimated on basis of 3 discharge measurements, weather records, and records for nearby stations including St. Joseph River at Berrien Springs and powerplant index at Buchanan.

St. Joseph River at Berrien Springs, Mich.

Location.--Lat 41°56'55", long. 86°20'00", in SW¼ sec. 18, T. 6 S., R. 17 W., on right bank 30 ft upstream from bridge on U. S. Highway 31 at Berrien Springs and at mile 24.
Drainage area.--4,081 sq mi.
Records available.--June 1951 to September 1952 in reports of Geological Survey. January 1909 to December 1931 (figures of maximum and minimum days and monthly average discharge only) in House Document 94, 73d Congress, 1st session.
Gage.--Water-stage recorder. Datum of gage is 594.38 ft above mean sea level (Indiana-Michigan Electric Co. benchmark).
Extremes.--1951: Maximum discharge during period June to September, 11,900 cfs July 11 (gage height, 10.47 ft); minimum, 648 cfs Aug. 14 (gage height, 1.96 ft); minimum daily, 2,330 cfs Sept. 17.
1951-52: Maximum discharge during water year, 13,200 cfs Jan. 21 (gage height, 11.23 ft); minimum, 520 cfs Oct. 20 (gage height, 1.72 ft); minimum daily, 1,410 cfs Sept. 21.
Remarks.--Records good. Flow regulated by powerplants above station.

Rating table, June 25, 1951, to Sept. 30, 1952 (gage height, in feet, and discharge, in cubic feet per second)

3.1	1,380	7.0	5,780
5.0	3,010	11.1	13,000

Discharge, in cubic feet per second, 1951-52

1951

Day	June	July	Aug.	Sept.	Day	June	July	Aug.	Sept.	Day	June	July	Aug.	Sept.
1	-	4,050	4,800	3,100	11	-	7,640	3,340	3,660	21	-	4,500	5,100	2,850
2	-	4,140	4,350	3,330	12	-	7,640	3,400	*4,310	22	-	4,350	5,720	2,620
3	-	3,760	4,070	3,120	13	-	6,980	3,250	3,460	23	-	4,490	5,000	2,460
4	-	3,390	4,150	3,040	14	-	5,920	2,980	3,260	24	-	4,500	4,340	2,780
5	-	3,900	4,540	3,160	15	-	5,520	*4,500	3,100	25	-	4,970	4,200	3,170
6	-	3,510	3,510	3,220	16	-	5,190	5,230	3,160	26	4,590	5,530	3,890	3,060
7	-	3,260	4,150	3,190	17	-	4,740	4,840	2,330	27	4,870	5,800	4,010	3,480
8	-	3,200	3,910	3,060	18	-	4,500	5,350	2,850	28	4,700	6,630	3,850	3,390
9	-	4,540	3,800	2,860	19	-	*4,300	4,570	2,640	29	4,480	5,140	3,840	2,990
10	-	7,830	3,800	3,540	20	-	4,500	4,390	2,780	30	3,840	4,930	3,640	3,400
										31	-	4,630	3,260	-
Total											-	153,980	129,780	93,370
Mean											-	4,967	4,186	3,112
Cfsm											-	1.22	1.03	0.763
In.											-	1.40	1.18	0.85

* Discharge measurement made on this day.
Note.--Results of discharge measurements made prior to daily records are as follows: Feb. 20 (7,420 cfs); Mar. 22 (6,030 cfs); Apr. 11 (6,610 cfs); May 2 (7,200 cfs); June 21 (5,040 cfs).

1951-52

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,270	5,230	4,750	7,180	8,580	5,190	6,000	5,460	7,680	3,370	2,810	2,500
2	2,880	4,540	4,640	10,800	8,880	4,850	5,790	5,400	7,750	3,340	2,910	2,670
3	2,780	4,060	4,640	8,920	8,820	5,010	5,670	5,120	6,320	3,350	2,380	3,040
4	2,910	4,180	5,490	8,040	8,870	5,160	5,440	5,080	6,480	3,290	3,070	*2,530
5	2,720	4,170	7,490	7,860	10,200	5,470	5,600	4,720	5,970	2,870	3,180	2,800
6	3,340	4,470	7,430	7,710	10,200	5,280	6,060	4,630	5,990	2,990	2,700	2,640
7	3,280	4,230	6,680	7,630	9,480	5,310	6,230	4,380	5,450	2,850	2,780	2,360
8	3,140	4,010	6,160	7,520	9,050	5,070	6,550	4,300	5,040	3,060	2,740	2,620
9	3,390	3,880	6,360	7,410	8,600	5,360	6,540	3,830	5,050	4,590	2,820	2,680
10	3,380	4,180	5,820	7,120	8,480	5,410	6,390	4,840	4,680	4,000	3,020	2,340
11	3,420	4,080	6,040	7,200	*7,880	6,090	6,900	4,510	*4,610	3,590	2,760	2,240
12	*3,370	4,820	*5,510	6,390	8,090	7,350	6,600	4,490	4,920	3,160	*3,150	2,510
13	3,080	7,220	5,130	6,870	7,680	6,960	7,480	4,540	4,950	3,110	2,520	2,160
14	3,910	8,190	5,470	6,430	7,370	7,320	8,900	4,340	6,160	2,980	3,040	2,160
15	2,260	*8,790	4,690	8,800	6,760	6,920	*9,180	*4,390	6,850	3,100	3,340	2,900
16	3,080	7,500	3,520	10,400	6,600	6,780	9,480	4,280	5,380	*2,900	3,820	2,740
17	3,310	7,250	3,400	10,200	6,140	6,310	8,980	4,180	4,860	3,080	4,000	2,500
18	2,860	6,740	3,680	9,800	5,800	6,660	8,430	4,520	4,870	3,440	3,380	2,570
19	2,840	6,430	4,080	10,900	6,050	7,880	8,640	4,290	4,200	3,470	3,440	2,450
20	2,960	6,140	4,340	11,600	6,410	8,000	8,100	4,440	4,040	3,930	3,250	2,700
21	2,510	6,020	4,550	13,000	5,710	8,020	7,830	4,400	3,800	4,800	3,040	1,410
22	2,620	5,600	4,520	*11,800	5,620	7,860	7,280	4,680	3,980	3,950	3,020	1,890
23	3,220	5,970	4,550	10,600	5,620	7,800	7,770	4,810	4,120	4,120	2,750	2,480
24	6,880	6,060	4,640	9,480	5,520	7,370	8,000	6,370	4,590	4,350	2,760	2,540
25	8,730	5,990	5,020	9,080	5,300	7,160	7,200	10,000	4,180	3,890	2,780	2,550
26	7,210	5,030	5,190	9,940	5,430	*7,310	6,800	10,800	4,210	3,480	2,780	2,310
27	6,640	5,570	5,490	10,400	5,240	6,880	6,800	9,810	3,770	3,320	2,580	2,280
28	6,460	5,180	4,990	11,300	5,280	6,440	6,800	10,500	3,710	3,140	2,540	2,590
29	6,240	4,980	4,980	10,000	5,220	6,370	6,340	9,800	3,020	3,400	2,740	1,820
30	5,970	4,740	4,580	8,350	-	6,530	6,200	8,990	3,280	3,200	1,950	2,400
31	5,520	-	5,460	7,650	-	6,160	-	8,330	-	3,080	2,440	-
Total	123,180	165,250	159,290	280,380	208,880	200,280	213,980	180,230	149,910	107,200	90,490	73,380
Mean	3,974	5,508	5,139	9,045	7,203	6,461	7,133	5,814	4,997	3,458	2,919	2,446
Cfsm	0.974	1.35	1.26	2.22	1.77	1.58	1.75	1.42	1.22	0.847	0.715	0.599
In.	1.12	1.51	1.45	2.56	1.90	1.83	1.95	1.64	1.37	0.98	0.82	0.67

Calendar year 1951: Max - Min - Mean - Cfsm - In. -
Water year 1951-52: Max 13,000 Min 1,410 Mean 5,335 Cfsm 1.31 In. 17.80

* Discharge measurement made on this day.

Paw Paw River at Riverside, Mich.

Location.--Lat 42°11'10", long. 86°22'05", in SE¼ sec. 23, T. 3 S., R. 18 W., on left bank at upstream side of highway bridge, three-quarters of a mile east of Riverside.

Drainage area.--422 sq mi.

Records available.--October 1951 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 588.83 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 1,650 cfs Jan. 23 (gage height, 8.72 ft); minimum, 244 cfs Sept. 16 (gage height, 3.59 ft).

Remarks.--Records good except those for periods of no gage-height record, which are fair. Diurnal fluctuation, principally during low flow, caused by paper mill at Watervliet.

Rating tables, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Aug. 15 to Sept. 2)

Oct. 1 to Jan. 22, Aug. 15 to Sept. 30				Jan. 23 to Aug. 14			
3.7	247	7.0	605	4.0	312	7.0	700
4.0	256	7.5	760	5.0	373	8.0	1,140
5.0	308	8.0	1,020	6.0	487	8.6	1,570
6.0	414	8.6	1,480				

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	478	760	630	960	898	558	625	538	1,050	358	332	264
2	517	675	592	1,200	970	520	600	520	945	344	338	272
3	517	618	478	1,090	970	503	578	487	835	358	312	272
4	414	568	557	1,090	970	558	578	390	760	373	338	277
5	364	537	705	1,120	1,050	578	600	390	700	338	351	*268
6	333	517	720	1,060	1,020	600	625	410	650	327	373	268
7	414	429	720	1,060	1,020	650	625	400	600	332	365	264
8	517	444	720	990	*1,020	675	675	410	558	327	358	260
9	630	497	720	960	995	650	730	390	458	344	351	268
10	645	497	618	930	945	650	745	458	445	365	344	264
11	660	497	690	825	898	700	760	472	*390	365	365	268
12	*660	517	690	740	835	715	760	433	445	373	373	260
13	690	675	*660	690	778	715	835	503	472	344	*338	260
14	690	875	630	675	745	715	*970	433	433	365	344	256
15	630	*990	550	780	700	730	970	*487	421	332	333	264
16	580	990	a460	960	675	730	995	503	400	*344	343	247
17	517	1,020	a390	900	625	700	995	520	445	351	364	253
18	444	1,090	a400	1,020	600	715	995	472	381	358	308	250
19	387	1,090	a420	1,160	600	760	970	410	445	390	308	253
20	387	1,020	a440	1,440	578	a800	898	503	433	390	316	253
21	364	930	a460	1,390	578	a850	815	503	410	400	294	260
22	343	850	a480	*1,390	558	a880	760	472	381	400	294	264
23	387	850	a500	1,570	472	a880	745	578	400	390	308	272
24	537	850	a510	1,410	458	a880	745	675	458	381	277	272
25	740	800	a520	1,270	433	a860	730	920	472	373	272	282
26	780	690	a520	1,110	487	*835	715	1,080	715	381	282	282
27	760	705	a530	1,050	520	795	700	1,080	503	358	272	277
28	780	720	520	1,020	538	760	650	1,240	487	358	268	272
29	850	690	500	778	558	715	625	1,340	520	351	264	277
30	875	660	520	760	-	700	558	1,270	358	351	264	277
31	850	-	700	778	-	650	-	1,170	-	338	264	-
Total	17,740	22,051	17,550	32,176	21,494	22,027	22,572	19,457	15,970	11,159	9,913	7,976
Mean	572	735	566	1,038	741	711	752	628	532	360	320	266
Cfsm	1.36	1.74	1.34	2.46	1.76	1.68	1.78	1.49	1.26	0.853	0.758	0.630
In.	1.56	1.94	1.55	2.84	1.89	1.94	1.99	1.71	1.41	0.98	0.87	0.70

Calendar year 1951: Max - Min - Mean - Cfsm - In. -
Water year 1951-52: Max 1,570 Min 247 Mean 601 Cfsm 1.42 In. 19.38

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of recorded range in stage, weather records, and records for St. Joseph River at Mottville and Thornapple River near Caledonia.

Kalamazoo River at Marshall, Mich.

Location.--Lat 42°15'55", long. 84°57'55", on line between secs. 25 and 26, T. 2 S., R. 6 W., on left bank at upstream side of bridge on U. S. Highway 27 at Marshall.

Drainage area.--449 sq mi.

Records available.--January to October 1948 (gage heights only), November 1948 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 877.09 ft above mean sea level (levels by Michigan Department of Conservation). Prior to Nov. 11, 1948, wire-weight gage at same site and datum.

Extremes.--Maximum discharge during year, 1,180 cfs Apr. 16 (gage height, 6.72 ft); minimum, 26 cfs Aug. 30 (gage height, 3.43 ft); minimum daily, 127 cfs Sept. 29.
1948-52: Maximum discharge, 2,130 cfs Mar. 29, 1950 (gage height, 8.20 ft); minimum, that of Aug. 30, 1952; minimum daily, 119 cfs Aug. 5, 1949.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Flow regulated at all stages by powerplant above station.

Rating table, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 6 to Sept. 5)

3.8	123
4.0	173
5.0	480
6.0	850
6.7	1,180

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	148	384	366	550	513	396	475	484	497	177	315	250
2	250	338	387	704	534	377	488	434	484	310	236	*270
3	206	386	393	743	540	345	464	417	442	289	279	233
4	328	310	*473	726	626	466	468	393	432	318	196	316
5	176	280	602	694	671	557	488	408	432	289	224	287
6	319	302	636	601	693	535	505	368	392	282	*265	265
7	314	304	604	554	642	511	521	405	368	317	186	203
8	382	*343	534	539	580	488	657	419	347	269	278	350
9	315	344	495	494	548	479	736	420	314	254	193	145
10	353	370	455	484	489	476	778	436	310	310	316	213
11	350	366	457	445	534	640	734	431	345	280	192	219
12	334	413	431	462	517	739	710	430	208	194	287	210
13	262	581	348	a475	*518	745	775	*416	*334	286	174	254
14	271	703	320	a550	444	696	939	424	348	*354	284	260
15	295	735	294	a650	444	629	1,170	491	280	208	204	198
16	a320	727	280	a800	444	593	*1,110	464	286	203	338	160
17	*a340	664	266	a950	392	545	1,030	460	342	286	208	229
18	306	577	349	a1,000	416	576	901	436	308	404	255	276
19	211	516	373	a950	370	650	777	416	232	267	218	219
20	271	464	376	a900	389	706	668	431	314	410	274	212
21	261	387	387	a850	409	717	601	464	268	411	218	270
22	257	404	394	a800	382	766	607	474	299	350	195	232
23	350	488	325	a750	389	736	686	537	371	340	266	176
24	698	497	357	*a700	398	*685	623	720	355	390	196	246
25	743	427	333	654	400	665	631	897	363	242	249	222
26	765	423	369	657	429	630	563	916	238	353	168	210
27	736	408	353	677	422	587	540	898	338	279	231	218
28	684	411	333	681	426	565	515	841	298	341	182	241
29	571	352	346	558	425	524	476	702	227	172	258	127
30	516	371	380	525	-	508	518	608	318	317	131	192
31	471	-	397	526	-	491	-	540	-	194	327	-
Total	11,805	13,275	12,413	20,649	13,984	18,023	20,154	16,180	10,090	9,096	7,343	6,903
Mean	381	442	400	666	482	581	672	522	336	293	237	230
Cfsm	0.849	0.984	0.891	1.48	1.07	1.29	1.50	1.16	0.748	0.653	0.528	0.512
In.	0.98	1.10	1.03	1.71	1.16	1.49	1.67	1.34	0.84	0.75	0.61	0.57

Calendar year 1951: Max 961 Min 148 Mean 448 Cfsm 0.998 In. 13.55
Water year 1951-52: Max 1,170 Min 127 Mean 437 Cfsm 0.973 In. 13.25

* Discharge measurements made on this day.
a No gage-height record; discharge estimated on basis of 2 discharge measurements and records for stations near Battle Creek and at Comstock.

Battle Creek at Charlotte, Mich.

Location.--Lat 42°32'20", long. 84°50'55", in SW¼ sec. 24, T. 2 N., R. 5 W., on left bank at upstream side of highway bridge, 1 mile southwest of Charlotte.

Drainage area.--67 sq mi, approximately.

Records available.--February 1948 to September 1952.

Gage.--Staff gage read twice daily. Datum of gage is 869.36 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation).

Extremes.--Maximum discharge observed during year, 336 cfs Apr. 14 (gage height, 5.15 ft); minimum discharge, 5.3 cfs Sept. 22, 23, 25-27; minimum gage height, 1.14 ft Sept. 30. 1948-52: Maximum discharge, 722 cfs Mar. 20, 1948 (gage height, 7.64 ft); minimum, 3.8 cfs Sept. 9, 10, 1950; minimum gage height, that of Sept. 30, 1952.

Remarks.--Records fair.

Rating table, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 21 to Sept. 30)

1.0	5.0	2.0	52
1.2	11	3.0	132
1.5	25	5.0	325

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a10	24	32	182	47	32	46	34	46	13	10	11
2	a13	22	32	221	51	32	46	31	40	14	11	*18
3	a12	22	32	164	62	31	49	30	42	14	13	13
4	a11	20	94	128	123	141	50	30	38	14	*14	11
5	a11	18	90	93	128	86	56	29	34	16	12	10
6	a11	18	76	78	102	74	65	28	32	16	11	12
7	24	18	69	70	73	*53	91	26	29	14	9.8	13
8	24	19	60	63	61	45	150	32	30	16	9.5	11
9	18	*22	51	58	55	51	164	*31	*26	16	11	8.9
10	15	23	*48	50	54	85	136	31	24	13	12	8.0
11	14	27	43	36	74	211	132	30	20	13	11	7.4
12	14	36	38	37	58	177	114	28	21	12	11	8.3
13	14	128	33	46	53	141	246	26	20	12	11	8.3
14	14	191	31	54	43	98	326	25	20	*11	11	9.8
15	14	159	30	266	*38	83	306	29	20	11	8.6	9.5
16	13	98	30	276	38	71	216	27	18	11	11	8.9
17	13	76	28	246	36	65	150	26	20	11	9.5	8.3
18	13	55	24	236	32	71	128	25	18	13	9.5	7.7
19	*13	44	24	168	31	206	94	24	18	21	9.2	6.8
20	13	38	24	246	31	186	85	28	19	24	10	6.5
21	13	33	24	201	31	154	73	31	16	21	9.8	6.8
22	13	30	24	132	30	132	*62	29	16	20	9.8	5.6
23	16	41	24	106	30	123	62	57	16	16	9.2	5.6
24	110	50	24	89	30	109	56	118	16	15	9.8	5.9
25	92	44	24	77	32	90	51	251	16	13	8.9	5.3
26	64	38	26	78	34	79	47	172	14	10	8.3	5.3
27	56	34	30	88	36	74	44	113	14	10	8.3	5.3
28	50	32	32	*82	35	67	42	103	14	12	9.8	6.8
29	41	30	32	54	34	61	40	74	12	13	9.5	6.8
30	29	30	36	48	-	56	36	60	12	13	8.9	6.5
31	26	-	40	47	-	50	-	53	-	12	9.5	-
Total	794	1,420	1,205	3,720	1,482	2,934	3,163	1,631	681	440	316.9	257.3
Mean	25.6	47.3	38.9	120	51.1	94.6	105	52.6	22.7	14.2	10.2	8.58
Cfsm	0.382	0.706	0.581	1.79	0.763	1.41	1.57	0.785	0.339	0.212	0.152	0.128
In.	0.44	0.79	0.67	2.06	0.82	1.63	1.76	0.91	0.38	0.24	0.18	0.14

Calendar year 1951: Max 326 Min 10 Mean 43.5 Cfsm 0.649 In. 8.83
Water year 1951-52: Max 326 Min 5.3 Mean 49.3 Cfsm 0.736 In. 10.02

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of records for stations at Battle Creek and at Bellevue.

Battle Creek at Bellevue, Mich.

Location.--Lat 42°26'35", long. 85°02'00", in W½ sec. 28, T. 1 N., R. 6 W., on right bank at downstream side of bridge on State Highway 78, 0.8 mile west of Bellevue.
Drainage area.--178 sq mi.
Records available.--February 1948 to September 1952.
Gage.--Staff gage read twice daily. Altitude of gage is 840 ft (from topographic map).
Extremes.--Maximum and minimum discharges for the water years 1948-52 are contained in the following table:

Water year	Maximum			Minimum
	Date	Discharge (cfs)	Gage height (feet)	
1948†.....	Mar. 20	2,190	‡6.1	not determined
1948-49...	Feb. 16	1,600	5.59	do.
1949-50...	Mar. 9	1,660	5.66	do.
1950-51...	Jan. 5	1,450	‡5.4	do.
1951-52...	Apr. 14	900	4.73	do.

† Period February to September.
‡ From graph based on gage readings.

1948-52: Maximum discharge, 2,190 cfs Mar. 20, 1948 (gage height, 6.1 ft, from graph based on gage readings); minimum not determined.
Remarks.--Records good above 75 cfs and poor below 75 cfs and for periods of ice effect. Slight diurnal fluctuation caused by mill above station.
Cooperation.--Gage readings furnished by city of Battle Creek.

Rating tables, Feb. 10, 1948, to Sept. 30, 1952, except periods of ice effect and periods of indefinite stage-discharge relation (gage height, in feet, and discharge, in cubic feet per second)

Feb. 10, 1948, to Mar. 29, 1950				Mar. 30, 1950, to Sept. 30, 1952			
1.5	98	4.5	700	1.5	104	4.0	565
2.0	158	5.0	1,020	2.0	173	4.5	760
3.0	299	6.0	2,070	3.0	334	5.3	1,350
4.0	525						

Discharge, in cubic feet per second, February to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1					-	1,190	308	127	73	72	25	20
2					-	750	317	118	*63	78	25	20
3					-	640	258	126	60	100	20	20
4					-	555	223	129	54	88	25	15
5					-	422	202	112	54	73	25	20
6					-	346	*216	114	54	60	25	20
7					-	282	244	141	56	52	25	25
8					-	223	244	202	61	43	20	25
9					-	183	258	202	60	38	*25	25
10					68	164	216	*700	58	40	25	25
11					63	152	299	1,440	59	49	25	25
12					56	154	640	1,390	58	43	25	25
13					67	133	570	1,190	61	40	25	*25
14					76	122	446	940	60	43	25	25
15					80	237	346	780	59	38	25	25
16					84	640	266	620	58	29	25	25
17					92	725	223	497	54	29	25	25
18					120	585	190	388	37	32	20	25
19					258	810	170	290	44	31	20	25
20					525	*2,010	158	230	51	*37	20	25
21					570	1,770	145	216	47	27	20	25
22					484	*1,540	133	196	52	27	20	25
23					399	*1,190	100	170	69	30	20	25
24					336	*870	142	135	74	28	20	25
25		†55			434	*640	152	123	60	26	20	25
26					471	511	138	117	50	28	20	25
27					446	434	130	102	49	27	20	25
28					725	388	148	106	55	26	20	25
29					1,240	326	170	99	84	25	20	25
30					-	317	147	99	85	25	20	30
31		-			-	274	-	80	-	25	20	-
Total					-	18,583	7,199	11,179	1,759	1,309	695	720
Mean					-	599	240	361	58.6	42.2	22.4	24.0
Cfsm					-	3.37	1.35	2.03	0.329	0.237	0.126	0.135
In.					-	3.88	1.50	2.34	0.37	0.27	0.15	0.15

Calendar year	: Max	Min	Mean	Cfsm	In.	
Water year	: Max	Min	Mean	Cfsm	In.	

* Discharge measurement made on this day.
† Result of discharge measurement made on this day.
Note.--Stage-discharge relation indefinite July 29 to Sept. 30; discharge estimated on basis of records for stations at Charlotte and at Battle Creek.

Battle Creek at Bellevue, Mich.--Continued

Discharge, in cubic feet per second, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	30	25	35	68	b95	176	905	78	68	62	25	30
2	30	25	35	60	b90	147	870	82	58	53	25	30
3	30	25	35	47	b90	135	680	96	63	46	25	30
4	30	25	35	53	b90	135	525	91	64	46	25	30
5	25	30	35	104	b85	146	410	81	53	43	25	25
6	25	35	35	209	b85	153	317	80	49	34	25	25
7	25	40	35	176	*b85	151	258	69	44	34	20	25
8	30	40	35	128	b85	132	202	59	43	30	20	25
9	30	40	35	97	b85	134	170	67	38	37	20	25
10	30	40	35	92	b85	133	147	62	34	51	25	25
11	*30	35	35	79	b90	120	132	51	28	*56	30	25
12	30	35	40	78	97	109	123	49	32	36	*40	25
13	30	35	*45	67	540	100	114	48	43	36	40	25
14	30	35	35	42	1,020	*94	105	44	60	38	35	25
15	25	*30	50	60	1,140	92	138	42	123	41	30	25
16	25	35	80	90	1,340	81	151	43	308	32	25	25
17	25	40	92	112	1,060	74	150	49	*410	28	25	30
18	25	55	92	*93	700	76	164	55	388	34	25	50
19	25	70	60	346	602	70	183	*87	299	26	25	60
20	25	75	54	602	640	64	156	164	202	24	25	65
21	25	70	60	484	446	69	144	237	170	22	20	60
22	25	65	56	336	274	80	*136	190	158	23	20	60
23	25	60	58	202	251	123	122	209	158	23	20	*60
24	25	55	54	164	237	126	120	274	122	23	20	60
25	25	50	46	164	258	116	114	251	100	25	20	55
26	25	45	51	154	274	118	104	183	94	25	20	45
27	25	45	39	133	223	138	99	138	92	25	20	40
28	25	40	37	b125	196	156	93	114	81	25	20	35
29	25	40	68	b120	-	140	85	96	70	30	25	30
30	25	40	134	b110	-	135	81	86	64	30	25	30
31	25	-	183	b100	-	346	-	76	-	30	30	-
Total	830	1,280	1,719	4,695	10,263	3,869	6,998	3,251	3,516	1,068	775	1,100
Mean	26.8	42.7	55.5	151	367	125	233	105	117	34.5	25.0	36.7
Cfsm	0.151	0.240	0.312	0.848	2.06	0.702	1.31	0.590	0.657	0.194	0.140	0.206
In.	0.17	0.27	0.36	0.98	2.14	0.81	1.46	0.68	0.73	0.22	0.16	0.23

Calendar year 1948: Max - Min - Mean - Cfsm - In. -
Water year 1948-49: Max 1,340 Min 20 Mean 108 Cfsm 0.607 In. 8.21

* Discharge measurement made on this day. b Stage-discharge relation affected by ice.
Note.--Stage-discharge relation indefinite Oct. 1 to Dec. 14, July 26 to Sept. 30; discharge estimated on basis of records for stations at Charlotte and at Battle Creek.

Discharge, in cubic feet per second, water year October 1949 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	30	35	49	183	196	b160	710	483	91	69	56	69
2	30	35	49	183	104	b170	760	404	94	67	53	57
3	30	30	53	251	170	b180	840	353	170	59	56	49
4	30	*30	56	399	136	b190	1,200	298	217	54	54	44
5	35	30	64	511	117	b240	*1,300	256	187	52	44	41
6	40	30	70	446	115	336	1,080	224	141	47	42	34
7	*45	30	58	336	112	471	870	202	110	46	41	28
8	45	30	54	244	112	980	710	177	96	43	40	28
9	45	30	*59	183	127	1,340	580	162	89	38	36	28
10	45	30	85	190	*135	1,060	496	167	89	36	35	44
11	50	35	98	209	147	750	580	163	83	34	36	80
12	55	35	110	196	135	750	580	151	75	34	35	*210
13	55	35	145	244	123	458	496	139	74	40	35	670
14	55	35	99	585	133	377	414	131	87	45	35	930
15	50	35	b80	640	258	290	325	125	94	41	30	810
16	50	35	b75	446	366	274	298	*123	109	36	30	471
17	45	35	b70	410	346	251	272	120	110	86	30	325
18	45	35	69	308	299	282	248	115	98	123	*30	290
19	45	35	74	258	244	202	232	110	85	125	30	217
20	45	35	85	196	216	196	217	104	74	210	30	187
21	40	35	274	170	190	*237	210	92	73	217	30	176
22	40	35	640	146	170	366	194	90	68	159	26	162
23	40	35	780	141	141	525	180	90	*58	117	26	149
24	40	40	660	144	b135	620	550	91	77	89	26	134
25	40	40	525	225	b130	660	1,250	86	81	79	26	112
26	40	40	434	*525	b125	780	1,350	101	87	73	26	107
27	35	40	410	640	b130	1,140	1,080	116	74	79	29	86
28	35	45	388	471	153	1,440	900	108	67	*77	38	80
29	35	45	308	346	-	1,240	710	96	69	59	46	77
30	35	50	230	326	-	1,040	550	94	69	57	56	69
31	35	-	209	299	-	840	-	94	-	55	56	-
Total	1,285	1,065	6,360	9,851	4,765	17,845	19,182	5,065	2,896	2,346	1,163	5,764
Mean	41.5	35.5	205	318	170	576	639	163	96.5	75.7	37.5	192
Cfsm	0.233	0.199	1.15	1.79	0.955	3.24	3.59	0.916	0.542	0.425	0.211	1.08
In.	0.27	0.22	1.33	2.06	1.00	3.73	4.01	1.06	0.61	0.49	0.24	1.20

Calendar year 1949: Max 1,340 Min 20 Mean 121 Cfsm 0.680 In. 9.23
Water year 1949-50: Max 1,440 Min 26 Mean 213 Cfsm 1.20 In. 16.22

* Discharge measurement made on this day. b Stage-discharge relation affected by ice.
Note.--Stage-discharge relation indefinite Oct. 1 to Nov. 30; discharge estimated on basis of records for stations at Charlotte and at Battle Creek.

Battle Creek at Bellevue, Mich.--Continued

Discharge, in cubic feet per second, water year October 1950 to September 1951

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	65	49	77	80	70	298	184	264	73	90	49	41
2	63	48	96	120	70	264	224	194	99	*80	*35	41
3	63	49	281	*500	75	256	240	172	124	65	38	38
4	77	48	483	1,350	75	307	217	149	109	60	38	37
5	56	48	448	1,250	90	325	186	127	90	64	35	35
6	53	47	363	900	95	272	163	114	84	59	36	33
7	53	48	334	690	100	240	117	103	*75	59	38	*29
8	56	*59	471	522	95	217	173	101	74	57	40	29
9	60	74	580	448	95	186	281	91	66	59	37	28
10	58	84	414	307	95	162	264	91	63	62	37	29
11	53	81	290	264	100	144	210	173	59	59	36	30
12	55	77	*224	210	*150	130	194	334	56	58	32	28
13	62	69	170	166	650	127	217	290	58	57	29	28
14	66	67	150	166	870	145	281	210	68	53	29	29
15	62	75	140	162	670	180	298	187	63	56	32	29
16	*57	94	130	142	550	194	232	152	58	52	36	27
17	64	98	120	125	459	194	202	*149	62	50	37	29
18	52	86	110	130	425	202	187	139	69	48	38	29
19	52	80	110	163	612	210	*180	117	75	38	41	29
20	48	101	100	194	965	187	159	73	158	37	41	29
21	46	151	100	240	810	159	142	90	210	38	49	27
22	49	149	95	248	630	137	141	96	210	58	49	28
23	52	123	95	202	496	128	159	98	298	113	48	26
24	52	105	94	173	393	110	141	96	240	104	43	29
25	48	89	90	131	363	131	152	89	179	87	37	29
26	45	86	90	125	344	109	160	78	135	73	36	30
27	48	86	85	115	373	107	187	79	114	69	37	38
28	54	86	85	110	363	108	159	85	130	60	40	37
29	52	81	85	100	-	125	187	91	138	56	44	35
30	54	79	85	85	-	*194	281	86	109	53	40	36
31	49	-	80	71	-	187	-	78	-	56	40	-
Total	1,724	2,417	6,075	9,489	10,083	5,735	5,918	4,196	3,346	1,930	1,197	942
Mean	55.6	80.6	196	306	360	185	197	135	112	62.3	38.6	31.4
Cfsm	0.312	0.453	1.10	1.72	2.02	1.04	1.11	0.758	0.629	0.350	0.217	0.176
In.	0.36	0.50	1.27	1.98	2.11	1.20	1.24	0.88	0.70	0.40	0.25	0.20

Calendar year 1950: Max 1,440 Min 26 Mean 217 Cfsm 1.22 In. 16.53
Water year 1950-51: Max 1,350 Min 26 Mean 145 Cfsm 0.815 In. 11.09

* Discharge measurement made on this day. Note.--Stage-discharge relation affected by ice Dec. 13-21, Dec. 26 to Jan. 3, Jan. 27-30, Feb. 1-12.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	38	96	117	363	187	96	194	104	180	42	33	e35
2	38	85	123	735	202	92	194	98	159	41	33	37
3	38	83	131	810	217	91	187	90	149	47	31	42
4	36	75	*202	670	272	180	179	84	146	49	34	42
5	37	71	363	565	373	353	186	104	130	43	*41	38
6	41	65	344	436	373	307	224	55	107	42	38	34
7	64	71	298	373	281	*202	256	45	89	37	34	37
8	101	77	256	344	232	159	344	79	86	34	38	32
9	104	*79	210	290	194	151	*425	95	*81	35	33	31
10	81	75	187	248	181	194	*448	98	75	35	44	29
11	69	90	167	240	210	425	436	94	69	*34	44	26
12	64	123	149	224	224	565	404	*86	71	31	43	25
13	59	290	*140	210	187	496	522	81	72	31	40	24
14	56	522	b130	210	*172	393	840	78	68	30	38	23
15	50	565	b125	483	149	316	810	90	65	31	48	25
16	48	459	b125	810	118	256	670	90	63	29	38	24
17	47	363	b110	760	108	232	536	85	59	31	45	22
18	*46	272	b100	760	96	217	425	81	57	46	47	26
19	46	210	b95	670	92	383	353	77	54	85	38	*29
20	43	173	b90	690	96	595	281	81	50	100	e35	28
21	42	142	b90	670	91	565	232	103	55	81	e35	27
22	42	135	b90	522	92	496	210	112	58	66	e35	27
23	55	172	b90	471	94	483	202	169	60	63	e30	27
24	224	224	b85	383	89	425	210	256	62	55	e30	26
25	404	194	b100	334	92	344	179	580	60	48	e30	25
26	373	159	b100	290	91	298	159	690	56	45	e30	24
27	290	139	b105	344	94	264	142	536	49	42	e30	22
28	217	124	b110	*344	98	248	128	436	45	41	e30	23
29	165	117	b120	b280	98	224	118	353	45	40	e30	22
30	135	116	b135	240	-	202	109	248	44	36	e35	20
31	110	-	202	187	-	194	-	210	-	34	e35	-
Total	3,163	5,366	4,699	13,956	4,803	9,446	9,603	5,388	2,364	1,404	1,125	852
Mean	102	179	152	450	166	305	320	174	78.8	45.3	36.3	28.4
Cfsm	0.573	1.01	0.854	2.53	0.933	1.71	1.80	0.978	0.443	0.254	0.204	0.160
In.	0.66	1.12	0.98	2.92	1.00	1.97	2.01	1.13	0.49	0.29	0.24	0.18

Calendar year 1951: Max 1,350 Min 26 Mean 154 Cfsm 0.865 In. 11.72
Water year 1951-52: Max 840 Min 20 Mean 170 Cfsm 0.955 In. 12.99

* Discharge measurement made on this day. b Stage-discharge relation affected by ice.
e Stage-discharge relation indefinite; discharge estimated on basis of records for stations at Charlotte and at Battle Creek.

Battle Creek at Battle Creek, Mich.

Location.--Lat 42°19'55", long. 85°09'15", in sec. 5, T. 2 S., R. 7 W., on right bank 350 ft upstream from Emmett Street Bridge at Battle Creek and 3 miles upstream from mouth.

Drainage area.--241 sq mi.

Records available.--October 1930 to July 1931, October 1932 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 823.24 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation). Prior to May 14, 1951, staff gage at same site and datum.

Average discharge.--18 years (1934-52), 217 cfs.

Extremes.--Maximum discharge during year, 1,300 cfs Jan. 18 (gage height, 2.42 ft); minimum, 62 cfs Aug. 28 to Sept. 1 and part of each day Sept. 13-18 (gage height, 0.64 ft).

1930-31, 1932-52: Maximum discharge, 3,640 cfs Apr. 7, 1947 (gage height, 4.48 ft, from floodmark); minimum, 22 cfs Aug. 14, 1934; minimum gage height, about -0.5 ft in July 1936 and on Aug. 31, 1939, due to opening of gates at dam forming control.

Remarks.--Records good.

Rating table, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)

0.6	52	1.5	480
.8	105	2.0	910
1.0	190	2.4	1,300

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	92	220	210	251	334	200	328	215	374	89	68	65
2	92	190	210	317	339	195	322	210	322	83	68	78
3	89	168	215	431	350	186	317	195	306	83	68	81
4	86	154	*278	685	386	225	317	186	295	89	73	81
5	83	145	312	775	424	268	317	172	300	86	*78	75
6	83	137	374	685	504	*334	328	172	251	83	78	75
7	117	*121	459	568	480	392	344	154	210	78	78	73
8	168	154	459	459	480	392	392	158	168	78	73	70
9	190	158	410	398	350	322	*452	181	154	81	75	70
10	195	163	368	362	328	284	600	205	*145	78	78	68
11	176	176	322	334	328	350	712	205	137	*78	78	68
12	154	200	295	317	312	520	703	*190	141	73	86	65
13	141	273	240	300	*328	802	730	176	137	70	83	62
14	117	380	190	295	284	775	910	168	137	70	78	65
15	109	576	168	362	225	649	1,210	186	129	75	75	62
16	105	775	176	560	246	520	1,250	190	121	78	81	62
17	102	748	195	1,110	220	424	1,050	190	121	75	83	62
18	*100	616	200	1,270	210	380	856	181	117	94	78	73
19	97	480	186	1,210	195	392	694	172	105	168	78	*78
20	97	368	181	1,180	186	512	560	186	102	190	75	75
21	97	312	176	919	176	811	466	210	113	176	83	73
22	97	278	176	1,020	181	883	398	225	121	154	83	73
23	125	273	176	811	181	802	356	268	121	125	70	75
24	251	278	176	649	181	730	339	339	125	109	65	73
25	322	284	176	528	181	658	322	488	117	97	65	73
26	404	290	172	496	186	576	312	793	105	92	65	70
27	504	268	176	466	195	488	284	973	100	83	65	70
28	473	246	176	459	200	424	262	892	94	81	62	68
29	380	220	186	*404	200	392	240	730	92	75	62	65
30	306	215	190	368	-	362	230	576	89	73	62	68
31	251	-	210	322	-	339	-	445	-	73	62	-
Total	5,603	8,866	7,438	18,311	8,190	14,587	15,651	9,631	4,849	2,937	2,276	2,116
Mean	181	296	240	591	282	471	522	311	162	94.7	73.4	70.5
Cfsm	0.751	1.23	0.996	2.45	1.17	1.95	2.17	1.29	0.672	0.393	0.305	0.293
In.	0.86	1.37	1.15	2.83	1.26	2.25	2.42	1.49	0.75	0.45	0.35	0.33

Calendar year 1951: Max 1,510 Min 63 Mean 238 Cfsm 0.988 In. 13.40
Water year 1951-52: Max 1,270 Min 62 Mean 274 Cfsm 1.14 In. 15.51

* Discharge measurement made on this day.

Kalamazoo River near Battle Creek, Mich.

Location (revised).--Lat 42°20'45", long. 85°15'45", in NE¼ sec. 32, T. 1 S., R. 8 W., on left bank, 0.4 mile upstream from Wabascon Creek, and 4.3 miles northwest of confluence of Battle Creek and Kalamazoo River in city of Battle Creek.

Drainage area.--849 sq mi.

Records available.--July 1937 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 796.49 ft (corrected) above mean sea level, datum of 1929. Prior to Oct. 1, 1937, at datum 2.00 ft higher.

Average discharge.--15 years (1937-52), 725 cfs.

Extremes.--Maximum discharge during year, 2,560 cfs Apr. 16 (gage height, 6.69 ft); minimum, 238 cfs Oct. 6 (gage height, 2.00 ft); minimum daily, 352 cfs Oct. 6, Sept. 30. 1937-52: Maximum discharge, 7,290 cfs Apr. 7, 1947 (gage height, 9.13 ft); minimum, 50 cfs Sept. 22, 1939; minimum daily, 143 cfs Aug. 21, 1941; minimum gage height, 1.51 ft Feb. 22, 1940.

Remarks.--Records good except those for periods of no gage-height record and shifting control, which are fair. Diurnal fluctuation, below about 1,500 cfs, caused by powerplants above station.

Revisions (water years).--W 924: 1938, 1939.

Rating table, water year 1951-52, except periods of shifting control
(gage height, in feet, and discharge, in cubic feet per second)

2.0	340
4.0	1,030
6.0	2,000
6.6	2,470

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	525	788	788	1,010	1,030	805	1,030	892	1,150	578	415	445
2	382	682	770	1,240	1,070	735	1,010	840	1,030	475	460	490
3	460	595	788	1,370	1,070	718	990	770	1,070	525	430	490
4	400	612	990	1,500	1,240	822	970	752	990	525	475	460
5	490	542	*1,150	1,650	1,370	990	1,030	752	950	490	430	490
6	352	560	1,190	1,550	1,420	1,030	1,070	700	*910	460	*445	475
7	648	578	1,280	1,370	1,370	1,030	1,110	700	840	460	460	460
8	648	*595	1,190	1,240	1,320	1,070	1,240	770	805	508	415	415
9	648	612	1,150	1,110	1,150	1,010	1,420	*788	770	490	460	475
10	612	648	1,070	1,030	1,070	970	1,550	805	700	445	430	385
11	595	648	970	950	1,030	1,190	1,650	805	735	*475	475	382
12	578	682	950	910	1,030	1,460	1,650	770	752	445	430	397
13	542	1,010	858	910	950	1,650	1,810	770	682	415	475	385
14	475	1,370	805	892	*930	1,750	2,140	770	735	460	415	415
15	475	1,460	a700	1,240	858	1,600	2,300	858	752	475	460	400
16	508	1,600	a600	1,650	892	1,370	2,470	840	718	415	460	367
17	415	1,600	a650	2,000	805	1,190	2,470	840	735	430	508	367
18	*460	1,460	a750	2,380	788	1,150	2,140	805	718	665	460	400
19	490	1,240	a830	2,470	805	1,370	1,810	752	700	735	460	*445
20	378	1,030	a850	2,470	752	1,500	1,550	822	665	665	445	415
21	460	910	a850	2,300	770	1,650	1,280	875	718	700	475	394
22	445	875	a810	2,220	788	1,870	*1,190	910	718	648	445	415
23	542	950	a730	2,000	735	1,870	1,320	1,070	788	612	415	379
24	1,110	970	a700	1,700	770	1,700	1,320	1,320	840	595	430	376
25	1,320	950	a720	*1,460	770	1,550	1,110	1,810	770	560	415	415
26	1,280	892	710	1,420	752	1,500	1,110	2,000	718	475	400	397
27	1,280	875	700	1,460	805	*1,320	990	2,220	612	508	400	379
28	1,280	822	680	1,420	805	1,240	950	2,220	648	475	415	376
29	1,150	805	665	1,280	805	1,150	910	1,930	595	490	400	394
30	950	752	735	1,110	-	1,070	875	1,550	525	415	400	352
31	840	-	770	1,030	-	1,030	-	1,280	-	475	400	-
Total	20,738	27,113	26,399	46,342	27,950	39,360	42,465	32,986	23,339	16,089	13,603	12,435
Mean	669	904	852	1,495	964	1,270	1,416	1,064	778	519	439	414
Cfsm	0.778	1.06	1.00	1.76	1.14	1.50	1.67	1.25	0.916	0.611	0.517	0.488
In.	0.91	1.19	1.16	2.03	1.22	1.72	1.86	1.44	1.02	0.70	0.60	0.54

Calendar year 1951: Max 2,750 Min 352 Mean 851 Cfsm 1.00 In. 13.59
Water year 1951-52: Max 2,470 Min 352 Mean 901 Cfsm 1.06 In. 14.39

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records and records for stations at Comstock and at Marshall.
Note.--Shifting-control method used Oct. 1 to Nov. 18, June 23 to Sept. 30.

Kalamazoo River at Comstock, Mich.

Location.--Lat 42°17'05", long. 85°30'50", in NE¼ sec. 19, T. 2 S., R. 10 W., on left bank at downstream side of bridge on River Street at Comstock, a quarter mile downstream from Comstock Creek.

Drainage area.--1,010 sq mi, approximately.

Records available.--April to August 1931, October 1932 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 759.12 ft above mean sea level, datum of 1929. Prior to October 1936, staff gage at same site and datum. October 1936 to October 1945 wire-weight gage at same site and datum.

Average discharge.--18 years (1934-52), 901 cfs.

Extremes.--Maximum discharge during year, 3,120 cfs Jan. 19 (gage height, 4.47 ft); minimum, 330 cfs Aug. 29 (gage height, 1.06 ft).
1931, 1932-52: Maximum discharge, 6,910 cfs Apr. 8, 1947 (gage height, 7.94 ft); minimum observed, 199 cfs Oct. 14, 1934; minimum gage height observed, 0.56 ft May 4, 1931.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Flow regulated by powerplants above station.

Revisions (water years).--W 824: 1933-36.

Rating table, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used July 4 to Sept. 30)

1.0	410
1.5	720
2.0	1,120
4.3	2,980

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	568	1,080	960	1,200	1,440	1,080	1,280	1,120	1,560	615	520	622
2	720	992	1,000	1,480	1,480	1,080	1,320	1,040	1,400	685	508	699
3	622	904	1,040	1,600	1,440	1,000	1,280	928	1,360	622	514	650
4	643	872	1,160	1,600	1,520	992	1,280	968	1,320	636	636	622
5	615	880	1,400	1,840	1,680	1,200	1,280	904	1,200	699	643	514
6	643	840	1,440	1,880	a1,700	1,320	1,400	896	*1,120	664	532	568
7	744	896	1,480	1,840	*a1,750	1,320	1,400	904	1,080	629	544	568
8	1,160	904	1,560	1,640	a1,750	1,320	1,440	936	944	692	544	601
9	1,120	872	1,400	1,440	a1,700	1,320	1,520	*1,080	968	784	568	484
10	992	880	1,280	1,360	a1,600	1,320	1,760	1,080	856	*692	601	502
11	*904	928	1,280	1,240	a1,500	1,360	1,840	984	840	608	636	490
12	896	1,000	1,160	1,200	a1,400	1,640	1,880	1,040	864	657	a650	430
13	880	1,320	1,120	1,200	a1,400	1,720	2,080	1,020	848	608	*615	455
14	832	1,680	*1,080	1,200	a1,300	1,920	2,240	976	792	574	520	450
15	671	1,880	800	1,400	a1,200	2,000	2,320	1,080	888	580	520	478
16	692	1,840	671	a1,900	a1,200	1,920	2,560	1,200	848	699	532	490
17	760	1,920	526	a2,300	a1,100	1,600	2,800	1,080	728	664	615	466
18	685	2,080	736	a2,600	a1,100	1,560	*2,880	1,040	848	580	671	*455
19	692	1,720	1,080	2,800	1,040	1,560	2,640	1,030	776	1,000	601	496
20	699	1,520	1,080	2,960	1,020	1,760	2,160	1,040	760	1,240	544	520
21	657	*1,240	1,080	2,720	992	1,840	1,840	1,120	650	508	532	556
22	650	1,160	992	2,720	1,020	1,960	1,640	1,160	752	928	484	538
23	744	1,240	872	2,480	1,010	2,080	1,560	1,440	928	960	484	508
24	1,480	1,240	904	2,400	984	2,240	1,600	1,800	1,120	832	544	556
25	1,720	1,280	896	*2,160	1,040	2,080	1,600	2,000	976	776	594	532
26	1,800	1,240	848	1,960	1,020	1,880	1,400	2,240	832	736	490	532
27	1,720	1,160	904	1,800	1,020	*1,760	1,320	2,400	808	556	440	532
28	1,600	1,080	976	1,800	1,040	1,640	1,160	2,560	760	692	460	490
29	1,600	1,020	1,040	1,640	1,040	1,520	1,160	2,480	728	643	440	514
30	1,480	984	936	1,400	-	1,440	1,080	2,240	678	636	430	502
31	1,240	-	1,020	1,400	-	1,320	-	1,840	-	520	455	-
Total	30,229	36,652	32,721	57,160	37,486	48,752	51,720	41,626	28,232	21,715	16,867	15,820
Mean	975	1,222	1,056	1,844	1,293	1,573	1,724	1,343	941	700	544	527
Cfsm	0.965	1.21	1.05	1.83	1.28	1.56	1.71	1.33	0.932	0.693	0.539	0.522
In.	1.11	1.35	1.20	2.10	1.38	1.80	1.90	1.53	1.04	0.80	0.62	0.58

Calendar year 1951: Max 2,860 Min 512 Mean 1,093 Cfsm 1.08 In. 14.69
Water year 1951-52: Max 2,960 Min 430 Mean 1,145 Cfsm 1.13 In. 15.41

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of 1 discharge measurement, weather records, and records for stations near Battle Creek and near Fennville.

Portage Creek at Kalamazoo, Mich.

Location.--Lat 42°16'30", long. 85°34'35", on line between secs. 22 and 27, T. 2 S., R. 11 W., on upstream side of Reed Street Bridge, at Kalamazoo, and 1½ miles upstream from mouth.

Drainage area.--48 sq mi, approximately.

Records available.--December 1947 to September 1952.

Gage.--Wire-weight gage read twice daily. Datum of gage is 761.50 ft above mean sea level, datum of 1929. Prior to Feb. 25, 1948, staff gage at same site and datum.

Extremes.--Maximum discharge observed during year, 195 cfs May 23, 24; maximum gage height observed, 3.67 ft May 24; minimum discharge observed, 18 cfs July 4 (gage height, 2.02 ft).

1947-52: Maximum discharge, 285 cfs Mar. 19, 1948 (gage height, 4.20 ft, from graph based on gage readings); minimum observed, that of July 4, 1952.

Remarks.--Records good except those below 50 cfs and those for periods of no gage-height record, which are fair. Flow regulated by St. Regis Paper Co. dams above station.

Rating tables, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to May 24		May 25 to Sept. 30	
2.3	36	2.0	17
3.0	114	2.5	54
3.7	202	3.0	107
		3.4	157

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	63	62	74	97	80	66	82	70	a75	a67	58	56
2	63	62	59	85	a76	65	79	66	75	a65	a60	65
3	56	58	68	78	72	76	76	60	83	64	a60	60
4	57	52	97	72	89	76	78	60	76	18	a60	62
5	54	60	80	78	95	72	82	72	*72	68	a60	*61
6	98	62	77	63	a87	73	82	68	72	36	a60	55
7	128	67	73	66	*79	68	89	66	40	66	a60	62
8	95	68	67	71	76	65	89	*73	64	81	a60	64
9	79	68	62	71	a72	70	83	76	68	77	a60	59
10	73	63	71	72	68	79	88	72	66	*76	a65	61
11	*68	63	66	76	73	101	a88	67	65	76	a65	60
12	66	a90	66	a70	73	88	89	70	76	a74	65	60
13	62	114	65	a65	73	85	124	71	72	a72	*66	60
14	49	126	*59	77	72	77	114	68	64	71	64	50
15	62	97	66	118	66	74	96	80	64	72	64	56
16	62	*82	66	97	a67	74	90	74	71	71	68	56
17	59	72	66	100	68	79	85	74	76	71	68	58
18	62	59	66	112	68	78	*78	66	72	72	70	57
19	60	72	67	113	70	128	73	74	65	124	68	56
20	57	68	a65	a100	71	97	70	86	62	66	62	52
21	63	65	a65	*84	71	90	71	86	62	66	62	52
22	62	a75	a65	76	70	78	80	88	61	86	60	62
23	131	82	a65	76	a68	78	42	195	84	102	59	67
24	162	73	a60	77	66	85	74	195	90	77	59	62
25	102	74	a60	78	67	77	77	a157	74	77	59	60
26	91	78	a60	a77	72	*78	68	119	72	67	58	60
27	77	73	a60	76	73	76	67	96	68	67	58	57
28	68	76	a60	72	73	73	77	102	62	67	58	49
29	68	74	60	72	a70	71	70	86	62	61	58	62
30	67	74	60	66	-	66	71	a80	68	61	50	48
31	64	-	91	68	-	74	-	a80	-	56	50	-
Total	2,328	2,209	2,086	2,503	2,125	2,437	2,432	2,697	2,081	2,174	1,889	1,749
Mean	75.1	73.6	67.3	80.7	73.3	78.6	81.1	87.0	69.4	70.1	60.9	58.3
Cfsm	1.56	1.53	1.40	1.68	1.53	1.64	1.69	1.81	1.45	1.46	1.27	1.21
In.	1.80	1.71	1.62	1.94	1.65	1.89	1.88	2.09	1.61	1.68	1.46	1.36

Calendar year 1951: Max 272 Min 40 Mean 68.4 Cfsm 1.42 In. 19.35
Water year 1951-52: Max 195 Min 18 Mean 73.0 Cfsm 1.52 In. 20.69

* Discharge measurement made on this day.
a No gage-height record; discharge interpolated or estimated on basis of records for Kalamazoo River at Marshall and Paw Paw River at Riverside.

Kalamazoo River near Fennville, Mich.

Location.--Lat 42°36', long. 85°59', in NE¼ sec. 5, T. 2 N., R. 14 W., on left bank 40 ft upstream from highway bridge, 2 miles downstream from Swan Creek, 3½ miles downstream from Calkins Dam, and 6½ miles east of Fennville.

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

Records available.--April 1929 to September 1936, October 1937 to September 1952. Published as "near Allegan" 1929 to September 1932; as "at Calkins Bridge, near Allegan" October 1932 to September 1936, October 1937 to September 1938; as "at Calkins Dam, near Allegan" October 1938 to September 1950.

Gage.--Water-stage recorder. Datum of gage is 586.51 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation). April 1929 to September 1936 at bridge and October 1937 to September 1950 in powerplant 3½ miles upstream at mean sea level datum (levels by city of Allegan).

Average discharge.--21 years (1930-36, 1937-52), 1,359 cfs.

Extremes.--Maximum discharge during year, 5,000 cfs Jan. 19 (gage height, 12.52 ft); minimum, 450 cfs Oct. 21 (gage height, 5.60 ft); minimum daily, 720 cfs Oct. 21. 1929-36, 1937-52: Maximum discharge, 17,500 cfs Apr. 11, 1947 (gage height, 606.76 ft, site and datum then in use); minimum daily, 73 cfs Aug. 31, 1941; minimum gage height, 593.16 ft Oct. 20, 1948, site and datum then in use.

Remarks.--Records excellent. Flow regulated by powerplants upstream and since June 1936 by Calkins Dam and powerplant 3½ miles upstream. Slight diversion above station due to natural flow into Gerber Swamp in Allegan State Forest game preserve.

Rating tables, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)

6.6	720
8.0	1,170
11.0	2,400
12.0	3,900
12.3	4,500

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	990	2,050	1,850	2,250	2,250	1,770	2,170	1,810	2,500	1,290	1,170	930
2	1,330	1,930	1,730	2,700	2,350	1,730	2,210	1,810	2,210	1,210	900	900
3	1,370	1,850	1,770	3,000	2,920	1,810	2,210	1,750	2,090	1,210	1,090	870
4	1,330	1,730	1,810	2,780	2,650	1,850	2,090	1,570	2,010	1,130	960	930
5	1,250	1,650	1,930	2,600	3,000	*1,850	2,130	1,570	2,010	930	1,170	1,170
6	1,250	1,610	2,170	2,700	2,850	1,850	2,210	1,570	1,930	1,050	1,210	930
7	1,290	1,650	2,450	2,600	*2,700	1,890	2,170	1,490	1,730	900	930	1,090
8	1,450	1,610	2,400	2,650	2,700	1,930	2,350	*1,530	1,650	1,130	900	1,050
9	1,650	1,610	2,400	2,850	2,700	1,930	2,350	1,530	1,650	1,210	1,170	960
10	1,730	1,570	2,210	*2,500	2,500	2,130	2,400	1,570	*1,570	*1,210	1,090	930
11	*1,730	1,530	2,130	2,300	2,300	2,250	2,400	1,530	1,570	1,250	1,130	900
12	1,690	1,610	2,210	2,170	2,210	2,350	2,780	1,610	1,410	990	1,170	870
13	1,650	2,010	*2,170	2,010	2,130	2,350	3,500	1,490	1,370	900	1,020	900
14	1,530	3,300	1,890	2,090	2,210	2,400	4,350	1,610	1,330	900	*900	930
15	1,530	3,080	1,850	2,010	2,130	2,550	3,500	1,690	1,250	1,170	930	870
16	1,490	*2,500	1,810	3,150	1,970	2,650	2,920	1,690	1,410	990	1,250	870
17	1,450	2,920	1,730	3,220	1,770	2,550	*3,300	1,690	1,410	1,170	1,170	870
18	1,410	2,920	1,650	4,000	1,810	2,550	3,700	1,610	1,290	1,250	1,250	*870
19	1,490	2,850	1,570	4,300	1,850	2,700	3,700	1,610	1,250	1,250	1,250	840
20	1,370	2,700	1,530	4,200	1,890	3,220	3,600	1,650	1,330	1,170	1,130	840
21	720	2,500	1,650	4,400	1,850	3,000	3,500	1,610	1,290	1,410	960	1,090
22	990	2,250	1,850	4,400	1,810	3,000	2,400	1,610	1,170	1,530	900	960
23	1,050	2,130	1,850	3,700	1,770	2,920	2,450	1,930	1,170	1,450	870	1,330
24	1,330	2,350	1,810	3,500	1,690	2,700	2,400	2,250	1,370	1,490	990	1,090
25	1,530	2,010	1,810	3,600	1,730	2,920	2,210	2,550	1,530	1,410	930	1,250
26	1,770	2,010	1,850	3,400	1,730	3,080	2,210	2,850	1,530	1,410	960	990
27	2,210	2,010	1,770	3,000	1,770	2,920	2,170	2,600	1,490	1,250	960	1,370
28	2,500	2,010	1,770	3,220	1,730	2,350	2,050	2,780	1,330	1,330	990	1,170
29	2,300	1,970	1,730	2,900	1,770	2,650	1,970	3,080	1,210	1,330	930	1,290
30	2,090	1,890	1,730	2,700	-	2,170	1,890	3,080	1,330	1,210	870	1,050
31	2,170	-	1,810	2,500	-	2,130	-	3,000	-	1,170	840	-
Total	47,640	63,810	58,890	93,400	62,740	74,150	79,290	59,700	46,390	37,300	31,990	30,110
Mean	1,537	2,127	1,900	3,013	2,163	2,392	2,643	1,926	1,546	1,203	1,031	1,004
Cfsm	0.961	1.33	1.19	1.88	1.35	1.50	1.65	1.20	0.966	0.752	0.644	0.628
In.	1.11	1.48	1.37	2.17	1.46	1.72	1.84	1.39	1.08	0.87	0.74	0.70

Calendar year 1951: Max 3,800 Min 585 Mean 1,762 Cfsm 1.10 In. 14.96
Water year 1951-52: Max 4,400 Min 720 Mean 1,873 Cfsm 1.17 In. 15.93

* Discharge measurement made on this day.

Grand River at Jackson, Mich.

Location.--Lat 42°17'05", long. 84°24'30", in sec. 22, T. 2 S., R. 1 W., on left bank at Sewage Treatment Plant, 1 mile north of Jackson, 2¼ miles upstream from Portage River, and at mile 216.

Drainage area.--174 sq mi.

Records available.--April 1935 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 900.00 ft above mean sea level (Fargo Engineering Co. benchmark). Prior to Sept. 24, 1935, staff gage at same site and datum.

Average discharge.--17 years, 128 cfs.

Extremes.--Maximum discharge during year, 626 cfs Apr. 13 (gage height, 11.76 ft); minimum, 29 cfs Sept. 28 (gage height, 8.75 ft).
1935-52: Maximum discharge, 1,070 cfs June 25, 1937 (gage height, 13.50 ft); minimum, 9.2 cfs Aug. 22, 1936.

Remarks.--Records fair. Slight regulation above station.

Revisions (water year).--W 974: 1937(M).

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*46	113	95	286	226	123	248	157	197	70	45	37
2	48	101	89	277	237	116	226	148	182	67	41	69
3	48	74	109	258	258	128	197	137	177	82	34	50
4	50	68	*164	192	306	169	199	130	153	62	52	51
5	47	63	184	182	336	155	220	120	139	63	*45	48
6	47	56	180	182	336	205	226	111	123	62	45	60
7	105	68	184	178	316	205	239	103	106	68	45	42
8	70	75	182	203	326	239	296	121	94	68	45	47
9	72	126	177	201	306	239	306	120	*94	65	75	47
10	75	137	177	239	306	248	306	125	89	63	45	48
11	75	135	169	220	*296	306	306	116	83	63	51	51
12	74	162	171	210	286	296	326	123	82	56	52	50
13	70	203	151	195	277	296	397	123	79	51	52	47
14	63	*239	130	212	239	306	*489	125	74	57	51	41
15	68	277	116	296	237	306	465	150	70	56	51	48
16	70	277	84	268	230	296	465	*192	75	74	65	47
17	66	268	100	277	210	*296	465	188	79	60	45	46
18	63	258	90	268	207	296	442	182	72	80	54	66
19	67	258	84	286	186	326	408	188	72	66	53	46
20	56	248	80	430	132	356	376	195	74	60	51	41
21	48	224	82	430	130	356	346	207	77	*65	51	35
22	79	142	66	*454	126	356	336	201	94	66	47	*44
23	296	142	76	408	123	356	268	248	95	67	42	45
24	346	126	74	419	114	356	235	326	92	61	37	43
25	326	113	71	442	123	346	218	376	88	59	45	46
26	306	118	75	408	123	346	203	386	84	54	45	43
27	286	113	76	366	123	326	190	386	83	47	45	38
28	277	109	77	346	125	286	184	386	75	54	45	32
29	268	101	76	306	128	268	177	366	68	52	46	43
30	150	100	84	224	-	258	166	336	72	51	51	44
31	123	-	113	216	-	248	-	230	-	45	39	-
Total	3,785	4,494	3,586	8,879	6,368	8,409	8,925	6,302	2,942	1,914	1,490	1,395
Mean	122	150	116	286	220	271	298	203	98.1	61.7	48.1	46.5
Cfsm	0.701	0.862	0.667	1.64	1.26	1.56	1.71	1.17	0.564	0.355	0.276	0.267
In.	0.81	0.96	0.77	1.90	1.36	1.80	1.91	1.35	0.63	0.41	0.32	0.30

Calendar year 1951: Max 477 Min 44 Mean 173 Cfsm 0.994 In. 13.46
Water year 1951-52: Max 489 Min 32 Mean 160 Cfsm 0.920 In. 12.52

* Discharge measurement made on this day.

Portage River below Little Portage Lake, near Munith, Mich.

Location.--Lat 42°20'55", long. 84°13'45", in NW¼ sec. 32, T. 1 S., R. 2 E., on upstream handrail of highway bridge on Portage Lake Road, 0.3 mile below Little Portage Lake and 3¼ miles southeast of Munith.

Drainage area.--55 sq mi, approximately.

Records available.--April 1944 to September 1952.

Gage.--Wire-weight gage read once daily. Datum of gage is 900.00 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation). Prior to Nov. 9, 1945, staff gage at same site and datum.

Average discharge.--8 years, 45.3 cfs.

Extremes.--Maximum discharge observed during year, 227 cfs Apr. 16 (gage height, 11.06 ft); minimum, 3.6 cfs Aug. 3; minimum gage height, 7.80 ft Aug. 30.
1944-52: Maximum discharge, 800 cfs Apr. 6, 7, 1947 (gage height, 13.0 ft from graph based on gage readings); no flow at times in 1946 and 1949; minimum gage height, that of Aug. 30, 1952.

Remarks.--Records fair.

Rating table, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Jan. 16-29, June 7-27, Aug. 4-8; stage-discharge relation affected by ice Dec. 22, 25)

7.7	2.9	9.0	50
8.0	7.7	10.0	119
8.5	24	11.1	233

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*9.8	52	38	42	57	36	83	50	82	12	5.0	5.3
2	12	45	38	61	66	36	81	45	64	11	4.6	6.8
3	12	40	*39	71	70	36	75	40	60	11	3.6	6.1
4	11	34	44	72	83	40	72	36	56	11	*4.1	8.2
5	11	30	62	69	103	43	77	34	51	11	4.1	8.4
6	11	28	70	64	103	48	84	30	45	10	4.0	7.7
7	14	28	71	61	97	44	94	29	40	9.5	4.0	7.9
8	28	30	73	60	99	46	107	30	36	9.1	4.0	6.8
9	32	30	71	57	84	46	124	34	34	8.2	5.4	6.8
10	36	32	66	55	75	46	132	37	30	7.9	7.3	6.6
11	34	42	61	54	75	64	132	38	*26	7.9	7.7	6.3
12	30	46	55	48	*67	97	132	36	22	7.9	7.9	6.1
13	26	*55	47	49	64	128	142	36	20	7.7	7.9	5.6
14	22	87	42	48	58	132	176	34	18	7.3	7.5	5.4
15	20	103	36	63	52	137	*215	36	16	7.3	7.2	5.2
16	18	107	31	90	50	111	227	*40	14	6.3	6.8	4.8
17	15	111	30	111	48	*103	215	40	13	7.9	7.7	4.6
18	14	89	26	132	42	101	198	40	11	8.6	7.5	4.6
19	14	89	23	146	42	101	171	39	9.8	12	7.2	5.2
20	12	70	24	166	40	115	151	37	8.4	15	7.0	5.4
21	12	60	24	*166	39	124	128	40	8.2	*16	6.8	5.3
22	12	54	26	161	39	137	120	42	7.9	15	6.4	*5.3
23	16	57	27	146	36	146	110	50	9.8	14	5.9	5.6
24	54	58	26	128	36	146	105	68	12	14	5.6	5.6
25	89	51	27	102	36	146	97	111	11	12	5.4	5.9
26	101	40	27	98	34	137	90	137	13	10	5.3	5.4
27	101	43	26	98	34	124	80	151	11	8.6	5.2	5.3
28	92	40	26	99	35	115	70	146	13	7.5	4.7	4.8
29	79	38	27	102	36	102	62	137	14	6.6	4.7	5.0
30	69	37	28	77	-	94	55	93	13	5.8	4.4	5.2
31	63	-	31	64	-	86	-	97	-	5.4	4.6	-
Total	1,069.8	1,626	1,242	2,760	1,700	2,867	3,605	1,813	769.1	303.5	179.5	177.2
Mean	34.5	54.2	40.1	89.0	58.6	92.5	120	58.5	25.6	9.79	5.79	5.91
Cfsm	0.627	0.985	0.729	1.62	1.07	1.68	2.18	1.06	0.465	0.178	0.105	0.107
In.	0.72	1.10	0.84	1.87	1.15	1.94	2.44	1.23	0.52	0.21	0.12	0.12

Calendar year 1951: Max 260 Min 7.8 Mean 54.0 Cfsm 0.982 In. 13.33
Water year 1951-52: Max 227 Min 3.6 Mean 49.5 Cfsm 0.900 In. 12.26

* Discharge measurement made on this day.

Orchard Creek at Munith, Mich.

Location.--Lat 42°23'35", long. 84°15'50", on line between secs. 12 and 13, T. 1 S., R. 1 E., on left upstream wingwall of highway bridge, half a mile west of Munith and 3 miles upstream from mouth.

Drainage area.--49 sq mi, approximately.

Records available.--March 1944 to September 1952.

Gage.--Staff gage read twice daily. Datum of gage is 900.00 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation).

Average discharge.--8 years, 40.6 cfs.

Extremes.--Maximum discharge observed during year, 440 cfs Apr. 14 (gage height, 12.00 ft); minimum, 4.2 cfs Sept. 29, 30.
1944-52: Maximum discharge, 1,470 cfs Apr. 5, 1947 (gage height, 14.88 ft, from graph based on gage readings); minimum observed, 1.6 cfs Sept. 5-7, 22, 23, 1946.

Remarks.--Records fair except for those for periods of ice effect, which are poor.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 14				Apr. 15 to Sept. 30			
7.6	5.0	10.0	155	7.6	3.0	9.0	78
7.9	16	11.0	265	7.7	6.0	10.0	155
8.5	48	12.0	440	8.0	18	11.2	295
9.0	82			8.5	45		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*5.0	16	30	100	50	29	54	30	105	8.4	6.8	6.0
2	7.7	15	30	142	56	29	54	28	99	8.4	5.7	6.8
3	6.8	14	*47	120	75	30	53	27	96	8.4	5.1	8.0
4	6.2	13	106	110	120	61	53	26	98	8.4	*5.1	8.0
5	6.2	12	114	90	106	47	55	26	85	8.4	5.1	7.2
6	6.2	12	106	78	96	41	66	25	67	8.4	5.1	7.2
7	8.4	15	89	66	85	37	75	25	48	8.4	5.1	6.4
8	12	18	64	58	77	32	103	32	35	8.4	5.1	6.4
9	10	19	55	52	60	30	110	30	28	8.4	5.1	6.4
10	10	20	47	47	55	100	117	32	24	8.4	5.1	6.4
11	10	25	41	45	54	165	106	30	*18	8.4	5.4	6.4
12	9.6	38	36	43	*54	114	124	27	16	7.6	6.4	5.4
13	9.6	*89	30	50	53	89	230	26	14	7.6	6.0	5.4
14	9.6	114	23	96	53	70	410	26	13	7.6	5.7	5.4
15	9.6	77	21	242	54	63	*288	30	11	7.2	5.4	5.4
16	9.6	58	22	200	49	56	170	*28	10	7.2	6.8	5.4
17	8.8	48	23	175	41	*51	135	26	14	7.2	8.0	4.8
18	8.8	42	23	170	37	58	107	23	12	9.2	6.8	4.8
19	8.8	38	22	180	33	120	88	22	11	10	6.8	4.8
20	9.6	32	22	230	30	106	70	22	10	9.6	6.4	4.8
21	9.6	28	22	*160	28	100	62	25	9.6	*8.8	6.0	4.8
22	8.8	28	22	128	26	100	55	24	9.2	9.2	6.0	*4.8
23	31	30	22	110	26	96	67	51	9.2	10	6.0	4.8
24	67	34	22	86	26	92	59	123	8.4	10	5.4	4.8
25	47	35	22	72	27	84	53	170	8.4	9.2	5.4	4.8
26	49	30	22	92	28	77	47	139	8.4	8.8	4.8	5.4
27	30	26	22	106	30	70	43	135	9.2	8.0	4.8	5.4
28	25	22	22	86	28	64	38	139	9.2	8.0	4.8	4.8
29	20	25	23	78	29	58	36	131	9.2	7.6	4.8	4.5
30	19	28	25	65	-	55	33	119	9.2	7.6	4.8	4.2
31	18	-	50	58	-	54	-	111	-	6.8	5.1	-
Total	496.9	1,001	1,225	3,335	1,486	2,178	2,961	1,708	904.0	259.6	174.9	169.7
Mean	16.0	33.4	39.5	108	51.2	70.3	98.7	55.1	30.1	8.37	5.64	5.66
Cfsm	0.327	0.682	0.806	2.20	1.04	1.43	2.01	1.12	0.614	0.171	0.115	0.116
In.	0.38	0.76	0.93	2.53	1.13	1.65	2.25	1.30	0.69	0.20	0.13	0.13

Calendar year 1951: Max 305 Min 4.8 Mean 41.4 Cfsm 0.845 In. 11.47
Water year 1951-52: Max 410 Min 4.2 Mean 43.4 Cfsm 0.886 In. 12.08

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 13-31, Jan. 5-13, 30, Feb. 17-22.

Grand River near Eaton Rapids, Mich.

Location.--Lat 42°32'05", long. 84°37'25", in NE¼ sec. 26, T. 2 N., R. 3 W., on right bank 400 ft above Petrieville Highway bridge, 2 miles northeast of Eaton Rapids, 2½ miles downstream from Spring Brook, 25 miles upstream from Cedar River, and at mile 178.

Drainage area.--661 sq mi.

Records available.--October 1950 to September 1952. Gage-height records for flood seasons collected in this vicinity 1905-28 are contained in reports of United States Weather Bureau.

Gage.--Water-stage recorder. Altitude of gage is 855 ft (from river-profile map).

Extremes.--Maximum discharge during year, 2,910 cfs Apr. 15 (gage height, 6.96 ft), minimum, 26 cfs Aug. 19 (gage height, 1.12 ft); minimum daily, 104 cfs July 14.
1950-52: Maximum discharge, that of Apr. 15, 1952; minimum, 18 cfs Sept. 12, 1951 (gage height, 1.02 ft); minimum daily, that of July 14, 1952.

Remarks.--Records excellent except those for periods of ice effect or no gage-height record, which are fair. Diurnal fluctuation caused by powerplant in Eaton Rapids and dam at Smithville.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.5	100	3.0	570
2.0	200	5.0	1,590
2.5	365	6.8	2,750

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	160	683	501	989	1,010	472	872	687	954	191	144	156
2	206	583	502	1,260	964	470	850	645	822	192	132	*194
3	152	515	513	1,410	964	448	828	588	766	185	140	225
4	166	448	610	1,830	1,060	698	808	554	690	222	*128	218
5	171	358	746	1,830	1,140	764	812	536	637	257	141	194
6	174	342	882	1,590	1,260	720	842	475	586	216	132	160
7	230	258	997	1,360	1,230	696	904	422	548	180	134	190
8	350	392	966	1,150	1,140	672	1,050	451	428	154	136	178
9	357	*438	892	1,050	1,090	648	1,230	491	*408	179	148	165
10	295	436	*829	980	1,060	736	1,360	506	360	168	157	167
11	291	494	777	930	978	1,020	*1,420	492	378	153	206	138
12	276	576	714	890	918	1,150	1,380	*492	328	160	142	143
13	263	756	644	850	896	1,320	1,710	460	316	153	167	150
14	245	954	500	830	896	1,280	2,510	448	327	104	141	138
15	252	1,120	370	1,320	872	1,180	2,750	475	310	144	172	122
16	232	1,200	370	1,590	768	1,090	2,750	484	248	153	190	126
17	224	1,150	430	1,950	710	1,030	2,370	510	259	156	197	111
18	220	1,060	440	2,070	619	980	2,070	493	264	168	162	166
19	*242	955	440	1,890	581	1,130	1,830	527	260	268	150	168
20	209	830	460	2,010	548	1,240	1,650	514	214	264	143	167
21	208	836	470	1,950	522	1,340	1,370	512	238	232	146	152
22	194	746	460	1,830	490	1,380	1,270	546	246	215	132	134
23	262	760	460	a1,650	468	1,380	1,180	685	257	226	137	146
24	698	714	460	a1,500	452	*1,380	1,150	906	309	200	124	134
25	812	678	450	a1,300	464	1,310	1,140	1,330	268	202	118	144
26	996	646	440	a1,450	*445	1,250	1,020	1,770	259	186	112	144
27	1,060	586	440	a1,600	470	1,190	936	1,770	262	178	118	128
28	1,050	550	440	*a1,500	463	1,120	866	1,530	212	163	106	142
29	938	527	440	1,170	474	1,050	782	1,320	222	152	109	112
30	850	506	460	900	-	952	741	1,190	230	155	106	120
31	768	-	500	950	-	922	-	1,070	-	146	133	-
Total	12,551	20,097	17,603	43,579	22,952	31,018	40,451	22,879	11,606	5,722	4,403	4,632
Mean	405	670	568	1,406	791	1,001	1,348	738	387	185	142	154
Cfsm	0.613	1.01	0.859	2.13	1.20	1.51	2.04	1.12	0.585	0.280	0.215	0.233
In.	0.71	1.13	0.99	2.45	1.29	1.75	2.28	1.29	0.65	0.32	0.25	0.26

Calendar year 1951: Max 2,250 Min 131 Mean 636 Cfsm 0.962 In. 13.06
Water year 1951-52: Max 2,750 Min 104 Mean 649 Cfsm 0.982 In. 13.37

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of 1 discharge measurement, weather records, and record for station at Lansing.
Note.--Stage-discharge relation affected by ice Dec. 14-31, Jan. 8-14, 30, 31.

Cedar River at East Lansing, Mich.

Location.--Lat 42°43'40", long. 84°28'40", in SW¼ sec. 18, T. 4 N., R. 1 W., in left downstream bridge abutment of Farm Lane Bridge on Michigan State College campus in East Lansing, 3 miles upstream from Sycamore Creek and 4 miles upstream from mouth.

Drainage area.--355 sq mi, approximately.

Records available.--August 1902 to December 1903, March 1931 to September 1952. August 1902 to December 1903 published as Red Cedar River at Agricultural College, Mich. Gage-height records collected in this vicinity 1911-19, and for flood seasons only 1920-28, are contained in reports of United States Weather Bureau.

Gage.--Water-stage recorder and concrete control. Datum of gage is 824.39 ft above mean sea level, datum of 1929. August 1902 to December 1903 chain gage at location three-quarters of a mile downstream at different datum. March 1931 to November 1940 water-stage recorder at site 250 ft upstream at datum 0.57 ft higher.

Average discharge.--21 years (1931-52), 205 cfs.

Extremes.--Maximum discharge during year, 2,740 cfs Apr. 14 or 15 (gage height, 7.87 ft, from floodmark); minimum, 24 cfs Oct. 6; minimum gage height, 3.18 ft Sept. 26-28, 30. 1902-3, 1931-52: Maximum discharge, 5,920 cfs Apr. 7, 1947 (gage height, 11.58 ft); minimum, 3 cfs July 31, 1931.

Remarks.--Records good.

Rating table, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second) (Shifting-control method used Oct. 1-19)

3.1	21	4.5	476
3.3	61	6.0	1,290
3.8	201	7.7	2,580

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	36	93	175	423	340	175	348	188	235	54	34	43
2	36	85	182	797	398	169	352	172	204	50	34	61
3	30	80	185	1,020	393	157	336	163	198	50	34	61
4	28	78	271	906	573	472	321	151	215	59	39	41
5	28	71	592	692	851	718	344	145	198	59	43	36
6	28	63	611	550	797	536	423	136	169	57	43	36
7	52	61	508	458	611	398	476	*125	148	52	36	36
8	71	85	406	393	517	313	626	142	131	52	34	34
9	68	119	328	348	398	305	1,020	157	122	52	38	34
10	83	136	282	325	356	352	1,320	151	111	52	54	36
11	75	139	253	275	385	1,110	1,350	142	101	50	52	36
12	71	157	225	264	377	1,480	1,110	133	95	48	50	36
13	71	423	154	260	344	1,140	1,380	128	93	41	48	36
14	68	661	133	260	267	824	2,320	119	88	36	36	38
15	61	651	136	692	201	656	2,580	133	85	36	32	36
16	61	494	139	1,420	235	527	1,920	139	80	38	43	36
17	61	377	148	1,480	208	423	1,350	133	75	38	52	34
18	61	305	145	*1,350	185	368	990	125	73	46	48	32
19	61	246	139	1,140	172	517	744	119	68	59	39	34
20	61	198	139	990	166	797	582	119	66	59	38	36
21	68	175	139	1,020	166	824	472	139	68	63	38	34
22	75	166	142	851	179	797	389	142	68	63	38	32
23	80	208	142	656	154	824	373	264	68	61	38	48
24	211	246	142	481	166	797	364	467	68	57	38	38
25	305	225	139	340	157	641	332	851	66	52	38	30
26	246	195	136	463	160	545	290	*934	61	52	34	28
27	195	175	139	626	172	476	260	744	*59	48	34	28
28	163	160	139	592	*182	428	235	592	57	39	32	30
29	136	154	*148	352	182	393	218	499	46	*39	*32	30
30	*114	*163	157	257	-	360	*201	398	41	38	32	*28
31	103	-	179	298	-	*344	-	294	-	38	38	-
Total	2,807	6,389	6,753	19,979	9,292	17,866	23,026	8,144	3,157	1,538	1,219	1,098
Mean	90.5	213	218	644	320	576	768	263	105	49.6	39.3	36.6
Cfsm	0.255	0.600	0.614	1.81	0.901	1.62	2.16	0.741	0.296	0.140	0.111	0.103
In.	0.29	0.67	0.71	2.09	0.97	1.87	2.41	0.85	0.33	0.16	0.13	0.12

Calendar year 1951: Max 2,080 Min 24 Mean 272 Cfsm 0.766 In. 10.43
Water year 1951-52: Max 2,580 Min 28 Mean 277 Cfsm 0.780 In. 10.60

Peak discharge (base, 1,100 cfs).--Jan. 16 (11 p.m.) 1,590 cfs (6.45 ft); Mar. 12 (8 a.m.) 1,550 cfs (6.39 ft); Apr. 11 (2 a.m.) 1,420 cfs (6.19 ft); Apr. 14 or 15 (time unknown) 2,740 cfs (7.87 ft).

* Discharge measurement made on this day.

Grand River at Lansing, Mich.

Location.--Lat 42°45'05", long. 84°33'20", in NW¼ sec. 9, T. 4 N., R. 2 W., on right bank 30 ft upstream from North Grand River Avenue bridge in Lansing, 2 miles downstream from Cedar River, and at mile 152.

Drainage area.--1,230 sq mi, approximately.

Records available.--March 1901 to August 1906, November 1934 to September 1952. Published as "at North Lansing" 1901-6. Gage-height records collected in this vicinity 1907-10 (flood seasons only), 1911-19, 1920-28 (flood seasons only), and since 1931 are contained in reports of United States Weather Bureau.

Gage.--Water-stage recorder. Datum of gage is 805.53 ft above mean sea level (levels by Michigan Department of Conservation). Prior to August 1906, staff gage at same site at different datum. November 1934 to June 1949, at site 1¾ miles downstream at datum 2.42 ft lower.

Average discharge.--15 years (1935-37, 1938-39, 1940-52), 881 cfs.

Extremes.--Maximum discharge during year, 6,200 cfs Apr. 15 (gage height, 11.02 ft); minimum, 4.0 cfs Aug. 28 (gage height, 0.90 ft); minimum daily, 153 cfs Sept. 30.
1934-52: Maximum discharge, 16,400 cfs Apr. 7, 1947 (gage height, 15.59 ft, from floodmark, site and datum then in use); minimum, that of Aug. 28, 1952; minimum daily, 20 cfs Aug. 25, 1941.

Remarks.--Records good. Large diurnal fluctuation at medium and low flows caused by powerplants above station.

Revisions (water years).--W 1174: 1949.

Rating table, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 24 to Dec. 5)

1.8	150
3.0	640
5.0	1,660
9.0	4,450
10.9	6,110

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	238	867	684	1,470	1,840	827	*1,540	1,080	1,430	314	221	262
2	298	780	792	2,140	1,840	800	1,480	926	1,320	251	194	511
3	234	669	768	2,510	1,720	795	1,540	949	1,240	330	207	382
4	208	594	962	2,580	2,080	1,660	1,510	834	1,110	324	278	376
5	176	463	1,540	2,510	2,510	1,960	1,660	801	1,060	340	242	285
6	236	381	1,780	2,200	2,580	1,840	1,480	764	965	338	212	277
7	454	350	2,020	1,900	2,380	1,510	1,360	672	846	278	207	254
8	461	347	1,720	1,660	2,080	1,280	2,140	773	766	259	215	295
9	488	536	1,510	1,540	1,720	1,250	2,790	774	642	265	258	264
10	456	562	1,300	1,480	1,720	1,450	3,350	818	612	271	295	233
11	408	652	1,280	1,330	1,780	2,720	3,350	738	509	257	282	266
12	392	777	1,430	1,300	1,660	3,490	3,210	748	542	268	324	188
13	347	1,360	954	1,250	1,600	3,140	3,890	751	476	210	271	233
14	372	1,900	778	1,250	1,310	2,720	5,390	693	485	218	243	242
15	292	2,020	533	2,260	1,140	2,380	*6,110	759	462	191	256	179
16	308	2,020	544	3,420	1,210	2,080	5,480	752	425	227	350	231
17	320	1,840	640	4,130	1,070	1,900	4,530	763	401	227	318	161
18	271	1,600	662	4,290	1,010	1,720	3,730	726	360	371	291	248
19	316	1,330	640	3,810	934	2,080	3,140	743	359	347	256	250
20	267	1,210	708	3,570	894	2,580	2,720	798	370	409	260	248
21	285	1,040	730	3,350	859	2,720	2,380	834	337	394	260	226
22	230	1,040	687	3,210	825	2,720	2,140	838	361	394	234	239
23	428	1,090	710	2,790	761	2,860	2,020	1,390	350	334	244	229
24	1,000	1,100	690	2,380	780	2,790	1,900	1,840	430	320	213	221
25	1,280	1,000	665	2,080	773	2,440	1,840	2,440	426	326	213	223
26	1,380	949	644	2,260	775	2,260	1,660	*3,070	347	316	206	212
27	1,440	824	635	2,580	764	2,140	1,450	3,000	*346	254	173	220
28	1,310	757	647	2,440	*894	1,960	1,360	2,790	321	305	195	205
29	1,110	752	*678	1,840	842	1,840	1,320	2,380	266	*276	*195	220
30	*1,050	*746	710	1,420	-	1,660	1,080	2,020	336	221	190	*153
31	933	-	760	*1,540	-	1,540	-	1,780	-	227	304	-
Total	16,988	29,556	28,801	72,490	40,351	63,112	77,550	38,244	17,900	9,062	7,607	7,533
Mean	548	985	929	2,338	1,391	2,036	2,585	1,234	597	292	245	251
Cfsm	0.446	0.801	0.755	1.90	1.13	1.66	2.10	1.00	0.485	0.237	0.199	2.04
In.	0.51	0.89	0.87	2.19	1.22	1.91	2.34	1.16	0.54	0.27	0.23	0.23

Calendar year 1951: Max 4,570 Min 156 Mean 1,034 Cfsm 0.841 In. 11.40
Water year 1951-52: Max 6,110 Min 153 Mean 1,118 Cfsm 0.909 In. 12.36

Peak discharge (base, 2,800 cfs).--Jan. 3 (7:30 p.m.) 2,860 cfs (6.92 ft); Jan. 17 (11 p.m.) 4,530 cfs (9.10 ft); Mar. 12 (9:30 a.m.) 3,650 cfs (8.03 ft); Mar. 23 (11 a.m. to 2 p.m.) 2,930 cfs (6.97 ft); Apr. 15 (6 a.m.) 6,200 cfs (11.02 ft); May 26 (4 p.m.) 3,140 cfs (7.26 ft).
* Discharge measurement made on this day.

Lookingglass River near Eagle, Mich.

Location.--Lat 42°49'45", long. 84°46'40", in sec. 10, T. 5 N., R. 4 W., on upstream truss member of highway bridge, 1½ miles northeast of Eagle and 10 miles upstream from mouth.

Drainage area.--281 sq mi.

Records available.--August 1944 to September 1952.

Gage.--Wire-weight gage read twice daily. Altitude of gage is 747 ft (from river-profile map).

Average discharge.--8 years, 216 cfs.

Extremes.--Maximum discharge during year, 1,180 cfs Apr. 14 (gage height, 5.11 ft); minimum, 28 cfs Aug. 30 (gage height, 1.24 ft).
1944-52: Maximum discharge, 2,860 cfs Apr. 5, 1947 (gage height, 7.70 ft, from graph based on gage readings), from rating curve extended above 1,900 cfs by logarithmic plotting; minimum daily, 15 cfs Jan. 2, 1947 (occurred during period of ice effect); minimum gage height observed, 1.12 ft Aug. 13, 1944.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 2-24)

1.1	19	3.0	360
1.5	66	4.0	690
2.0	134	5.1	1,180
2.5	230		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	47	103	139	200	330	196	435	218	273	47	34	36
2	59	94	143	300	375	a190	405	186	238	43	31	48
3	52	80	150	450	405	a190	360	163	226	47	30	52
4	49	73	194	490	435	a210	345	150	190	47	48	50
5	53	64	200	460	510	230	339	143	170	44	41	50
6	59	63	218	400	480	a240	333	134	147	43	41	48
7	76	63	232	360	450	a260	333	124	131	*42	41	44
8	*79	66	a260	310	435	264	405	*136	114	40	37	41
9	67	72	a270	290	435	a260	420	131	103	37	41	38
10	67	80	*250	270	420	339	435	138	86	36	43	36
11	56	98	a210	250	a430	870	435	138	85	36	42	36
12	55	128	192	240	a370	a810	555	131	83	35	41	34
13	53	366	160	240	330	730	1,080	128	*78	35	41	34
14	50	420	140	540	a290	a680	1,180	121	76	32	40	32
15	48	342	120	980	a250	650	1,160	141	71	35	*37	*32
16	46	324	100	890	216	a600	1,080	131	68	32	128	31
17	46	324	110	870	214	650	1,060	134	66	35	101	30
18	44	327	120	*630	212	690	1,060	126	62	44	56	32
19	48	300	120	630	a190	890	1,060	121	58	59	52	32
20	47	280	130	630	170	790	1,080	118	55	53	49	34
21	44	250	130	550	a160	750	1,080	134	61	53	44	35
22	44	230	130	a480	a150	690	930	129	60	48	40	36
23	59	210	130	420	145	650	790	254	60	43	40	38
24	141	202	130	a390	a140	610	*690	351	58	41	35	37
25	152	188	130	a380	*136	590	570	465	58	38	32	36
26	165	*180	120	400	a160	590	495	420	54	36	32	36
27	182	165	120	440	182	570	435	387	50	35	30	34
28	200	150	120	430	a190	*525	357	390	49	36	29	31
29	200	140	130	360	a190	510	291	378	48	36	29	30
30	147	138	140	a300	-	480	248	354	47	36	28	31
31	120	-	150	310	-	450	-	321	-	34	40	-
Total	2,555	5,520	4,888	13,890	8,400	16,154	19,446	6,395	2,925	1,258	1,353	1,114
Mean	82.4	184	158	448	290	521	648	206	97.5	40.6	43.6	37.1
Cfsm	0.293	0.655	0.562	1.59	1.03	1.85	2.31	0.733	0.347	0.144	0.155	0.132
In.	0.34	0.73	0.65	1.84	1.11	2.14	2.57	0.85	0.39	0.17	0.18	0.15

Calendar year 1951: Max 1,500 Min 35 Mean 224 Cfsm 0.797 In. 10.85
Water year 1951-52: Max 1,180 Min 28 Mean 229 Cfsm 0.815 In. 11.12

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records and records for stations on nearby streams.
Note.--Stage-discharge relation affected by ice Nov. 2-10, 19-23, 27-29, Dec. 13 to Jan. 13, Jan. 21 to Feb. 1.

Maple River at Maple Rapids, Mich.

Location.--Lat 43°06'35", long. 84°41'35", in sec. 5, T. 8 N., R. 3 W., on upstream side of highway bridge at Maple Rapids, 300 ft downstream from Pine Creek, and three-quarters of a mile upstream from Hayworth Creek.

Drainage area.--434 sq mi.

Records available.--August 1944 to September 1952.

Gage.--Wire-weight gage read twice daily. Altitude of gage is 643 ft (from topographic map).

Average discharge.--8 years, 291 cfs.

Extremes.--Maximum daily discharge during year, 2,000 cfs Jan. 20; minimum, 28 cfs Sept. 14 (gage height, 2.25 ft).
1944-52: Maximum daily discharge, 6,500 cfs Mar. 20, 1948; maximum gage height, 11.22 ft Mar. 20, 1948, from floodmark (backwater from ice); minimum discharge observed, 8.2 cfs Aug. 11, 1944 (gage height, 1.61 ft).
Flood of March 1904 reached a stage of 13.8 ft, from information by local resident.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Nov. 13)

Oct. 1 to Jan. 18

3.3	74
4.0	115
5.0	205

Note.--Same as following table above 5.0 ft.

Jan. 19 to Sept. 30

2.2	27	7.0	540
3.0	62	8.0	940
4.0	117	8.5	1,260
5.0	205	9.2	2,040
6.0	340		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	74	400	362	190	a580	b170	585	280	235	38	31	32
2	85	370	355	a240	600	a170	555	259	223	37	29	35
3	109	340	355	a290	a700	175	540	241	211	36	39	38
4	112	318	390	a350	840	a190	525	229	200	35	52	40
5	112	295	450	440	a900	247	500	211	190	34	66	40
6	112	265	480	a720	a950	259	480	195	180	34	63	38
7	123	247	510	710	a960	310	510	180	170	32	56	36
8	*200	235	540	a680	a930	332	670	*170	160	32	50	34
9	247	217	555	a600	840	340	840	160	147	32	46	33
10	265	211	*525	a530	a760	362	1,000	147	135	32	48	32
11	272	211	490	a470	a650	540	1,120	139	128	31	*62	*31
12	272	217	470	440	570	890	1,160	135	117	31	59	30
13	259	348	430	a430	a500	1,340	1,260	128	*107	30	52	29
14	247	750	390	420	a460	1,580	1,630	124	95	29	47	28
15	229	1,160	355	a500	a430	1,480	1,760	120	87	32	42	60
16	211	1,430	340	a840	390	1,300	1,700	120	80	32	67	56
17	200	1,430	302	1,260	a370	1,120	1,520	117	74	33	104	48
18	185	1,260	280	*1,580	340	970	1,260	114	67	37	101	44
19	175	1,090	259	1,820	a310	1,030	1,060	107	63	53	95	41
20	170	970	253	a2,000	a290	1,120	890	104	58	56	84	40
21	160	790	241	1,580	a270	1,160	*750	104	56	*55	77	38
22	147	690	229	a1,400	a250	1,160	630	107	54	51	70	36
23	151	630	217	a1,300	229	1,090	570	114	53	46	60	35
24	241	585	195	a1,100	a220	1,060	500	135	52	42	52	36
25	355	540	185	a900	211	970	460	155	51	38	45	36
26	450	480	180	750	a200	915	420	185	48	36	41	35
27	490	*460	180	a690	a190	815	390	211	45	33	38	34
28	500	420	175	630	*b175	*770	362	241	42	36	36	32
29	490	400	170	a610	a170	690	332	259	40	37	34	31
30	460	370	165	a600	-	670	310	253	39	35	32	30
31	430	-	165	a590	-	615	-	247	-	33	31	-
Total	7,533	17,129	10,193	24,660	14,285	23,840	24,289	5,291	3,207	1,148	1,709	1,108
Mean	243	571	329	795	493	769	810	171	107	37.0	55.1	36.9
Cfsm	0.560	1.32	0.758	1.83	1.14	1.77	1.87	0.394	0.247	0.085	0.127	0.085
In.	0.65	1.47	0.87	2.11	1.22	2.04	2.08	0.45	0.27	0.10	0.15	0.09

Calendar year 1951: Max 2,280 Min 27 Mean 360 Cfsm 0.829 In. 11.27
Water year 1951-52: Max 2,000 Min 28 Mean 367 Cfsm 0.846 In. 11.50

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records and records for stations on nearby streams.
b Stage-discharge relation affected by ice.

Grand River at Ionia, Mich.

Location.--Lat 42°58'20", long. 85°04'10", in NW¼ sec. 30, T. 7 N., R. 6 W., on left bank 15 ft downstream from bridge on State Highway 66 at Ionia and 2.7 miles downstream from Prairie Creek.
Drainage area.--2,840 sq mi, approximately.
Records available.--March to September 1931 (fragmentary), July 1951 to September 1952. Gage-height records for flood seasons collected in this vicinity 1907-28 are contained in reports of United States Weather Bureau.
Gage.--Water-stage recorder. Datum of gage is 615.38 ft above mean sea level, datum of 1929. Mar. 19 to Sept. 24, 1931, chain gage at site 1½ miles upstream at different datum. Dec. 23, 1948, to July 20, 1951, wire-weight gage at same site and datum.
Extremes.--1951: Maximum discharge during period July to September, 2,010 cfs July 29 (gage height, 10.18 ft); minimum, 217 cfs Aug. 14 (gage height, 6.76 ft).
1951-52: Maximum discharge during year, 14,000 cfs Apr. 15 (gage height, 19.78 ft); minimum, 203 cfs Sept. 29 (gage height, 6.71 ft).
1931, 1951-52: Maximum discharge, that of Apr. 15, 1952; minimum, 123 cfs Sept. 24, 1931.
Remarks.--Records excellent except those for periods of ice effect or no gage-height record, which are fair. Diurnal fluctuation below about 5,000 cfs caused by powerplants above station.

Discharge measurements made prior to beginning of continuous discharge record

Date	Discharge (cfs)	Date	Discharge (cfs)	Date	Discharge (cfs)
Jan. 24, 1949	2,950	Sept. 12, 1949	501	June 16, 1950	1,180
Feb. 23	5,530	Oct. 3	212	July 12	629
25	5,550	31	215	Aug. 14	812
Mar. 23	1,120	Dec. 5	813	Oct. 3	895
Apr. 1	5,990	Jan. 25, 1950	4,080	27	828
2	6,190	Feb. 9	2,660	Nov. 9	738
4	6,160	Mar. 13	7,780	Dec. 15	2,760
11	3,020	31	13,400	Jan. 17, 1951	1,990
May 9	763	Apr. 6	19,500	Mar. 27	1,920
June 13	220	7	15,900	Apr. 24	3,330
July 11	2,290	10	8,600	May 8	2,390
Aug. 26	210	June 1	1,230	June 5	1,720
				July 10	814

Rating table, July 21, 1951, to Sept. 30, 1952, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

7.2	387	18.0	8,900
10.0	1,890	19.7	13,700
17.0	7,350		

Discharge, in cubic feet per second, July to September 1951

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1										-	979	776
2										-	989	814
3										-	966	947
4										-	734	*767
5										-	714	711
6										-	548	739
7										-	*722	725
8										-	544	710
9										-	566	735
10										-	727	781
11										-	407	928
12										-	604	932
13										-	619	889
14										-	354	866
15										-	620	875
16										-	924	777
17										-	675	827
18										-	781	733
19										-	845	643
20										-	975	636
21										511	995	573
22										586	a1,100	551
23										612	a1,050	631
24										512	a970	608
25										958	a820	662
26										1,080	a730	649
27										1,290	a700	715
28										1,480	a830	743
29										1,350	a680	794
30										1,130	a750	730
31										1,230	815	-
Total										-	23,733	22,467
Mean										-	766	749
Cfsm										-	0.270	0.264
In.										-	0.31	0.29

Calendar year	: Max	Min	Mean	Cfsm	In.
Water year	: Max	Min	Mean	Cfsm	In.

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records and records for nearby stations.

Grand River at Ionia, Mich.--Continued

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	757	1,780	2,010	2,100	3,760	1,900	4,080	2,410	2,970	683	515	*598
2	899	2,050	2,010	3,000	5,040	1,830	3,840	2,050	*2,480	603	469	779
3	858	1,820	2,010	4,500	4,880	*1,720	3,680	2,150	2,340	566	470	498
4	873	1,680	2,480	5,400	*5,120	2,070	3,600	1,890	2,270	538	818	843
5	805	*1,640	3,040	5,680	6,000	3,180	3,760	*1,800	2,110	537	794	666
6	782	1,330	3,390	5,600	6,240	3,530	4,000	1,640	1,820	681	733	720
7	1,060	1,470	*3,680	4,900	6,080	3,180	3,760	1,660	1,820	*540	655	584
8	*1,320	1,630	3,840	4,500	5,600	2,970	4,400	1,550	1,610	581	624	561
9	1,440	1,220	3,680	4,200	4,800	2,760	5,680	1,580	1,520	562	698	576
10	1,440	1,020	3,320	4,000	4,320	3,110	6,480	1,550	1,270	656	767	497
11	1,830	1,380	3,040	3,700	4,320	5,360	*6,930	1,530	1,130	509	654	549
12	1,830	1,530	2,830	3,300	4,080	6,830	6,930	1,510	1,140	509	818	485
13	1,470	2,830	2,690	3,200	4,000	7,590	7,850	1,480	1,040	442	581	472
14	1,320	5,360	2,130	3,100	3,530	7,350	11,900	1,460	1,010	535	708	508
15	1,280	6,560	1,770	4,200	2,900	6,650	*13,700	1,510	1,030	551	493	760
16	1,320	6,400	1,700	6,000	2,830	6,240	13,100	1,490	1,010	445	1,110	*589
17	1,380	5,920	1,700	*8,100	2,620	5,760	a11,700	1,390	968	635	1,400	386
18	680	5,440	1,600	11,600	2,410	5,360	a10,000	1,390	921	737	935	543
19	552	4,640	1,600	11,900	2,270	5,600	8,160	1,430	805	678	816	508
20	624	4,240	1,700	10,400	2,200	6,480	7,130	1,370	749	866	769	490
21	532	3,390	1,700	a9,000	1,970	7,130	6,480	1,420	806	845	732	481
22	706	3,320	1,700	a8,200	1,950	7,130	5,840	1,590	810	760	644	567
23	870	3,040	1,750	a7,800	1,900	6,930	5,200	1,630	785	836	590	553
24	1,520	2,970	1,670	a7,000	1,730	6,740	4,640	2,830	772	752	652	599
25	2,690	2,900	1,600	a5,800	1,790	6,400	4,160	3,680	685	491	532	592
26	2,550	2,900	1,600	a5,200	1,730	6,080	3,920	4,160	780	637	476	433
27	2,760	2,270	1,600	a5,200	1,760	5,600	3,530	4,400	801	610	517	457
28	2,830	2,410	1,620	a5,200	1,850	5,360	3,180	4,480	645	700	499	412
29	2,620	2,130	1,650	a4,800	1,810	4,800	2,970	4,080	678	618	513	457
30	2,340	2,070	1,700	a4,000	-	4,560	2,620	3,680	603	568	467	497
31	2,690	-	1,750	3,320	-	4,240	-	3,110	-	514	525	-
Total	44,628	87,340	68,560	174,900	99,490	154,440	183,220	67,900	37,378	19,385	20,972	16,660
Mean	1,440	2,911	2,212	5,642	3,431	4,982	6,107	2,190	1,246	625	677	555
Cfsm	0.507	1.02	0.779	1.99	1.21	1.75	2.15	0.771	0.439	0.220	0.238	0.195
In.	0.58	1.14	0.90	2.29	1.30	2.02	2.40	0.89	0.49	0.25	0.27	0.22

Calendar year 1951: Max - Min - Mean - Cfsm - In. -
Water year 1951-52: Max 13,700 Min 386 Mean 2,664 Cfsm 0.938 In. 12.75

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records and records for nearby stations.
Note.--Stage-discharge relation affected by ice Dec. 16 to Jan. 4, Jan. 7-17.

Flat River at Smyrna, Mich.

Location.--Lat 43°03'10", long. 85°15'50", in NW¼ sec. 28, T. 8 N., R. 8 W., on right bank at downstream side of highway bridge, 600 ft downstream from Consumers Power Co. hydroelectric plant and half a mile south of Smyrna.

Drainage area.--528 sq mi.

Records available.--December 1950 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 730 ft (from river-profile map).

Extremes.--Maximum discharge during year, 1,800 cfs Mar. 21 (gage height, 6.20 ft); minimum, 12 cfs July 6; minimum gage height, 2.36 ft June 5; minimum daily discharge, 192 cfs July 7.
1950-52: Maximum discharge, that of Mar. 21, 1952; minimum, 12 cfs July 6, 1952; minimum gage height, 2.36 ft June 5, 1952; minimum daily discharge, 131 cfs July 21, 1951.

Remarks.--Records good. Diurnal fluctuation caused by powerplants above station.

Rating table, water year 1951-52, (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Sept. 4-20)

3.2	170
3.5	280
4.0	440
5.0	960
6.0	1,640

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	258	524	612	587	680	450	980	520	437	198	509	367
2	352	442	555	611	787	573	1,010	516	407	224	462	511
3	460	380	586	622	821	*400	996	445	456	220	511	518
4	455	379	670	610	*949	521	931	446	*441	225	622	463
5	446	*364	706	618	1,080	488	1,020	450	340	223	634	420
6	400	365	668	625	1,000	547	1,020	*466	427	204	696	388
7	466	365	*766	617	890	519	933	473	367	*192	659	374
8	*560	419	830	*588	847	482	919	428	324	255	577	316
9	690	428	715	592	827	429	1,000	446	384	371	566	372
10	688	415	724	595	738	554	1,000	449	307	318	581	296
11	622	415	691	548	773	828	*1,030	435	344	296	534	327
12	553	471	601	564	758	978	1,020	429	366	241	587	295
13	495	679	498	565	711	1,120	1,220	425	274	258	467	296
14	572	930	404	559	619	1,060	*1,370	426	359	261	472	303
15	324	1,050	364	679	629	1,180	1,470	468	318	285	450	321
16	426	996	412	751	542	998	1,350	488	298	318	565	*346
17	472	1,010	471	912	526	922	1,250	532	346	346	585	302
18	357	983	411	1,080	522	947	1,170	559	287	490	478	236
19	369	871	421	1,060	503	1,070	992	461	264	640	520	296
20	393	810	421	1,190	505	1,370	936	382	308	713	454	351
21	421	547	440	1,060	491	1,560	829	420	290	699	438	495
22	412	698	428	921	397	1,640	811	390	246	659	*386	253
23	424	717	456	903	438	1,560	746	475	275	741	394	291
24	534	631	464	745	470	1,480	696	633	284	819	363	388
25	628	706	457	798	455	1,270	619	642	244	807	348	334
26	686	578	464	883	457	1,220	672	607	266	868	328	322
27	710	607	455	909	457	1,050	591	582	239	895	330	312
28	600	597	461	825	467	1,010	554	582	230	869	292	341
29	602	552	470	656	493	971	537	451	266	722	309	263
30	524	447	478	651	-	900	528	476	248	736	373	348
31	549	-	493	683	-	918	-	462	-	617	345	-
Total	15,448	18,356	16,592	23,007	18,812	29,015	28,200	14,964	9,642	14,710	14,835	10,445
Mean	498	612	535	742	649	936	940	483	321	475	479	348
Cfsm	0.943	1.16	1.01	1.41	1.23	1.77	1.78	0.915	0.608	0.900	0.907	0.659
In.	1.09	1.29	1.17	1.62	1.33	2.04	1.99	1.05	0.68	1.04	1.04	0.74

Calendar year 1951: Max 1,240 Min 131 Mean 488 Cfsm 0.924 In. 12.54
Water year 1951-52: Max 1,640 Min 192 Mean 585 Cfsm 1.11 In. 15.08

* Discharge measurement made on this day.

Thornapple River near Hastings, Mich.

Location.--Lat 42°36'55", long. 85°14'15", in sec. 27, T. 3 N., R. 8 W., on downstream side of highway bridge, half a mile downstream from Cedar Creek, 2 miles downstream from Thornapple Lake, and 3½ miles southeast of Hastings.

Drainage area.--385 sq mi.

Records available.--October 1944 to September 1952.

Gage.--Wire-weight gage read twice daily. Datum of gage is 786.71 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation).

Average discharge.--8 years, 353 cfs.

Extremes.--Maximum discharge observed during year, 2,090 cfs Apr. 15 (gage height, 6.45 ft); minimum, 84 cfs Sept. 30; minimum gage height, 3.04 ft Aug. 1, 30.
1944-52: Maximum discharge, 6,810 cfs Apr. 7, 1947 (gage height, 10.20 ft, from graph based on gage readings); minimum, 43 cfs Aug. 26-28, 1946.

Remarks.--Records good except those for period of no gage-height record, which are fair.

Rating table, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Aug. 20 to Sept. 30)

2.9	82
3.3	176
3.8	360
5.0	1,060
6.5	2,140

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	146	279	264	380	448	283	465	264	504	124	98	111
2	157	232	271	641	587	275	492	250	400	122	102	124
3	165	216	287	905	647	261	487	261	385	120	104	a130
4	157	206	365	1,020	671	291	454	250	390	120	129	a125
5	149	188	*526	1,020	815	454	454	243	*356	117	146	a125
6	142	191	611	935	905	*564	482	219	315	117	139	a120
7	160	*185	605	755	815	587	514	213	279	109	126	a110
8	303	185	575	641	665	498	635	*261	264	115	120	a100
9	356	197	536	536	520	410	*875	299	236	*129	139	a96
10	*320	209	448	482	443	443	1,060	303	209	129	173	a100
11	279	229	426	*416	482	701	1,180	283	203	117	157	a100
12	213	264	356	395	536	965	1,220	253	203	113	139	94
13	188	504	303	360	536	1,060	1,380	246	203	106	126	90
14	176	905	271	370	438	1,060	1,850	232	197	104	117	90
15	171	1,150	236	629	*365	845	2,090	250	191	113	115	88
16	162	1,180	222	1,090	324	731	2,010	264	179	120	146	86
17	152	1,150	216	1,480	328	587	1,740	253	168	134	179	*86
18	146	935	216	1,700	261	520	1,420	236	160	144	168	92
19	149	677	229	1,740	257	599	1,090	222	149	197	*144	96
20	152	526	250	1,700	243	875	845	226	149	213	129	94
21	152	432	264	1,450	243	1,060	647	271	162	191	122	92
22	152	365	232	1,280	243	1,120	536	299	168	162	115	94
23	179	356	236	1,060	239	1,060	504	380	171	154	106	98
24	385	360	236	845	239	995	492	647	173	144	102	98
25	570	360	239	671	239	905	438	1,020	165	132	96	96
26	671	311	229	599	250	755	395	1,220	157	122	96	92
27	635	291	229	629	261	635	351	1,250	152	120	94	90
28	542	271	236	635	275	570	338	1,180	139	122	92	88
29	405	257	243	575	283	520	295	965	132	120	88	86
30	324	243	243	470	-	487	279	755	129	113	86	84
31	291	-	264	395	-	460	-	593	-	109	98	-
Total	8,149	12,854	9,864	25,804	12,558	20,576	25,018	13,608	6,688	4,052	3,791	2,975
Mean	263	428	318	832	433	664	834	439	223	131	122	99.2
Cfsm	0.683	1.11	0.826	2.16	1.12	1.72	2.17	1.14	0.579	0.340	0.317	0.258
In.	0.79	1.24	0.95	2.49	1.21	1.99	2.42	1.31	0.65	0.39	0.37	0.29

Calendar year 1951: Max 1,760 Min 88 Mean 347 Cfsm 0.901 In. 12.24
Water year 1951-52: Max 2,090 Min 84 Mean 399 Cfsm 1.04 In. 14.10

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of records for station near Caledonia.

Thornapple River near Caledonia, Mich.

Location.--Lat 42°48'40", long. 85°29'00", in NW¼ sec. 22, T. 5 N., R. 10 W., on right bank 200 ft downstream from LaBarge powerplant, 2.3 miles northeast of Caledonia, and 3.3 miles downstream from Coldwater River.

Drainage area.--773 sq mi.

Records available.--October 1930 to September 1938, October 1951 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 676.31 ft above mean sea level, unadjusted (Consumers Power Co. benchmark). Oct. 1, 1930, to Sept. 30, 1938, staff gage at same site at mean sea level datum (unadjusted).

Average discharge.--8 years (1930-37, 1951-52), 530 cfs.

Extremes.--Maximum discharge during year, 3,700 cfs Apr. 13 (gage height, 8.96 ft); minimum, 8.5 cfs Sept. 17, 18 (gage height, 2.47 ft).
1930-37, 1951-52: Maximum daily discharge, 3,780 cfs Apr. 22, 1937; minimum daily, 5 cfs Oct. 27, 1934.
Flood of Apr. 7, 1947, reached a stage of 14.4 ft, from information by powerplant operator.

Remarks.--Records good except those below 300 cfs and those for periods of no gage-height record, which are fair. Large diurnal fluctuation at low and medium flow caused by powerplant above station.

Revisions (water years).--W 824: 1931-36.

Rating table, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)

3.6	185
3.8	265
4.0	380
6.0	1,590
8.3	3,200

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a450	632	626	950	980	608	950	638	920	319	278	323
2	a380	560	626	1,250	1,190	590	980	608	800	309	269	322
3	a470	556	632	1,340	1,190	590	980	596	770	295	255	300
4	a380	478	740	1,400	1,340	626	950	590	*740	320	414	320
5	a350	497	920	1,490	1,430	740	950	596	704	289	418	292
6	a410	465	980	1,460	1,430	*860	980	530	638	247	354	274
7	a360	485	1,070	1,280	1,400	920	1,040	*530	632	313	320	245
8	a580	491	1,070	1,130	1,280	920	1,280	524	584	208	316	292
9	a640	485	980	1,040	1,100	860	1,460	614	566	*313	345	353
10	a680	501	920	950	980	950	*1,590	632	499	319	501	256
11	a650	521	830	*830	1,040	1,250	1,730	632	459	467	365	201
12	a600	602	770	830	1,010	*1,460	1,760	602	452	362	374	282
13	a550	1,070	716	770	1,010	1,520	2,430	590	473	186	354	257
14	a350	1,800	554	800	980	1,490	*3,200	518	455	290	314	199
15	a420	2,010	602	1,370	830	1,430	3,130	524	418	319	288	247
16	a370	1,940	482	1,940	770	1,280	3,060	590	413	315	456	262
17	a330	1,800	452	2,220	710	1,160	2,850	590	433	336	506	*283
18	a360	1,700	536	a2,500	668	1,010	2,290	566	347	419	492	224
19	350	1,340	578	a2,600	650	1,220	2,010	530	341	526	479	231
20	368	1,100	*590	a2,600	620	1,460	1,620	530	387	309	*317	246
21	358	*950	602	*2,360	608	1,560	1,310	590	397	501	388	246
22	400	860	524	2,290	602	1,520	1,130	536	381	425	307	295
23	383	860	530	1,940	596	1,490	1,010	662	362	355	290	271
24	392	830	584	1,460	596	1,560	950	830	405	343	286	237
25	1,010	770	560	1,220	584	1,460	890	1,100	398	351	300	291
26	1,040	740	536	1,190	*554	1,370	830	1,370	409	313	272	246
27	1,040	704	548	1,190	548	1,220	770	1,460	392	327	372	296
28	950	662	560	1,190	590	1,130	728	1,520	354	295	240	225
29	830	638	578	1,040	614	1,040	692	1,460	301	306	254	257
30	728	626	596	920	-	980	662	1,250	331	281	236	235
31	656	-	614	920	-	950	-	1,040	-	274	275	-
Total	16,835	26,673	20,906	44,470	25,810	35,224	44,212	23,348	14,761	10,232	10,635	8,008
Mean	543	889	674	1,435	890	1,136	1,474	753	492	330	343	267
Cfsm	0.702	1.15	0.872	1.86	1.15	1.47	1.91	0.974	0.636	0.427	0.444	0.345
In.	0.81	1.28	1.01	2.14	1.24	1.69	2.13	1.12	0.71	0.49	0.51	0.39

Calendar year 1951 Max - Min - Mean - Cfsm - In. -
Water year 1951-52 Max 3,200 Min 186 Mean 768 Cfsm 0.994 In. 13.52

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of records for station near Hastings and powerplant records.

Rogue River near Rockford, Mich.

Location.--Lat 43°05'00", long. 85°35'30", in NE¼ sec. 15; T. 8 N., R. 11 W., on left bank at downstream side of highway bridge, 2.2 miles above mouth and 3.0 miles southwest of Rockford.

Drainage area.--234 sq mi.

Records available.--February to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 625 ft (from river-profile map). Prior to Aug. 30, 1952, wire-weight gage at same site and datum.

Extremes.--Maximum discharge during period, 1,220 cfs Apr. 14 (gage height, 7.10 ft); minimum not determined; minimum gage height, 3.60 ft Sept. 14.

Remarks.--Records fair Feb. 5 to Aug. 29 and good thereafter except those for periods of no gage-height record and those below 100 cfs, which are poor. Some diurnal fluctuation at low flow caused by mills above station.

Rating table, Feb. 1, to Sept. 30, 1952 (gage height, in feet, and discharge, in cubic feet per second)

3.9	70
4.5	215
6.0	680
7.1	1,220

Discharge, in cubic feet per second, February to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1					a350	235	384	202	a260	94	195	200
2					a450	210	363	190	a230	99	178	252
3					a550	235	360	185	*205	97	145	267
4					a600	*230	348	165	195	94	384	235
5					*628	210	348	200	190	85	312	185
6					525	215	330	*172	165	70	333	158
7					450	220	405	165	150	140	312	135
8					390	220	384	210	135	*99	261	155
9					378	215	405	205	142	88	210	135
10					294	336	*420	215	135	110	165	128
11					342	628	405	160	130	106	210	110
12					315	*628	384	220	138	94	182	128
13					303	780	840	190	150	77	175	125
14					279	510	*1,160	182	150	110	155	92
15					252	480	940	252	120	160	150	135
16					230	420	680	243	198	168	465	*122
17					210	360	510	246	145	180	378	120
18					246	345	435	230	132	378	465	122
19					215	610	384	225	138	321	238	145
20					205	940	348	185	128	339	208	145
21					195	840	294	180	125	420	*240	135
22					195	700	300	178	120	378	185	132
23					200	592	279	240	130	645	165	145
24					198	510	264	235	125	366	148	148
25					208	435	246	a600	125	450	170	145
26					198	435	235	a800	120	465	140	135
27					198	405	208	a700	92	405	135	125
28					210	390	232	a550	72	435	132	97
29					225	375	222	a450	85	282	130	132
30					-	336	205	a360	104	243	125	120
31					-	384	-	a310	-	225	104	-
Total					9,039	13,429	12,318	8,645	4,334	7,223	6,795	4,408
Mean					312	433	411	279	144	233	219	147
Cfsm					1.33	1.85	1.76	1.19	0.615	0.996	0.936	0.628
In.					1.44	2.13	1.96	1.37	0.69	1.15	1.08	0.70

Calendar year	: Max	Min	Mean	Cfsm	In.	
Water year	: Max	Min	Mean	Cfsm	In.	

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records and records for Thornapple River near Hastings.

Grand River at Grand Rapids, Mich.

Location.--Lat 42°57'10", long. 85°41'15", in NE¼ sec. 35, T. 7 N., R. 12 W., on left bank at municipal sewage pumping plant in Grand Rapids, three-quarters of a mile upstream from Plaster Creek and at mile 40.

Drainage area.--4,900 sq mi, approximately.

Records available.--March 1901 to December 1905, January 1906 to September 1918 (gage heights only), October 1930 to September 1952. Gage-height records collected in this vicinity since 1907 are contained in reports of United States Weather Bureau.

Gage.--Water-stage recorder. Datum of gage is 588.69 ft above mean sea level, datum of 1929 (levels by city of Grand Rapids). March 1901 to December 1905 and January 1906 to September 1918, staff gage at Fulton Street Bridge 1 mile upstream at same datum.

Average discharge.--22 years (1930-52), 3,458 cfs.

Extremes.--Maximum discharge during year, 19,000 cfs Apr. 17 (gage height, 11.07 ft); minimum, 1,320 cfs July 6, 14; minimum gage height, -3.34 ft July 6; minimum daily discharge, 1,420 cfs July 6, 7, Sept. 29.
1901-5, 1916-18, 1930-52: Maximum discharge, 54,500 cfs (revised) Mar. 28, 1904 (gage height, 19.05 ft, revised, site then in use); minimum daily, 381 cfs Aug. 9, 17, 1936.
Maximum discharge since 1901, that of Mar. 28, 1904.

Remarks.--Records good except those for periods of ice effect, which are fair. Moderate diurnal fluctuation at low and medium flow caused by powerplants above station.

Revisions (water years).--W 924: 1938(M).

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

-3.1	1,420
-1.0	2,740
5.0	8,680
11.0	18,800

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,080	4,390	4,120	4,980	8,000	3,850	7,430	4,480	5,180	1,670	1,840	1,840
2	2,420	3,850	4,120	5,980	8,800	3,760	7,210	4,300	4,880	1,570	1,720	2,020
3	2,280	3,850	4,120	6,880	9,000	3,760	6,990	3,760	*4,580	1,570	1,620	2,140
4	2,210	3,580	4,680	7,760	10,100	3,850	6,680	3,760	4,300	1,470	2,580	1,840
5	2,140	3,310	5, :0	7,980	10,400	*4,300	6,680	3,580	4,030	1,470	2,580	2,020
6	2,020	*2,820	*5,780	8,090	10,500	5,280	6,880	3,310	3,760	1,420	2,420	1,960
7	2,500	2,500	6,380	7,980	10,700	5,680	6,880	*3,140	3,310	1,420	2,280	1,840
8	3,400	2,740	6,680	7,650	9,770	5,680	7,540	3,310	3,140	1,620	2,210	1,780
9	*3,580	3,060	6,680	7,100	8,810	5,380	7,980	3,220	3,060	*1,670	2,020	1,720
10	3,580	2,740	6,380	6,680	7,760	5,680	*8,940	3,310	2,740	1,620	2,140	1,780
11	3,490	2,660	5,880	6,280	7,540	7,320	10,100	3,220	2,420	1,670	2,280	1,670
12	3,850	3,140	5,680	5,880	7,320	9,070	11,000	3,220	2,280	1,780	2,080	1,570
13	3,580	4,680	5,180	5,580	6,880	10,500	13,200	3,140	2,350	1,470	2,020	1,520
14	2,980	8,810	4,680	5,480	6,380	11,500	15,300	3,060	2,280	1,420	1,900	1,520
15	2,900	10,400	3,760	6,880	5,780	11,800	17,000	3,310	2,140	1,620	1,900	1,570
16	2,580	11,200	3,490	8,320	5,380	11,500	18,400	3,140	2,140	1,620	2,350	1,670
17	2,500	11,200	3,200	9,770	5,080	10,700	18,800	3,220	2,210	1,670	3,060	*1,670
18	2,580	10,690	3,500	13,700	4,780	9,340	18,400	3,060	2,080	2,210	3,220	1,570
19	2,280	9,620	3,700	15,800	4,480	9,920	17,000	3,140	2,080	2,660	2,740	1,620
20	1,900	8,200	3,800	17,000	4,210	10,800	15,300	2,980	1,840	2,580	2,350	1,570
21	1,780	7,100	4,000	17,000	4,030	11,300	13,400	2,900	1,840	2,500	*2,140	1,520
22	1,900	6,280	3,600	16,400	3,940	12,100	11,500	2,980	1,900	2,580	2,020	1,620
23	2,080	6,280	3,600	15,100	3,760	12,800	9,770	3,670	1,900	2,900	1,840	1,840
24	2,740	5,780	3,900	13,400	3,580	12,800	8,200	4,030	1,840	2,660	1,840	1,670
25	4,030	5,480	3,700	11,800	3,580	12,300	7,320	5,180	1,840	2,420	1,780	1,620
26	4,880	5,480	3,600	10,800	3,490	11,600	6,580	6,180	1,840	2,420	1,670	1,720
27	4,980	5,180	3,700	9,920	3,580	10,700	6,180	6,580	1,780	2,210	1,620	1,620
28	5,180	4,680	3,800	9,340	*3,670	9,620	5,780	6,990	1,670	2,500	1,670	1,520
29	5,080	4,580	3,900	8,810	3,760	8,680	5,280	7,100	1,570	2,350	1,620	1,420
30	4,680	4,300	4,000	7,800	-	7,980	4,880	6,680	1,570	2,140	1,570	1,520
31	4,300	-	4,300	7,000	-	7,540	-	5,780	-	2,080	1,570	-
Total	96,480	168,580	139,190	293,140	185,060	267,090	306,600	125,730	78,550	60,960	64,650	50,960
Mean	3,112	5,619	4,490	9,456	6,381	8,616	10,220	4,056	2,618	1,966	2,085	1,699
Cfsm	0.635	1.15	0.916	1.93	1.30	1.76	2.09	0.828	0.534	0.401	0.426	0.347
In.	0.73	1.28	1.06	2.22	1.40	2.03	2.33	0.95	0.60	0.46	0.49	0.39

Calendar year 1951: Max 19,200 Min 1,320 Mean 4,619 Cfsm 0.943 In. 12.79
Water year 1951-52: Max 18,800 Min 1,420 Mean 5,019 Cfsm 1.02 In. 13.94

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 17-30, Jan. 30 to Feb. 3.

Muskegon River near Merritt, Mich.

Location.--Lat 44°20'10", long. 84°53'30", in NW¼ sec. 2, T. 22 N., R. 5 W., on right bank 35 ft upstream from bridge on State Highway 55, half a mile upstream from West Branch, 2⅝ miles east of Merritt, 5 miles west of Houghton Lake, and at mile 210.8.

Drainage area.--309 sq mi.

Records available.--October 1946 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 1,117.82 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation). Prior to July 13, 1949, wire-weight gage on downstream side of bridge at same datum.

Average discharge.--6 years, 213 cfs.

Extremes.--Maximum discharge during year, 890 cfs Apr. 3 (gage height, 7.48 ft); minimum, 68 cfs July 7.
1946-52: Maximum discharge, 965 cfs Apr. 13, 1951 (gage height, 7.65 ft); minimum, 36 cfs Sept. 26, 1949.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Occasional regulation by operation of gates at Reedsburg Dam.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Dec. 12, May 25 to July 10, Sept. 29-30)

3.0	72	6.0	378
4.0	147	6.5	482
5.0	247	7.5	890

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	179	354	340	300	300	280	728	529	247	88	134	165
2	179	340	354	300	300	260	819	497	236	86	134	174
3	170	326	362	320	330	230	850	423	230	84	134	165
4	174	314	378	340	360	230	830	423	*242	82	180	156
5	174	295	395	370	380	230	773	423	225	79	210	152
6	170	277	404	360	400	230	706	423	220	76	200	156
7	189	277	395	350	390	230	685	413	214	72	190	152
8	209	271	395	350	*380	230	685	*404	194	84	180	142
9	204	*265	413	350	350	230	706	404	194	102	170	142
10	*209	271	*404	350	350	240	*773	395	189	91	180	142
11	209	283	395	*350	350	260	773	386	184	*87	170	*138
12	209	289	404	350	330	280	728	378	174	83	180	138
13	204	326	320	330	320	290	773	378	147	80	170	134
14	204	386	310	320	320	*310	819	362	102	80	*170	134
15	204	395	300	350	320	310	819	370	110	90	170	134
16	199	370	250	404	320	310	819	362	106	90	174	134
17	209	370	300	423	350	320	819	307	106	90	170	134
18	209	378	320	469	340	320	819	320	102	100	174	134
19	230	395	320	482	310	340	796	326	102	122	174	134
20	230	404	320	456	250	370	796	333	96	126	170	134
21	236	413	320	469	260	380	773	333	99	140	174	134
22	236	404	350	430	250	410	728	320	99	170	170	134
23	253	395	350	350	250	410	644	314	96	210	160	138
24	307	386	350	300	250	410	644	320	92	300	160	134
25	333	378	350	300	250	420	644	320	99	360	156	130
26	340	362	350	300	250	423	624	283	99	360	152	134
27	413	370	330	300	250	423	604	199	96	330	152	126
28	404	347	330	310	250	413	584	220	90	280	147	122
29	386	333	300	330	250	433	565	236	92	230	147	126
30	362	333	300	310	-	469	546	230	92	190	147	122
31	354	-	300	300	-	584	-	242	-	160	147	-
Total	7,588	10,307	10,709	11,023	9,010	10,275	21,872	10,873	4,374	4,522	5,146	4,194
Mean	245	344	345	356	311	331	729	351	146	146	166	140
Cfsm	0.793	1.11	1.12	1.15	1.01	1.07	2.36	1.14	0.472	0.472	0.537	0.453
In.	0.91	1.24	1.29	1.33	1.09	1.23	2.63	1.31	0.53	0.54	0.62	0.51

Calendar year 1951: Max 965 Min 120 Mean 314 Cfsm 1.02 In. 13.78
Water year 1951-52: Max 850 Min 72 Mean 300 Cfsm 0.971 In. 13.23

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Jan. 12-15, Jan. 22 to Mar. 16, Mar. 21-25. No gage-height record Dec. 13 to Jan. 11, Apr. 3-4, July 11-18, 21-31, Aug. 4-14; discharge estimated on basis of weather records, recorded range in stage, and records for station at Evart.

Muskegon River at Evart, Mich.

Location.--Lat 43°54'10", long. 85°15'45", in SE¼ sec. 34, T. 18 N., R. 8 W., near center of span on downstream side of bridge on U. S. Highway 10 at Evart, half a mile upstream from Twin Creek and at mile 124.

Drainage area --1,450 sq mi, approximately.

Records available.--November 1930 to June 1931, January 1934 to September 1952.

Gage.--Wire-weight gage read twice daily. Datum of gage is 977.72 ft above mean sea level, datum of 1929. Prior to May 22, 1935, chain gage on upstream side of Pere Marquette Railroad bridge 100 ft downstream at same datum.

Average discharge.--18 years (1934-52), 968 cfs.

Extremes.--Maximum discharge during year, 5,320 cfs Apr. 4 (gage height, 12.28 ft); minimum, 472 cfs Feb. 20.
1930-31, 1934-52: Maximum discharge, 7,000 cfs June 3, 4, 1945 (gage height, 13.68 ft, from high-water mark); minimum observed, 164 cfs Dec. 20, 1947.

Remarks.--Records good except those for periods of ice effect, which are fair.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 16		Nov. 17 to Sept. 30	
7.4	625	7.0	455
8.0	1,030	8.0	1,080
9.0	1,850	11.0	3,860
11.0	3,860	13.0	6,160

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	692	1,580	1,400	1,300	1,360	1,200	3,860	1,650	975	625	1,010	709
2	692	1,500	1,440	1,300	1,480	1,120	4,630	1,560	975	601	940	758
3	704	1,380	1,480	1,350	1,560	940	4,960	1,520	975	571	908	752
4	692	1,220	1,650	1,400	1,650	975	5,200	1,440	*975	548	1,040	745
5	673	1,140	1,780	1,600	1,780	975	4,960	1,400	975	532	1,160	715
6	679	1,060	1,740	1,500	1,830	950	4,520	1,320	975	510	1,120	673
7	820	1,030	1,830	1,450	2,010	950	3,970	1,240	940	499	1,080	655
8	1,180	1,030	1,880	1,400	*1,650	930	3,750	*1,200	908	521	1,010	619
9	1,140	1,030	1,880	1,350	1,500	940	3,640	1,200	875	625	1,010	613
10	*1,060	1,050	*1,830	1,350	1,500	975	3,860	1,200	862	620	1,080	595
11	995	1,060	1,740	*1,350	1,500	1,080	3,860	1,160	810	*631	1,040	*577
12	960	1,140	1,650	1,300	1,440	1,200	3,860	1,120	810	595	1,080	571
13	925	1,380	1,360	1,250	1,400	1,320	4,300	1,080	830	560	1,040	565
14	890	2,800	1,360	1,200	1,400	*1,480	4,740	1,080	797	554	*975	565
15	855	2,800	1,280	1,400	1,400	1,480	4,960	1,240	764	637	908	565
16	820	3,000	1,040	1,650	1,360	1,320	*4,740	1,240	697	625	875	565
17	820	2,910	1,500	1,700	1,400	1,360	4,520	1,200	745	637	856	554
18	848	2,640	1,450	2,140	1,360	1,320	4,080	1,160	721	830	823	577
19	960	2,370	1,400	2,280	1,300	1,440	3,640	1,080	661	940	804	577
20	1,030	2,240	1,400	2,010	1,080	1,830	3,420	1,040	625	1,040	784	589
21	1,140	2,140	1,400	2,060	1,120	2,460	3,100	1,040	613	1,360	784	583
22	1,260	1,960	1,600	1,830	1,080	2,820	2,910	1,040	613	1,520	758	589
23	1,300	1,920	1,600	1,440	1,050	2,640	2,730	1,120	601	2,100	745	601
24	1,850	1,780	1,600	1,280	1,010	2,370	2,550	1,200	601	2,370	739	625
25	2,350	1,650	1,600	1,320	1,000	2,140	2,460	1,200	589	2,460	721	625
26	2,400	1,480	1,550	1,360	1,040	2,100	2,280	1,160	589	2,460	721	601
27	2,400	1,400	1,500	1,400	1,080	2,060	2,060	1,120	577	2,190	709	583
28	2,080	1,320	1,450	1,480	1,080	2,060	1,920	1,120	565	1,880	697	565
29	1,800	1,360	1,400	1,440	1,040	2,190	1,830	1,010	600	1,520	679	554
30	1,720	1,360	1,300	1,360	-	2,640	1,740	940	661	1,280	655	543
31	1,670	-	1,300	1,400	-	3,310	-	940	-	1,080	649	-
Total	37,405	50,730	47,390	46,650	39,460	50,575	109,050	37,020	22,904	32,921	27,400	18,408
Mean	1,207	1,691	1,529	1,505	1,361	1,631	3,635	1,194	763	1,062	884	614
Cfsm	0.832	1.17	1.05	1.04	0.939	1.12	2.51	0.823	0.526	0.732	0.610	0.423
In.	0.96	1.30	1.21	1.20	1.01	1.29	2.80	0.95	0.59	0.84	0.70	0.47

Calendar year 1951: Max 3,970 Min 455 Mean 1,308 Cfsm 0.902 In. 12.24
Water year 1951-52: Max 5,200 Min 499 Mean 1,421 Cfsm 0.980 In. 13.32

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 17 to Jan. 14, Feb. 13-15, 19, 23, 25, Mar. 6-8.

Muskegon River at Newaygo, Mich.

Location.--Lat 43°25', long. 85°48', in sec. 24, T. 12 N., R. 13 W., on left bank, in tailrace of powerplant operated by Consumers Power Co. at Newaygo, 600 ft downstream from Penoyer Creek and at mile 39.

Drainage area.--2,350 sq mi, approximately.

Records available.--June 1901 to December 1906 and October 1930 to September 1952 in reports of Geological Survey. July 1908 to December 1919 in House Document 143, 72d Congress, 1st Session (published as "at Croton Power Plant near Newaygo").

Gage.--Water-stage recorder. Datum of gage is 585.83 ft above mean sea level, datum of 1929. October 1930 to January 1939 staff gage at same site and datum. June 1901 to December 1906 staff gage half a mile upstream at dam of Newaygo Portland Cement Co. at different datum.

Average discharge.--22 years (1930-52), 1,807 cfs.

Extremes.--Maximum discharge during year, 6,950 cfs Apr. 13 (gage height, 50.86 ft); minimum gage height, 45.75 ft Sept. 9; minimum daily discharge, 548 cfs June 29.
1901-6, 1930-52: Maximum discharge, 11,600 cfs June 2, 1945 (gage height, 53.76 ft); minimum, about 150 cfs June 4, 1941, July 7, 1950; minimum daily, 390 cfs July 13, 1934.

Remarks.--Records excellent except those for period of no gage-height record, which are good. Flow regulated by Hardy Dam (since 1931), Croton Dam, and several smaller dams, and by powerplant at Newaygo at all stages.

Revisions (water years).--W 974: 1933, 1935, 1937-38.

Rating tables, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to July 24		July 25 to Sept. 30	
46.4	540	46.8	840
47.0	1,100	47.0	1,020
48.0	2,400	48.0	2,310
50.7	6,630	49.9	5,350

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a1,600	3,000	1,770	2,180	3,300	1,790	5,030	2,920	1,170	1,290	2,000	1,170
2	a2,000	2,180	1,950	2,700	3,300	1,740	5,510	2,100	2,180	1,720	1,610	1,960
3	a2,100	1,800	2,320	3,300	3,300	1,890	5,830	1,690	2,180	1,600	1,020	2,080
4	a2,000	1,740	2,780	3,300	3,600	*2,180	5,830	1,690	*2,180	1,040	1,650	2,000
5	a1,700	1,730	3,150	2,250	*3,750	2,180	5,830	2,180	2,100	1,040	2,150	1,370
6	a1,100	*1,920	*3,220	2,480	3,750	1,900	5,830	*2,780	1,740	1,040	2,230	993
7	a1,500	2,180	3,300	3,150	3,750	a1,700	*5,510	2,250	1,070	1,070	2,710	1,010
8	a3,200	2,180	3,300	3,300	3,750	a1,200	5,510	2,180	1,010	*1,080	2,710	1,180
9	*2,780	2,180	3,300	*3,300	3,750	a1,000	5,670	1,950	1,480	1,380	2,080	*1,180
10	2,250	1,840	3,300	3,300	3,520	a1,500	5,830	1,180	1,720	1,480	1,810	1,670
11	2,180	1,820	3,300	3,080	3,300	a2,000	6,150	1,060	1,760	1,040	2,080	1,380
12	1,830	2,180	3,300	2,550	3,300	2,180	6,630	1,660	1,760	1,040	2,230	993
13	1,450	2,920	2,920	2,180	3,300	2,850	6,470	2,100	1,090	1,030	2,230	984
14	a1,000	4,550	2,180	2,850	3,300	3,300	5,990	2,250	1,040	1,050	*2,230	975
15	1,090	5,030	1,700	3,450	3,220	2,250	5,990	2,250	658	1,390	2,080	993
16	1,860	5,350	1,050	3,600	3,300	2,180	5,990	1,770	1,090	1,760	1,450	1,400
17	2,250	5,190	1,050	3,750	3,300	2,180	5,670	1,760	1,720	1,760	1,050	1,470
18	2,250	4,070	1,330	3,750	3,080	2,180	5,350	a1,700	1,770	1,510	1,390	921
19	2,250	3,680	1,730	3,750	2,850	2,700	5,510	a2,000	1,760	2,620	1,810	993
20	1,830	3,450	1,760	3,750	2,850	3,910	5,510	a2,700	1,070	2,400	1,820	984
21	1,800	3,680	1,760	3,680	2,550	3,750	5,350	a2,500	1,040	3,220	1,810	993
22	2,020	3,300	1,760	3,750	2,180	3,750	5,030	2,100	1,030	3,450	1,360	1,020
23	2,480	3,300	1,770	3,680	2,180	3,750	4,550	1,790	1,250	3,380	1,030	1,670
24	3,520	3,300	1,770	3,680	1,800	3,910	4,230	1,830	1,720	5,030	1,030	1,670
25	3,750	3,300	1,740	3,680	1,770	4,390	3,520	2,020	1,540	5,350	1,050	1,400
26	3,750	3,220	1,950	3,750	1,950	4,390	2,180	2,180	1,000	4,230	1,030	984
27	3,750	2,780	2,180	3,750	2,180	4,390	2,180	2,180	1,000	3,590	1,050	975
28	3,750	2,180	2,180	3,680	2,180	3,750	2,700	2,180	556	3,190	1,050	975
29	3,600	2,180	2,020	3,520	2,020	3,750	3,220	2,100	548	3,110	1,050	984
30	3,300	1,760	1,740	3,300	-	3,600	3,220	1,370	940	2,630	1,060	1,330
31	3,300	-	1,950	3,300	-	4,390	-	1,050	-	2,150	1,040	-
Total	73,240	87,990	69,530	101,740	86,380	86,630	151,820	61,470	41,152	67,670	50,900	37,707
Mean	2,363	2,933	2,243	3,282	2,979	2,795	5,061	1,983	1,372	2,183	1,642	1,257
Cfsm	1.01	1.25	0.954	1.40	1.27	1.19	2.15	0.844	0.584	0.929	0.699	0.535
In.	1.16	1.39	1.10	1.61	1.37	1.37	2.40	0.97	0.65	1.07	0.81	0.60

Calendar year 1951: Max 5,510 Min 580 Mean 2,308 Cfsm 0.982 In. 13.33
Water year 1951-52: Max 6,630 Min 548 Mean 2,503 Cfsm 1.07 In. 14.50

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records, Croton Power Plant records, and records for Muskegon River at Evart.

Pere Marquette River at Scottville, Mich.

Location.--Lat 43°46'40", long. 86°16'45", in NW¼ sec. 19, T. 18 N., R. 16 W., on right bank 20 ft upstream from bridge at south edge of Scottville and 5¾ miles downstream from South Branch.

Drainage area.--709 sq mi.

Records available.--August 1939 to September 1952. Published as "at Custer" prior to October 1942.

Gage.--Water-stage recorder. Datum of gage is 606.30 ft above mean sea level, datum of 1929. Prior to June 12, 1943, wire-weight gage at bridge 4¾ miles upstream at different datum.

Average discharge.--13 years, 627 cfs.

Extremes.--Maximum discharge during year, 1,470 cfs Apr. 3, 4 (gage height, 4.70 ft); maximum gage height, 5.71 ft Jan. 24 (ice jam); minimum discharge, 398 cfs Sept. 14. 1939-52: Maximum discharge, 2,400 cfs June 4, 5, 1945 (gage height, 5.84 ft); minimum observed, 310 cfs Aug. 9, 10, 1941 (site and datum then in use).

Remarks.--Records good except those for periods of ice effect, which are fair.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 24		Jan. 25 to Sept. 30	
2.3	450	1.9	390
3.0	645	3.0	655
4.0	1,070	4.0	1,070
5.0	1,650	5.0	1,650

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	475	645	662	700	860	595	1,180	670	610	445	595	445
2	475	610	680	760	860	580	1,350	640	595	435	565	445
3	475	595	700	780	850	580	1,440	625	*595	435	540	455
4	475	580	720	760	880	610	1,440	625	580	445	610	445
5	462	565	720	800	945	625	1,320	610	580	425	640	435
6	450	550	700	780	945	580	1,230	610	565	425	670	435
7	488	565	740	740	*898	565	1,120	*595	552	415	655	425
8	525	565	780	720	852	595	1,070	610	540	435	580	425
9	*580	*565	840	700	830	610	1,040	610	528	455	580	425
10	610	565	840	*680	790	625	1,070	625	515	*465	580	*415
11	565	580	*800	680	755	685	1,100	625	502	455	565	415
12	525	610	760	680	738	755	1,120	610	515	435	565	405
13	512	700	740	680	720	*830	1,180	610	515	425	*540	405
14	500	862	720	720	702	810	1,230	610	515	425	528	398
15	488	1,040	710	908	640	810	*1,290	640	515	465	502	405
16	475	1,170	680	1,040	685	772	1,350	685	502	528	502	405
17	475	1,250	720	1,170	670	755	1,260	720	502	528	502	405
18	500	1,220	740	1,220	655	738	1,150	702	515	580	490	405
19	550	1,100	720	1,200	625	852	1,040	655	515	685	478	415
20	580	975	680	1,150	640	1,040	995	625	490	898	478	425
21	628	908	680	1,100	655	1,180	920	625	478	1,100	478	425
22	662	840	680	800	610	1,290	875	610	490	1,180	465	445
23	700	820	680	830	610	1,380	830	625	490	1,230	455	445
24	780	820	680	920	595	1,380	810	655	490	1,150	445	445
25	840	800	680	920	610	1,260	790	702	490	1,120	445	445
26	930	760	660	920	595	1,120	755	738	478	1,120	445	435
27	975	740	660	890	595	1,040	720	720	465	1,020	435	425
28	930	700	660	860	595	1,020	702	685	465	898	435	425
29	840	662	660	840	595	970	685	655	455	790	425	415
30	760	662	660	840	-	970	670	640	445	720	425	415
31	700	-	680	820	-	1,020	-	610	-	655	435	-
Total	18,930	23,024	22,032	26,628	21,000	26,642	31,732	19,967	15,492	20,787	16,053	12,753
Mean	611	767	711	859	724	859	1,058	644	516	671	518	425
Cfsm	0.862	1.08	1.00	1.21	1.02	1.21	1.49	0.908	0.728	0.946	0.731	0.599
In.	0.99	1.20	1.15	1.40	1.10	1.40	1.66	1.05	0.81	1.09	0.84	0.67

Calendar year 1951: Max 1,420 Min 370 Mean 652 Cfsm 0.920 In. 12.46
Water year 1951-52: Max 1,440 Min 398 Mean 697 Cfsm 0.983 In. 13.36

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 15 to Jan. 13, Jan. 19 to Feb. 4.

Big Sable River near Free Soil, Mich.

Location.--Lat 44°07'15", long. 86°16'50", in NE¼ sec. 24, T. 20 N., R. 17 W., on left bank 30 ft downstream from bridge on U. S. Highway 31, 2½ miles northwest of Free Soil, and 6 miles upstream from Hamlin Lake.

Drainage area.--127 sq mi.

Records available.--May 1942 to September 1952.

Gage.--Staff gage read once daily. Datum of gage is 615.32 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation).

Average discharge.--10 years, 142 cfs.

Extremes.--Maximum discharge during year, 371 cfs Apr. 2, 3; maximum gage height, 2.85 ft Apr. 2; minimum discharge, 92 cfs Sept. 18, 19.
1942-52: Maximum discharge observed, 487 cfs Apr. 7, 1947; maximum gage height observed, 3.26 ft Jan. 20, 1943 (ice jam); minimum discharge observed, 81 cfs Aug. 14, 1944.

Remarks.--Records good except those for periods of ice effect, which are fair.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1-26		Oct. 27 to Sept. 30	
1.2	117	1.0	88
2.0	220	1.5	142
		2.0	212
		3.0	401

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	127	140	157	155	160	135	342	144	138	106	106	106
2	124	137	162	165	160	140	*371	140	136	104	104	106
3	124	135	167	170	155	142	371	130	*134	104	102	106
4	124	140	170	170	155	123	332	132	130	102	126	104
5	124	132	167	175	160	135	285	132	127	101	140	102
6	123	130	162	170	165	137	276	130	124	100	126	100
7	133	140	178	162	*160	144	256	130	122	100	121	100
8	137	135	175	157	150	149	247	*132	120	106	117	98
9	*147	*136	170	152	150	149	238	135	120	117	119	98
10	142	140	164	*152	150	142	266	132	118	*110	130	*96
11	137	140	*162	149	150	162	266	132	114	106	126	96
12	133	140	159	149	150	167	256	132	119	106	112	96
13	129	229	157	149	145	*164	285	135	118	102	*112	96
14	127	256	154	147	140	162	304	132	118	104	108	94
15	124	285	152	200	142	162	*323	138	116	112	106	94
16	121	304	150	210	140	157	304	146	119	109	106	94
17	123	304	160	230	140	149	266	140	116	107	112	94
18	139	304	160	230	140	147	229	138	116	152	106	92
19	157	212	155	229	142	206	212	140	116	162	106	92
20	156	196	150	220	140	220	199	135	114	162	110	98
21	158	187	150	212	142	247	184	141	116	174	108	102
22	156	175	150	159	144	285	181	143	115	163	106	104
23	148	175	150	164	144	276	178	142	115	162	104	108
24	179	182	150	181	147	247	173	147	112	154	102	104
25	179	173	150	178	137	229	167	144	115	135	102	102
26	186	162	145	175	132	212	164	138	112	128	100	102
27	181	159	145	175	135	199	159	138	108	121	100	100
28	167	154	145	170	137	193	154	143	108	117	98	98
29	159	154	145	167	135	190	147	141	106	115	100	98
30	149	152	145	162	-	209	147	143	106	110	98	96
31	144	-	150	159	-	285	-	143	-	106	104	-
Total	4,457	5,408	4,856	5,443	4,247	5,664	7,282	4,268	3,548	3,757	3,417	2,976
Mean	144	180	157	176	146	183	243	138	118	121	110	99.2
Cfsm	1.13	1.42	1.24	1.39	1.15	1.44	1.91	1.09	0.929	0.953	0.866	0.781
In.	1.30	1.58	1.43	1.60	1.24	1.66	2.13	1.26	1.04	1.10	1.00	0.87

Calendar year 1951: Max 342 Min 104 Mean 157 Cfsm 1.24 In. 16.83
Water year 1951-52: Max 371 Min 92 Mean 151 Cfsm 1.19 In. 16.21

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 16 to Jan. 4, Jan. 15-18, 27, 28, Feb. 1-14, 17.

Manistee River near Grayling, Mich.

Location.--Lat 44°41'35", long. 84°50'50", in NW¼ sec. 31, T. 27 N., R. 4 W., on right bank 25 ft upstream from State Highway 72 bridge, 2½ miles downstream from Goose Creek, and 6½ miles northwest of Grayling.

Drainage area.--159 sq mi.

Records available.--November 1942 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 1,120.64 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation).

Average discharge.--10 years, 186 cfs.

Extremes.--Maximum discharge during year, 284 cfs July 23 (gage height, 1.40 ft); minimum discharge, 157 cfs Jan. 29.
1942-52: Maximum discharge, 354 cfs Apr. 12, 1947 (gage height, 1.73 ft); maximum gage height, 2.00 ft Feb. 9, 1951 (ice jam); minimum discharge, 122 cfs Feb. 14, 1943.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 28 to Jan. 21, Mar. 8 to June 11, Aug. 16, Aug. 23 to Sept. 30)

0.6	157
1.0	202
1.5	292
2.0	398

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	176	187	198	b190	186	170	237	a200	194	183	194	175
2	174	184	201	198	180	172	*248	a200	189	180	194	174
3	178	182	207	191	177	173	240	a200	189	181	192	173
4	182	184	213	194	180	174	230	a200	187	178	210	172
5	186	183	208	191	178	173	223	a200	187	176	212	169
6	177	189	202	188	177	174	220	a200	187	175	199	167
7	183	186	208	186	176	174	212	a200	186	175	194	167
8	198	*184	207	184	176	175	216	a200	187	191	189	166
9	191	181	202	184	176	174	228	a200	191	204	201	165
10	182	181	201	*183	174	178	244	195	184	192	218	165
11	178	181	199	182	178	186	239	198	183	191	205	164
12	177	182	198	182	173	183	230	199	182	191	208	*163
13	176	201	192	182	172	181	246	205	182	183	198	163
14	175	242	*196	183	173	181	276	207	182	182	192	164
15	177	244	194	196	b165	180	268	210	181	218	*188	a163
16	176	220	173	196	b165	180	259	205	188	213	188	a165
17	176	207	b180	195	171	181	261	201	202	194	187	a160
18	181	204	b190	199	171	180	255	196	189	196	a190	a165
19	*202	196	b190	194	171	186	251	195	184	216	a200	a170
20	202	195	b175	195	171	*191	244	195	181	213	a190	168
21	192	194	b175	188	171	191	233	198	180	240	a190	171
22	188	195	b175	183	171	189	228	195	180	270	a185	171
23	186	195	b175	183	170	189	221	*195	180	*274	180	173
24	210	191	b180	182	172	187	216	198	181	270	178	170
25	225	188	b180	184	170	183	213	196	182	237	176	167
26	210	194	b170	191	171	183	210	195	199	220	175	165
27	195	189	b170	184	*171	183	208	192	*192	210	174	164
28	189	195	b170	178	171	184	*207	196	183	205	172	164
29	187	192	b170	169	170	184	205	195	192	201	172	164
30	187	194	b170	188	-	188	202	192	189	201	172	164
31	187	-	b175	186	-	208	-	195	-	198	172	-
Total	5,803	5,840	5,844	5,809	5,027	5,635	6,970	6,153	5,593	6,358	5,895	5,013
Mean	187	195	189	187	173	182	232	198	186	205	190	167
Cfsm	1.18	1.23	1.19	1.18	1.09	1.14	1.46	1.25	1.17	1.29	1.19	1.05
In.	1.36	1.37	1.37	1.36	1.18	1.31	1.63	1.44	1.30	1.49	1.37	1.17

Calendar year 1951: Max 276 Min 150 Mean 184 Cfsm 1.16 In. 15.69
Water year 1951-52: Max 276 Min 160 Mean 191 Cfsm 1.20 In. 16.35

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of recorded range in stage, weather records, and records for station near Sherman.
b Stage-discharge relation affected by ice.

Manistee River near Sherman, Mich.

Location.--Lat 44°26'30", long. 85°41'45", on line between sec. 36, T. 24 N., R. 12 W., and sec. 31, T. 24 N., R. 11 W., near center of span on downstream side of bridge on State Highway 37, 150 ft upstream from Wheeler Creek, three-quarters of a mile north of Sherman, and at mile 60.8.

Drainage area.--900 sq mi.

Records available.--July 1903 to May 1916, November 1930 to June 1931, January 1934 to September 1952.

Gage.--Wire-weight gage read twice daily. Altitude of gage is 804 ft (from river-profile map). Prior to Apr. 13, 1934, chain gages at various datums. Apr. 13, 1934, to May 22, 1935, staff gage at present datum.

Average discharge.--30 years (1903-15, 1934-52), 1,082 cfs.

Extremes.--Maximum discharge during year, 2,360 cfs Apr. 14, 15; maximum gage height, 13.61 ft Apr. 14; minimum discharge, 840 cfs Sept. 12-14, 17, 29, 30.
1903-16, 1930-31, 1934-52: Maximum discharge observed, 3,500 cfs Mar. 25, 1913 (gage height, 7.0 ft datum then in use); minimum observed, 540 cfs Feb. 21-23, 1936 (backwater from ice).

Remarks.--Records good except those for periods of ice effect, which are fair.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 14		Apr. 15 to Sept. 30	
10.3	930	10.1	840
12.0	1,620	12.0	1,580
14.0	2,560	14.0	2,560

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,040	1,190	1,230	1,100	1,100	1,000	1,710	1,240	1,040	1,000	1,000	935
2	1,040	1,150	1,270	1,250	1,100	982	2,210	1,200	*1,000	970	1,000	935
3	1,040	1,110	1,350	1,200	1,110	965	2,210	1,160	1,000	935	1,000	900
4	1,070	1,110	1,400	1,190	1,110	1,000	2,160	1,160	1,000	935	1,200	900
5	1,110	1,070	1,400	1,190	1,150	1,040	2,020	1,160	1,000	900	1,320	900
6	1,040	1,040	1,350	1,150	*1,190	982	1,940	1,120	970	900	1,240	870
7	1,070	*1,070	1,400	1,150	1,070	948	1,800	1,120	970	870	1,160	870
8	1,190	1,070	1,400	1,110	982	948	1,760	1,120	970	*900	1,040	*870
9	*1,230	1,070	1,350	*1,110	1,040	1,000	1,940	*1,080	970	1,000	1,200	870
10	1,230	1,070	1,310	1,110	1,040	1,040	2,070	1,080	970	1,000	1,490	870
11	1,150	1,110	1,270	1,070	1,040	1,110	2,070	1,080	935	970	*1,360	870
12	1,110	1,150	*1,230	1,070	1,040	1,110	1,890	1,080	935	935	1,280	840
13	1,040	1,350	1,150	1,070	1,000	1,150	2,020	1,120	935	900	1,200	840
14	1,040	1,800	1,040	1,070	1,040	1,110	*2,310	1,120	935	970	1,120	840
15	1,000	1,980	1,100	1,270	1,040	1,070	2,360	1,200	935	1,160	1,080	870
16	1,000	1,980	1,200	1,350	1,000	1,070	2,310	1,200	935	1,240	1,040	870
17	1,000	1,890	1,100	1,350	1,040	1,040	2,210	1,160	970	1,240	1,000	840
18	1,040	1,710	1,100	1,480	1,040	1,040	2,160	1,160	1,000	1,280	1,000	870
19	1,150	1,480	1,100	1,440	1,040	1,110	2,060	1,120	970	1,280	1,040	870
20	1,270	1,350	1,100	1,350	1,000	1,230	2,010	1,080	935	1,240	1,000	870
21	1,270	1,310	1,100	1,270	1,040	1,350	1,910	1,080	935	1,360	1,000	870
22	1,270	1,310	1,100	1,230	1,040	1,440	1,760	1,080	900	1,440	970	870
23	1,230	1,270	1,100	1,200	1,040	1,400	1,720	1,080	900	1,960	935	900
24	1,350	1,230	1,100	1,250	1,000	1,310	1,620	1,080	900	2,060	935	900
25	1,660	1,190	1,050	1,400	1,000	1,230	1,440	1,080	935	1,720	935	900
26	1,660	1,190	1,000	1,400	1,000	1,190	1,400	1,040	970	1,490	900	870
27	1,660	1,150	1,000	1,350	1,000	1,190	1,360	1,040	970	1,320	900	870
28	1,530	1,150	1,000	1,250	1,000	1,190	1,320	1,080	1,000	1,240	900	870
29	1,400	1,150	1,000	1,150	1,000	1,230	1,280	1,040	1,080	1,160	900	840
30	1,270	1,190	1,000	1,100	-	1,350	1,240	1,040	1,040	1,080	900	840
31	1,230	-	1,000	1,100	-	*1,840	-	1,040	-	1,040	900	-
Total	37,390	38,890	36,300	37,780	30,292	35,665	56,270	34,440	29,005	36,495	32,945	26,230
Mean	1,206	1,296	1,171	1,219	1,045	1,150	1,876	1,111	967	1,177	1,063	874
Cfsm	1.34	1.44	1.30	1.35	1.16	1.28	2.08	1.23	1.07	1.31	1.18	0.971
In.	1.54	1.61	1.50	1.56	1.25	1.48	2.32	1.42	1.19	1.51	1.36	1.08

Calendar year 1951: Max 2,510 Min 840 Mean 1,173 Cfsm 1.30 In. 17.66
Water year 1951-52: Max 2,360 Min 840 Mean 1,180 Cfsm 1.31 In. 17.82

* Discharge measurement made on this day.
Note.---Stage-discharge relation affected by ice Dec. 15 to Jan. 3, Jan. 23 to Feb. 2.

East Branch Pine River near Tustin, Mich.

Location.--Lat 44°06'15", long. 85°31'30", in NW¼ sec. 28, T. 20 N., R. 10 W., on left bank 75 ft downstream from highway bridge, half a mile upstream from North Branch, 2¾ miles west of Tustin, and 5½ miles northwest of Le Roy.
Drainage area.--63 sq mi, approximately.
Records available.--July to September 1952.
Gage.--Water-stage recorder. Altitude of gage is 1,140 ft (by barometer).
Extremes.--Maximum discharge during period, 244 cfs July 23 (gage height, 4.10 ft); minimum, 6.8 cfs July 14.
Remarks.--Records good.

Rating tables, July 1 to Sept. 30, 1952 (gage height, in feet, and discharge, in cubic feet per second)

July 1-23				July 24 to Sept. 30	
1.6	5.5	2.4	48	1.6	7
1.8	11	3.0	106	1.8	11.5
2.0	20	4.0	230	2.0	20

Note.--Same as preceding table above 1.9 ft.

Discharge, in cubic feet per second, July to September 1952

Day	July	Aug.	Sept.	Day	July	Aug.	Sept.	Day	July	Aug.	Sept.
1	7.2	12	12	11	8.0	19	8.8	21	66	11	9.5
2	7.2	12	12	12	7.5	*18	8.8	22	41	9.8	10
3	7.5	11	11	13	7.2	14	8.6	23	*202	9.5	12
4	7.5	46	10	14	7.2	13	8.6	24	147	9.5	10
5	7.2	45	9.8	15	13	12	9.0	25	91	9.2	10
6	7.0	28	9.2	16	10	11	9.0	26	59	9.0	9.5
7	*7.0	18	9.2	17	8.3	11	8.8	27	35	9.0	9.0
8	9.8	14	9.0	18	22	10	12	28	*27	8.8	9.0
9	13	19	*9.0	19	24	9.8	10	29	21	8.8	8.6
10	8.9	27	8.8	20	31	10	9.8	30	16	9.0	8.6
								31	14	9.8	-
Total									939.5	463.2	289.6
Mean									30.3	14.9	9.65
Cfsm									0.481	0.237	0.153
In									0.55	0.27	0.17

* Discharge measurement made on this day.

Pine River near Le Roy, Mich.

Location.--Lat 44°03'50", long. 85°33'50", in SE¼ sec. 6, T. 19 N., R. 10 W., on right bank 15 ft downstream from highway bridge, 3½ miles downstream from East Branch, 5 miles northwest of Le Roy, and 5½ miles southwest of Tustin.
Drainage area.--118 sq mi.
Records available.--July to September 1952.
Gage.--Water-stage recorder. Altitude of gage is 1,040 ft (by barometer).
Extremes.--Maximum discharge during period, 630 cfs July 23 (gage height, 6.06 ft); minimum, 48 cfs July 7.
Remarks.--Records good except those for period of no gage-height record, which are fair.

Rating tables, July 1 to Sept. 30, 1952 (gage height, in feet, and discharge, in cubic feet per second)

July 1 to Aug. 30				Aug. 31 to Sept. 30	
1.4	47	4.0	303	1.7	50
2.5	137	6.0	613	1.8	54
				2.0	65

Discharge, in cubic feet per second, July to September 1952

Day	July	Aug.	Sept.	Day	July	Aug.	Sept.	Day	July	Aug.	Sept.
1	53	69	64	11	54	83	51	21	189	66	56
2	53	67	65	12	53	*90	51	22	169	62	56
3	a54	65	60	13	51	76	50	23	*505	62	65
4	a54	142	56	14	53	69	51	24	511	60	58
5	a52	146	54	15	77	66	54	25	264	60	57
6	a50	105	53	16	64	66	52	26	160	60	55
7	*a49	82	54	17	58	65	52	27	117	59	54
8	59	74	52	18	103	63	62	28	*102	58	54
9	74	83	*52	19	117	61	60	29	90	57	53
10	58	99	52	20	124	63	57	30	80	56	53
								31	73	54	-
Total									3,570	2,288	1,663
Mean									115	73.8	55.4
Cfsm									0.975	0.625	0.469
In									1.12	0.72	0.52

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records and records for East Branch Pine River near Tustin.

Low-flow investigation, Pine River near Cadillac, Mich.

An investigation of the low-flow characteristics of the upper Pine River watershed was made on Aug. 27, 1952, for the purpose of determining the base-flow yields of various parts of the basin. The Michigan Department of Conservation is carrying on intensive watershed and channel improvement work in this basin, one of the objectives being the improvement of trout propagation and fishing. Results of base-flow investigations such as this are used to determine which portions of the basin are most apt to be susceptible to successful improvement work and to later appraise the results of such improvements. This investigation and the records of gaging stations in and near the area were used in planning future work. No runoff-producing precipitation had occurred for at least a week prior to this investigation so the measurements are believed to represent essentially base flow.

The measurements on each stream are listed in order proceeding downstream and each measured tributary is inserted in the order in which it enters the main stream. Drainage areas shown were determined from county highway maps showing physical and cultural features but no contours.

Discharge measurements, Pine River basin near Cadillac, Mich.

Stream	Location	Drainage area in sq mi	Discharge in cfs	Cfs per sq mi
Sixteen Creek	NE¼ sec. 27, T. 21 N., R. 10 W., 2½ miles west of Hobart.	4.6	1.31	0.285
Do	NW¼ sec. 26, T. 21 N., R. 10 W., 2¼ miles west of Hobart.	8.2	2.48	.302
Do	SW¼ sec. 35, T. 21 N., R. 10 W., ¼ mile north of Wexford County line and 2½ miles southwest of Hobart.	22.7	9.52	.419
Do	SE¼ sec. 4, T. 20 N., R. 10 W., ¼ mile above Nigger Creek and 3½ miles southwest of Hobart.	26.0	11.0	.423
Nigger Creek	NW¼ sec. 19, T. 21 N., R. 10 W., 1¼ miles west of Axin and 5 miles above Pine River.	5.0	.98	.196
Do	SE¼SE¼ sec. 19, T. 21 N., R. 10 W., 1 mile south of Axin and 3¾ miles above Pine River.	7.6	3.22	.424
Do	NW¼ sec. 33, T. 21 N., R. 10 W., 2 miles above Pine River and 4 miles west of Hobart.	11.8	7.92	.671
North Branch Pine River	SW¼ sec. 4, T. 20 N., R. 10 W., ¼ mile below Nigger Creek and 3¾ miles northwest of Tustin.	42.8	20.2	.472
Do	SE¼SE¼ sec. 8, T. 20 N., R. 10 W., 1½ miles below Nigger Creek and 3¾ miles northwest of Tustin.	44.8	20.2	.451
Do	On line between secs. 20 and 29, T. 20 N., R. 10 W., ¼ mile above East Branch Pine River and 3¼ miles west of Tustin.	49.5	24.9	.503
East Branch Pine River	NW¼ sec. 14, T. 20 N., R. 10 W., ½ mile above Lake Outlet Creek and 2¼ miles northwest of Tustin.	15.0	1.07	.071
Lake Outlet Creek	SW¼ sec. 14, T. 20 N., R. 10 W., ½ mile above East Branch Pine River and 1½ miles northwest of Tustin.	42.7	3.08	.072
East Branch Pine River	NW¼ sec. 22, T. 20 N., R. 10 W., 1½ miles above gaging station near Tustin, 2 miles northwest of Tustin, and 2 miles above Pine River.	60.0	4.99	.832
Pine River	SW¼ sec. 29, T. 20 N., R. 10 W., ½ mile above Sprague Creek, 3 miles above gaging station near LeRoy, and 4 miles west of Tustin.	114	42.4	.372
Sprague Creek	E½ sec. 32, T. 20 N., R. 10 W., ¼ mile above Pine River and 4 miles southwest of Tustin.	2.6	1.54	.592
Pine River	On line between sec. 7, T. 19 N., R. 10 W., and sec. 12, T. 19 N., R. 11 W., 200 ft above Beaver Creek, 1 mile below gaging station near LeRoy, and 3¼ miles south of Bristol.	120	53.3	.444
Beaver Creek	NE¼ sec. 16, T. 19 N., R. 10 W., 2½ miles above Little Beaver Creek and 2½ miles west of LeRoy.	13.1	3.87	.295
Little Beaver Creek	N½ sec. 18, T. 19 N., R. 10 W., ½ mile above Beaver Creek and 4¾ miles west of LeRoy.	1.9	2.92	1.54
Beaver Creek	SW¼ sec. 7, T. 19 N., R. 10 W., ¼ mile below Little Beaver Creek and 4¾ miles west of LeRoy.	20.4	12.6	.618
Pine River	SE¼ sec. 2, T. 19 N., R. 11 W., 1 mile below Beaver Creek and 2¾ miles south of Bristol.	143	72.6	.508
Do	NE¼ sec. 3, T. 19 N., R. 11 W., 1¼ miles above Coe Creek and 2½ miles south of Bristol.	147	79.7	.542
Do	On line between sec. 33, T. 20 N., R. 11 W., and sec. 4, T. 19 N., R. 11 W., ½ mile above Coe Creek and 3 miles south of Bristol.	151	82.5	.546
Coe Creek	SE¼ sec. 36, T. 21 N., R. 11 W., ¼ mile above Olga Lake and 3½ miles southwest of Axin.	1.0	.10	.100
Do	NE¼ sec. 12, T. 20 N., R. 11 W., 2 miles above Dyers Creek and 2¾ miles north of Bristol.	4.4	.94	.214
Do	N½ sec. 19, T. 20 N., R. 10 W., 400 ft above Dyers Creek and 1¾ miles northeast of Bristol.	5.9	1.39	.236
Dyers Creek	SW¼ sec. 18, T. 20 N., R. 10 W., ½ mile above Coe Creek and 1½ miles northeast of Bristol.	3.9	1.79	.459
Coe Creek	S½ sec. 19, T. 20 N., R. 10 W., 1 mile below Dyers Creek and 1½ miles east of Bristol.	12.3	2.91	.237
Do	NW¼ sec. 36, T. 20 N., R. 11 W., 1¼ miles south of Bristol and 2¾ miles above Pine River.	14.5	3.68	.254

Low-flow investigation, Pine River near Cadillac, Mich.--Continued

Discharge measurements, Pine River basin near Cadillac, Mich.--Continued

Stream	Location	Drainage area in sq mi	Discharge in cfs	Cfs per sq mi
Coe Creek	NE¼NE¼ sec. 34, T. 20 N., R. 11 W., 1½ miles southwest of Bristol and 1½ miles above Pine River.	17.8	4.51	0.253
Pine River	SE¼ sec. 32, T. 20 N., R. 11 W., 1¼ miles below Coe Creek and 3½ miles southwest of Bristol.	173	109	.630
Coe Creek	NE¼ sec. 24, T. 20 N., R. 12 W., ½ mile above Silver Creek and 4¾ miles south of Hoxeyville.	183	133	.727
Silver Creek	SW¼ sec. 16, T. 20 N., R. 11 W., 2 miles above Pine River and 5¼ miles southeast of Hoxeyville.	5.0	1.56	.312
Do	SW¼SW¼ sec. 18, T. 20 N., R. 11 W., ¼ mile above Pine River and 4½ miles south of Hoxeyville.	9.6	4.31	.449
Pine River	NW¼ sec. 13, T. 20 N., R. 12 W., 1¼ miles below Silver Creek and 3¼ miles south of Hoxeyville.	198	127	.641
Do	SE¼ sec. 2, T. 20 N., R. 12 W., 200 ft above Elm Creek and 2 miles south of Hoxeyville.	203	148	.729
Elm Creek	SE¼ sec. 2, T. 20 N., R. 12 W., at mouth and 2 miles south of Hoxeyville.	2.3	3.38	1.47
Poplar Creek	NE¼ sec. 34, T. 21 N., R. 11 W., 4¾ miles east of Hoxeyville and 5½ miles north of Bristol.	2.3	.80	.348
Do	SW¼ sec. 27, T. 21 N., R. 11 W., 4 miles east of Hoxeyville and 5 ½ miles north of Bristol.	8.2	6.39	.779
Do	On line between secs. 28 and 29, T. 21 N., R. 11 W., 2¾ miles east of Hoxeyville.	10.3	10.1	.981
Do	NW¼ sec. 32, T. 21 N., R. 11 W., 2 miles east of Hoxeyville and 3 miles above Pine River.	17.1	13.7	.801
Do	E½ sec. 36, T. 21 N., R. 12 W., ½ mile southeast of Hoxeyville and 1½ miles above Pine River	19.1	15.8	.827
Do	NE¼ sec. 3, T. 20 N., R. 12 W., at mouth, 1½ miles southwest of Hoxeyville.	19.7	16.1	.817
Pine River	NE¼ sec. 3, T. 20 N., R. 12 W., 200 ft below Poplar Creek and 1½ miles southwest of Hoxeyville.	228	178	.781
Hoxey Creek	NW¼ sec. 36, T. 21 N., R. 12 W., at Hoxeyville 2 miles above Pine River.	4.2	2.51	.598
Pine River	SE¼SE¼ sec. 28, T. 21 N., R. 12 W., 2¼ miles west of Hoxeyville.	238	206	.866
Do	N½ sec. 28, T. 21 N., R. 12 W., 2½ miles above gaging station near Hoxeyville, and 3 miles west of Hoxeyville.	245	213	.869

Pine River near Hoxeyville, Mich.

Location.--Lat 44°12'10", long. 85°47'50", in NW¼ sec. 20, T. 21 N., R. 12 W., on right bank 500 ft upstream from State Highway 37 bridge, 4½ miles northwest of Hoxeyville, 7 miles east of Wellston, and 9 miles upstream from mouth.
Drainage area.--251 sq mi.
Records available.--July to September 1952.
Gage.--Water-stage recorder. Altitude of gage is 775 ft (by barometer).
Extremes.--Maximum discharge during period, 1,600 cfs July 23 (gage height, 5.59 ft); minimum, 202 cfs July 7.
Remarks.--Records good.

Discharge, in cubic feet per second, July to September 1952

Day	July	Aug.	Sept.	Day	July	Aug.	Sept.	Day	July	Aug.	Sept.
1	210	260	234	11	222	*292	214	21	412	245	222
2	210	255	240	12	220	288	214	22	412	236	224
3	218	252	234	13	218	280	214	23	993	228	232
4	218	310	224	14	222	265	214	24	970	224	230
5	212	390	218	15	250	258	216	25	725	220	224
6	206	*339	214	16	258	258	216	26	436	218	222
7	204	292	214	17	236	255	214	27	369	216	218
8	*228	275	*214	18	272	252	220	28	*321	214	218
9	248	280	214	19	363	245	232	29	302	214	220
10	238	300	214	20	348	245	226	30	285	216	220
								31	270	224	-
Total									10,296	8,046	6,630
Mean									332	260	221
Cfsm									1.32	1.04	0.880
In.									1.52	1.20	0.98

* Discharge measurement made on this day.

Manistee River near Manistee, Mich.

Location.--Lat 44°16'30", long. 86°11'55", in NW¼ sec. 36, T. 22 N., R. 16 W., on right bank 6 miles northeast of Manistee, 6½ miles south of Onekama, 9 miles upstream from Manistee Lake, and at mile 10.8.
Drainage area.--1,780 sq mi.
Records available.--November 1951 to September 1952.
Gage.--Water-stage recorder. Altitude of gage is 585 ft (from river-profile map).
Extremes.--Maximum discharge during period, 5,450 cfs Apr. 11 (gage height, 7.90 ft); maximum gage height, 8.29 ft Dec. 22 (ice jam); minimum daily discharge, 1,160 cfs June 15.
Remarks.--Records good except those for periods of ice effect or those below 1,200 cfs, which are fair.

Discharge measurements made prior to beginning of continuous discharge record

Date	Discharge (cfs)	Date	Discharge (cfs)
July 11, 1951	2,510	July 13, 1951	2,150
11	2,520	19	1,470
11	2,230	23	1,490
12	2,350	Oct. 25	2,920
12	1,690		

Discharge, in cubic feet per second, November 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		-	2,140	2,730	2,420	2,000	*b3,100	2,360	1,780	2,150	2,320	1,440
2		-	2,140	2,480	1,790	1,450	b4,000	2,590	1,490	2,170	1,910	1,910
3		-	2,140	3,210	2,000	1,570	b4,000	1,910	*2,080	1,970	1,400	2,020
4		-	2,480	2,620	2,210	1,860	b4,400	1,670	2,170	1,570	1,690	1,640
5		-	2,560	2,340	2,500	2,070	b4,200	1,700	2,060	1,400	2,520	1,680
6		-	2,650	2,340	2,210	1,930	b3,900	2,240	1,910	1,430	2,590	1,820
7		-	2,650	1,860	*2,420	2,070	3,640	*2,340	1,770	1,380	2,500	1,620
8		-	2,650	2,200	2,280	1,780	*3,640	2,410	1,320	1,940	2,250	1,280
9		-	2,740	2,080	2,420	1,620	3,460	2,190	1,680	1,950	2,170	1,630
10		-	2,200	*2,270	2,000	1,550	3,640	2,160	1,960	*1,710	2,300	*1,780
11		-	2,560	2,140	1,990	2,580	5,000	1,610	1,800	1,920	2,490	1,610
12		-	*2,330	1,860	1,930	2,350	4,580	1,680	1,960	1,970	2,690	1,680
13		-	2,340	1,540	2,210	*2,210	4,200	2,260	1,780	1,310	*2,500	1,890
14		2,950	2,140	2,020	2,070	2,350	4,580	2,350	1,960	1,270	2,340	1,260
15		3,840	1,910	2,740	2,070	2,280	*4,200	2,360	1,160	2,080	2,190	1,220
16		4,570	b1,500	2,270	2,000	1,860	5,000	2,410	1,470	2,380	2,100	1,660
17		5,000	b1,900	2,840	1,680	1,400	4,580	2,270	2,010	2,070	1,820	1,490
18		4,180	b2,000	2,950	1,530	1,910	4,200	1,560	1,880	2,630	1,550	1,650
19		2,950	b2,300	3,070	2,280	2,500	4,200	1,990	1,880	2,690	1,970	1,810
20		2,840	b2,500	2,990	2,140	2,990	3,880	2,130	1,780	1,740	1,980	1,500
21		3,380	b2,300	2,500	2,270	2,990	3,200	2,360	1,900	2,540	1,980	1,360
22		2,880	b2,600	2,580	1,790	3,460	3,460	2,280	1,280	2,860	1,990	1,350
23		2,080	b2,000	2,580	1,800	3,460	3,880	2,330	1,470	2,870	1,900	1,870
24		2,560	b2,500	2,420	1,400	2,480	3,320	2,280	1,900	3,410	1,280	1,750
25		2,650	b2,200	2,500	1,450	2,990	2,990	1,700	1,920	4,200	1,330	1,740
26		1,910	b2,700	2,500	1,930	2,740	2,820	1,620	2,000	5,000	1,810	1,690
27		2,270	b2,700	2,280	2,070	2,740	2,120	1,950	1,760	3,330	1,710	1,560
28		*2,270	b2,200	2,140	2,140	2,500	1,840	2,310	1,570	2,300	1,720	1,310
29		2,340	b1,900	2,500	1,860	2,470	2,640	2,130	1,390	2,400	1,840	1,340
30		2,080	b2,300	2,660	-	2,420	2,640	1,990	1,800	2,140	1,730	1,640
31		-	2,640	2,740	-	2,350	-	1,750	-	2,110	1,350	-
Total		-	72,070	75,950	58,860	70,930	111,310	64,890	52,890	70,890	61,920	48,200
Mean		-	2,325	2,450	2,030	2,288	3,710	2,093	1,763	2,287	1,997	1,607
Cfsm		-	1.31	1.38	1.14	1.29	2.08	1.18	0.990	1.28	1.12	0.903
In.		-	1.51	1.59	1.23	1.49	2.32	1.36	1.10	1.48	1.29	1.00

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

Boardman River near Mayfield, Mich.

Location.--Lat 44°38'35", long. 85°31'00", in NE¼ sec. 21, T. 26 N., R. 10 W., on right bank 25 ft downstream from Brown's Bridge, 300 ft downstream from Parker Creek, three-quarters of a mile downstream from Brown's Bridge dam, 1 mile northeast of Mayfield, 10 miles southeast of Traverse City, and 16 miles upstream from Boardman Lake.

Drainage area.--223 sq mi.

Records available.--June to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 760 ft (by barometer).

Extremes.--Maximum discharge during period, 612 cfs July 23 (gage height, 5.23 ft); minimum daily, 140 cfs Sept. 21.

Remarks.--Records good. Diurnal fluctuation caused by powerplant three-quarters of a mile upstream.

Rating table, June 20 to Sept. 30, 1952 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Sept. 20-30)

3.3	133
4.0	270
5.0	525

Discharge, in cubic feet per second, June to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							-		-	186	186	182
2					†169		†449		†236	193	202	181
3							-		-	197	163	189
4							-		-	171	212	168
5							-		-	169	220	198
6							-		-	182	190	167
7							-		-	180	183	167
8		†238					-		-	*211	183	*166
9				†160			-		†238	-	211	259	174
10							-		-	189	236	174
11							-		-	210	*204	162
12						†243	-		-	190	213	172
13			†240				-		-	163	211	173
14							†543		-	192	192	145
15							-		-	255	194	151
16							-		-	232	191	178
17							-		-	211	208	166
18							-		-	218	205	160
19							-		-	209	192	170
20							-		191	230	198	196
21							-		188	327	182	140
22							-		170	298	173	169
23							-		197	498	182	169
24							-		191	320	160	196
25							-		207	268	178	174
26							-		216	273	186	165
27							-		205	226	171	160
28							-		214	190	165	147
29							-		220	193	190	163
30					-		-		215	199	168	164
31		-			-		-		-	213	179	-
Total							-		-	7,036	5,976	5,086
Mean							-		-	227	193	170
Cfsm							-		-	1.02	0.865	0.762
In.							-		-	1.18	1.00	0.85

Calendar year	: Max	Min	Mean	Cfsm	In.	
Water year	: Max	Min	Mean	Cfsm	In.	

* Discharge measurement made on this day.
† Result of discharge measurement made on this day.

Sturgeon River near Wolverine, Mich.

Location.--Lat 45°17'25", long. 84°36'15", in SW¼ sec. 31, T. 34 N., R. 2 W., on left bank 1½ miles north of Wolverine, 2 miles downstream from West Branch, and 11 miles upstream from mouth.

Drainage area.--164 sq mi.

Records available.--April 1942 to September 1952.

Gage.--Staff gage read once daily. Altitude of gage is 750 ft (by barometer).

Average discharge.--10 years, 201 cfs.

Extremes.--Maximum discharge observed during year, 620 cfs Apr. 14 (gage height, 3.88 ft); minimum, 145 cfs Sept. 9-11.
1942-52: Maximum discharge, 919 cfs Apr. 1, 1943 (gage height, 5.45 ft); minimum, 118 cfs Aug. 22, 24, 1944.

Remarks.--Records good except those for periods of ice effect or doubtful or no gage-height record, which are fair.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 14		Apr. 15 to Sept. 30	
2.3	145	2.3	141
3.0	317	3.0	314
4.0	655	4.0	655

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	d225	211	231	200	208	177	515	199	185	194	159	a160
2	a210	201	247	230	208	177	515	194	180	194	163	172
3	d240	196	247	220	211	180	412	194	180	176	178	176
4	d290	196	241	215	206	180	301	190	180	163	172	167
5	d240	186	236	210	204	180	312	225	178	159	167	163
6	d230	186	236	205	201	175	306	240	172	155	163	155
7	d260	191	231	200	198	168	290	204	a160	155	163	155
8	340	194	224	201	196	160	312	199	a190	a170	159	148
9	290	201	221	198	201	168	340	197	359	a250	a170	145
10	211	196	214	194	198	190	372	194	256	a210	a190	145
11	196	a200	211	191	196	230	352	a220	190	240	230	145
12	191	*218	206	196	196	210	329	240	185	204	194	a150
13	186	532	200	194	195	190	a400	273	180	190	176	a150
14	182	446	190	*194	195	190	*620	230	176	*185	172	a170
15	182	409	180	200	185	190	439	251	172	320	163	*178
16	*177	415	190	200	186	190	*432	225	365	204	163	176
17	168	a300	195	200	182	*186	412	204	204	194	163	180
18	216	a250	195	200	*198	201	412	199	*204	209	159	176
19	263	214	*195	200	200	236	378	*194	176	225	*163	167
20	274	206	190	200	200	247	346	190	172	204	167	172
21	252	208	190	200	195	231	320	180	172	a400	167	163
22	236	211	190	200	191	216	290	a190	167	333	163	167
23	211	206	190	182	196	216	262	a190	163	a370	159	185
24	498	201	190	194	182	211	246	199	214	a270	159	176
25	a450	204	190	201	186	201	235	190	a250	a230	155	172
26	317	206	185	201	186	196	230	180	251	a200	152	167
27	226	182	185	206	182	191	220	185	214	185	152	163
28	221	206	185	200	182	221	212	194	220	172	155	161
29	211	201	185	200	179	239	204	190	a200	163	152	157
30	216	211	185	200	-	290	199	190	262	163	152	159
31	214	-	185	206	-	480	-	185	-	161	a150	-
Total	7,623	7,184	6,340	6,238	5,643	6,517	10,213	6,335	6,177	6,648	5,150	4,920
Mean	246	239	205	201	195	210	340	204	206	214	166	164
Cfsm	1.50	1.46	1.25	1.23	1.19	1.28	2.07	1.24	1.26	1.30	1.01	1.00
In.	1.73	1.63	1.44	1.42	1.28	1.48	2.31	1.43	1.41	1.50	1.16	1.12

Calendar year 1951: Max 532 Min 120 Mean 211 Cfsm 1.29 In. 17.44
Water year 1951-52: Max 620 Min 145 Mean 216 Cfsm 1.32 In. 17.91

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records, records for Pigeon River near Vanderbilt and Manistee River near Grayling.
d Doubtful gage-height record; discharge estimated on basis of weather records, records for Pigeon River near Vanderbilt and Manistee River near Grayling.
Note.--Stage-discharge relation affected by ice Dec. 13 to Jan. 7, Jan. 15-22, 28-30, Feb. 13-15, 19-21, Mar. 3-6, 10-16 (no gage-height record Dec. 22, 27, Mar. 13-16).

Indian River at Indian River, Mich.

Location.--Lat 45°24'35", long. 84°37'10", in SW¼ sec. 24, T. 35 N., R. 3 W., on left bank at Indian River, an eighth of a mile downstream from Burt Lake and 3½ miles upstream from Mullett Lake.

Drainage area.--583 sq mi.

Records available.--April 1942 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 590.21 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation). Prior to Nov. 12, 1943, staff gage at site 100 ft downstream at same datum.

Average discharge.--10 years, 568 cfs.

Extremes.--Maximum discharge during year, 1,050 cfs Apr. 22 (gage height, 5.32 ft); minimum daily, 401 cfs Sept. 30.
1942-52: Maximum discharge, 1,080 cfs Apr. 25, 1943 (gage height, 5.65 ft); minimum daily, 281 cfs Aug. 30, Sept. 2, 3, 1949.

Remarks.--Records fair.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	496	679	695	706	783	718	706	976	700	644	550	461
2	507	679	689	712	789	699	718	950	684	644	550	461
3	536	679	670	718	768	699	754	922	684	626	536	457
4	564	679	683	708	768	704	763	914	684	626	550	442
5	579	679	683	713	774	704	777	914	667	608	550	442
6	579	679	658	713	774	704	789	914	667	603	536	438
7	584	700	676	719	774	709	777	887	667	589	536	427
8	598	679	670	725	759	709	771	887	667	621	536	a420
9	598	700	670	731	780	696	781	861	667	621	550	423
10	584	700	646	737	759	713	819	861	672	603	550	423
11	584	700	664	737	785	733	812	861	654	598	550	423
12	603	*661	658	723	764	713	831	880	654	598	550	419
13	589	700	676	723	764	713	849	854	654	598	550	419
14	589	720	689	*729	770	718	925	854	654	*598	*550	419
15	589	739	689	771	749	718	917	854	660	598	536	*419
16	*589	784	682	a760	749	718	*946	831	*660	598	545	419
17	589	777	682	a760	754	*700	974	807	678	584	531	409
18	621	777	664	a760	*733	700	974	807	660	598	527	423
19	638	777	657	a760	716	700	992	*807	660	598	527	423
20	638	754	657	a760	721	718	1,020	784	642	584	522	423
21	638	733	*676	a750	721	718	1,020	784	624	584	522	427
22	661	754	676	a750	721	718	a1,000	784	624	598	503	427
23	661	748	682	a750	726	713	1,040	760	624	615	498	432
24	679	727	664	a750	708	713	1,040	760	637	615	487	421
25	700	727	670	a750	726	709	1,040	739	654	603	483	425
26	700	748	676	a800	732	704	1,040	720	654	603	478	425
27	679	720	670	a800	713	699	1,010	720	637	589	478	419
28	700	701	689	a800	713	694	1,010	720	631	589	463	408
29	679	701	695	a800	713	689	1,010	700	631	574	459	412
30	679	695	707	801	-	684	a1,000	700	649	574	459	401
31	700	-	700	783	-	698	-	700	-	564	465	-
Total	19,130	21,496	20,963	23,199	21,706	21,925	27,105	25,512	19,700	18,645	16,127	12,787
Mean	617	717	676	748	748	707	904	823	657	601	520	426
Cfsm	1.06	1.23	1.16	1.28	1.28	1.21	1.55	1.41	1.13	1.03	0.892	0.731
In.	1.22	1.37	1.34	1.48	1.38	1.40	1.73	1.63	1.26	1.19	1.03	0.82

Calendar year 1951: Max 910 Min 445 Mean 616 Cfsm 1.06 In. 14.35
Water year 1951-52: Max 1,040 Min 401 Mean 678 Cfsm 1.16 In. 15.85

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records, recorded range in stage, and records for Manistee River near Grayling.

Pigeon River near Vanderbilt, Mich.

Location.--Lat 45°10', long. 84°26', in SE¼ sec. 9, T. 32 N., R. 1 W., on right bank at Pigeon River Fisheries Experiment Station, 10 miles east of Vanderbilt and 10½ miles southeast of Wolverine.

Drainage area.--63 sq mi, approximately.

Records available.--September 1950 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 870 ft (by barometer).

Extremes.--Maximum discharge during year, 345 cfs Nov. 14 (gage height, 4.42 ft); minimum, 43 cfs Oct. 23.
1950-52: Maximum discharge, 345 cfs July 4, Nov. 14, 1951; maximum gage height, 4.42 ft Nov. 14, 1951; minimum discharge, 31 cfs Sept. 23, 1950.

Remarks.--Records good except those for periods of ice effect, which are fair. Occasional regulation by Lansing Club Dam 4 miles upstream.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.9	49
3.0	144
4.0	254

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	81	81	76	105	73	73	176	73	68	94	58	57
2	75	73	101	94	77	68	*195	68	67	61	58	59
3	92	70	99	86	77	67	162	75	64	68	58	60
4	104	79	97	85	75	68	126	69	58	60	67	59
5	84	63	94	80	75	66	112	81	64	56	92	59
6	79	70	77	77	74	65	109	106	63	56	59	56
7	83	78	92	75	73	64	106	77	62	57	63	55
8	130	79	99	71	72	64	107	71	63	86	59	54
9	111	71	88	70	72	71	130	75	107	144	67	53
10	84	78	82	73	72	77	158	74	90	110	80	53
11	74	85	75	72	75	100	144	70	67	79	63	52
12	75	85	73	72	71	101	117	92	68	75	67	52
13	67	*130	70	72	69	79	144	103	63	70	68	51
14	67	232	70	74	61	82	*246	101	58	*65	*66	53
15	66	205	70	104	58	66	180	82	75	183	60	*57
16	*65	135	70	112	60	72	162	95	*185	166	59	59
17	64	108	70	*104	60	*79	180	80	128	79	59	59
18	69	83	73	107	*60	67	176	70	81	94	59	59
19	144	77	*75	95	60	75	185	*71	77	110	59	61
20	148	75	75	93	60	87	171	71	66	83	59	63
21	92	75	75	78	62	93	*140	69	59	140	61	67
22	94	71	80	75	64	92	130	69	51	117	63	64
23	69	74	80	70	65	90	112	69	64	130	59	65
24	130	72	80	74	67	75	89	70	68	95	55	65
25	176	72	78	76	72	71	95	71	83	75	55	63
26	130	72	80	78	69	71	81	70	92	70	55	60
27	94	68	83	78	70	70	89	68	95	62	54	59
28	76	79	81	79	67	70	75	68	69	59	54	59
29	78	83	77	71	67	71	76	69	144	59	54	55
30	79	73	73	80	-	76	76	68	98	59	55	51
31	81	-	75	79	-	114	-	68	-	59	56	-
Total	2,861	2,696	2,488	2,559	1,977	2,384	4,049	2,363	2,403	2,721	1,901	1,739
Mean	92.3	89.9	80.3	82.5	68.2	76.9	135	76.2	80.1	87.8	61.3	58.0
Cfsm	1.47	1.43	1.27	1.21	1.08	1.22	2.14	1.21	1.27	1.39	0.973	0.921
In.	1.70	1.60	1.46	1.51	1.16	1.41	2.39	1.40	1.42	1.60	1.12	1.03

Calendar year 1951: Max 232 Min 51 Mean 81.9 Cfsm 1.30 In. 17.65
Water year 1951-52: Max 246 Min 51 Mean 82.4 Cfsm 1.31 In. 17.80

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 20, 21, 23-27, Dec. 14-29, Jan. 22-26, Feb. 10, 15-23, Mar. 5-8.

Pigeon River at Afton, Mich.

Location.--Lat 45°22'25", long. 84°30'50", in NE¼ sec. 2, T. 34 N., R. 2 W., on right upstream abutment of State Highway 68 bridge, three-quarters of a mile west of Afton, 2 miles downstream from Wilkes Creek, and 5½ miles upstream from Mullett Lake.

Drainage area.--159 sq mi.

Records available.--April 1942 to September 1952.

Gage.--Staff gage read twice daily. Altitude of gage is 675 ft (by barometer).

Average discharge.--10 years, 137 cfs.

Extremes.--Maximum discharge observed, 730 cfs Apr. 2 (gage height, 5.70 ft); minimum, 83 cfs Aug. 28, Sept. 8-14.
1942-52: Maximum daily discharge, 1,100 cfs Mar. 31, 1943; maximum gage height, about 10.5 ft Mar. 31, 1943, from floodmarks (ice jam); minimum discharge observed, 60 cfs Aug. 12, 1945.

Remarks.--Records good except those for periods of ice effect, which are fair.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 27				Mar. 28 to Sept. 30			
4.2	75	5.0	271	4.2	77	5.0	290
4.3	91	5.5	488	4.3	92	5.7	730
4.7	178	6.0	770	4.6	155		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	130	151	160	180	150	140	611	143	120	169	92	90
2	137	148	160	220	160	140	695	136	114	138	92	92
3	198	128	176	200	160	140	632	136	112	110	92	92
4	215	130	163	180	150	140	436	136	105	110	105	92
5	218	137	168	170	150	130	376	148	106	97	118	86
6	192	137	168	160	150	130	286	169	106	92	116	86
7	170	132	195	160	150	130	290	175	103	94	99	86
8	206	142	181	150	150	130	335	145	106	118	96	84
9	228	170	170	150	140	140	358	141	145	163	101	83
10	200	168	160	150	140	150	466	143	166	202	101	83
11	160	173	144	150	150	180	430	150	129	189	123	83
12	139	*166	130	150	150	200	340	166	110	163	118	83
13	128	247	124	150	140	200	541	196	106	150	108	83
14	122	453	115	*160	130	160	660	212	106	*110	*106	86
15	115	519	126	210	130	150	667	202	110	153	97	*99
16	*109	378	130	230	130	140	*604	172	*158	193	97	94
17	109	282	140	210	130	*140	527	166	236	218	97	92
18	122	257	140	220	*130	140	548	148	177	205	94	94
19	212	237	*150	200	130	150	514	*138	129	166	92	92
20	264	166	150	190	130	180	484	129	106	161	92	92
21	247	150	150	170	130	198	*406	127	106	169	94	92
22	170	150	150	160	130	206	320	118	96	218	94	94
23	158	140	150	140	130	192	278	123	99	250	92	96
24	200	140	150	150	135	181	229	123	110	218	92	99
25	301	135	140	150	140	151	199	123	136	172	92	99
26	301	128	150	160	140	158	193	114	148	129	92	94
27	237	89	150	160	140	151	169	120	129	114	92	92
28	189	120	150	160	140	155	166	123	123	105	83	89
29	151	130	140	150	140	177	155	118	196	101	89	89
30	153	150	130	160	-	226	143	129	250	99	89	89
31	158	-	140	160	-	388	-	127	-	97	89	89
Total	5,639	5,653	4,650	5,310	4,075	5,193	12,058	4,496	3,943	4,673	3,034	2,705
Mean	182	188	150	171	141	168	402	145	131	151	97.9	90.2
Cfsm	1.14	1.18	0.943	1.08	0.887	1.06	2.53	0.912	0.824	0.950	0.616	0.567
In.	1.31	1.32	1.09	1.24	0.96	1.22	2.82	1.05	0.92	1.10	0.71	0.63

Calendar year 1951: Max 560 Min 70 Mean 154 Cfsm 0.969 In. 13.12
Water year 1951-52: Max 695 Min 83 Mean 168 Cfsm 1.06 In. 14.37

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 21-25, 28-30, Dec. 16 to Mar. 20

Cheboygan River near Cheboygan, Mich.

Location.--Lat 45°34'40", long. 84°29'15", in SW¼ sec. 19, T. 37 N., R. 1 W., 300 ft downstream from Mullett Lake, 2½ miles upstream from Black River, and 5 miles south of Cheboygan.

Drainage area.--865 sq mi.

Records available.--November 1942 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 591.21 ft above mean sea level, datum of 1929. Auxiliary staff gage at Cheboygan 5 miles downstream read hourly. Datum of auxiliary gage is 590.00 ft above mean sea level, datum of 1929.

Average discharge.--10 years, 801 cfs.

Extremes.--Maximum daily discharge during year, 1,550 cfs Apr. 22; maximum daily gage height, 2.68 ft Apr. 22; minimum daily discharge, 359 cfs Sept. 2; minimum daily gage height, 1.44 ft Mar. 11.
1942-52: Maximum daily discharge, 1,590 cfs Apr. 16, 1943; maximum daily gage height, 3.18 ft Apr. 17, 1945, Apr. 11, 1948; minimum daily discharge, 100 cfs Nov. 3, 1949; minimum daily gage height, 1.17 ft Oct. 23, 27, 1946.

Remarks.--Records fair except those for periods of ice effect, no gage-height record, or indefinite fall, which are poor. Discharge computed using fall as determined from hourly readings of auxiliary staff gage as a factor. Flow affected by backwater from powerplant at Cheboygan.

Cooperation.--Auxiliary gage readings furnished by Consumers Power Co.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	819	a1,110	1,180	1,150	1,160	1,030	1,100	1,370	949	812	552	399
2	1,000	a1,090	1,130	1,150	1,160	a980	1,140	1,380	1,080	947	564	359
3	989	a1,050	1,140	1,130	1,150	a920	1,190	1,350	1,150	864	572	594
4	1,070	a1,000	1,180	1,160	1,160	930	1,210	1,370	955	718	688	612
5	1,020	a1,050	1,220	1,150	1,140	987	1,230	1,380	1,050	776	596	517
6	939	a1,100	1,190	1,150	1,140	a900	1,200	1,290	1,030	e640	610	555
7	956	a1,180	1,220	1,140	1,130	a900	1,230	1,230	890	778	720	446
8	1,020	1,120	1,200	1,150	1,130	a920	1,240	1,190	e850	813	569	555
9	1,050	1,110	1,190	1,150	1,130	a920	1,280	1,240	e800	774	e600	629
10	1,030	1,110	1,170	1,140	1,140	1,020	1,310	1,130	e880	746	e480	536
11	1,100	1,120	1,180	1,150	1,150	1,030	1,330	1,160	955	868	558	602
12	1,100	1,090	1,170	1,160	1,150	1,010	1,370	1,220	1,010	714	657	386
13	922	1,110	b1,050	1,140	1,130	984	1,390	1,310	908	607	*574	438
14	856	1,210	b900	1,150	1,080	952	1,420	1,210	836	687	592	501
15	847	1,240	b920	1,180	1,130	984	1,440	1,200	1,040	*665	540	516
16	867	1,300	b960	*1,180	1,080	993	1,450	1,190	1,150	667	504	*564
17	*840	1,330	b850	1,190	1,070	972	*1,500	1,210	*1,100	728	515	522
18	1,000	1,320	b900	1,200	1,020	*969	1,510	1,090	929	789	443	633
19	1,010	1,310	b920	1,160	*879	972	1,520	1,160	814	721	628	562
20	1,070	*1,320	*b920	1,190	634	889	1,520	*1,120	769	e540	668	560
21	1,050	1,310	b940	1,200	620	992	1,530	1,110	609	e720	764	415
22	1,100	1,320	b950	1,210	954	1,020	1,550	1,180	585	782	598	e520
23	1,090	1,320	b850	1,250	1,100	1,050	1,540	1,120	637	891	654	e700
24	1,080	1,290	b950	1,170	1,090	1,050	1,540	1,130	1,130	890	434	542
25	1,060	1,280	1,000	1,190	1,080	999	1,530	1,040	1,180	681	677	561
26	a1,120	1,190	1,010	1,220	907	1,040	1,510	1,080	1,090	635	624	598
27	a1,120	1,080	1,070	1,220	968	1,040	1,510	1,190	864	692	696	400
28	a1,100	e900	1,050	1,220	1,080	1,050	1,480	1,150	829	620	723	380
29	a1,100	e800	988	1,220	1,070	1,030	1,440	1,180	e800	639	598	433
30	a1,100	e1,000	939	1,210	-	1,030	1,410	1,060	923	534	386	524
31	a1,150	-	1,050	1,200	-	1,060	-	1,110	-	518	500	-
Total	31,575	34,860	32,387	36,480	30,632	30,623	41,620	37,150	27,792	22,456	18,284	15,559
Mean	1,019	1,162	1,045	1,177	1,056	988	1,387	1,198	926	724	590	519
Cfsm	1.18	1.34	1.21	1.36	1.22	1.14	1.60	1.38	1.07	0.837	0.682	0.600
In.	1.36	1.50	1.40	1.57	1.32	1.31	1.78	1.59	1.19	0.96	0.79	0.67

Calendar year 1951: Max 1,550 Min 326 Mean 942 Cfsm 1.09 In. 14.79
Water year 1951-52: Max 1,550 Min 359 Mean 982 Cfsm 1.14 In. 15.44

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records, gage-height record at auxiliary gage, and powerplant operation.
b Stage-discharge relation affected by ice.
e Indefinite fall; discharge estimated on basis of weather records and powerplant operation.

Black River near Tower, Mich.

Location.--Lat 45°24', long. 84°20', in NW¼ sec. 29, T. 35 N., R. 1 E., on right bank 400 ft downstream from Kleber Dam, 800 ft upstream from Milligan Creek, 3 miles northwest of Tower, and 8 miles upstream from Black Lake.

Drainage area.--313 sq mi.

Records available.--November 1942 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 658.00 ft above mean sea level (Stanley Engineering Co. benchmark). Prior to Aug. 1, 1949, at site 1 mile upstream at different datum.

Average discharge.--10 years, 254 cfs.

Extremes.--Maximum discharge during year, 1,200 cfs Apr. 19 (gage height, 5.34 ft); minimum, 3.9 cfs Mar. 19; minimum daily, 120 cfs Sept. 14.
1942-52: Maximum discharge, 1,660 cfs Apr. 1, 1943 (gage height, 5.30 ft), site and datum then in use); minimum, 0.6 cfs Mar. 11, 1950; minimum daily, 4.0 cfs Nov. 27, 1949.

Remarks.--Records good. Flow regulated by powerplants at Tower and Kleber Dam.

Rating tables, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 19		Apr. 20 to Sept. 30	
2.5	162	2.2	111
3.0	268	3.0	268
4.0	590	4.0	590
5.2	1,130	5.0	1,030

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	232	351	351	298	271	242	768	353	218	322	150	161
2	227	356	362	311	268	200	789	358	205	313	202	156
3	289	291	344	369	257	224	826	215	211	396	147	167
4	325	285	352	378	265	197	800	334	209	269	166	154
5	362	243	407	283	267	185	866	313	193	213	160	142
6	391	215	353	349	331	178	649	290	201	179	293	154
7	374	232	378	341	281	168	512	326	221	219	287	144
8	375	221	373	382	269	194	675	343	237	301	198	146
9	359	333	346	267	281	189	681	327	205	312	229	145
10	321	343	380	216	286	342	657	315	242	237	207	188
11	395	350	367	288	265	307	809	300	283	350	207	210
12	366	331	345	250	266	325	766	329	227	387	272	183
13	381	*421	211	281	321	327	763	321	230	395	313	141
14	302	776	189	314	289	312	995	426	239	383	191	120
15	230	584	188	*317	177	311	1,090	442	206	*356	203	139
16	223	698	247	323	173	325	1,080	362	213	323	217	136
17	234	730	218	346	280	275	1,060	428	*297	366	197	*150
18	*235	538	207	528	194	263	*925	352	493	375	215	148
19	338	479	209	389	199	*175	1,000	268	391	417	*227	168
20	372	421	215	267	*226	341	992	262	341	424	205	175
21	363	379	*260	374	224	315	906	*268	297	426	175	189
22	470	360	258	372	228	332	860	302	347	429	161	166
23	378	362	268	278	223	326	722	280	243	384	140	166
24	459	373	267	264	275	335	637	243	191	399	133	169
25	456	341	241	265	293	346	553	207	220	414	150	198
26	494	248	292	277	238	*324	492	209	245	424	141	213
27	541	269	293	267	242	361	399	210	231	432	174	213
28	539	232	289	340	196	330	470	222	276	414	180	153
29	449	293	295	302	190	377	376	227	281	296	166	148
30	441	305	279	281	-	329	356	287	306	199	182	149
31	299	-	251	269	-	575	-	270	-	139	152	-
Total	11,220	11,360	9,035	9,786	7,275	9,030	22,474	9,389	7,699	10,493	6,040	4,891
Mean	362	379	291	316	251	291	749	303	257	338	195	163
Cfsm	1.16	1.21	0.930	1.01	0.802	0.930	2.39	0.968	0.821	1.08	0.623	0.521
In.	1.34	1.35	1.07	1.16	0.86	1.07	2.67	1.12	0.92	1.24	0.72	0.58

Calendar year 1951: Max 1,220 Min 122 Mean 305 Cfsm 0.974 In. 13.25
Water year 1951-52: Max 1,090 Min 120 Mean 324 Cfsm 1.04 In. 14.10

* Discharge measurement made on this day.

Rainy River near Onaway, Mich.

Location.--Lat 45°21'25", long. 84°10'00", in SW¼ sec. 2, T. 34 N., R. 2 E., on left bank 50 ft upstream from bridge on State Highway 68, 1½ miles downstream from Little Rainy River, and 3 miles east of Onaway.

Drainage area.--79 sq mi, approximately.

Records available.--January 1942 to September 1952.

Gage.--Staff gage read once daily. Datum of gage is 747.77 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation).

Average discharge.--10 years, 24.8 cfs.

Extremes.--Maximum discharge, 388 cfs Apr. 15, 17-19; maximum gage height, 4.80 ft Apr. 18; minimum daily discharge, 0.8 cfs Sept. 12, 13.
1942-52: Maximum discharge observed, 668 cfs Apr. 1, 1943 (gage height, 5.55 ft); no flow Aug. 24-28, 1949.

Remarks.--Records fair.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 14		Nov. 15 to Sept. 30			
2.6	14	2.1	0.8	3.0	47
2.9	35	2.2	2.1	3.4	89
3.1	53	2.3	4.2	4.0	194
3.5	103	2.4	7.0	4.8	388
4.0	194	2.6	17		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	18	40	50	27	47	23	288	71	17	5.9	16	2.1
2	20	38	55	33	47	23	288	52	13	5.9	16	2.1
3	21	35	60	43	45	24	278	52	12	6.4	16	2.1
4	23	30	63	49	45	26	278	47	12	5.9	16	1.8
5	33	25	61	49	43	24	274	42	13	6.4	15	1.8
6	45	23	60	49	45	23	274	40	12	6.4	15	1.8
7	54	22	54	47	45	23	278	40	12	7.0	13	1.6
8	70	22	48	47	44	23	274	40	11	7.0	13	1.3
9	90	22	44	45	44	24	269	40	11	7.8	16	1.3
10	120	23	40	42	43	26	288	41	10	8.6	13	1.0
11	130	30	35	38	40	27	307	42	8.6	8.6	12	1.0
12	110	60	30	36	37	30	302	42	9.4	47	12	.8
13	80	*97	28	33	34	33	324	43	7.8	43	11	.8
14	65	110	27	32	32	33	349	43	7.0	42	11	1.0
15	50	105	30	*32	31	35	388	45	6.4	38	10	1.3
16	38	100	35	33	29	33	*375	47	6.4	*35	10	1.3
17	32	90	40	35	26	32	388	47	*5.3	30	8.6	*1.3
18	*29	80	35	35	25	32	388	42	5.3	27	7.0	1.0
19	32	75	30	36	24	*30	388	38	4.8	24	*7.0	1.3
20	34	68	27	35	*24	32	362	32	4.8	24	5.9	1.0
21	38	62	*26	35	24	33	278	*30	4.2	23	5.9	1.3
22	45	55	28	35	24	33	194	27	4.8	23	4.8	1.3
23	50	50	30	36	24	35	192	27	4.8	22	4.2	1.6
24	55	47	30	36	23	36	190	24	5.9	23	3.7	1.6
25	65	45	30	35	23	38	190	24	5.3	23	3.3	1.3
26	90	43	29	36	23	47	181	23	5.3	22	2.9	1.6
27	110	43	29	47	23	60	172	23	5.3	21	2.7	1.6
28	100	43	27	47	23	71	160	22	5.9	19	2.5	1.6
29	80	44	27	49	23	79	134	21	5.9	18	2.3	1.3
30	60	47	27	49	-	194	103	21	5.9	17	2.2	1.3
31	47	-	26	49	-	264	-	19	-	17	2.2	-
Total	1,834	1,574	1,161	1,230	960	1,446	8,154	1,147	242.1	613.9	280.2	42.2
Mean	59.2	52.5	37.5	39.7	33.1	46.6	272	37.0	8.07	19.8	9.04	1.41
Cfsm	0.749	0.665	0.475	0.503	0.419	0.590	3.44	0.468	0.102	0.251	0.114	0.018
In.	0.86	0.74	0.55	0.58	0.45	0.68	3.84	0.54	0.11	0.29	0.13	0.02

Calendar year 1951: Max 324 Min 3.0 Mean 40.2 Cfsm 0.509 In. 6.92
Water year 1951-52: Max 388 Min 0.8 Mean 51.1 Cfsm 0.647 In. 8.79

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Feb. 8-29. No gage-height record Oct. 1-17, Oct. 19 to Nov. 12, Nov. 14 to Dec. 20, Dec. 22, Apr. 23, May 6-10, June 1-7, July 27-29, July 31 to Aug. 2, Aug. 24 to Sept. 16, Sept. 18-30; discharge estimated on basis of discharge measurements, weather records, and records for North Branch Tunder Bay River near Bolton.

Black River near Cheboygan, Mich.

Location.--Lat 45°30'00", long. 84°19'24", in sec. 21, T. 36 N., R. 1 E., on left bank half a mile downstream from Black Lake, 5½ miles upstream from Alverno Dam, and 12 miles southeast of Cheboygan.

Drainage area--597 sq mi.

Records available.--November 1942 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 609.26 ft above mean sea level, datum of 1929. Auxiliary water-stage recorder 3 miles downstream at same datum.

Average discharge.--10 years, 419 cfs.

Extremes.--Maximum daily discharge during year, 2,260 cfs Apr. 19; minimum daily, 62 cfs Sept. 14.
1942-52: Maximum daily discharge, that of Apr. 19, 1952; minimum daily, 11 cfs Aug. 14, 1949.

Remarks.--Records fair except those for periods of no gage-height record or period of indefinite stage-discharge relation, which are poor. Flow affected during most of the time by backwater from powerplant at Alverno Dam.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	426	820	557	579	a650	486	715	1,490	142	500	515	210
2	482	791	541	614	a600	476	848	1,390	402	500	478	160
3	351	810	578	634	a650	474	984	1,290	376	501	91	140
4	499	712	534	652	561	483	1,090	1,240	357	529	382	160
5	592	752	544	623	656	466	1,300	1,020	350	517	402	220
6	617	746	551	604	560	463	1,410	918	398	85	397	220
7	611	a750	586	570	575	475	1,400	806	472	376	154	80
8	608	a780	a680	585	539	478	1,400	661	116	509	297	160
9	618	636	a140	599	634	487	1,460	604	395	490	308	160
10	626	632	a580	628	617	487	1,570	593	417	506	122	160
11	635	595	a580	614	625	545	1,560	556	387	452	300	160
12	638	724	a580	613	596	556	1,670	488	355	385	318	160
13	616	692	a580	591	592	548	1,740	519	373	89	*300	160
14	546	714	a580	577	581	539	1,760	455	444	446	300	62
15	558	782	a520	*580	579	556	1,950	595	82	*472	290	187
16	535	968	a160	524	520	555	2,090	601	386	508	200	*265
17	*555	1,010	a520	528	527	567	*2,110	552	403	504	90	262
18	540	1,060	a500	596	438	*536	2,210	141	*395	514	280	270
19	594	1,050	a500	678	*425	536	2,260	563	343	543	280	273
20	604	*1,010	*a500	701	453	542	2,210	*527	364	124	340	251
21	588	949	480	687	463	552	2,170	593	357	677	280	101
22	638	860	559	722	486	574	2,240	579	91	566	280	410
23	620	820	132	748	492	586	2,150	547	354	608	200	605
24	601	773	468	642	490	617	2,090	609	433	652	80	205
25	801	764	574	641	471	603	2,050	321	419	617	150	284
26	832	750	565	643	458	606	1,950	472	443	743	160	223
27	869	704	573	638	467	604	1,880	396	443	656	160	263
28	840	688	571	652	493	602	1,740	424	467	755	150	88
29	830	a650	591	647	494	615	1,670	402	78	630	150	225
30	825	554	139	a630	-	620	1,570	417	485	626	150	227
31	852	-	482	a630	-	669	-	464	-	576	70	-
Total	19,547	23,546	15,445	19,370	15,692	16,903	51,247	20,251	10,547	15,656	7,674	6,351
Mean	631	785	498	625	541	545	1,708	653	352	505	248	212
Cfsm	1.06	1.31	0.834	1.05	0.906	0.913	2.86	1.09	0.590	0.846	0.415	0.355
In.	1.22	1.46	0.96	1.21	0.98	1.05	3.19	1.26	0.66	0.98	0.48	0.40

Calendar year 1951: Max 1,920 Min 62 Mean 551 Cfsm 0.923 In. 12.52
Water year 1951-52: Max 2,260 Min 62 Mean 607 Cfsm 1.02 In. 13.85

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records and records of powerplant operation at Alverno Dam.
Note.--Stage-discharge relation indefinite Aug. 13 to Sept. 14; discharge estimated on basis of gage readings and powerplant operation at Alverno Dam.

Thunder Bay River near Hillman, Mich.

Location.--Lat 45°00'30", long. 83°58'15", on line between secs. 8 and 9, T. 30 N., R. 4 E., on left bank 25 ft upstream from bridge on State Highway 32, a quarter of a mile downstream from Miller Creek, and 5 miles southwest of Hillman.

Drainage area.--232 sq mi.

Records available.--June 1945 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 760 ft (by barometer).

Average discharge.--7 years, 211 cfs.

Extremes.--Maximum discharge during year, 1,140 cfs Apr. 14 (gage height, 8.51 ft); minimum, 142 cfs Sept. 14.
1945-52: Maximum discharge, 1,380 cfs Apr. 12, 1947 (gage height, 8.86 ft); minimum daily, 98 cfs Aug. 7, 1949.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Occasional regulation by dam at Atlanta. Prior to May 12, 1950, diurnal fluctuation by powerplant at Atlanta.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 10-15)

4.6	146	7.0	500
5.0	183	8.0	870
6.0	314	9.0	1,440

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	200	219	232	250	270	180	*672	252	212	200	168	173
2	*188	212	245	250	270	180	799	226	200	183	168	178
3	206	206	258	250	270	210	635	226	178	173	163	173
4	212	200	*271	250	*270	*200	540	245	168	168	219	163
5	206	*200	271	240	270	200	476	*271	178	158	*292	158
6	206	190	258	230	250	210	434	285	178	154	238	154
7	212	180	258	*230	220	210	434	264	158	150	212	150
8	314	200	245	230	220	210	454	258	168	*173	206	*150
9	299	230	238	240	220	230	513	232	285	232	183	150
10	292	210	232	240	220	250	600	212	245	206	178	146
11	271	220	232	220	210	300	540	226	*200	219	183	146
12	232	238	212	250	190	250	476	278	163	226	232	146
13	206	314	210	240	190	220	540	306	158	200	200	146
14	173	476	190	210	180	200	1,050	292	158	178	178	146
15	173	454	180	220	200	190	*799	278	173	406	173	163
16	173	407	210	210	220	180	692	299	299	465	173	163
17	173	372	230	220	200	180	653	278	306	390	168	173
18	178	322	260	250	200	180	617	238	278	364	163	183
19	252	285	280	250	180	190	569	219	226	306	163	173
20	285	250	290	280	200	230	513	232	200	271	158	158
21	264	250	300	330	200	260	465	245	173	589	158	158
22	245	230	300	300	200	280	425	212	168	526	158	163
23	226	230	310	290	200	260	398	194	163	465	154	163
24	338	220	320	290	200	250	356	206	163	416	154	163
25	425	240	330	350	180	240	322	212	178	322	150	158
26	398	250	350	350	190	230	306	226	200	271	150	154
27	338	200	340	330	190	220	271	219	194	238	146	154
28	292	210	320	300	190	220	258	194	163	200	146	154
29	264	210	300	270	190	230	278	178	219	178	146	150
30	245	226	290	290	-	280	278	183	226	173	150	150
31	232	-	270	270	-	400	-	188	-	168	154	-
Total	7,718	7,651	8,232	8,130	6,190	7,070	15,363	7,374	5,978	8,368	5,484	4,759
Mean	249	255	266	262	213	228	512	238	199	270	177	159
Cfsm	1.07	1.10	1.15	1.13	0.918	0.983	2.21	1.03	0.858	1.16	0.763	0.685
In.	1.23	1.23	1.33	1.30	0.99	1.13	2.47	1.19	0.96	1.34	0.88	0.76

Calendar year 1951: Max 712 Min 120 Mean 237 Cfsm 1.02 In. 13.90
Water year 1951-52: Max 1,050 Min 146 Mean 252 Cfsm 1.09 In. 14.81

Peak discharge (base, 600 cfs).--Apr. 2 (4 to 6 a.m.) 822 cfs (7.90 ft); Apr. 10 (3 to 5 p.m.) 617 cfs (7.40 ft); Apr. 14 (9 a.m.) 1,140 cfs (8.51 ft); July 21 (7 to 8 p.m.) 799 cfs (7.84 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 6-11, 20-29, Dec. 13 to Mar. 31 (no gage-height record Dec. 16 to Jan. 7; discharge estimated on basis of weather records, 1 discharge measurement, recorded range in stage, and records for station near Bolton).

Upper South Branch Thunder Bay River near Lachine, Mich.

Location.--Lat 45°03'30", long. 83°47'00", on line between secs. 23 and 26, T. 31 N., R. 5 E., on left bank 50 ft upstream from bridge on State Highway 32, 1 mile upstream from mouth, 3½ miles downstream from Fletcher Pond, and 3½ miles southwest of Lachine.

Drainage area.--171 sq mi.

Records available.--March 1945 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 711.80 ft above mean sea level, datum of 1929. Prior to June 24, 1945, staff gage at same site and datum.

Average discharge.--7 years, 108 cfs.

Extremes.--Maximum daily discharge during year, 400 cfs Sept. 10-12; maximum gage height, 4.35 ft Apr. 15 (backwater from Thunder Bay River); minimum daily discharge, 17 cfs Nov. 5.

1945-52: Maximum daily discharge, 450 cfs Mar. 15, 1946; maximum gage height, 4.60 ft Apr. 12, 1947 (backwater from Thunder Bay River); minimum daily discharge, 0.7 cfs Nov. 21, 1949.

Remarks.--Records good except those below 25 cfs, or those for periods of ice effect or no gage-height record, or for periods of backwater from Thunder Bay River, which are fair. Flow regulated by Fletcher Pond (usable capacity, 1,750,000,000 cu ft).

Rating table, water year 1951-52, except periods of ice effect and backwater from Thunder Bay River (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-13)

1.6	15
1.8	33
2.1	72
3.0	238
4.0	446

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	145	20	161	258	156	248	*65	30	174	172	130	300
2	*123	20	147	258	159	238	90	31	184	152	165	260
3	87	19	129	250	161	232	80	31	338	a140	170	220
4	89	19	*132	246	*169	*234	68	75	308	a125	170	220
5	91	*17	127	240	169	236	54	*130	238	120	*180	220
6	93	58	129	232	167	242	40	127	236	120	220	220
7	102	120	125	*208	165	246	30	127	232	148	225	260
8	60	156	123	178	159	a250	37	132	220	*178	220	*340
9	35	224	120	156	159	a250	50	136	193	178	210	370
10	23	178	120	154	157	a250	70	136	138	186	190	400
11	21	116	118	152	156	a230	58	136	*136	161	180	400
12	21	87	121	154	154	a200	54	138	132	127	175	400
13	20	50	a150	154	154	157	64	143	105	120	172	390
14	20	25	a250	152	154	161	80	141	79	121	165	380
15	19	20	a270	b155	148	165	96	127	77	114	165	330
16	19	20	a290	b160	145	154	90	118	75	100	165	252
17	20	20	a300	b160	148	150	80	121	72	a85	165	246
18	20	21	a300	b160	147	141	70	118	70	a75	165	252
19	25	50	a300	b160	145	87	60	123	69	a60	175	250
20	22	110	a300	b160	145	26	56	116	68	a48	200	246
21	21	120	a300	b160	145	20	50	112	72	a45	230	240
22	21	121	a300	169	145	19	47	105	72	43	270	238
23	21	121	a280	163	143	18	43	84	72	42	310	238
24	28	118	a270	165	169	18	41	84	98	42	320	234
25	50	118	a260	163	201	18	40	84	127	42	320	230
26	52	121	a260	b160	222	18	39	82	127	42	320	230
27	35	157	260	b160	258	18	37	80	127	42	320	226
28	25	154	260	b160	256	20	34	79	150	43	320	224
29	23	165	260	b160	250	24	31	77	176	42	320	220
30	21	170	260	157	-	30	30	77	180	42	320	218
31	21	-	252	154	-	40	-	116	-	64	320	-
Total	1,373	2,715	6,674	5,518	4,906	4,140	1,684	3,216	4,345	3,019	6,977	8,254
Mean	44.3	90.5	215	178	169	134	56.1	104	145	97.4	225	275
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 446 Min 12 Mean 135 Cfsm - In. -
Water year 1951-52: Max 400 Min 17 Mean 144 Cfsm - In. -

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records, gate operation at Fletcher Pond, and records for Thunder Bay River near Hillman and Bolton.
b Stage-discharge relation affected by ice.
Note.--Stage-discharge relation affected by backwater from Thunder Bay River Oct. 24-28, Nov. 13-21, Dec. 27-30, Mar. 21-26, Mar. 28 to Apr. 30, July 16, 22-26, Aug. 2-12, Aug. 18 to Sept. 15; discharge computed on basis of 3 discharge measurements, record of gate operation at Fletcher Pond, and records for Thunder Bay River near Hillman and Bolton.

Thunder Bay River near Bolton, Mich.

Location.--Lat 45°07'40", long. 83°38'30", in NE¼ sec. 36, T. 32 N., R. 6 E., on left bank half a mile upstream from Orchard Hill bridge, 4 miles upstream from North Branch Thunder Bay River, 5 miles southwest of Bolton, and 11 miles northwest of Alpena.

Drainage area.--588 sq mi.

Records available.--March 1945 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 670 ft (by barometer). Prior to Aug. 12, 1945, staff gage at site 500 ft downstream at different datum.

Average discharge.--7 years, 450 cfs.

Extremes.--Maximum discharge during year, 2,710 cfs Apr. 15 (gage height, 8.27 ft); minimum, 237 cfs July 31.
1945-52: Maximum discharge, 3,690 cfs Mar. 15, 1946 (gage height, 8.78 ft); maximum gage height, 9.08 ft Mar. 21, 1948 (backwater from ice); minimum discharge, 96 cfs Nov. 27, 1949.

Remarks.--Records good except those for periods of ice effect, which are fair. Diurnal fluctuation caused by powerplant at Hillman and regulation by Fletcher Pond on the Upper South Branch Thunder Bay River (usable capacity, 1,750,000,000 cu ft).

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Dec. 27		Dec. 28 to Sept. 30			
3.6	301	3.4	263	6.0	1,290
4.0	403	4.0	415	7.0	1,860
5.0	778	5.0	805	9.0	3,250
6.0	1,250				

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	403	433	549	800	660	540	1,740	409	443	468	299	540
2	448	403	588	780	620	530	*2,300	354	422	436	320	560
3	*389	375	608	760	590	530	2,430	340	560	357	382	520
4	403	362	650	740	570	530	2,100	357	620	357	422	468
5	418	337	*650	720	*560	*530	1,620	468	502	340	485	443
6	418	*337	650	700	550	530	1,140	*502	468	334	*600	440
7	418	337	608	690	540	540	990	520	485	310	580	502
8	588	362	608	*690	530	550	1,120	485	468	*388	540	502
9	671	588	568	690	520	620	1,340	485	502	406	520	*560
10	671	650	530	690	510	660	1,680	450	520	502	468	580
11	608	512	512	690	510	660	1,740	443	468	502	422	580
12	568	512	479	660	520	630	1,620	443	*415	432	443	580
13	479	629	448	720	470	560	1,510	560	350	412	450	560
14	418	910	440	660	450	520	2,160	580	308	422	391	580
15	375	1,180	450	700	440	520	*2,640	580	301	440	363	560
16	337	1,250	480	740	450	500	2,500	540	342	600	363	468
17	313	1,100	520	790	450	490	2,040	580	446	700	352	412
18	325	888	600	830	460	480	1,740	468	432	600	368	440
19	362	756	640	880	450	480	1,510	468	412	520	400	450
20	463	671	680	900	450	490	1,290	422	344	446	468	440
21	495	978	720	880	450	520	1,140	385	320	485	468	422
22	479	910	760	840	450	580	1,020	418	310	640	468	391
23	433	588	800	810	450	630	895	379	278	760	502	422
24	588	549	820	800	460	630	782	347	272	720	540	412
25	821	629	860	810	480	600	680	357	340	640	540	403
26	932	629	870	820	500	570	620	352	371	485	540	409
27	910	671	880	820	520	560	580	368	377	397	540	394
28	778	756	880	800	530	600	502	365	368	350	540	382
29	650	588	870	780	540	700	397	350	422	313	540	371
30	530	629	860	740	-	918	450	327	485	265	520	377
31	479	-	850	700	-	1,240	-	330	-	267	520	-
Total	16,170	19,519	20,428	23,630	14,680	18,438	42,276	13,432	12,351	14,294	14,354	14,168
Mean	522	651	659	762	506	595	1,409	433	412	461	463	472
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 1,940 Min 250 Mean 546 Cfsm - In. -
Water year 1951-52: Max 2,640 Min 265 Mean 611 Cfsm - In. -

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 14 to Mar. 28.

North Branch Thunder Bay River near Bolton, Mich.

Location.--Lat 45°08'55", long. 83°36'35", in sec. 29, T. 32 N., R. 7 E., on left bank 1½ miles upstream from mouth, 2½ miles south of Bolton, and 9 miles northwest of Alpena.

Drainage area.--184 sq mi.

Records available.--March 1945 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 675 ft (by barometer). Prior to Aug. 16, 1945, staff gage at site half a mile upstream at different datum.

Average discharge.--7 years, 105 cfs.

Extremes.--Maximum discharge during year, 1,520 cfs Apr. 16 (gage height, 6.07 ft); minimum, 9.8 cfs Sept. 21, 22.
1945-52: Maximum discharge, 2,330 cfs Apr. 13, 1947 (gage height, 7.00 ft), from rating curve extended above 1,370 cfs; maximum gage height, 7.98 ft Mar. 31, 1950 (ice jam); minimum discharge, 1.4 cfs Oct. 4, 1948.

Remarks.--Records good except those for periods of ice effect, which are fair.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.8	11	3.8	154
2.9	17	4.5	405
3.1	35	5.0	680
3.5	90	6.0	1,440

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	73	180	127	130	150	62	350	136	57	36	54	19
2	73	183	149	130	140	62	*920	118	42	48	48	19
3	*77	168	180	135	120	62	1,310	118	41	45	35	20
4	103	163	225	140	130	65	1,390	112	43	40	33	21
5	142	132	*278	145	*140	*65	1,070	112	50	35	37	20
6	205	*121	256	150	130	65	794	*108	47	32	*41	25
7	232	97	246	150	120	65	700	104	43	32	42	22
8	300	103	218	*150	120	64	641	97	46	37	46	17
9	371	103	193	150	120	62	738	94	39	*41	45	*15
10	538	106	183	150	120	62	822	94	39	39	42	15
11	573	121	168	140	110	67	871	94	41	45	37	14
12	432	139	139	130	100	70	992	88	*52	43	39	13
13	315	222	120	130	90	70	955	92	47	48	41	12
14	253	376	150	130	85	70	1,030	99	41	50	43	12
15	222	787	170	140	85	65	1,310	112	40	64	47	12
16	177	955	200	150	80	65	1,440	123	30	87	46	11
17	144	738	170	160	75	70	1,390	123	40	94	50	11
18	134	538	150	190	68	75	1,220	121	39	101	41	11
19	152	397	130	220	72	85	1,070	112	41	110	41	11
20	157	308	120	250	72	95	920	103	43	94	37	11
21	177	225	125	260	75	110	745	95	39	85	33	10
22	229	189	135	260	72	120	538	84	36	80	30	10
23	229	170	135	260	68	110	460	77	32	85	27	10
24	260	160	145	230	65	100	363	76	33	95	24	11
25	300	150	140	210	62	100	315	74	37	104	23	11
26	414	140	135	200	62	110	278	71	36	106	23	11
27	516	130	130	180	65	120	239	70	36	95	22	12
28	470	120	130	180	65	120	209	68	37	82	20	11
29	363	139	130	150	65	110	186	67	42	71	19	12
30	274	121	130	150	-	120	166	66	35	63	19	13
31	209	-	130	160	-	180	-	64	-	56	19	-
Total	8,114	7,481	5,037	5,310	2,726	2,666	23,432	2,972	1,233	2,043	1,104	422
Mean	262	249	162	171	94.0	86.0	781	95.9	41.1	65.9	35.6	14.1
Cfsm	1.42	1.35	0.880	0.929	0.511	0.467	4.24	0.521	0.223	0.358	0.193	0.077
In.	1.64	1.51	1.01	1.07	0.55	0.54	4.73	0.60	0.25	0.41	0.22	0.09

Calendar year 1951: Max 1,220 Min 23 Mean 164 Cfsm 0.891 In. 12.06
Water year 1951-52: Max 1,440 Min 10 Mean 171 Cfsm 0.929 In. 12.62

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 23-28, Dec. 13 to Apr. 1.

Lower South Branch Thunder Bay River near Hibbard Lake, Mich.

Location.--Lat 44°51'35", long. 83°35'40", in NE¼ sec. 4, T. 28 N., R. 7 E., on right bank 50 ft downstream from Hubbard Lake, 1 mile south of town of Hubbard Lake, and 8½ miles upstream from Wolf Creek.

Drainage area.--146 sq mi.

Records available.--August 1945 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 701.08 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation).

Average discharge.--7 years, 103 cfs.

Extremes.--Maximum daily discharge during year, 660 cfs Apr. 18; minimum daily, 13 cfs Apr. 5.
1945-52: Maximum daily discharge, that of Apr. 18, 1952; no flow May 25-27, 30, 31, 1949.

Remarks.--Records good. Flow regulated at Hubbard Lake (usable capacity, 1,310,000,000 cu ft).

Rating table, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Nov. 15, Feb. 26 to Mar. 19, Aug. 31 to Sept. 30)

3.8	13	4.4	85
4.0	27	4.9	230
4.2	49	6.1	680

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	130	23	156	177	177	296	*23	77	132	206	162	240
2	*130	23	106	174	177	279	23	71	164	171	180	192
3	130	23	77	174	177	296	24	124	304	153	195	165
4	112	23	*73	174	*177	*335	20	189	244	153	198	195
5	102	*48	69	177	177	335	13	*212	220	153	*212	206
6	100	102	69	177	177	349	14	180	226	156	216	195
7	66	135	69	*174	174	384	14	153	220	186	223	189
8	26	159	67	174	174	384	14	153	230	*216	223	*237
9	21	180	67	174	177	374	15	153	168	223	195	265
10	21	117	67	174	174	370	17	150	122	220	174	254
11	22	75	67	171	174	346	18	153	*122	144	171	248
12	22	45	71	174	174	310	18	153	102	95	171	240
13	22	19	81	174	174	304	129	156	43	95	174	237
14	22	19	115	174	177	230	402	153	43	95	168	234
15	22	18	132	177	177	174	540	153	44	67	174	230
16	21	19	150	174	174	177	600	153	43	44	174	226
17	21	20	186	177	171	177	640	150	43	31	189	146
18	21	20	212	180	180	145	660	138	44	26	198	95
19	21	74	230	177	186	68	640	112	44	43	220	95
20	21	118	234	183	180	16	580	112	43	28	226	92
21	21	118	237	180	186	18	540	112	43	43	254	92
22	21	125	220	180	183	21	500	112	79	79	262	95
23	21	130	180	183	183	21	460	112	138	141	282	95
24	22	130	180	183	209	21	318	108	153	141	293	95
25	22	125	180	180	223	22	150	105	168	177	286	92
26	22	138	180	183	276	23	90	102	177	195	276	95
27	22	165	177	183	314	23	81	100	174	192	272	92
28	22	162	171	183	314	23	88	90	186	186	272	92
29	21	162	171	180	310	22	85	90	195	162	258	92
30	22	159	174	180	-	22	83	88	202	147	248	90
31	22	-	174	177	-	22	-	112	-	150	244	-
Total	1,291	2,674	4,342	5,502	5,726	5,587	6,799	4,026	4,116	4,118	6,790	4,911
Mean	41.6	89.1	140	177	197	180	227	130	137	133	219	164
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 425 Min 18 Mean 133 Cfsm - In. -
Water year 1951-52: Max 660 Min 13 Mean 153 Cfsm - In. -

* Discharge measurement made on this day.

Middle Branch Au Sable River at Grayling, Mich.

Location.--Lat 44°39'35", long. 84°42'45", in SE¼ sec. 7, T. 26 N., R. 3 W., on right bank 65 ft upstream from bridge on U. S. Highway 27 at Grayling, and three-quarters of a mile upstream from East Branch.

Drainage area.--110 sq mi.

Records available.--November 1942 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 1,123.49 ft above mean sea level, datum of 1929.

Average discharge.--10 years, 77.8 cfs.

Extremes.--Maximum discharge during year, 189 cfs Apr. 14 (gage height, 2.39 ft); minimum, 33 cfs June 27.
1942-52: Maximum discharge, 274 cfs June 2, 1943 (gage height, 3.00 ft); minimum, 28 cfs Apr. 21, 1946.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Diurnal fluctuation caused by powerplant 2.5 miles upstream.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.1	44
2.0	141
3.0	268

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	74	93	90	90	85	71	*137	89	60	78	76	68
2	73	84	88	89	93	59	159	88	52	73	75	67
3	76	a82	88	84	89	70	153	93	67	65	71	66
4	77	a82	97	77	85	81	140	82	71	64	89	72
5	77	a80	97	84	87	66	137	83	66	63	103	73
6	81	a78	92	84	86	61	128	88	67	62	89	65
7	89	a78	99	65	84	66	115	83	70	61	81	65
8	95	*a78	102	73	80	70	118	83	70	72	75	66
9	97	87	98	74	81	72	126	84	66	95	88	64
10	89	93	85	*76	76	77	142	86	64	94	94	64
11	82	86	86	68	82	81	142	84	64	84	90	63
12	73	77	86	80	83	82	137	81	63	84	88	*61
13	76	102	*78	76	76	80	146	86	63	83	88	57
14	76	152	68	68	67	72	183	89	65	75	82	57
15	65	171	a68	69	65	76	177	95	63	105	*75	67
16	62	148	a70	94	83	71	165	92	62	114	72	63
17	70	115	a74	96	84	70	171	90	82	102	71	62
18	73	114	a74	99	65	66	171	83	77	93	75	65
19	*97	98	a70	90	68	76	171	78	76	103	68	62
20	105	95	a70	85	68	*84	153	73	73	114	67	63
21	96	87	a70	94	77	88	129	76	85	136	66	65
22	85	97	b70	84	76	88	124	73	68	153	65	70
23	84	90	b72	75	80	87	112	*75	64	*142	62	74
24	112	94	b72	72	73	81	106	93	140	139	63	68
25	139	78	b72	93	63	*73	102	95	100	125	62	67
26	130	73	b72	96	63	75	102	93	46	110	63	67
27	112	81	a70	86	*78	75	97	85	*51	96	60	59
28	98	78	a70	78	70	72	93	83	75	88	59	63
29	87	89	b70	77	72	78	92	80	93	87	60	63
30	89	94	74	72	-	77	88	71	88	83	60	60
31	88	-	77	83	-	94	-	58	-	80	63	-
Total	2,727	2,854	2,469	2,551	2,239	2,339	4,016	2,592	2,171	2,923	2,300	1,946
Mean	88.0	95.1	79.6	82.3	77.2	75.5	134	83.6	72.4	94.3	74.2	64.9
Cfsm	0.800	0.865	0.724	0.748	0.702	0.686	1.22	0.760	0.658	0.857	0.675	0.590
In.	0.92	0.97	0.83	0.86	0.76	0.79	1.36	0.88	0.73	0.99	0.78	0.66

Calendar year 1951: Max 177 Min 45 Mean 78.8 Cfsm 0.716 In. 9.71
Water year 1951-52: Max 183 Min 46 Mean 85.0 Cfsm 0.773 In. 10.53

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records and records for Manistee River near Grayling and Sherman.
b Stage-discharge relation affected by ice.

Au Sable River at Mio, Mich.

Location.--Lat 44°39'35", long. 84°07'30", on line between sec. 7, T. 26 N., R. 3 E., and sec. 12, T. 26 N., R. 2 E., on right bank 150 ft upstream from State Highway 33 bridge at Mio, 10 miles downstream from Big Creek, and 80 miles upstream from mouth.

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

Records available.--July to September 1952.

Gage.--Water-stage recorder. Datum of gage is 929.60 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during period, 2,980 cfs Aug. 5 (gage height, 5.16 ft); minimum daily, 742 cfs Sept. 14.

Remarks.--Records good.

Rating table, July 9 to Sept. 30, 1952 (gage height, in feet, and discharge, in cubic feet per second)

2.7	740
3.0	900
4.0	1,700
5.0	2,800

Discharge, in cubic feet per second, July to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							†1,790			-	910	834
2										-	894	890
3										-	962	1,010
4										-	1,140	944
5										-	1,270	789
6										-	1,170	786
7										-	1,120	850
8										-	1,060	901
9										944	916	748
10										1,100	1,140	925
11										*898	1,100	867
12										842	*1,080	848
13										930	1,080	812
14										926	1,000	742
15										1,100	996	946
16									†679	1,280	928	876
17										1,200	910	850
18										1,040	1,100	838
19										1,220	943	894
20										1,190	858	818
21										1,740	1,020	948
22								†2,370		1,780	879	875
23										1,980	799	*765
24									†1,170	1,860	853	964
25										1,550	913	922
26					†948					1,200	812	830
27										1,240	910	796
28							†2,360			1,020	903	837
29							-			1,090	786	851
30				†796	-		-			946	762	862
31					-		-		-	994	988	-
Total										-	30,202	25,818
Mean										-	974	861
Cfsm										-	0.885	0.783
In.										-	1.02	0.87

Calendar year : Max Min Mean Cfsm In.
Water year : Max Min Mean Cfsm In.

* Discharge measurement made on this day.
† Result of discharge measurement made on this day.
Note.--Additional discharge measurements made prior to 1952 water year are as follows: May 16, 1951 (1,110 cfs); Aug. 23, 1951 (923 cfs); Sept. 20, 1951 (837 cfs).

Au Gres River near National City, Mich.

Location.--Lat 44°10'45", long. 83°44'15", in NW¼ sec. 32, T. 21 N., R. 6 E., on left bank 20 ft downstream from highway bridge, 1½ miles upstream from Elm Creek, 4 miles southwest of National City, 12½ miles southwest of Tawas City, and 15½ miles upstream from mouth.

Drainage area.--169 sq mi.

Records available.--November 1950 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 710 ft (by barometer). Prior to Oct. 1, 1951, wire-weight gage 1.7 miles upstream at different datum.

Extremes.--Maximum daily discharge during year, 1,600 cfs Apr. 14; minimum discharge, 9.4 cfs July 7, 8.
1950-52: Maximum daily discharge, that of Apr. 14, 1952; minimum, that of July 7, 8, 1952.

Remarks.--Records good except those for periods of ice effect, which are fair.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 22		Mar. 23 to July 21		July 22 to Sept. 30	
1.5	24	1.2	13	1.2	16
1.7	40	2.0	97	2.0	102
2.0	79	3.0	231	2.5	162
4.0	401	4.5	501	3.0	231
5.0	616	6.0	890	4.0	401
7.0	1,210	9.0	1,990		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	36	94	90	100	140	55	1,180	137	39	16	23	230
2	29	96	105	100	140	55	1,010	125	34	14	31	162
3	28	74	121	90	150	55	650	119	34	14	75	91
4	28	70	140	90	160	55	491	104	39	13	133	59
5	28	73	168	90	180	55	421	102	32	11	108	43
6	26	96	142	90	150	55	431	95	30	10	59	34
7	38	90	158	90	130	55	461	105	26	9.4	43	30
8	94	80	181	90	110	55	628	117	24	10	34	27
9	73	75	162	90	90	60	639	101	24	22	34	26
10	73	75	150	90	80	100	570	64	20	18	62	31
11	64	80	136	90	80	130	524	61	19	20	44	26
12	55	97	124	90	75	150	431	113	18	17	47	32
13	49	324	120	90	70	180	a800	109	19	13	*37	21
14	38	481	110	90	65	200	a1,600	76	19	12	31	20
15	30	324	100	100	60	200	*a900	83	19	76	28	21
16	40	231	100	110	55	190	582	66	18	34	28	20
17	37	180	100	130	55	160	431	53	27	22	28	19
18	67	150	95	145	55	180	367	48	*26	89	91	27
19	84	110	80	160	55	300	324	44	21	110	50	31
20	72	105	90	170	55	550	290	41	18	62	35	26
21	55	105	90	170	55	700	265	42	18	282	32	25
22	52	105	90	160	55	1,000	248	38	19	*121	28	*25
23	*51	110	90	*150	55	800	231	39	18	276	24	30
24	367	110	90	140	55	600	*193	84	19	214	24	30
25	308	100	90	140	*55	*500	165	72	18	96	23	27
26	198	110	90	140	55	450	138	55	18	77	22	24
27	156	110	*90	140	55	420	156	*44	15	55	20	22
28	128	120	90	140	55	500	158	50	14	42	20	21
29	109	100	100	140	55	570	151	51	21	37	19	20
30	97	*90	100	140	-	755	145	47	22	31	20	20
31	91	-	100	140	-	*a1,350	-	42	-	26	80	-
Total	2,601	3,965	3,492	3,695	2,450	10,485	14,580	2,327	688	1,849.4	1,333	1,220
Mean	83.9	132	113	119	84.5	338	486	75.1	22.9	59.7	43.0	40.7
Cfsm	0.496	0.781	0.669	0.704	0.500	2.00	2.88	0.444	0.136	0.353	0.254	0.241
In.	0.57	0.87	0.77	0.81	0.54	2.31	3.21	0.51	0.15	0.41	0.29	0.27

Calendar year 1951: Max 1,390 Min 17 Mean 119 Cfsm 0.713 In. 9.69
Water year 1951-52: Max 1,600 Min 9.4 Mean 133 Cfsm 0.787 In. 10.71

Peak discharge (base, 600 cfs).--Mar. 22 (7:30 a.m.), discharge unknown; Mar. 31 (time and discharge unknown); Apr. 8 (11 a.m.) 650 cfs (5.17 ft); Apr. 14 (time and discharge unknown).
* Discharge measurement made on this day.
a No gage-height record; discharge based on weather records and records for East Branch Au Gres River at McIvor and Rifle River near Sterling.
Note.--Stage-discharge relation affected by ice Nov. 7-11, Nov. 19 to Dec. 2, Dec. 13 to Mar. 28 (no gage-height record Jan. 18-20, Feb. 5-7).

East Branch Au Gres River at McIvor, Mich.

Location.--Lat 44°14'20", long. 83°41'50", on line between secs. 3 and 10, T. 21 N., R. 6 E., on right bank 25 ft downstream from highway bridge at McIvor, 1.1 miles east of National City, and 9 miles southwest of Tawas City.

Drainage area.--84 sq mi, approximately.

Records available.--November 1950 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 646.58 ft above mean sea level, datum of 1929. Prior to Aug. 30, 1951, wire-weight gage 25 ft upstream at same datum.

Extremes.--Maximum discharge during year, 865 cfs Apr. 14 (gage height, 7.67 ft); minimum, 32 cfs Sept. 28.
1950-52: Maximum discharge, that of Apr. 14, 1952; minimum, 23 cfs Nov. 24, 1950.

Remarks.--Records good except those for period of ice effect, which are fair.

Rating tables, water year 1951-52, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 14		Apr. 15 to Sept. 30	
1.6	37	1.5	33
2.5	103	2.5	103
4.0	254	4.0	254
5.0	380	5.0	380
7.0	728	7.0	728

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	48	54	59	65	70	50	493	107	70	41	38	78
2	43	52	63	65	70	50	352	107	66	41	49	82
3	43	50	66	60	70	50	242	103	65	41	66	61
4	45	50	78	60	80	50	186	101	64	40	103	48
5	43	53	78	65	90	50	165	111	62	37	76	43
6	39	61	73	60	85	50	165	113	62	37	58	41
7	59	53	83	60	80	50	170	101	57	37	49	39
8	74	52	76	60	70	50	219	98	56	38	45	39
9	54	48	73	60	70	50	302	95	55	43	49	38
10	48	49	68	60	65	55	284	95	52	40	59	38
11	45	50	64	60	60	80	230	93	52	41	49	38
12	42	59	59	60	60	84	186	93	50	38	50	37
13	40	145	60	60	55	91	438	90	50	37	*45	37
14	40	192	60	65	60	89	*690	86	50	43	41	37
15	38	132	60	75	65	91	380	107	49	78	40	38
16	36	103	60	75	60	86	296	91	49	50	39	39
17	46	89	60	85	60	76	254	85	60	44	39	39
18	55	78	55	95	60	85	224	81	*51	93	50	46
19	68	70	50	95	60	111	214	78	50	89	41	44
20	55	70	55	80	55	197	192	78	47	77	39	42
21	53	73	60	70	60	358	170	78	48	107	39	41
22	51	61	60	65	55	410	160	73	47	*68	37	*40
23	*53	66	60	65	55	260	150	78	46	82	36	41
24	145	59	60	*65	50	197	*140	102	46	64	36	40
25	107	58	60	65	*50	*160	136	93	45	50	35	39
26	87	61	60	65	50	150	132	81	44	46	35	37
27	76	72	*60	60	50	136	127	*75	43	42	35	37
28	68	71	60	60	50	150	123	81	42	47	35	36
29	62	57	65	65	50	214	119	74	47	44	35	37
30	59	*55	65	65	-	296	111	71	44	40	37	37
31	57	-	65	65	-	*459	-	70	-	38	51	-
Total	1,779	2,143	1,977	2,075	1,815	4,285	7,050	2,789	1,569	1,613	1,436	1,289
Mean	57.4	71.4	63.8	66.9	62.6	138	235	90.0	52.3	52.0	46.3	43.0
Cfsm	0.683	0.850	0.760	0.796	0.745	1.64	2.80	1.07	0.623	0.619	0.551	0.512
In.	0.79	0.95	0.88	0.92	0.80	1.89	3.12	1.23	0.70	0.71	0.64	0.57

Calendar year 1951: Max 527 Min 30 Mean 74.3 Cfsm 0.885 In. 12.01
Water year 1951-52: Max 690 Min 35 Mean 81.5 Cfsm 0.970 In. 13.20

Peak discharge (base, 300 cfs).--Mar. 22 (4 to 5 a.m.) 527 cfs (5.91 ft); Apr. 1 (6 a.m.) 527 cfs (5.87 ft); Apr. 9 (6 a.m.) 339 cfs (4.71 ft); Apr. 14 (2:30 a.m.) 865 cfs (7.67 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 13 to Mar. 9.

Houghton Creek near Lupton, Mich.

Location.--Lat 44°23'50", long. 84°02'55", in SE¼ sec. 10, T. 23 N., R. 3 E., on right bank half a mile upstream from mouth, 3 miles downstream from Wilkins Creek, and 3 miles southwest of Lupton.

Drainage area.--27 sq mi, approximately.

Records available.--July 1950 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 860 ft (by barometer).

Extremes.--Maximum discharge during year, 460 cfs Apr. 14 (gage height, 5.82 ft); minimum, 29 cfs Mar. 8, July 6, 8.
1950-52: Maximum discharge, that of Apr. 14, 1952; minimum, 29 cfs Mar. 8, July 6, 8, 1952.

Remarks.--Records good except those for periods of ice effect, which are fair.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 24-26)

2.2	31
3.0	96
5.0	281
5.3	330

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	46	51	50	61	57	48	*281	51	46	35	36	53
2	44	49	56	58	68	44	*251	47	43	36	44	47
3	47	46	60	56	65	48	*164	49	45	34	47	41
4	47	43	123	50	81	48	123	44	40	31	71	37
5	51	50	89	51	*85	45	102	57	41	36	51	41
6	43	39	66	49	65	49	91	51	40	31	41	37
7	56	50	82	49	55	45	108	49	41	35	*42	37
8	73	42	67	53	55	47	132	45	36	36	38	43
9	47	47	60	46	53	43	136	45	42	*39	45	40
10	45	51	57	50	53	*49	136	44	37	35	46	37
11	49	47	51	50	56	67	102	45	39	33	42	34
12	46	54	52	51	46	72	84	48	36	35	44	*38
13	39	128	49	47	50	78	196	48	*39	34	42	36
14	43	190	47	48	52	67	330	43	38	35	38	36
15	43	97	42	98	47	62	172	54	37	39	42	43
16	46	67	42	83	48	56	123	47	42	36	38	36
17	47	58	b42	76	47	56	108	47	42	35	36	39
18	43	53	b42	112	47	71	96	38	36	51	47	42
19	*55	*49	*b42	83	51	76	84	43	39	44	40	39
20	47	43	b42	66	46	128	71	48	39	39	37	38
21	53	43	b43	59	46	172	66	*41	34	55	42	37
22	56	46	b44	58	43	190	65	40	37	39	39	36
23	48	51	b44	57	43	118	*55	44	39	52	37	41
24	*114	46	b42	59	43	93	59	55	36	42	39	36
25	*105	45	b42	62	45	75	53	47	36	37	37	39
26	58	46	b42	54	46	79	52	48	32	38	39	36
27	55	46	b42	51	45	71	51	41	35	35	36	32
28	52	46	b43	b51	47	73	52	42	37	43	41	35
29	51	46	b44	b52	44	91	51	40	36	42	37	35
30	50	46	b45	b52	-	141	49	39	36	39	36	37
31	54	-	48	b53	-	226	-	43	-	36	45	-
Total	1,652	1,715	1,640	1,845	1,529	2,528	3,443	1,423	1,156	1,187	1,295	1,158
Mean	53.3	57.2	52.9	59.5	52.7	81.5	115	45.9	38.5	38.3	41.8	38.6
Cfsm	1.97	2.12	1.96	2.20	1.95	3.02	4.26	1.70	1.43	1.42	1.55	1.43
In.	2.27	2.36	2.26	2.54	2.10	3.48	4.75	1.96	1.60	1.64	1.79	1.60

Calendar year 1951: Max 294 Min 33 Mean 56.1 Cfsm 2.08 In. 28.21
Water year 1951-52: Max 330 Min 31 Mean 56.2 Cfsm 2.08 In. 28.35

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

Rifle River at "The Ranch" near Lupton, Mich.

Location.--Lat 44°23'35", long. 84°02'15", in SW¼ sec. 11, T. 23 N., R. 3 E., on left bank a quarter of a mile downstream from Houghton Creek and 3 miles southwest of Lupton.

Drainage area.--54 sq mi, approximately.

Records available.--July 1950 to September 1952.

Gage.--Water-stage recorder and wooden control. Altitude of gage is 850 ft (by barometer).

Extremes.--Maximum discharge during year, 550 cfs Apr. 14 (gage height, 9.67 ft); minimum, 54 cfs Sept. 30.
1950-52: Maximum discharge, that of Apr. 14, 1952; minimum, 54 cfs Sept. 30, 1952.

Remarks.--Records good except those for periods of ice effect, which are fair.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Sept. 16-30)

Oct. 1 to Dec. 28		Dec. 29 to Sept. 30	
6.7	64	6.3	57
7.0	79	6.5	63
7.5	126	7.0	91
8.0	186	8.0	186
9.0	246	9.0	320
		9.6	525

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	75	80	81	104	101	84	455	86	79	64	65	89
2	70	77	92	101	118	78	*435	84	75	65	79	81
3	74	74	100	98	118	84	302	89	78	63	89	71
4	72	70	168	90	132	86	240	81	74	61	114	65
5	77	72	140	92	*132	80	198	95	74	64	98	68
6	71	66	115	91	118	84	180	91	71	61	83	65
7	86	78	131	90	106	80	180	86	71	63	*80	64
8	120	71	115	95	106	80	204	83	66	*65	72	67
9	83	79	107	88	101	80	222	81	71	70	80	68
10	75	85	101	90	100	*87	228	80	66	64	85	67
11	76	76	90	90	100	114	192	82	67	62	77	67
12	71	84	86	90	88	123	162	84	65	63	79	*74
13	66	174	76	86	90	123	282	84	*68	62	74	68
14	70	272	72	89	94	114	525	80	66	63	68	66
15	69	186	72	136	85	110	330	94	65	71	71	73
16	70	144	b75	132	88	100	252	87	71	66	68	63
17	71	116	b75	128	85	100	216	85	75	67	65	65
18	70	102	b75	156	85	114	192	73	67	93	89	69
19	*72	*89	*b75	128	87	123	168	75	71	88	74	66
20	65	77	b75	118	83	174	146	81	70	80	68	64
21	74	74	b75	110	84	228	132	*77	64	102	72	63
22	83	78	b75	110	81	265	123	77	68	81	68	63
23	79	85	b75	110	81	204	*110	79	69	100	65	66
24	198	77	b75	114	81	174	110	94	66	84	66	63
25	*198	72	b75	114	81	146	102	89	66	73	65	63
26	138	76	b72	104	84	146	97	87	62	70	66	62
27	112	74	b74	102	82	132	93	77	65	65	63	58
28	100	74	b76	101	85	132	93	76	66	78	67	61
29	93	75	b80	b100	81	146	89	74	66	75	63	58
30	88	77	87	b100	-	204	85	73	67	69	62	57
31	85	-	89	b100	-	311	-	76	-	66	75	-
Total	2,751	2,834	2,774	3,257	2,757	4,106	6,143	2,560	2,069	2,218	2,310	1,994
Mean	88.7	94.5	89.5	105	95.1	132	205	82.6	69.0	71.5	74.5	66.5
Cfsm	1.64	1.75	1.66	1.94	1.76	2.44	3.80	1.53	1.28	1.32	1.38	1.23
In.	1.89	1.95	1.91	2.24	1.90	2.81	4.24	1.76	1.43	1.52	1.59	1.37

Calendar year 1951: Max 445 Min 57 Mean 97.3 Cfsm 1.80 In. 24.47
Water year 1951-52: Max 525 Min 57 Mean 97.7 Cfsm 1.81 In. 24.61

Peak discharge (base, 250 cfs).--Nov. 14 (11:30 a.m.) 286 cfs (8.82 ft); Mar. 22 (6:30 to 9 a.m.) 286 cfs (8.81 ft); Apr. 2 (3 to 6 a.m.) 475 cfs (9.49 ft); Apr. 14 (1 to 4 a.m.) 550 cfs (9.67 ft).
* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

Prior Creek near Selkirk, Mich.

Location.--Lat 44°20'10", long. 84°04'00", in SE¼ sec. 33, T. 23 N., R. 3 E., on right bank a quarter of a mile upstream from mouth, half a mile downstream from Ammond Creek, and 1½ miles north of Selkirk.

Drainage area.--19 sq mi, approximately.

Records available.--September 1950 to September 1952.

Gage.-Water-stage recorder. Altitude of gage is 840 ft (by barometer).

Extremes.--Maximum discharge during year, 155 cfs Apr. 13 (gage height, 4.97 ft); minimum, 5.0 cfs July 14.
1950-52: Maximum discharge, that of Apr. 13, 1952; minimum, 3.8 cfs Sept. 10, 1950.

Remarks.--Records fair except those for periods of ice effect, or discharge above 80 cfs, which are poor.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Nov. 18)

Oct. 1 to Apr. 13		Apr. 14 to Sept. 30	
1.3	8.0	1.2	5.0
1.6	15	1.5	10
3.0	68	2.0	26
4.6	135	4.5	130

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11	12	20	20	20	14	135	15	10	6.4	6.5	9.4
2	9.2	12	25	19	23	14	*108	14	9.6	6.2	6.7	9.7
3	12	10	28	19	23	14	72	14	9.4	6.4	7.3	8.0
4	10	10	50	18	30	14	54	14	9.0	6.2	16	7.3
5	9.6	10	56	18	45	14	47	18	8.6	5.8	14	6.7
6	9.6	11	36	18	*43	14	43	16	8.8	5.5	9.0	6.5
7	13	11	39	18	30	14	49	14	8.0	5.5	7.6	6.5
8	22	11	35	18	20	14	70	13	8.0	6.4	7.3	6.4
9	16	11	28	18	19	14	58	13	7.6	*7.3	8.2	6.4
10	12	12	24	18	19	*15	56	13	7.5	6.4	10	6.2
11	10	13	22	18	19	20	50	13	*7.5	6.2	*8.4	6.0
12	9.6	16	18	18	17	23	40	14	7.3	5.8	8.2	*6.0
13	9.2	50	18	17	16	23	92	14	7.5	5.5	7.3	6.0
14	9.4	96	16	17	16	20	130	13	7.5	5.7	6.9	6.4
15	8.8	60	15	30	15	19	78	20	7.1	8.0	6.9	7.1
16	8.6	33	14	27	15	19	50	17	7.3	6.5	6.7	6.5
17	9.0	23	14	25	15	27	44	14	9.2	7.5	6.5	6.5
18	13	16	*14	40	15	33	41	12	7.5	15	6.9	8.4
19	*14	*15	14	30	15	42	37	*12	7.3	12	6.5	7.6
20	13	15	14	23	15	72	32	12	7.3	12	6.5	7.1
21	16	15	14	21	15	90	28	11	7.5	18	6.4	7.1
22	17	16	14	21	14	115	25	10	7.5	12	6.0	7.3
23	16	18	14	21	14	100	*22	11	7.3	20	6.0	7.8
24	60	15	14	22	14	74	21	18	7.1	17	5.8	7.5
25	76	15	14	22	14	52	20	17	6.7	9.6	*5.8	7.1
26	46	15	14	20	14	46	19	13	6.5	8.2	5.7	6.9
27	25	15	14	20	14	40	18	11	6.4	7.5	5.7	6.9
28	19	15	15	20	14	39	17	10	6.4	8.6	5.5	6.5
29	16	15	16	20	14	56	16	9.9	7.5	8.0	5.5	6.4
30	14	16	17	20	-	98	16	9.7	6.7	7.3	6.0	6.5
31	14	-	17	20	-	135	-	9.7	-	6.7	7.8	-
Total	548.0	602	663	656	557	1,282	1,486	415.3	231.6	269.2	229.6	210.7
Mean	17.7	20.1	21.4	21.2	19.2	41.4	49.5	13.4	7.72	8.68	7.41	7.02
Cfsm	0.932	1.06	1.13	1.12	1.01	2.18	2.61	0.705	0.406	0.457	0.390	0.369
In.	1.07	1.18	1.30	1.29	1.09	2.51	2.91	0.81	0.45	0.53	0.45	0.41

Calendar year 1951: Max 122 Min 5.8 Mean 19.2 Cfsm 1.01 In. 13.69
Water year 1951-52: Max 135 Min 5.5 Mean 19.5 Cfsm 1.03 In. 14.00

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 19-21, 25-29, Dec. 14 to Feb. 27, Mar. 1-16 (no gage-height record Jan. 27 to Feb. 1, Mar. 21, 22).

Low-flow investigation, Rifle River near Rose City, Mich.

An investigation of the low-flow characteristics of the upper Rifle River watershed was made on Aug. 25, 1952, for the purpose of determining the base-flow yields of various parts of the basin. The Michigan Department of Conservation is carrying on intensive watershed and channel improvement work in this basin, one of the objectives being the improvement of trout propagation and fishing. Results of base-flow investigations such as this are used to determine which portions of the basin are most apt to be susceptible to successful improvement work and to later appraise the results of such improvements. This investigation and the records of gaging stations in and near the area were used in planning future work. No runoff-producing precipitation had occurred for an extended period prior to this investigation so the measurements are believed to represent essentially base flow.

The measurements on each stream are listed in order proceeding downstream and each measured tributary is inserted in the order in which it enters the main stream. Drainage areas shown were determined from county highway maps on which the major drainage divides were determined in the field.

Discharge measurements, Rifle River basin near Rose City, Mich., Aug. 25, 1952

Stream	Location	Drainage area in sq mi	Discharge in cfs	Cfs per sq mi
Gamble Creek	SW¼ sec. 36, T. 24 N., R. 3 E., ½ mile below Lupton Creek, ½ mile above Vaughn Creek, ¾ mile south of Lupton, and 4 miles east of Rose City.	9.6	9.27	0.966
Vaughn Creek	SE¼SW¼ sec. 35, T. 24 N., R. 3 E., ½ mile above Gamble Creek and ¾ mile southwest of Lupton.	3.9	7.01	1.80
Gamble Creek	NE¼ sec. 2, T. 23 N., R. 3 E., 100 ft below Vaughn Creek and 1¼ miles south of Lupton.	13.9	17.1	1.23
Oyster Creek	SE¼SW¼ sec. 27, T. 24 N., R. 3 E., 1¼ miles above Mayhue Creek and 1¾ miles west of Lupton.	2.1	2.41	1.15
Do	SW¼SE¼ sec. 34, T. 24 N., R. 3 E., ½ mile above Mayhue Creek, 2 miles southwest of Lupton and 3 miles east of Rose City.	2.5	1.84	.736
Brown Trout Creek	SW¼ sec. 2, T. 23 N., R. 3 E., 0.3 mile above Gamble Creek and 1½ miles southwest of Lupton.	9.5	7.91	.833
Gamble Creek	NE¼ sec. 11, T. 23 N., R. 3 E., 200 ft above Devoe Lake and 1¾ miles south of Lupton.	24.8	24.3	.980
Gamble Creek Canal	SW¼NE¼ sec. 11, T. 23 N., R. 3 E., 500 ft above Rifle River and 2 miles southwest of Lupton.	24.9	26.9	1.08
Rifle River	NW¼SE¼ sec. 11, T. 23 N., R. 3 E., ½ mile above Houghton Creek, ¼ mile above gaging station at The Ranch near Lupton, and 2 miles southwest of Lupton.	26.2	29.1	1.11
Houghton Creek	NW¼NE¼ sec. 31, T. 24 N., R. 3 E., 100 ft above Bixby Creek and 1 mile north of Rose City.	6.1	6.21	1.02
Do	NE¼ sec. 31, T. 24 N., R. 3 E., 100 ft below Bixby Creek and ¾ mile north of Rose City.	9.5	8.13	.856
Sandback Creek	SE¼ sec. 31, T. 24 N., R. 3 E., 500 ft below Sandback Pond, on State Highway 33 and ¼ mile north of Rose City.	1.3	5.19	3.99
Houghton Creek	SE¼ sec. 31, T. 24 N., R. 3 E., 200 ft below Sandback Creek and ¼ mile northeast of Rose City.	11.1	15.2	1.37
Do	NE¼ sec. 6, T. 23 N., R. 3 E., 1 mile above Wilkins Creek, ¾ mile southeast of Rose City.	12.0	15.6	1.30
Do	SE¼SW¼ sec. 5, T. 23 N., R. 3 E., ¼ mile above Wilkins Creek, 1¼ miles southeast of Rose City, and 3½ miles above gaging station near Lupton.	12.5	15.2	1.22
Wilkins Creek	SW¼ sec. 12, T. 23 N., R. 2 E., 3 miles above Houghton Creek and 2 miles southwest of Rose City, just below Krug Creek.	6.6	8.74	1.32
Do	NW¼NE¼ sec. 7, T. 23 N., R. 3 E., 100 ft above unnamed tributary, 1 mile above Houghton Creek, on State Highway 33, and 1 mile south of Rose City.	8.2	16.4	2.00
Do	NE¼NW¼ sec. 8, T. 23 N., R. 3 E., 100 ft above Houghton Creek, and 1½ miles southeast of Rose City.	10.4	16.9	1.62
Houghton Creek	SE¼SW¼ sec. 4, T. 23 N., R. 3 E., 2¼ miles above gaging station near Lupton, 2½ miles above Rifle River and 2 miles southeast of Rose City.	27.8	34.8	1.25
Rifle River	SW¼SW¼ sec. 14, T. 23 N., R. 3 E., ½ mile above Clear Creek, 1½ miles below gaging station at The Ranch near Lupton, and 3¾ miles southwest of Lupton.	62.0	57.4	.926
Do	SE¼ sec. 22, T. 23 N., R. 3 E., ¾ mile below Clear Creek and 3¾ miles northeast of Selkirk.	64.3	57.7	.897
Do	SW¼SE¼ sec. 27, T. 23 N., R. 3 E., ¾ mile above unnamed tributary, 1½ miles above Prior Creek and 2¾ miles northeast of Selkirk.	72.2	58.6	.812
Do	NW¼NW¼ sec. 3, T. 22 N., R. 3 E., ¼ mile above Prior Creek, 1½ miles north of Selkirk, and 1¾ miles above gaging station at Selkirk.	79.8	62.8	.787

Low-flow investigation, Rifle River near Rose City, Mich.--Continued

Discharge measurements, Rifle River basin near Rose City, Mich., Aug. 25, 1952--Continued

Stream	Location	Drainage area in sq mi	Discharge in cfs	Cfs per sq mi
Prior Creek	NW¼ sec. 24, T. 23 N., R. 2 E., ¾ mile below Prior Lake and 3¼ miles southwest of Rose City.	4.3	2.97	0.691
Do	NW¼ sec. 19, T. 23 N., R. 3 E., ½ mile above North Branch Prior Creek on State Highway 33, and 3¼ miles south of Rose City.	5.3	3.53	.666
Do	NE¼ sec. 19, T. 23 N., R. 3 E., 500 ft above North Branch Prior Creek, 3 miles southeast of Rose City.	5.4	3.59	.665
North Branch Prior Creek	SW¼ sec. 17, T. 23 N., R. 3 E., 500 ft above Prior Creek, 3 miles southeast of Rose City.	1.7	.72	.424
South Branch Prior Creek	NW¼ sec. 20, T. 23 N., R. 3 E., ½ mile above Prior Creek and 3½ miles southeast of Rose City.	2.2	.17	.077
Prior Creek	SW¼ sec. 21, T. 23 N., R. 3 E., 1½ miles above Ammond Creek, 2¼ miles above gaging station near Selkirk, and 3½ miles north of Selkirk.	12.6	4.82	.383
Do	SE¼ sec. 33, T. 23 N., R. 3 E., ¼ mile above Rifle River and 1½ miles north of Selkirk.	19.1	5.83	.305
Klacking Creek	NW¼NW¼ sec. 1, T. 22 N., R. 2 E., 4 miles above Rifle River and 4 miles northwest of Selkirk, just below Little Klacking Creek.	7.6	9.97	1.31
Do	NE¼ sec. 1, T. 22 N., R. 2 E., 3 miles above Rifle River on State Highway 33 and 3 miles northwest of Selkirk.	8.6	13.0	1.51
Do	SW¼ sec. 5, T. 22 N., R. 3 E., 1⅝ miles above Rifle River and 2 miles northwest of Selkirk.	9.3	12.2	1.31
Do	SE¼ sec. 4, T. 22 N., R. 3 E., 100 ft above Rifle River, 1 mile north of Selkirk.	9.9	13.5	1.36

Rifle River at Selkirk, Mich.

Location.--Lat 44°18'50", long. 84°04'00", in NE¼ sec. 9, T. 22 N., R. 3 E., on left bank at upstream side of highway bridge at Selkirk, 1½ miles downstream from Prior Creek.

Drainage area.--110 sq mi.

Records available.--September 1950 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 828.47 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 1,400 cfs Apr. 14 (gage height, 4.54 ft); minimum, 70 cfs July 6, 8.
1950-52: Maximum discharge that of Apr. 14, 1952; minimum, 70 cfs Sept. 8, 1951, July 6, 8, 1952.

Remarks.--Records good except those for periods of ice effect, which are fair.

Rating tables, water year 1951-52, except for periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 14				Apr. 15 to Sept. 30			
1.7	96	3.0	500	1.6	72	3.0	500
2.0	165	3.5	720	2.0	162	4.0	1,020
2.5	310	4.4	1,300	2.5	310		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	112	145	140	b150	199	126	1,090	144	114	83	87	129
2	104	135	158	b145	193	128	*1,020	136	106	87	97	124
3	112	128	172	b140	190	121	695	141	108	78	126	106
4	110	121	268	b140	229	126	484	129	102	76	162	95
5	110	126	274	b140	256	128	388	146	102	80	159	93
6	108	133	223	138	*235	b130	337	152	102	74	122	91
7	123	121	232	135	211	b125	331	141	95	76	108	87
8	178	121	211	138	185	b125	408	129	91	83	102	91
9	135	123	193	135	b180	116	408	124	95	*93	108	93
10	116	138	180	135	b170	126	420	122	89	85	122	95
11	110	138	168	b140	168	*178	364	126	*87	82	*108	*93
12	106	145	155	b140	155	193	301	126	87	82	104	102
13	100	298	b140	133	b140	208	596	131	93	82	97	97
14	98	480	b130	135	b140	193	1,300	124	85	80	95	91
15	98	412	b120	220	b140	188	800	154	87	99	91	102
16	98	271	b120	223	b140	175	500	141	93	87	95	91
17	100	214	b120	229	b135	165	400	131	108	89	85	95
18	108	182	*b120	268	b135	190	340	124	93	141	110	102
19	*110	*160	b120	268	b130	220	304	*114	93	141	97	97
20	104	162	b120	208	128	334	271	114	91	124	91	95
21	116	142	b120	b190	130	508	235	117	91	159	93	93
22	128	138	b120	b185	123	548	214	112	89	124	89	89
23	135	148	b120	b185	128	480	190	112	91	157	82	95
24	319	138	b120	b190	126	392	*182	144	89	136	83	93
25	*396	152	b120	b190	130	331	168	141	87	108	82	91
26	280	128	b120	b180	130	295	157	131	82	97	83	89
27	211	158	b120	168	126	262	159	117	85	87	80	83
28	180	162	b120	180	126	256	157	112	85	102	85	85
29	162	126	b130	180	126	301	144	108	91	106	83	83
30	150	128	b140	b180	-	452	139	114	85	93	82	80
31	148	-	b145	b185	-	720	-	110	-	91	97	-
Total	4,465	5,175	4,739	5,373	4,604	7,840	12,502	3,967	2,796	3,084	3,105	2,850
Mean	144	172	153	173	159	253	417	128	93.2	99.5	100	95.0
Cfsm	1.31	1.56	1.39	1.57	1.45	2.30	3.79	1.16	0.847	0.905	0.909	0.864
In.	1.51	1.74	1.60	1.81	1.56	2.65	4.23	1.34	0.94	1.04	1.05	0.96

Calendar year 1951: Max 950 Min 73 Mean 163 Cfsm 1.48 In. 20.13
Water year 1951-52: Max 1,300 Min 74 Mean 165 Cfsm 1.50 In. 20.43

Peak discharge (base, 500 cfs).--Nov. 14 (11:30 p.m.) 512 cfs (3.03 ft); Mar. 21 (8 p.m.) 600 cfs (3.25 ft); Apr. 1 (9 p.m.) 1,260 cfs (4.33 ft); Apr. 14 (9:30 a.m.) 1,400 cfs (4.54 ft).
* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

West Branch Rifle River near Selkirk, Mich.

Location.--Lat 44°15'40", long. 84°06'30", in NE¼ sec. 31, T. 22 N., R. 3 E., on left bank half a mile downstream from Campbell Creek, 3½ miles upstream from mouth, 4 miles southwest of Selkirk, and 6½ miles southeast of West Branch.

Drainage area.--52 sq mi, approximately.

Records available.--February to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 796 ft (by barometer).

Extremes.--Maximum discharge during period, 810 cfs Mar. 21 (gage height, 7.41 ft); minimum, 20 cfs June 7.

Remarks.-- Records good except those for periods of doubtful or no gage-height record, which are fair.

Rating table, Feb. 1 to Sept. 30, 1952 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 23 to July 18)

2.3	20
2.7	43
3.5	112
5.0	285
6.2	490

Discharge, in cubic feet per second, February to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1					d120	58	450	52	43	32	30	a50
2					d130	54	*285	51	36	28	31	a45
3					d140	54	175	48	37	30	34	a40
4					d170	54	137	49	35	27	50	a35
5					d150	56	129	52	35	28	54	34
6					*142	58	137	52	33	32	42	33
7					d110	59	153	48	28	24	34	32
8					d90	80	153	50	34	30	*37	28
9					d85	51	137	46	32	*31	42	30
10					d80	58	148	47	35	30	56	31
11					78	*97	124	49	*31	31	46	29
12					d74	93	106	45	31	28	42	31
13					d72	121	a250	49	30	30	35	28
14					d68	99	a400	46	33	27	36	30
15					d66	94	*210	63	36	40	34	30
16					d64	84	148	56	31	35	34	30
17					d63	82	124	49	40	32	34	29
18					d62	103	117	48	35	64	37	33
19					d60	132	99	*44	a35	79	38	35
20					d60	311	86	46	a34	70	32	32
21					d60	488	79	44	a33	a200	34	32
22					d59	410	75	45	a32	80	31	33
23					d59	222	*70	45	a33	93	30	35
24					d58	180	68	56	a32	73	32	34
25					d58	142	64	54	a31	49	a31	34
26					d58	137	63	46	a30	43	a31	31
27					d58	132	56	45	28	36	a30	29
28					57	127	55	41	28	33	a31	30
29					62	298	57	35	33	35	a31	29
30					-	308	*50	34	28	34	a32	30
31					-	*470	-	38	-	34	a40	-
Total					2,413	4,712	4,205	1,473	992	1,438	1,131	982
Mean					83.2	152	140	47.5	33.1	46.4	36.5	32.7
Cfsm					1.60	2.92	2.69	0.913	0.637	0.892	0.702	0.629
In.					1.73	3.37	3.00	1.05	0.71	1.03	0.81	0.70

Calendar year	: Max	Min	Mean	Cfsm	In.	
Water year	: Max	Min	Mean	Cfsm	In.	

* Discharge measurement made on this day
a No gage-height record; discharge estimated on basis of weather records, appearance of recorder chart, and records for stations on nearby streams.
d Doubtful gage-height record; discharge estimated on basis of weather records, engineers' notes, recorder chart, and records for stations on nearby streams.

Rifle River at Michigan Highway 70, near Sterling, Mich.

Location.--Lat 44°04', long. 84°02', in SW¼ sec. 5, T. 19 N., R. 4 E., on left bank 30 ft downstream from bridge on State Highway 70, 3 miles north of Sterling, and 18 miles upstream from mouth.

Drainage area.--320 sq mi.

Records available.--January 1937 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 641 ft (by barometer). Jan. 14, 1937, to June 7, 1938, chain gage, June 8, 1938, to Nov. 29, 1938, wire-weight gage, and Nov. 30, 1938, to Jan. 10, 1939, staff gage at same site and datum.

Average discharge.--14 years (1937-39, 1940-52), 316 cfs.

Extremes.--Maximum discharge during year, 2,960 cfs Apr. 14 (gage height, 9.39 ft); minimum, 122 cfs July 8.
1937-52: Maximum discharge, 5,340 cfs Mar. 28, 1950 (gage height, 13.74 ft), from rating curve extended above 2,900 cfs; minimum discharge, 87 cfs Dec. 2, 1946.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Diurnal fluctuation during low flow caused by powerplant above station.

Rating tables, water year 1951-52, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 14, May 16 to Sept. 30		Nov. 15 to May 15	
1.3	116	1.8	227
2.0	229	3.0	500
4.0	730	5.0	1,110
6.0	1,410	7.0	1,870
		10.0	3,260

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	214	268	316	330	450	270	2,440	316	225	152	164	478
2	205	258	375	330	470	260	2,300	316	210	147	164	414
3	214	242	388	320	500	240	1,750	305	208	144	194	299
4	208	238	538	300	550	250	1,280	295	205	138	264	235
5	194	216	665	300	600	260	1,080	295	196	130	321	201
6	190	233	512	300	550	260	970	327	199	137	244	189
7	237	231	525	300	500	260	970	305	180	126	201	178
8	390	237	525	300	450	260	1,080	305	185	137	182	167
9	288	231	462	300	400	260	1,040	295	175	162	192	167
10	238	244	400	300	380	260	1,040	295	177	152	262	167
11	223	258	375	300	380	350	970	295	167	153	225	162
12	218	266	362	300	350	400	815	285	167	138	208	164
13	206	586	327	300	330	500	1,530	283	165	136	*192	164
14	190	1,140	310	300	300	450	2,860	262	165	138	180	162
15	189	970	290	400	300	400	2,160	319	170	218	172	162
16	189	680	280	500	300	380	1,390	310	165	182	175	165
17	199	538	280	550	300	360	1,110	266	190	156	169	154
18	223	462	280	650	280	400	935	256	*187	274	175	175
19	252	350	280	600	280	550	815	231	161	402	194	184
20	248	338	280	500	280	850	710	231	169	310	175	169
21	237	327	280	450	270	1,790	620	237	167	656	170	162
22	258	316	280	450	270	1,950	562	225	162	*452	165	*a160
23	278	338	280	410	270	1,430	538	235	159	1,080	159	a180
24	*730	327	280	*370	270	1,140	475	310	161	715	159	a170
25	910	295	280	400	*270	*970	*438	310	159	378	162	a160
26	656	305	280	400	270	935	412	266	154	278	158	a150
27	478	295	280	380	270	845	388	*a250	146	231	156	a150
28	390	338	*280	400	270	815	375	a240	147	201	147	148
29	310	305	280	400	270	1,040	350	235	170	210	153	152
30	299	*305	290	400	-	1,390	338	218	159	189	150	148
31	288	-	310	420	-	*1,990	-	216	-	175	308	-
Total	9,349	11,137	10,890	11,960	10,380	21,515	31,741	8,534	5,250	8,097	5,940	5,736
Mean	302	371	351	386	358	694	1,058	275	175	261	192	191
Cfsm	0.944	1.16	1.10	1.21	1.12	2.17	3.31	0.859	0.547	0.816	0.600	0.597
In.	1.09	1.29	1.27	1.40	1.21	2.50	3.69	0.99	0.61	0.94	0.69	0.67

Calendar year 1951: Max 2,210 Min 138 Mean 367 Cfsm 1.15 In. 15.55
Water year 1951-52: Max 2,860 Min 126 Mean 384 Cfsm 1.20 In. 16.35

Peak discharge (base, 1,600 cfs).--Mar. 22 (6 a.m.) 2,260 cfs (7.93 ft); Apr. 1 (12 m. to 3 p.m.) 2,480 cfs (8.41 ft); Apr. 14 (2 to 4 p.m.) 2,960 cfs (9.39 ft); July 23 (9:30 a.m.) 1,730 cfs (6.80 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of weather records and records for station at Selkirk.

Note.--Stage-discharge relation affected by ice Dec. 14 to Mar. 20.

North Branch Kawkawlin River near Kawkawlin, Mich.

Location.--Lat 43°40'05", long. 83°58'15", in SE¼ sec. 27, T. 15 N., R. 4 E., on left bank 50 ft upstream from bridge on Beaver Road, 1½ miles northwest of Kawkawlin, and 2½ miles upstream from mouth.

Drainage area.--101 sq mi.

Records available.--March 1951 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 586.00 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation). Prior to Sept. 27, 1951, staff gage at same site and datum.

Extremes.--1951: Maximum discharge during period March to September, 520 cfs Apr. 27 (gage height, 5.56 ft); no flow for long periods.
1951-52: Maximum discharge during water year, 990 cfs Apr. 15 (gage height, 6.62 ft); no flow for long periods.

Remarks.--Records good except those for periods of ice effect or no gage-height record and those below 50 cfs, which are poor.

Rating table, Mar. 13, 1951, to Sept. 30, 1952, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 12 to July 10 and Oct. 31 to Dec. 12, 1951, May 9 to June 10 and July 28 to Sept. 1, 1952)

1.1	0	1.8	12	4.0	200
1.2	.6	2.0	18	5.0	386
1.3	1.9	2.5	44	6.0	675
1.4	3.5	3.0	82	6.5	925
1.6	7.5	3.5	133		

Discharge, in cubic feet per second, March to September 1951

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						-	480	188	18	8.8		
2						-	420	167	30	7.1		
3						-	365	146	37	6.9		
4						-	345	143	44	6.0		
5						-	249	125	69	6.7		
6						-	198	172	69	5.0		
7						-	166	170	63	4.8		
8						-	139	145	58	3.9		
9						-	179	113	43	3.9		
10						-	172	95	36	2.5		
11						-	240	74	28	2.7		
12						-	258	54	19	2.2		
13						*139	208	50	17	2.1		
14						122	200	46	*10	1.8	(*)	
15						125	166	40	8.4	1.2		
16						135	155	30	7.9	.6		
17						172	133	26	6.2	1.2		
18						216	135	20	5.0	*.7		
19						216	139	19	9.7	.4		
20						185	132	18	16	.2		(*)
21						163	132	21	13	0		
22						138	154	*29	11	0		
23						111	167	29	12	0		
24						116	154	26	10	0		
25						116	*258	26	9.9	0		
26						90	365	20	10	0		
27						66	480	20	12	0		
28						83	431	19	11	0		
29						157	355	18	11	0		
30						305	240	16	9.0	0		
31						397	-	15	-	0		
Total						-	7,215	2,080	703.1	68.7	0	0
Mean						-	240	67.1	23.4	2.22	0	0
Cfsm						-	2.38	0.664	0.232	0.022	0	0
In.						-	2.66	0.77	0.26	0.03	0	0

Calendar year	: Max	Min	Mean	Cfsm	In.	
Water year	: Max	Min	Mean	Cfsm	In.	

* Discharge measurement made on this day.

North Branch Kawkawlin River near Kawkawlin, Mich.--Continued

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	42	25	30	249	64	267	30	17	0	54	0
2	0	33	26	51	335	58	286	28	16	0	40	.7
3	0	24	30	66	355	55	276	24	15	0	29	.6
4	0	18	48	60	a600	110	249	21	15	0	24	.4
5	*0	16	51	55	a800	120	216	18	14	0	19	.2
6	0	11	54	55	a600	108	208	16	14	0	16	.2
7	0	11	87	50	a400	107	258	13	13	0	12	0
8	.6	9.7	101	*50	a300	108	335	12	11	0	8.4	0
9	1.8	10	114	50	a200	107	376	10	9.0	0	6.2	0
10	.3	12	108	50	a140	131	365	9.7	7.3	0	4.6	*0
11	0	15	102	50	a120	376	296	9.0	6.7	0	3.3	0
12	0	26	*90	52	a110	431	232	8.4	5.2	0	3.7	0
13	0	150	80	55	a90	400	408	8.2	3.9	0	5.2	0
14	0	159	60	60	a75	350	635	7.5	2.9	0	*5.6	0
15	0	224	40	100	a65	300	*895	8.4	1.9	0	5.2	0
16	*0	296	30	258	a60	a280	582	8.4	1.6	0	5.8	0
17	0	258	28	386	a52	a280	408	7.9	.9	0	5.4	0
18	0	190	23	565	a48	a290	296	7.7	*.4	0	3.9	0
19	.3	131	22	785	*45	a320	216	6.9	0	0	3.5	0
20	1.2	*90	22	925	40	a400	164	6.7	0	0	2.4	0
21	.9	67	23	a700	38	a700	129	*6.7	0	0	1.4	0
22	.5	49	24	550	35	a650	106	7.5	0	*0	.9	0
23	.5	45	23	480	34	a600	86	8.2	0	0	.4	0
24	47	45	22	376	33	a550	72	9.5	0	0	.2	0
25	26	44	20	296	34	a500	62	9.9	0	0	.4	0
26	10	26	19	249	38	*397	54	11	0	0	.1	0
27	5.2	35	18	224	45	345	49	9.9	0	0	0	0
28	2.7	28	18	194	50	296	45	11	0	51	0	0
29	1.9	28	19	184	62	276	39	11	0	102	0	0
30	21	26	20	175	-	258	35	13	0	94	0	0
31	44	-	23	166	-	249	-	15	-	77	0	-
Total	163.9	2,118.7	1,370	7,347	5,053	9,216	7,645	373.5	154.8	324	280.6	2.1
Mean	5.29	70.6	44.2	237	174	297	255	12.0	5.16	10.5	8.41	0.07
Cfsm	0.052	0.699	0.438	2.35	1.72	2.94	2.52	0.119	0.051	0.104	0.083	0.00069
In.	0.06	0.78	0.50	2.71	1.86	3.39	2.82	0.14	0.06	0.12	0.10	0.0008

Calendar year 1951: Max - Min - Mean - Cfsm - In. -
Water year 1951-52: Max 925 Min 0 Mean 93.0 Cfsm 0.92 In. 12.54

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of weather records and records for stations on nearby streams including Salt River near North Bradley, Bad River near Brant, and Tobacco River at Beaverton.

Note.--Stage-discharge relation affected by ice Dec. 13 to Jan. 1, Jan. 4-15, Feb. 19-28.

Shiawassee River at Byron, Mich.

Location.--Lat 42°49'25", long. 83°56'45", on line between secs. 14 and 23, T. 5 N., R. 4 E., on upstream side of highway bridge at Byron, a quarter of a mile downstream from mill dam which is just upstream from South Branch Shiawassee River.

Drainage area.--368 sq mi.

Records available.--January 1948 to September 1952.

Gage.--Wire-weight gage read twice daily. Altitude of gage is 822 ft (from topographic map).

Extremes.--Maximum discharge observed during year, 1,580 cfs Apr. 15 (gage height, 9.99 ft); minimum observed, 53 cfs June 30 (gage height, 4.04 ft).
1948-52: Maximum discharge, 2,860 cfs May 13, 1948 (gage height, 12.51 ft); minimum observed, 36 cfs Sept. 6, 1948 (gage height, 4.01 ft).

Remarks.--Records good except those for periods of ice effect, which are fair. Low flow slightly regulated at times by mill above station.

Revisions.--W 1144: Drainage area.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used July 12 to Sept. 2)

Oct. 1 to Nov. 15				Nov. 16 to Sept. 30			
4.1	56	6.0	395	4.0	53	7.0	635
4.5	116	6.8	595	4.5	122	9.0	1,180
5.0	199			5.0	212	9.8	1,490

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	66	224	260	500	440	189	460	350	380	69	81	59
2	82	211	260	598	460	177	440	310	330	70	86	63
3	96	201	250	710	490	177	400	280	290	81	86	90
4	95	187	380	735	548	240	390	250	310	78	82	96
5	94	160	522	660	735	270	420	210	290	65	86	88
6	84	56	635	572	835	320	460	218	270	68	83	96
7	107	86	522	500	785	380	470	184	229	65	78	88
8	202	119	420	450	685	360	585	114	197	73	74	*75
9	134	189	300	400	610	340	785	*197	180	75	88	81
10	*124	180	280	350	685	320	885	182	153	74	87	83
11	110	185	330	330	560	735	910	155	148	70	72	81
12	114	190	*330	320	510	995	885	134	*137	69	77	79
13	110	290	290	350	480	1,290	910	168	127	66	78	77
14	102	508	220	440	350	1,060	1,080	159	116	66	72	78
15	89	595	190	572	320	835	1,490	166	106	70	74	73
16	101	560	170	735	290	660	1,490	159	88	75	98	70
17	104	522	160	*935	270	572	*1,290	155	104	73	106	70
18	98	460	160	885	250	522	1,060	155	108	72	81	84
19	107	420	150	885	240	585	835	117	108	86	84	94
20	98	360	150	860	230	735	660	136	96	84	84	92
21	100	290	150	750	220	835	560	159	100	88	87	84
22	86	216	150	700	220	835	522	104	102	100	77	64
23	128	231	140	600	210	785	490	195	83	106	72	79
24	216	280	140	500	200	735	490	360	88	91	66	87
25	340	290	140	470	197	710	450	572	90	*83	58	84
26	382	280	140	622	*202	660	400	810	88	73	57	86
27	350	260	140	735	214	*685	380	910	74	68	61	84
28	310	*260	140	710	214	598	330	735	72	59	60	69
29	280	250	150	598	204	510	340	635	73	66	*61	54
30	270	250	170	490	-	480	360	548	54	81	63	72
31	250	-	250	390	-	460	-	480	-	78	64	-
Total	4,829	8,310	7,689	18,352	11,654	18,055	20,227	9,307	4,591	2,342	2,383	2,380
Mean	156	277	248	592	402	582	674	300	153	75.5	76.9	79.3
Cfsm	0.424	0.753	0.674	1.61	1.09	1.58	1.83	0.815	0.416	0.205	0.209	0.215
In.	0.49	0.84	0.78	1.85	1.18	1.82	2.04	0.94	0.46	0.24	0.24	0.24

Calendar year 1951: Max 2,020 Min 55 Mean 338 Cfsm 0.918 In. 12.46
Water year 1951-52: Max 1,490 Min 54 Mean 301 Cfsm 0.818 In. 11.12

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 14-31, Jan. 8-13, 21-25, Feb. 14-24.

Shiawassee River at Owosso, Mich.

Location.--Lat 43°00'54", long. 84°10'52", in SW¼ sec. 12, T. 7 N., R. 2 E., on right bank on grounds of Sewage Treatment Plant 1½ miles (revised) north of Owosso.

Drainage area.--538 sq mi.

Records available.--March 1931 to September 1952. Gage-height records collected in this vicinity 1910-28 are contained in reports of United States Weather Bureau.

Gage.--Water-stage recorder. Datum of gage is 707.25 ft above mean sea level, datum of 1929. Prior to Oct. 15, 1933, at site 1½ miles upstream at datum 6.03 ft higher.

Average discharge.--19 years (1931-33, 1935-52), 345 cfs.

Extremes.--Maximum discharge during year, 2,850 cfs Apr. 13 (gage height, 6.96 ft); minimum, 31 cfs July 13 (gage height, 1.75 ft); minimum daily, 34 cfs July 13.
1931-52: Maximum discharge, 6,240 cfs Apr. 6, 1947 (gage height, 10.35 ft); minimum, 0.2 cfs July 27, 1934 (gage height, 1.12 ft); minimum daily, 2.0 cfs July 28, 1934.

Remarks.--Records good except those for periods of ice effect, which are fair. Flow regulated below about 800 cfs by powerplant at Shiawasseetown.

Rating tables, water year 1951-52, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 13				Apr. 14 to Sept. 30			
2.0	79	4.0	795	1.7	30	3.0	385
2.3	140	6.0	2,000	1.9	61	4.0	810
2.5	195	6.5	2,400	2.2	130	6.0	2,000
3.0	365			2.5	220	6.7	2,580

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	120	264	323	932	665	253	618	424	520	97	86	79
2	104	239	344	1,440	878	253	618	402	402	75	79	122
3	92	228	354	1,150	795	267	618	374	368	122	59	99
4	94	219	535	1,180	1,290	659	575	343	364	112	122	81
5	104	210	932	1,180	1,380	640	575	318	354	95	114	86
6	96	136	878	878	1,150	618	640	265	332	63	97	88
7	108	127	878	800	1,070	595	740	271	274	104	99	83
8	145	177	640	700	905	535	1,240	*250	259	117	86	99
9	127	246	535	600	740	555	1,880	232	241	107	95	97
10	*125	270	439	560	768	656	1,720	208	208	95	67	83
11	129	256	*386	520	850	2,320	1,650	229	175	99	99	83
12	140	264	443	480	715	1,720	1,460	244	181	104	97	88
13	110	850	337	471	715	1,650	2,400	205	169	34	79	83
14	114	1,210	260	475	450	1,580	2,580	202	157	77	67	54
15	129	1,020	250	1,320	*400	1,340	2,080	211	130	99	77	95
16	102	850	240	1,520	370	1,020	2,000	196	*148	95	107	99
17	90	740	230	1,560	350	795	1,880	178	122	81	44	83
18	102	640	220	1,850	340	740	*1,580	211	117	109	95	88
19	102	575	210	1,340	330	1,070	1,290	211	125	122	99	88
20	102	475	210	1,380	300	1,240	988	163	127	67	90	90
21	94	467	210	1,120	290	1,240	785	205	95	139	95	71
22	118	379	210	1,070	280	1,240	735	229	112	102	92	*122
23	120	334	210	960	280	1,380	665	290	151	*104	77	114
24	309	344	210	715	270	1,120	620	480	109	102	43	102
25	435	351	210	665	260	988	642	860	109	102	95	90
26	467	368	210	850	250	905	580	910	109	92	88	92
27	483	270	210	1,070	250	*932	540	1,020	114	79	63	83
28	400	*302	210	*960	250	932	488	988	125	102	59	59
29	344	316	220	795	250	795	420	785	77	95	*63	104
30	288	306	240	555	-	690	428	665	104	75	67	95
31	316	-	350	555	-	640	-	600	-	79	49	-
Total	5,609	12,433	11,134	29,651	16,841	29,368	33,035	12,169	5,878	2,945	2,549	2,700
Mean	181	414	359	956	581	947	1,101	393	196	95.0	82.2	90.0
Cfsm	0.336	0.770	0.667	1.78	1.08	1.76	2.05	0.730	0.364	0.177	0.153	0.167
In.	0.39	0.86	0.77	2.05	1.16	2.03	2.28	0.84	0.41	0.20	0.18	0.19

Calendar year 1951: Max 2,580 Min 63 Mean 472 Cfsm 0.877 In. 11.90
Water year 1951-52: Max 2,580 Min 34 Mean 449 Cfsm 0.835 In. 11.36

Peak discharge (base, 1,500 cfs).--Jan. 2 (6 to 8 a.m.) 1,580 cfs (5.41 ft); Jan. 17 (7:30 p.m.) 2,240 cfs (6.34 ft); Feb. 4 (12 p.m.) 1,650 cfs (5.52 ft); Mar. 11 (6 p.m.) 2,580 cfs (6.73 ft); Apr. 9 (3 to 4 a.m.) 2,080 cfs (6.14 ft); Apr. 13 (7 p.m.) 2,850 cfs (6.96 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 15-31, Jan. 7-12, Feb. 14-29.

Shiawassee River near Fergus, Mich.

Location.--Lat 43°15'17", long. 84°06'20", in sec. 22, T. 10 N., R. 3 E., on downstream handrail of highway bridge, 1.2 miles east of Fergus and 1¾ miles upstream from Bear Creek.

Drainage area.--637 sq mi.

Records available.--January 1940 to September 1952.

Gage.--Wire-weight gage read twice daily. Datum of gage is 587.80 ft above mean sea level, datum of 1929.

Average discharge.--12 years, 486 cfs.

Extremes.--Maximum discharge during year, 4,750 cfs Apr. 14 (gage height, 11.93 ft); maximum gage height observed, 12.84 ft Mar. 11 (ice jam); minimum discharge observed, 56 cfs Sept. 29 (gage height, 4.20 ft); minimum gage height observed, 4.08 ft Aug. 26. 1940-52: Maximum daily discharge, 7,290 cfs Apr. 6, 1947 (includes overflow bypassing gage); maximum gage height observed, 13.07 ft Feb. 20, 1951 (ice jam); minimum discharge observed, 29 cfs Aug. 31, 1946 (gage height, 3.10 ft).

Remarks.--Records fair except those for periods of ice effect, which are poor. Some regulation at low stages by powerplant above Owosso.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-23, June 4 to Sept. 30)

3.5	56	6.0	275	10.0	2,050
4.0	80	7.0	500	11.0	2,980
4.5	107	8.0	810	11.7	4,050
5.0	144	9.0	1,310		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	72	355	365	1,310	930	350	775	475	525	95	88	75
2	88	315	388	2,130	1,700	350	758	438	488	90	85	80
3	92	295	438	2,090	1,770	360	722	412	462	82	92	95
4	90	285	585	1,500	2,010	700	705	388	488	118	95	90
5	88	260	910	1,100	2,580	900	758	375	475	101	92	88
6	90	200	910	900	1,930	700	792	365	438	88	90	88
7	98	148	890	800	1,520	650	890	365	438	78	88	85
8	124	124	775	700	1,310	650	1,340	365	412	78	88	82
9	121	140	675	650	1,250	700	2,900	345	412	95	88	92
10	107	200	555	*600	1,250	900	2,680	325	365	98	90	98
11	114	275	450	580	1,190	3,500	2,490	305	238	95	92	92
12	118	462	400	550	1,030	3,200	2,780	275	186	90	90	*90
13	121	1,190	350	540	955	2,090	3,320	285	174	82	85	88
14	128	1,930	310	690	792	1,770	3,950	275	168	70	82	85
15	*124	1,250	290	1,190	650	1,480	2,780	295	158	75	78	82
16	118	890	280	2,680	550	980	2,220	*275	148	95	75	75
17	110	792	270	2,580	520	792	2,130	285	140	101	75	78
18	107	775	260	3,320	500	890	*1,930	275	130	101	72	82
19	110	630	260	2,490	460	1,130	1,480	285	*121	121	70	80
20	110	630	260	2,130	440	1,700	1,250	260	128	200	70	75
21	114	615	250	1,810	420	1,450	1,030	193	128	85	72	65
22	121	570	250	1,620	400	1,480	810	215	124	208	75	65
23	148	462	250	1,420	380	1,480	758	315	121	*124	78	78
24	412	438	250	1,280	370	1,380	740	810	121	90	68	82
25	475	430	250	1,100	360	*1,250	645	980	118	85	60	82
26	462	*420	250	1,000	350	1,060	630	890	110	95	58	72
27	555	380	250	1,130	*350	1,060	615	910	107	114	68	68
28	475	300	250	1,130	350	1,080	585	1,060	114	114	*72	60
29	412	300	260	1,000	350	1,000	555	850	110	95	72	56
30	388	300	280	810	-	910	500	705	98	90	70	58
31	388	-	400	690	-	810	-	600	-	88	70	-
Total	6,080	15,361	12,561	41,520	26,667	36,932	43,598	14,196	7,245	3,141	2,448	2,386
Mean	196	512	405	1,339	920	1,191	1,453	458	242	101	79.0	79.5
Cfsm	0.308	0.804	0.636	2.10	1.44	1.87	2.28	0.719	0.380	0.159	0.124	0.125
In.	0.35	0.90	0.73	2.42	1.56	2.16	2.55	0.83	0.42	0.18	0.14	0.14

Calendar year 1951: Max 3,600 Min 70 Mean 542 Cfsm 0.851 In. 11.55
Water year 1951-52: Max 3,950 Min 56 Mean 580 Cfsm 0.911 In. 12.38

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 25-30, Dec. 12-31, Jan. 10-13, Feb. 15 to Mar. 11.

Bad River near Brant, Mich.

Location.--Lat 43°17'50", long. 84°13'45", in NW¼ sec. 3, T. 10 N., R. 2 E., on downstream side of highway bridge, 2½ miles north of Brant, and 6 miles upstream from mouth of South Fork.

Drainage area.--89 sq mi, approximately.

Records available.--December 1948 to September 1952.

Gage.--Wire-weight gage read twice daily. Altitude of gage is 590 ft (from topographic map).

Extremes.--Maximum discharge observed during year, 1,930 cfs Jan. 18 (gage height, 13.81 ft), from rating curve extended above 1,100 cfs by logarithmic plotting; no flow, July 11-17.

1948-52: Maximum discharge observed, that of Jan. 18, 1952; maximum gage height observed, 13.92 ft Feb. 20, 1951 (backwater from ice); no flow at times.

Remarks.--Records fair except those for periods of ice effect, which are poor.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-8, July 22-25)

Oct. 1 to Jan. 17				Jan. 18 to Sept. 30					
6.6	2.6	9.5	150	5.9	0	6.5	2.2	10.5	230
6.8	6.4	10.0	215	6.0	.1	7.0	12	11.0	350
7.0	12	11.0	390	6.1	.3	8.0	40	12.0	710
7.5	27	12.0	710	6.2	.6	9.0	85	13.0	1,230
8.5	67	13.0	1,230	6.3	.9	10.0	160	13.7	1,830
9.0	100	13.6	1,730						

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.0	57	79	93	102	25	116	14	21	0.8	1.4	0.6
2	8.5	46	112	238	335	23	116	12	17	.6	4.8	.8
3	26	38	133	200	630	23	85	12	15	.6	6.4	1.0
4	47	32	191	150	470	26	72	10	15	.6	14	1.1
5	*31	27	370	100	850	60	70	9.6	14	.5	49	.9
6	21	25	275	90	470	55	106	8.6	11	.4	60	.8
7	29	24	275	80	240	50	220	7.6	9.0	.4	32	.7
8	128	23	370	70	130	45	510	7.0	7.8	.2	20	.6
9	350	24	215	65	90	45	365	6.4	7.0	.2	13	.5
10	215	31	143	*65	92	56	210	6.4	6.0	.1	9.2	.4
11	116	44	105	65	85	870	170	6.2	4.4	0	7.0	*.3
12	51	64	87	65	68	1,170	116	5.6	3.6	0	6.4	.3
13	55	630	54	65	45	810	470	5.4	3.1	0	4.2	.2
14	41	1,680	35	65	35	490	*900	4.4	2.6	0	2.2	.2
15	35	830	30	150	27	290	530	6.0	2.2	0	1.5	.9
16	30	515	25	600	24	185	270	*6.0	1.9	0	1.5	.7
17	26	300	20	1,000	21	102	155	6.8	1.9	0	1.3	.7
18	22	150	17	1,780	19	106	106	5.0	1.7	1.0	1.2	2.4
19	20	90	16	830	17	320	80	4.2	*1.4	3.1	1.2	1.4
20	25	60	16	670	16	610	62	4.0	1.2	27	1.1	1.0
21	32	*50	18	530	15	410	49	5.0	1.2	95	1.0	.9
22	31	55	19	280	14	320	42	4.0	1.3	112	.8	.8
23	28	70	17	150	14	280	43	8.4	1.2	*75	.8	.8
24	230	55	16	100	13	210	38	65	1.2	42	.7	.7
25	830	50	15	85	13	*135	31	160	1.1	31	.7	.6
26	470	60	14	90	13	120	26	102	1.1	19	.6	.6
27	350	50	*14	100	*13	126	23	59	1.1	11	.5	.7
28	222	50	14	80	14	123	20	45	1.0	7.6	*.5	.6
29	150	51	15	70	15	116	18	49	.9	4.6	.4	.4
30	100	56	16	60	-	106	15	37	.8	3.1	.4	.2
31	73	-	25	51	-	106	-	28	-	2.2	.5	-
Total	3,796.5	5,237	2,751	8,037	3,890	7,413	5,034	709.6	157.7	438.0	244.3	21.8
Mean	122	175	88.7	259	134	239	168	22.9	5.26	14.1	7.88	0.727
Cfsm	1.37	1.97	0.997	2.91	1.51	2.69	1.89	0.257	0.059	0.158	0.089	0.0082
In.	1.59	2.19	1.15	3.36	1.63	3.10	2.10	0.30	0.07	0.18	0.10	0.009

Calendar year 1951: Max 1,680 Min 0 Mean 98.0 Cfsm 1.10 In. 14.96
Water year 1951-52: Max 1,780 Min 0 Mean 103 Cfsm 1.16 In. 15.78

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 18-28, Dec. 14-31, Jan. 3-17, 23-30, Feb. 13 to Mar. 9.

Farmers Creek near Lapeer, Mich.

Location.--Lat 43°02', long. 83°20', on left bank at sewage-treatment plant at Michigan Home and Training School, 2 miles west of Lapeer.

Drainage area.--57 sq mi, approximately.

Records available.--March 1933 to September 1952.

Gage.--Staff gage and concrete control; gage read twice daily. Datum of gage is 805.79 ft above mean sea level, datum of 1929.

Average discharge.--19 years, 30.7 cfs.

Extremes.--Maximum discharge observed during year, 288 cfs Mar. 12 (gage height, 17.24 ft); minimum, 3.7 cfs July 8, 9, 15; minimum gage height, 15.12 ft July 2, 3, 8, 9, 15. 1933-52: Maximum discharge, 1,280 cfs Apr. 6, 1947 (gage height, 19.87 ft, from floodmark), from rating curve extended above 660 cfs on basis of contracted-opening determination of peak flow; minimum not determined.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Occasional regulation by dam above station.

Revisions (water years).--W 924: 1938, 1940. W 1084: 1942(M), 1943.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

15.1	3.5	15.7	41
15.2	6.4	16.0	79
15.3	10	17.0	248
15.5	22		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a7	20	a23	a40	44	a28	72	29	a35	5.7	4.5	a10
2	*10	17	a25	51	a55	a27	69	26	28	4.5	a5	19
3	11	a15	28	58	a80	26	71	a25	27	4.5	a7	19
4	11	a14	41	216	115	33	65	a25	26	a4.5	10	19
5	9.9	13	*46	a120	152	35	a75	24	24	a4.5	9.5	15
6	a9	*13	71	a80	174	49	a110	21	21	a4.5	10	a12
7	a10	12	72	65	108	50	134	21	a20	4.2	8.7	a10
8	14	13	a60	56	78	a50	*126	19	a17	3.7	7.9	8.3
9	16	18	a50	50	a65	a48	120	20	14	3.7	a9	*7.1
10	16	a23	39	46	a55	46	110	a20	12	4.2	a9	6.4
11	13	a25	36	44	*50	110	97	a20	9.9	4.2	8.3	6.4
12	12	a30	28	a40	49	228	a110	20	9.5	a4	6.4	5.7
13	a12	55	26	a38	44	162	a120	18	8.7	a4	5.1	a5.5
14	a11	82	21	38	43	149	149	*17	a8	4.2	5.1	a5
15	11	102	a17	*57	38	a130	244	19	a8	3.7	4.5	5.1
16	9.9	86	a16	102	a32	a100	196	21	7.9	4.2	a7	4.5
17	9.1	a70	b15	201	a28	75	134	a20	*7.5	4.2	a12	4.5
18	8.7	a50	b14	199	26	*82	104	a19	6.4	4.5	14	5.1
19	7.9	35	14	a180	25	82	a85	18	5.4	a5	12	9.1
20	a8	31	14	a150	26	142	a70	17	5.1	a6	10	a9
21	a8	29	13	110	24	168	62	21	a5	*11	*8.7	a8
22	7.9	a28	a12	84	a25	a170	56	26	a6	14	7.9	7.9
23	9.9	27	a12	72	a25	a130	50	29	5.7	13	a7	9.1
24	22	a27	12	61	a25	113	52	a70	5.7	11	a6	9.1
25	26	a27	a12	56	26	99	58	a100	5.1	8.7	5.1	9.1
26	45	27	b12	a60	26	85	a50	168	5.4	a7	5.1	8.3
27	a40	25	b12	a70	27	76	a45	147	4.8	a6	4.5	a7
28	a35	21	b12	76	28	72	39	105	a5	6.0	4.2	a6
29	34	19	a13	79	29	a70	36	71	a6	6.7	4.5	5.4
30	26	22	a15	57	-	a70	34	a60	7.1	5.4	a5	5.4
31	23	-	20	43	-	65	-	a45	-	5.4	a7	-
Total	493.3	976	801	2,599	1,522	2,770	2,743	1,261	356.2	182.2	230.0	261.0
Mean	15.9	32.5	25.8	83.8	52.5	89.4	91.4	40.7	11.9	5.88	7.42	8.70
Cfsm	0.279	0.570	0.453	1.47	0.921	1.57	1.60	0.714	0.209	0.103	0.130	0.153
In.	0.32	0.64	0.52	1.70	0.99	1.81	1.79	0.82	0.23	0.12	0.15	0.17

Calendar year 1951: Max 325 Min 3.2 Mean 40.8 Cfsm 0.716 In. 9.71
Water year 1951-52: Max 244 Min 3.7 Mean 38.8 Cfsm 0.681 In. 9.26

* Discharge measurement made on this day.
a No gage-height record; discharge interpolated or estimated on basis of weather records and records for Flint River at Columbiaville and Flint River near Flint.
b Stage-discharge relation affected by ice.

Flint River at Columbiaville, Mich.

Location.--Lat 43°09'20", long. 83°24'40", in sec. 33, T. 9 N., R. 9 E., on downstream side of highway bridge at Columbiaville, 3 miles downstream from South Branch Flint River.

Drainage area.--486 sq mi.

Records available.--January 1948 to September 1952 (discontinued). Gage-height records collected at site a third of a mile upstream January 1932 to July 1933 are contained in reports of United States Weather Bureau.

Gage.--Wire-weight gage read twice daily. Datum of gage is 736.26 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge observed during year, 2,780 cfs Mar. 13 (gage height, 14.84 ft); minimum not determined, occurred during period of indefinite stage-discharge relation; minimum gage height observed, 6.49 ft Oct. 1.
1948-52: Maximum discharge, 6,690 cfs Mar. 21, 1948 (gage height, 17.10 ft, from graph based on gage readings); minimum, 33 cfs Sept. 5, 6, 8, 1948; minimum gage height observed, 6.26 ft Aug. 28, 1951.

Remarks.--Records good except those for periods of ice effect or indefinite stage-discharge relation, which are poor.

Rating table, water year 1951-52, except periods of ice effect or indefinite stage-discharge relation (gage height, in feet, and discharge, in cubic feet per second)

6.1	37	12.0	950
6.5	59	13.0	1,350
7.0	94	14.0	1,900
9.0	325	14.8	2,650
11.0	670		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	60	178	238	468	452	210	610	226	298	60	70	90
2	*122	160	268	830	710	210	630	208	274	60	70	140
3	160	149	280	935	845	220	620	202	256	80	75	200
4	133	141	438	1,060	1,500	240	620	190	232	60	100	180
5	105	120	*600	1,050	1,800	348	700	178	214	55	95	160
6	93	*100	620	900	2,150	475	995	172	190	50	90	120
7	97	105	725	800	1,780	422	*1,380	166	184	50	85	110
8	154	130	680	700	1,420	438	1,600	154	147	50	80	95
9	172	214	600	600	965	408	1,550	152	132	55	90	80
10	160	232	482	550	845	370	1,100	149	114	60	80	70
11	147	250	422	480	725	1,300	1,080	147	102	75	70	70
12	132	274	280	450	620	2,050	995	144	97	60	65	65
13	115	580	238	410	540	2,650	1,120	142	93	45	65	65
14	108	845	220	400	468	2,400	1,500	*139	88	50	60	60
15	97	1,010	210	450	400	1,800	2,000	160	81	50	60	60
16	96	1,180	200	600	325	1,420	2,000	166	79	50	65	60
17	92	1,010	200	1,480	226	1,040	1,620	168	*79	40	65	60
18	88	830	200	1,800	*230	830	1,250	160	74	45	80	60
19	85	590	190	1,780	230	905	950	154	68	45	85	60
20	86	482	190	1,650	230	1,100	700	136	68	50	85	65
21	87	400	190	1,520	230	1,380	580	172	65	60	80	70
22	86	332	190	1,220	240	1,550	482	202	65	120	*65	70
23	86	325	190	800	230	1,520	452	298	70	210	55	*70
24	292	332	190	650	230	1,350	430	570	65	*180	55	75
25	430	292	190	600	230	1,150	400	755	60	150	50	75
26	392	274	190	560	220	980	370	935	60	90	50	70
27	362	268	190	580	220	830	325	995	60	100	50	70
28	325	256	190	500	220	740	298	1,010	55	140	50	65
29	292	220	200	520	220	670	286	725	60	110	50	65
30	234	214	210	530	-	640	256	520	60	90	50	60
31	202	-	250	445	-	610	-	370	-	80	50	-
Total	5,090	11,493	9,461	25,318	18,501	30,256	26,899	9,863	3,490	2,420	2,140	2,560
Mean	164	383	305	817	638	976	897	318	116	78.1	69.0	85.3
Cfsm	0.337	0.788	0.628	1.68	1.31	2.01	1.85	0.654	0.239	0.161	0.142	0.176
In.	0.39	0.88	0.72	1.94	1.42	2.32	2.06	0.75	0.27	0.19	0.16	0.20

Calendar year 1951: Max 3,520 Min 46 Mean 419 Cfsm 0.862 In. 11.70
Water year 1951-52: Max 2,650 Min 40 Mean 403 Cfsm 0.829 In. 11.30

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 5-8, Dec. 14-31, Jan. 5-16, 23-28, Feb. 18 to Mar. 4. Stage-discharge relation indefinite June 21 to Sept. 30; discharge estimated on basis of 5 discharge measurements, engineers' and observer's notes, and records for station at Genesee.

Flint River at Genesee, Mich.

Location.--Lat 43°06'25", long. 83°37'00", in sec. 10, T. 8 N., R. 7 E., on downstream side of highway bridge in Genesee, three-quarters of a mile downstream from Butternut Creek.

Drainage area.--593 sq mi.

Records available.--March 1931 to September 1952 (discontinued).

Gage.--Wire-weight gage read twice daily. Datum of gage is 695.27 ft above mean sea level, datum of 1929. Prior to Oct. 19, 1932, wire-weight gage at site 500 ft downstream at datum 0.52 ft lower.

Average discharge.--21 years, 371 cfs.

Extremes.--Maximum discharge during year, 2,860 cfs Mar. 14 (gage height, 21.79 ft); minimum not determined, occurred during period of indefinite stage-discharge relation; minimum gage height, 13.20 ft Aug. 30, 31.
1931-52: Maximum discharge, 8,650 cfs Apr. 8, 1947 (gage height, 27.06 ft, from floodmark); minimum observed, about 10 cfs Aug. 15, 1936.

Remarks.--Records good except those for periods of ice effect, no gage-height record, or indefinite stage-discharge relation, which are fair.

Revisions (water years).--W 1054: 1942.

Rating tables, water year 1951-52, except periods of ice effect or indefinite stage-discharge relation (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 14				Mar. 15 to Sept. 30			
13.3	77	17.0	835	13.0	60	18.0	1,250
14.0	163	19.0	1,430	13.2	72	20.0	2,000
15.0	353	22.0	2,980	13.5	106	22.0	3,100
				14.0	200		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*85	229	353	835	650	260	920	415	615	80	126	154
2	150	203	386	1,110	800	250	920	390	502	80	116	164
3	180	184	397	1,140	1,000	260	890	352	452	100	114	196
4	186	160	622	1,140	1,630	560	865	328	415	80	136	208
5	156	130	*810	1,000	1,850	622	865	310	378	70	148	192
6	128	140	835	1,000	1,950	572	a1,100	295	328	75	168	164
7	145	150	910	1,000	1,700	660	*1,400	280	298	75	144	148
8	204	160	910	900	1,600	585	1,880	260	265	70	129	136
9	217	210	835	750	1,400	560	2,050	252	228	70	122	119
10	203	300	735	650	1,000	535	1,880	245	204	80	a130	108
11	186	291	635	550	*850	1,750	1,640	238	182	100	106	98
12	169	463	535	500	750	1,750	1,400	*236	166	85	103	92
13	157	*860	400	452	600	2,320	1,720	232	144	70	98	88
14	145	1,170	300	660	500	2,860	1,920	240	135	65	93	85
15	129	1,080	250	1,350	450	2,740	1,960	250	126	65	a92	83
16	111	1,080	240	1,320	400	2,050	2,300	230	*126	65	92	81
17	109	1,140	230	1,550	380	*1,520	2,350	220	90	60	92	81
18	105	1,020	230	*1,670	350	1,190	1,960	220	95	60	119	85
19	102	910	230	1,750	330	1,220	1,440	220	95	100	131	85
20	98	735	230	1,950	300	1,310	1,130	230	90	150	136	90
21	98	635	220	1,630	300	1,440	980	240	a90	200	129	91
22	98	584	220	1,430	290	1,680	840	300	a90	250	*111	99
23	102	510	220	a1,200	290	1,840	790	502	90	200	106	*99
24	364	498	220	900	290	1,760	740	740	90	*220	93	98
25	485	452	a220	800	290	1,520	690	1,070	90	180	88	98
26	510	408	a220	900	270	1,310	640	1,130	85	160	82	98
27	474	375	a220	a1,000	270	1,190	602	1,250	80	170	78	96
28	441	331	a220	a900	270	1,070	540	1,250	80	a180	77	92
29	408	321	a230	750	270	1,010	502	1,160	85	a160	75	85
30	375	331	a240	600	-	890	452	950	85	136	72	86
31	271	-	a300	550	-	690	-	765	-	136	131	-
Total	6,591	15,060	12,603	31,937	21,030	38,174	37,366	14,800	5,799	3,592	3,437	3,398
Mean	213	502	407	1,030	725	1,231	1,246	477	193	116	111	113
Cfsm	0.359	0.847	0.686	1.74	1.22	2.08	2.10	0.804	0.325	0.196	0.187	0.191
In.	0.41	0.94	0.79	2.00	1.32	2.39	2.34	0.93	0.36	0.23	0.22	0.21

Calendar year 1951: Max 4,020 Min 64 Mean 536 Cfsm 0.904 In. 12.26
Water year 1951-52: Max 2,860 Min 60 Mean 529 Cfsm 0.822 In. 12.14

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records and records for stations at Flint and at Columbiaville.
Note.--Stage-discharge relation affected by ice Nov. 4-10, Dec. 13-24, Jan. 5-12, 24-26, Jan. 29 to Feb. 3, Feb. 7 to Mar. 3. Stage-discharge relation indefinite Oct. 1-3, May 14-22, June 17 to July 29; discharge estimated on basis of 4 discharge measurements, weather records and records for stations at Flint and at Columbiaville.

Flint River near Flint, Mich.

Location.--Lat 43°02'20", long. 83°46'10", in SW¼ sec. 4, T. 7 N., R. 6 E., on left bank on grounds of sewage-treatment plant, 1 mile upstream from Pirnie Creek, 2 miles downstream from Flint, and 5 miles downstream from Swartz Creek.

Drainage area.--927 sq mi.

Records available.--August 1932 to September 1952. Gage-height records for flood seasons collected in this vicinity 1911-28 are contained in reports of United States Weather Bureau.

Gage.--Water-stage recorder. Datum of gage is 678.80 ft above mean sea level (levels by U. S. Weather Bureau and city of Flint).

Average discharge.--20 years, 573 cfs.

Extremes.--Maximum discharge during year, 4,640 cfs Apr. 14 (gage height, 9.14 ft); minimum, 53 cfs July 18 (gage height, 2.38 ft).
1932-52: Maximum discharge, 14,900 cfs Apr. 6, 1947 (gage height, 16.35 ft); minimum, 9.0 cfs Aug. 7, 1934.

Remarks.--Records good. Some regulation by reservoirs above station. City of Flint diverts water above station for municipal and industrial use, but sewage from city is included in flow at station.

Revisions (water years).--W 954: 1941.

Rating table, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-24, July 11 to Aug. 20, Sept. 9-29)

2.4	70	5.0	1,150
2.7	118	7.0	2,680
3.0	190	9.0	4,540
4.0	540		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*111	364	531	1,430	1,010	410	1,320	518	700	109	133	388
2	241	340	580	2,110	1,460	388	1,320	487	585	104	128	374
3	260	327	590	1,790	1,430	410	1,290	467	570	161	137	282
4	260	208	*1,120	1,500	2,680	1,180	1,220	447	487	102	208	263
5	226	*179	1,570	1,460	2,950	1,180	1,320	417	451	97	166	232
6	182	235	1,460	1,500	2,590	880	1,710	374	417	92	174	211
7	304	244	1,360	1,460	2,430	820	2,110	364	374	95	168	187
8	253	238	1,320	1,290	2,430	850	3,040	364	337	94	151	168
9	269	381	1,220	1,120	1,830	975	3,310	354	308	94	174	149
10	276	694	1,040	975	1,360	1,010	3,130	330	276	95	144	137
11	263	676	910	850	*1,290	3,310	2,590	311	250	156	135	122
12	244	688	790	790	1,180	3,130	2,190	311	235	100	124	114
13	220	1,570	565	730	975	3,130	2,950	276	229	87	120	109
14	208	2,110	425	730	820	3,400	4,140	272	214	94	114	97
15	292	1,710	354	2,350	615	3,310	3,490	340	193	100	111	104
16	217	1,540	381	2,430	664	2,770	3,220	295	*185	94	128	95
17	163	1,540	374	2,430	635	*2,030	3,130	295	124	74	122	90
18	161	1,460	392	*2,860	560	1,680	*2,510	298	104	89	163	131
19	156	1,120	371	2,510	526	1,790	2,190	295	122	80	153	107
20	113	910	364	2,860	479	1,990	1,570	285	122	272	158	102
21	128	790	364	2,350	455	2,110	1,430	350	120	447	190	104
22	161	730	354	2,110	471	2,190	1,180	354	118	217	151	*131
23	279	730	347	1,500	455	2,510	1,180	640	133	253	131	133
24	760	730	347	1,180	459	2,430	1,010	1,120	126	282	120	120
25	880	635	350	1,040	471	2,190	820	1,750	118	*232	120	116
26	880	610	357	1,290	444	1,870	760	2,110	116	149	107	118
27	605	531	347	1,460	455	1,710	688	2,110	107	179	104	113
28	652	513	354	1,360	432	1,540	640	*1,870	98	272	98	107
29	417	508	357	1,120	428	1,430	600	1,540	120	208	*100	114
30	540	495	371	910	-	1,360	555	1,260	114	168	90	113
31	500	-	428	820	-	1,320	-	880	-	146	171	-
Total	10,221	22,806	19,693	48,315	31,984	55,303	56,613	21,084	7,453	4,742	4,293	4,631
Mean	330	760	635	1,559	1,103	1,784	1,887	680	248	153	138	154
Cfsm	0.356	0.820	0.685	1.68	1.19	1.92	2.04	0.734	0.268	0.165	0.149	0.166
In.	0.41	0.91	0.79	1.94	1.28	2.22	2.27	0.85	0.30	0.19	0.17	0.19

Calendar year 1951: Max 4,540 Min 63 Mean 801 Cfsm 0.864 In. 11.74
Water year 1951-52: Max 4,140 Min 80 Mean 785 Cfsm 0.847 In. 11.52

Peak discharge (base, 2,500 cfs).--Jan. 15 (6 p.m.) 3,130 cfs (7.48 ft); Jan. 18 (9 a.m.) 3,400 cfs (7.84 ft); Feb. 5 (12:30 a.m.) 3,400 cfs (7.84 ft); Feb. 8 (3 p.m.) 2,950 cfs (7.33 ft); Mar. 11 (12 m.) 3,850 cfs (8.30 ft); Mar. 23 (12 m. to 3 p.m.) 2,590 cfs (6.87 ft); Apr. 10 (1 p.m.) 3,400 cfs (7.85 ft); Apr. 14 (12 m.) 4,640 cfs (9.14 ft); May 26 (11 a.m.) 2,860 cfs (7.17 ft).
* Discharge measurement made on this day.

Flint River near Fosters, Mich.

Location.--Lat 43°17'56", long. 83°55'58", on west line of sec. 6, T. 10 N., R. 5 E., on downstream handrail of Sheridan Road Bridge, 1 mile west of Fosters, 1½ miles upstream from Birch Run, and 4 miles downstream from Silver Creek.

Drainage area.--1,120 sq mi, approximately.

Records available.--January 1940 to September 1952. Gage-height records for flood seasons collected in this vicinity 1910-20, 1922-27 are contained in reports of United States Weather Bureau.

Gage.--Wire-weight gage read twice daily. Datum of gage is 582.22 ft above mean sea level (levels by U. S. Weather Bureau). Prior to August 1943, chain gage at same site and datum.

Average discharge.--12 years, 841 cfs.

Extremes.--Maximum discharge during year, 5,340 cfs Apr. 15 (gage height, 17.0 ft, from graph based on gage readings); minimum, 107 cfs July 7, 8 (gage height, 4.21 ft).
1940-52: Maximum daily discharge, 18,200 cfs Apr. 7, 1947 (including flow bypassing gage); maximum gage height, 17.97 ft Apr. 6, 1947 (from floodmark); minimum discharge observed, 27 cfs Aug. 6, 1941 (gage height, 3.67 ft).
Maximum stage known, about 18.4 ft (from U. S. Weather Bureau data) in March 1904.

Remarks.--Records good except those for periods of ice effect, which are poor. Some regulation at times by reservoirs above Flint.

Revisions (water years).--W 954: 1941.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

4.2	105	11.0	2,000
6.0	445	14.0	3,440
8.0	930	17.0	5,340

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	167	498	597	1,200	1,200	509	1,520	619	785	127	201	134
2	285	445	575	2,500	1,700	487	1,520	575	687	129	165	275
3	345	375	641	2,200	1,800	498	1,440	553	641	127	177	425
4	315	237	960	1,800	3,000	930	1,360	531	597	127	204	375
5	305	172	2,120	1,800	3,500	1,880	1,360	509	531	126	305	295
6	247	241	1,880	1,800	3,000	1,110	1,760	476	487	115	204	234
7	305	455	1,640	1,700	2,900	840	2,290	435	445	108	199	217
8	509	487	1,560	1,500	2,800	900	3,940	435	405	108	197	197
9	385	476	1,320	1,300	2,000	960	4,730	425	375	111	177	194
10	345	553	*1,140	1,200	1,700	990	4,210	405	345	111	186	183
11	325	597	1,110	*1,000	1,500	4,330	*4,040	385	315	118	183	161
12	315	687	990	950	1,400	4,590	3,340	355	285	140	168	140
13	285	2,840	760	900	1,290	3,990	3,790	365	265	121	147	134
14	257	4,040	600	900	870	3,840	4,890	355	253	115	144	131
15	325	3,140	500	2,000	760	3,940	4,660	365	234	121	134	*137
16	405	2,240	450	4,000	760	3,740	4,150	*405	219	127	161	123
17	395	1,760	430	4,390	720	2,940	3,840	355	194	127	185	111
18	345	1,600	420	4,390	680	2,120	3,440	355	154	123	167	118
19	236	*1,520	420	3,540	620	2,240	2,790	355	131	131	161	158
20	190	1,440	410	3,500	580	2,840	2,240	345	*147	163	165	140
21	151	930	410	3,000	560	2,840	1,680	375	147	415	168	134
22	137	810	410	2,500	540	2,840	1,480	415	142	487	190	127
23	165	900	400	2,000	542	3,190	1,110	465	142	*305	174	132
24	760	900	400	1,500	520	3,290	1,080	1,110	140	295	144	156
25	1,560	850	400	1,300	553	*2,840	1,020	1,800	139	295	134	149
26	1,230	800	400	1,500	*553	2,390	840	2,160	132	305	127	129
27	1,080	700	400	1,700	542	2,200	785	1,600	127	335	121	124
28	870	619	400	1,600	553	1,960	735	1,800	127	265	*113	124
29	*760	597	430	1,300	542	1,680	711	1,760	123	305	113	121
30	641	597	470	1,200	-	1,600	641	1,400	131	253	113	116
31	619	-	600	1,000	-	1,520	-	1,080	-	215	113	-
Total	14,259	31,506	23,243	61,170	37,685	70,024	71,392	22,568	8,845	5,950	5,140	5,194
Mean	460	1,050	750	1,973	1,299	2,259	2,380	728	295	192	166	173
Cfsm	0.411	0.938	0.670	1.76	1.16	2.02	2.12	0.650	0.263	0.171	0.148	0.154
In.	0.47	1.05	0.77	2.03	1.25	2.33	2.37	0.75	0.29	0.20	0.17	0.17

Calendar year 1951: Max 5,800 Min 92 Mean 1,040 Cfsm 0.928 In. 12.60
Water year 1951-52: Max 4,890 Min 108 Mean 975 Cfsm 0.871 In. 11.85

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 23-27, Dec. 14 to Jan. 16, Jan. 20 to Feb. 12, Feb. 17-22.

Flint River near Alicia, Mich.

Location.--Lat 43°18'40", long. 84°02'00", in SE¼ sec. 31, T. 11 N., R. 4 E., on left bank 100 ft downstream from The Prairie Farms Association flood-pumping station, 2¾ miles north of Alicia, and 4 miles upstream from mouth.

Records available.--November 1948 to September 1952 (gage heights only).

Gage.--Water-stage recorder. Datum of gage is 577.00 ft above mean sea level, datum of 1929.

Extremes.--Maximum gage height during year, 11.41 ft Apr. 15; minimum, 3.56 ft Nov. 5.
1948-52: Maximum gage height, 13.65 ft Apr. 6, 1950; minimum, 1.48 ft Oct. 4, 1949.

Remarks.--Records represent stages in the Shiawassee Flats area.

Gage height, in feet, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.21	5.12	4.91	5.43	7.06	4.90	6.97	5.50	5.74	5.42	5.32	5.22
2	4.33	4.54	5.11	8.51	8.80	4.84	7.01	5.65	5.66	5.20	5.58	5.45
3	4.25	4.47	5.12	9.55	8.85	4.85	6.93	5.34	5.35	5.02	5.62	5.39
4	4.43	4.17	5.34	9.24	9.66	5.32	6.68	5.36	5.67	5.22	5.66	5.30
5	4.42	4.03	7.44	8.59	10.36	7.61	7.20	5.22	5.37	5.27	5.57	5.21
6	4.84	4.85	7.20	7.99	10.27	7.15	7.57	5.21	5.21	5.18	5.64	5.59
7	5.67	6.00	6.89	7.71	9.84	6.48	7.97	5.51	5.55	5.05	5.56	5.77
8	5.35	-	6.81	7.44	9.26	6.09	9.27	5.32	5.05	5.11	5.49	5.27
9	4.87	-	6.57	7.09	8.82	5.99	10.43	5.32	5.19	5.42	5.35	5.13
10	4.81	4.44	6.14	6.82	8.42	6.07	10.62	5.46	5.25	5.32	5.53	5.19
11	4.45	4.92	5.58	6.41	7.98	9.31	10.50	5.06	5.58	4.97	5.42	5.22
12	4.64	4.69	5.50	6.15	7.65	10.65	10.01	4.98	5.37	5.27	5.64	5.24
13	4.40	7.58	5.23	6.05	6.97	10.83	9.96	5.43	5.27	5.12	5.42	5.19
14	4.09	10.03	4.98	6.12	6.49	10.61	10.88	5.22	5.14	5.17	5.46	5.06
15	4.05	9.95	5.36	8.06	6.22	10.29	11.31	5.23	5.42	5.37	5.26	5.05
16	4.11	9.40	4.71	10.45	5.92	9.83	11.18	5.29	5.20	5.46	5.59	5.21
17	4.50	8.77	4.41	10.67	5.88	9.24	10.76	5.35	5.05	5.07	5.60	5.29
18	4.38	8.08	5.23	11.19	5.83	8.51	10.21	5.38	5.23	5.12	5.56	5.01
19	4.45	7.38	5.14	11.15	5.62	8.51	9.51	5.43	5.28	5.32	5.51	5.22
20	4.43	6.62	4.81	10.83	5.46	9.26	8.72	5.53	5.45	5.42	5.27	5.16
21	4.13	5.79	4.86	10.60	5.10	9.41	7.92	5.38	5.41	5.59	5.47	5.17
22	3.96	5.28	4.49	10.17	5.33	9.50	7.25	5.20	5.47	5.34	6.10	5.08
23	5.01	5.64	4.78	9.66	5.33	9.68	6.88	5.26	5.22	5.64	5.69	5.06
24	7.03	5.59	4.70	8.74	5.10	9.72	6.60	5.95	4.99	6.07	5.46	5.11
25	7.01	5.34	4.89	8.04	5.05	9.34	6.27	6.99	5.14	5.87	5.37	4.66
26	6.56	5.26	4.75	7.81	4.88	8.81	5.95	7.33	5.21	5.65	5.42	5.14
27	6.34	5.40	4.89	8.15	4.89	8.44	5.66	6.79	5.57	5.68	5.37	4.98
28	5.69	4.70	4.88	8.44	4.94	8.02	5.77	6.51	5.47	5.07	5.33	4.85
29	5.43	4.74	4.63	7.66	4.92	7.62	5.67	6.47	5.42	6.12	5.66	5.18
30	4.79	4.79	4.88	7.00	-	7.22	5.52	6.14	5.83	5.62	5.60	5.04
31	4.54	-	4.96	6.49	-	7.02	-	5.83	-	5.67	5.16	-

East Branch Cass River near Cass City, Mich.

Location.--Lat 43°33'10", long. 83°05'40", in E½ sec. 18, T. 13 N., R. 12 E., on downstream side of bridge on State Highway 53, 1 mile downstream from Stony Creek, 5 miles southeast of Cass City, and 5½ miles upstream from confluence with North Branch.

Drainage area.--247 sq mi.

Records available.--December 1948 to September 1952.

Gage.--Wire-weight gage read twice daily. Altitude of gage is 713.0 ft above mean sea level (river-profile survey).

Extremes.--Maximum discharge during year, 2,600 cfs Mar. 11 or 12 (gage height, 20.5 ft, from graph based on gage readings); minimum, 1.7 cfs Aug. 23 (gage height, 13.95 ft). 1948-52: Maximum discharge, 4,540 cfs Mar. 28, 1950 (gage height, 22.72 ft); minimum observed, 0.8 cfs Aug. 12, 13, 1951; minimum gage height observed, 13.48 ft Aug. 13, 1951.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor.

Revisions (water years).--W 1174: 1950.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-26, May 3 to July 3, July 18-24, Sept. 19-30)

13.9	1.8	14.5	35	18.0	1,000
14.0	2.1	15.0	105	19.0	1,500
14.1	4.9	15.5	200	21.0	3,000
14.2	9.0	16.0	325		
14.3	15	17.0	620		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.1	9.6	55	840	300	a55	635	21	28	4.2	11	59
2	3.1	9.6	122	1,320	900	a65	440	20	40	5.7	9.6	48
3	*2.8	9.0	135	960	1,320	a60	278	14	33	2.1	9.6	36
4	1.9	9.6	275	665	1,880	a80	198	13	34	a2	84	23
5	1.9	9.6	680	590	2,120	a150	245	16	25	a2	140	15
6	1.8	a12	*395	440	a1,500	a400	880	20	17	a2	66	a11
7	7.0	a15	260	338	a1,000	a300	1,440	20	9.6	a2	32	a9
8	11	a20	212	202	a700	a250	*1,290	16	7.0	150	27	a8
9	10	25	180	a150	a300	410	740	19	6.1	302	18	a7
10	4.9	28	131	a130	a200	1,470	196	20	5.7	124	11	*6.5
11	5.3	31	99	110	a150	2,200	395	16	5.7	16	8.2	a6
12	4.9	40	59	110	*126	2,360	200	18	4.6	3.4	7.0	a5
13	5.3	530	45	100	90	1,710	2,120	16	3.7	2.1	8.6	a4
14	2.6	980	40	100	70	1,350	2,120	a25	6.5	2.1	9.0	a3
15	4.0	*530	30	1,080	60	1,260	1,290	*39	7.0	2.0	*10	3.1
16	5.7	328	28	1,290	55	a800	780	32	a9	2.0	6.5	2.1
17	9.0	290	25	960	50	a500	440	25	*8.6	24	3.4	2.3
18	9.0	180	25	820	45	a300	196	18	4.0	84	2.1	2.6
19	14	89	24	1,560	45	*515	120	23	2.6	46	2.0	2.3
20	7.0	67	24	860	45	635	94	21	2.6	1,000	1.9	3.4
21	9.0	68	25	425	45	1,080	78	19	4.0	780	2.0	3.1
22	11	63	26	200	45	880	59	19	1.9	*356	2.0	4.0
23	32	60	26	150	45	680	59	46	2.0	80	1.8	2.8
24	51	55	26	120	45	410	50	176	3.4	47	1.9	2.6
25	47	52	27	100	45	338	47	720	10	61	1.9	2.6
26	40	50	27	80	45	305	41	320	35	43	2.3	2.1
27	33	47	27	a75	50	258	42	270	2.0	39	2.6	2.1
28	27	47	27	a70	50	356	28	252	1.8	35	1.9	2.0
29	20	48	30	a65	a50	380	27	124	70	39	2.1	2.0
30	10	46	40	a65	-	368	21	33	46	23	2.3	2.0
31	9.6	-	133	65	-	348	-	28	-	14	55	-
Total	403.9	3,748.4	3,258	14,040	11,376	20,273	14,549	2,419	435.8	3,294.6	542.7	281.6
Mean	13.0	125	105	453	392	654	485	78.0	14.5	106	17.5	9.39
Cfsm	0.053	0.506	0.425	1.83	1.59	2.65	1.96	0.316	0.059	0.429	0.071	0.038
In.	0.06	0.56	0.49	2.11	1.71	3.05	2.19	0.36	0.07	0.50	0.08	0.04

Calendar year 1951: Max 2,520 Min 0.8 Mean 181 Cfsm 0.733 In. 9.94
Water year 1951-52: Max 2,360 Min 1.8 Mean 204 Cfsm 0.826 In. 11.22

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records and records for Cass River at Cass City and Sebewaing River near Sebewaing.
Note.--Stage-discharge relation affected by ice Dec. 13-30, Jan. 11-14, 22-26, 31, Feb. 13-28.

Cass River at Cass City, Mich.

Location.--Lat 43°35'05", long. 83°10'20", on line between secs. 3 and 4, T. 13 N., R. 11 E., on downstream handrail of highway bridge 1,000 ft downstream from confluence of North Branch and East Branch and 1 mile south of Cass City.

Drainage area.--370 sq mi, approximately.

Records available.--January 1948 to September 1952.

Gage.--Wire-weight gage read twice daily. Datum of gage is 697.92 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 3,300 cfs Mar. 11 (gage height, 11.21 ft, from high-water mark); minimum, 4.3 cfs Aug. 30 (gage height, 4.51 ft).
1948-52: Maximum discharge, 9,600 cfs Mar. 20, 1948 (gage height, 15.80 ft, from graph based on gage readings), from rating curve extended above 5,300 cfs by logarithmic plotting; minimum, 0.5 cfs Sept. 26, 1948 (gage height, 4.34 ft).

Remarks.--Records good except those for periods of ice effect, which are poor.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 10				Mar. 11 to Sept. 30			
4.5	3.9	6.5	305	4.5	4.0	6.0	175
4.6	7.4	7.0	470	4.6	7.0	7.0	455
4.7	12	8.0	920	4.8	17	8.0	870
5.0	33	9.0	1,500	5.0	31	9.0	1,450
5.5	100	11.0	3,100	5.2	48	11.0	3,100
6.0	190			5.5	84		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.4	29	150	371	194	96	775	56	90	12	42	43
2	5.8	22	212	1,640	1,080	106	820	52	77	11	35	103
3	*6.6	27	235	1,710	1,570	97	580	49	66	12	36	124
4	5.4	27	470	1,500	2,740	127	425	50	60	11	65	94
5	5.1	28	1,020	900	2,650	311	560	54	54	10	147	64
6	5.1	30	725	700	2,170	502	2,040	54	50	9.0	98	44
7	8.2	28	*530	500	1,780	389	1,760	50	44	8.0	76	29
8	13	*27	395	400	1,350	347	2,280	52	36	7.0	58	21
9	17	32	290	300	770	314	*1,520	54	31	220	46	19
10	17	41	226	250	426	275	945	52	25	63	39	*16
11	14	47	186	240	295	2,370	870	51	21	49	34	14
12	13	55	164	230	200	3,000	580	46	19	43	30	12
13	11	194	130	230	*160	2,730	1,560	54	18	26	26	10
14	10	1,470	100	230	150	*2,200	2,910	54	17	16	*21	9.0
15	9.5	1,050	80	1,200	130	1,730	2,280	*87	16	14	19	10
16	9.0	725	70	2,650	120	1,050	1,560	90	14	13	17	8.0
17	8.6	402	60	2,650	110	620	945	78	13	19	19	10
18	8.2	268	60	2,570	100	560	470	68	*12	25	17	14
19	8.2	210	60	2,090	95	970	338	58	11	63	15	14
20	8.2	154	60	1,500	90	1,960	245	52	10	52	14	12
21	7.4	128	60	1,140	85	2,000	198	63	9.0	708	12	10
22	8.2	132	65	680	80	1,590	155	70	9.0	*775	11	11
23	8.2	290	65	498	85	1,290	155	86	10	425	10	12
24	50	230	65	350	85	970	135	1,290	9.0	470	9.0	9.5
25	97	214	65	260	90	708	119	1,110	8.0	380	8.0	8.5
26	92	214	65	230	90	580	105	820	7.0	275	7.0	7.5
27	78	194	65	220	90	470	94	485	7.0	235	6.4	9.5
28	66	178	65	210	90	560	81	299	6.4	139	5.8	8.5
29	50	142	70	200	96	560	74	205	10	94	5.2	7.5
30	43	124	90	200	-	560	65	135	12	65	4.6	6.7
31	37	-	202	200	-	600	-	107	-	52	10	-
Total	725.1	6,712	6,100	26,049	16,971	29,642	24,644	5,831	771.4	4,301.0	943.0	760.7
Mean	23.4	224	197	840	585	956	821	188	25.7	139	30.4	25.4
Cfsm	0.063	0.605	0.532	2.27	1.58	2.58	2.22	0.508	0.069	0.376	0.082	0.069
In.	0.07	0.67	0.61	2.62	1.71	2.98	2.48	0.59	0.08	0.43	0.09	0.08

Calendar year 1951: Max 3,710 Min 2.4 Mean 308 Cfsm 0.832 In. 11.30
Water year 1951-52: Max 3,000 Min 4.6 Mean 337 Cfsm 0.911 In. 12.41

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 7-9, Dec. 13-30, Jan. 5-14, 24-31, Feb. 12-28.

Cass River at Vassar, Mich.

Location.--Lat 43°22'10", long. 83°34'55", in SW¼ sec. 7, T. 11 N., R. 8 E., on downstream side of bridge on State Highway 15 in Vassar, 1¼ miles upstream from Goodings Creek.

Drainage area.--700 sq mi, approximately.

Records available.--December 1948 to September 1952. Gage-height records for flood seasons collected in this vicinity 1910-28 are contained in reports of United States Weather Brueau.

Gage.--Wire-weight gage and concrete control; gage read twice daily. Datum of gage is 612.376 ft above mean sea level (levels by U. S. Weather Bureau).

Extremes.--Maximum discharge observed during year, 6,060 cfs Mar. 12 (gage height, 12.60 ft); minimum observed, 17 cfs July 10 (gage height, 3.27 ft).
1948-52: Maximum discharge observed, 11,300 cfs Mar. 28, 1950 (gage height, 16.57 ft); minimum, that of July 10, 1952.
A stage of 20.8 ft, from United States Weather Bureau records, occurred on Mar. 20, 1948 (discharge, 18,000 cfs, from rating curve extended above 12,000 cfs by logarithmic plotting).

Remarks.--Records good except those for periods of ice effect, which are fair. Some regulation by dam at Michigan Sugar Co. 10 miles upstream.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

3.4	30	6.0	930
3.7	80	8.0	2,190
4.0	150	10.0	3,700
5.0	485	13.0	5,100

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	62	112	216	1,100	450	200	1,190	198	324	45	72	58
2	88	105	296	1,910	2,050	192	1,340	192	140	45	156	135
3	76	96	408	2,400	2,190	210	1,070	186	286	50	162	359
4	64	88	730	1,640	2,820	359	755	180	186	57	219	240
5	64	76	1,740	1,550	4,420	560	880	168	162	42	362	195
6	68	84	1,370	1,070	3,060	705	3,220	180	168	46	324	174
7	80	57	780	855	2,050	640	2,610	174	150	48	156	100
8	94	115	780	600	1,910	485	3,860	174	88	48	115	88
9	80	135	468	580	1,220	485	3,460	168	86	50	110	60
10	100	150	429	540	830	468	*2,330	387	96	78	135	48
11	102	171	*436	450	640	3,380	1,980	125	94	348	130	45
12	92	189	370	443	450	5,850	1,250	125	96	72	130	45
13	94	1,040	250	436	350	4,500	1,980	*198	94	66	120	48
14	64	*2,610	180	422	300	3,380	5,250	105	92	52	112	48
15	58	1,610	150	730	270	2,400	4,100	237	78	52	*80	51
16	60	1,250	130	2,900	240	1,700	2,750	222	52	48	70	*45
17	60	705	110	*3,380	220	1,280	1,550	222	51	48	60	48
18	60	520	110	3,220	200	880	1,100	180	*51	80	51	51
19	*64	338	110	2,900	*190	1,370	620	140	46	88	42	50
20	60	394	110	2,190	170	3,540	422	216	52	78	45	51
21	60	310	120	1,700	160	*3,140	600	210	54	600	45	51
22	58	317	120	1,310	170	2,680	380	156	52	1,980	45	54
23	57	384	120	600	170	2,050	485	250	51	*680	44	57
24	466	422	120	500	180	1,910	310	1,550	51	247	45	56
25	264	366	120	450	180	1,340	362	2,330	45	362	45	50
26	150	362	120	460	190	1,220	387	1,770	45	485	44	51
27	219	352	120	460	190	930	174	1,040	44	520	42	48
28	180	338	120	450	200	705	254	600	40	268	44	45
29	162	324	130	420	200	1,100	247	422	58	261	42	50
30	145	303	150	400	-	1,010	168	485	51	234	39	51
31	120	-	436	420	-	955	-	345	-	92	40	-
Total	3,373	13,323	10,849	36,486	25,670	49,624	45,084	12,935	2,883	7,170	3,126	2,452
Mean	109	444	350	1,177	885	1,601	1,503	417	96.1	231	101	81.7
Cfsm	0.156	0.634	0.500	1.68	1.26	2.29	2.15	0.596	0.137	0.330	0.144	0.117
In.	0.18	0.71	0.58	1.94	1.36	2.64	2.40	0.69	0.15	0.38	0.17	0.13

Calendar year 1951: Max 6,280 Min 33 Mean 583 Cfsm 0.833 In. 11.31
Water year 1951-52: Max 5,850 Min 39 Mean 582 Cfsm 0.832 In. 11.33

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 13-30, Jan. 23 to Feb. 1, Feb. 12 to Mar. 1.

Cass River at Frankenmuth, Mich.

Location.--Lat 43°19'35", long. 83°44'50", in sec. 27, T. 11 N., R. 6 E., on right bank half a mile west of Frankenmuth, 3.4 miles upstream from Dead Creek, and 5.4 miles downstream from Perry Creek.

Drainage area.--848 sq mi.

Records available.--February 1908 to March 1909, July 1935 to September 1936, June 1939 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 583.96 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation). February 1908 to March 1909 staff gage at site half a mile upstream at datum 1.81 ft lower. July 1935 to Oct. 1, 1949, water-stage recorder at site half a mile downstream at datum 0.04 ft higher.

Average discharge.--14 years (1935-36, 1939-52), 499 cfs.

Extremes.--Maximum discharge during year, 10,700 cfs Mar. 12 (gage height, 20.03 ft); minimum, 48 cfs Aug. 23 (gage height, 3.34 ft).
1908-9, 1935-36, 1939-52: Maximum discharge, 17,700 cfs Mar. 18, 1942; maximum gage height, 20.91 ft Mar. 10, 1942 (site and datum then in use, backwater from ice); minimum daily discharge, about 1.5 cfs Aug. 6, 1944.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Occasional regulation at low and medium flows by mill above station.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-23)

Oct. 1 to Apr. 14				Apr. 15 to Sept. 30			
3.4	53	10.0	1,800	3.5	59	6.0	520
3.7	86	14.0	3,800	3.8	88	9.0	1,450
4.0	130	16.0	5,200	4.5	199	12.0	2,700
5.0	312	20.0	10,700	5.0	290	16.0	5,200
7.0	850						

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	62	185	392	1,580	800	250	1,330	250	382	67	138	87
2	128	169	580	2,900	2,000	260	1,560	250	190	67	168	148
3	160	157	492*	3,100	2,500	300	1,480	233	260	67	224	310
4	113	151	760	2,250	3,500	450	1,450	224	280	75	290	300
5	85	141	1,590	1,800	5,000	650	1,090	224	224	71	432	250
6	73	122	1,760	1,300	4,000	800	2,200	224	214	64	395	224
7	84	93	1,300	1,000	3,000	800	3,440	208	197	63	280	168
8	166	171	1,120	800	2,500	600	4,220	204	146	64	174	114
9	133	220	910	700	2,000	600	4,480	201	113	73	184	*102
10	107	232	*555	600	1,000	700	*3,150	260	110	125	190	78
11	108	262	580	550	800	5,400	2,550	177	112	250	174	77
12	103	334	518	520	700	9,950	1,840	158	110	129	170	75
13	130	1,590	334	520	500	5,600	2,400	*192	112	94	156	71
14	85	*2,750	250	520	450	3,920	5,300	187	108	91	151	72
15	79	2,800	200	900	380	2,800	5,200	211	101	80	*136	81
16	78	1,660	170	2,000	320	2,250	3,440	270	94	83	108	77
17	75	1,330	160	*4,100	280	1,590	2,300	250	77	77	107	73
18	74	820	150	4,500	260	1,240	1,560	209	73	104	92	81
19	*74	685	140	3,500	240	1,660	1,110	204	*70	340	79	85
20	73	530	140	3,000	220	3,740	675	196	71	129	76	81
21	72	368	150	2,200	*210	*3,680	675	242	71	690	75	77
22	70	405	150	2,000	200	3,150	508	204	72	1,920	73	77
23	80	530	150	1,000	210	2,600	630	250	71	1,240	68	85
24	492	405	150	600	210	2,200	495	1,590	71	*545	66	87
25	790	530	150	550	220	1,660	420	2,800	70	520	69	84
26	380	468	150	550	220	1,450	545	2,080	65	900	68	80
27	368	480	150	550	230	1,330	290	1,420	63	900	66	75
28	302	418	150	550	230	1,120	260	960	59	395	64	73
29	262	368	160	520	240	1,360	310	570	70	395	63	71
30	225	455	200	500	-	1,150	250	585	73	330	62	69
31	205	-	500	520	-	1,360	-	330	-	242	65	-
Total	5,236	18,829	14,161	45,690	32,420	64,620	55,358	15,363	3,729	10,190	4,463	3,332
Mean	169	628	457	1,474	1,118	2,085	1,845	496	124	329	144	111
Cfsm	0.199	0.741	0.539	1.74	1.32	2.46	2.18	0.585	0.146	0.388	0.170	0.131
In.	0.23	0.83	0.62	2.00	1.42	2.83	2.43	0.67	0.16	0.45	0.20	0.15

Calendar year 1951: Max 7,100 Min 38 Mean 702 Cfsm 0.828 In. 11.24
Water year 1951-52: Max 9,950 Min 59 Mean 747 Cfsm 0.881 In. 11.99

Peak discharge (base, 2,000 cfs).--Nov. 14 (9 to 10 p.m.) 3,440 cfs (13.38 ft); Dec. 5 (9 to 10 p.m.) 2,040 cfs (10.57 ft); Jan. 3 (5 to 7 a.m.) 3,260 cfs (13.09 ft); Jan. 18 (time unknown) about 4,500 cfs; Feb. 5 (time unknown) about 5,500 cfs; Mar. 12 (10 a.m.) 10,700 cfs (20.03 ft); Mar. 20 (6 to 8 p.m.) 4,040 cfs (14.37 ft); Apr. 8 (10 p.m.) 5,200 cfs (16.02 ft); Apr. 14 (7 to 8 p.m.) 6,500 cfs (17.15 ft); May 25 (6 to 7 a.m.) 3,000 cfs (12.62 ft); July 22 (3 p.m.) 2,160 cfs (10.86 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 14-31, Jan. 5 to Mar. 10 (no gage-height record Dec. 18-28, Feb. 9, 10).

Tobacco River at Beaverton, Mich.

Location.--Lat 43°52'45", long. 84°28'25", in sec. 7, T. 17 N., R. 1 W., on left bank 15 ft downstream from highway bridge, 1 mile downstream from powerplant dam at Beaverton, and 2 miles upstream from Venison Creek.

Drainage area.--487 sq mi.

Records available.--July 1948 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 683 ft above mean sea level (Corps of Engineers river survey).

Extremes.--Maximum discharge during year, 3,790 cfs Mar. 22 (gage height, 9.09 ft); minimum, 9.0 cfs June 23 (gage height, 0.87 ft); minimum daily, 147 cfs Aug. 26.
1948-52: Maximum discharge, 6,200 cfs Mar. 28, 1950 (gage height, 11.58 ft); minimum, 6.5 cfs Jan. 13, 1949 (gage height, 0.78 ft); minimum daily, 25 cfs Aug. 12, 1951.
High water on Mar. 20, 1948, reached an observed stage of 12.00 ft (discharge, 6,630 cfs).

Remarks.--Records excellent except those for periods of ice effect or no gage-height record, which are good. Regulation at all stages by powerplant 1 mile upstream.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.2	145	4.0	660
2.5	195	6.0	1,600
3.0	310	9.0	3,700
3.5	460		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	236	a390	358	441	500	a280	1,960	344	262	194	222	492
2	259	273	386	355	715	a270	1,660	354	211	194	235	446
3	283	300	400	354	715	a260	1,180	252	237	166	260	364
4	232	272	748	296	780	387	925	316	246	184	404	264
5	248	284	750	272	1,200	290	900	282	253	164	528	183
6	260	236	692	231	1,180	303	889	294	236	172	367	195
7	412	277	663	292	836	273	948	195	207	158	223	314
8	739	327	639	387	666	239	1,100	316	216	174	276	148
9	419	351	546	*320	650	274	900	319	194	218	315	175
10	290	324	426	368	550	542	1,020	318	216	281	387	*186
11	272	397	422	294	480	602	1,000	322	186	199	446	182
12	265	414	383	323	400	718	840	297	185	186	*321	197
13	281	714	*198	380	320	732	1,780	324	190	186	225	211
14	240	1,840	198	402	350	748	2,760	360	206	208	259	212
15	244	1,000	212	575	330	741	1,600	343	204	264	260	210
16	265	849	287	688	320	736	1,000	407	189	438	220	254
17	361	692	228	724	330	672	*925	378	*223	240	229	217
18	*270	536	280	1,100	310	698	721	283	230	334	221	233
19	330	421	250	1,100	300	1,200	663	241	220	668	196	246
20	383	331	320	882	290	2,080	618	420	214	399	220	240
21	322	340	300	805	267	2,980	614	274	180	*1,450	218	221
22	363	395	280	690	a310	3,380	484	194	196	1,300	191	222
23	357	478	300	320	a280	a2,500	503	*260	192	1,300	166	263
24	1,050	402	260	350	a330	a1,500	438	438	198	1,780	240	225
25	1,720	268	270	400	a310	a1,100	390	447	196	806	194	232
26	a900	307	280	420	a320	1,000	312	252	204	720	147	214
27	a700	291	290	400	a340	*950	426	325	170	370	185	197
28	a550	307	300	350	a320	860	357	340	154	409	180	192
29	a400	404	398	320	a300	1,120	325	257	224	262	183	184
30	a420	*524	342	280	-	1,450	331	244	248	277	188	202
31	a380	-	390	260	-	1,960	-	257	-	234	311	-
Total	13,451	13,744	11,796	14,379	13,999	30,845	27,569	9,653	6,287	13,935	8,017	7,121
Mean	434	458	381	464	483	995	919	311	210	450	259	237
Cfsm	0.891	0.940	0.782	0.953	0.992	2.04	1.89	0.639	0.431	0.924	0.532	0.487
In.	1.03	1.05	0.90	1.10	1.07	2.36	2.11	0.74	0.48	1.06	0.61	0.54

Calendar year 1951: Max 2,080 Min 25 Mean 404 Cfsm 0.830 In. 11.25
Water year 1951-52: Max 3,380 Min 147 Mean 467 Cfsm 0.959 In. 13.05

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of records for Beaverton powerplant, Chippewa River near Mr. Pleasant, and Salt River near North Bradley.
Note.--Stage-discharge relation affected by ice Dec. 18-28, Jan. 23-31, Feb. 9-20.

Salt River near North Bradley, Mich.

Location (revised).--Lat 43°42'10", long. 84°28'15", in SE¼ sec. 7, T. 15 N., R. 1 W., on downstream handrail of bridge on U. S. Highway 10, half a mile above Bluff Creek and 1.1 miles southeast of North Bradley.

Drainage area.--138 sq mi.

Records available.--June 1934 to September 1952.

Gage.--Wire-weight gage and crest-stage indicator; gage read once or twice daily. Datum of gage is 618.01 ft above mean sea level (levels by Michigan Department of Conservation). Prior to Mar. 27, 1942, staff gage at site 100 ft upstream at same datum.

Average discharge.--18 years, 76.2 cfs.

Extremes.--Maximum discharge during year, 2,630 cfs Mar. 20 (gage height, 11.13 ft); minimum, 8.0 cfs July 6, 7, 8 (gage height, 0.35 ft).
1934-52: Maximum discharge, 8,200 cfs Mar. 20, 1948 (gage height, 14.95 ft, from graph based on gage readings), from rating curve extended above 4,400 cfs; minimum observed, 1.1 cfs Aug. 14, 1944 (gage height, 0.21 ft).

Remarks.--Records fair except those for periods of ice effect, which are poor.

Revisions (water years).--W 924: 1938.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 15-24)

Oct. 1 to Mar. 19				Mar. 20 to Sept. 30			
0.7	20	6.0	720	0.3	7.0	2.0	152
1.0	41	8.0	1,190	.4	9.0	4.0	435
2.0	137	10.0	1,980	.5	13	7.0	975
4.0	380			.8	32	10.0	1,980
				1.0	48	11.0	2,560

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	24	69	74	60	148	90	390	38	31	9.8	31	57
2	54	62	82	74	324	85	271	38	30	9.0	27	74
3	159	54	95	186	740	80	182	36	32	8.8	31	39
4	61	53	310	150	880	75	158	36	26	8.8	202	25
5	40	43	262	130	1,440	75	142	35	23	8.2	229	20
6	28	40	159	110	880	85	189	34	21	8.0	107	17
7	64	38	304	100	568	80	480	29	18	8.2	66	15
8	568	41	226	90	394	72	675	30	17	8.0	52	14
9	198	49	148	*85	268	86	345	29	15	9.8	45	13
10	105	59	124	80	238	78	271	31	14	12	70	*13
11	74	90	96	80	220	220	375	31	12	9.8	87	12
12	59	164	60	80	176	1,160	202	30	12	8.6	*57	12
13	47	640	*40	80	130	1,640	865	30	13	8.6	42	11
14	41	1,730	35	90	110	1,130	1,690	28	12	8.6	34	11
15	37	660	33	170	90	800	480	35	12	9.8	30	17
16	33	268	30	532	70	600	*271	38	12	12	27	15
17	*33	198	28	604	60	422	189	31	*12	14	25	12
18	226	147	27	1,340	55	586	147	26	10	24	21	15
19	142	123	27	1,480	50	840	126	25	10	106	14	17
20	159	91	29	900	*45	2,300	103	24	11	352	18	15
21	91	86	31	550	45	1,810	90	*24	11	300	21	14
22	70	80	33	394	40	1,330	79	26	11	*257	19	12
23	60	139	31	200	40	590	72	26	11	495	18	21
24	1,000	126	29	180	40	495	67	41	10	1,690	15	19
25	1,250	55	27	160	40	315	61	50	9.0	257	18	15
26	338	60	26	170	45	345	53	44	9.8	152	17	13
27	203	*50	25	180	50	*345	52	37	8.6	133	17	12
28	154	55	25	160	60	330	47	40	8.8	90	17	11
29	116	59	26	140	80	352	43	37	13	67	15	11
30	96	63	29	120	-	370	42	31	9.8	50	15	11
31	82	-	37	110	-	390	-	29	-	38	24	-
Total	5,612	5,392	2,508	8,785	7,326	17,178	8,357	1,019	445.0	4,173.0	1,411	563
Mean	181	180	80.9	283	253	544	279	32.9	14.8	135	45.5	18.8
Cfsm	1.31	1.30	0.586	2.05	1.83	4.01	2.02	0.238	0.107	0.978	0.330	0.136
In.	1.51	1.45	0.68	2.37	1.97	4.63	2.25	0.27	0.12	1.12	0.38	0.15

Calendar year 1951: Max 2,130 Min 7.2 Mean 126 Cfsm 0.913 In. 12.44
Water year 1951-52: Max 2,300 Min 8.0 Mean 172 Cfsm 1.25 In. 16.90

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 25-28, Dec. 12 to Jan. 1, Jan. 4-14, 23-31, Feb. 13 to Mar. 7.

Chippewa River near Mount Pleasant, Mich.

Location.--Lat 43°37'35", long. 84°42'30", on line between secs. 7 and 8, T. 14 N., R. 3 W., on right bank 12 ft downstream from highway bridge and 4 miles northeast of Mount Pleasant.

Drainage area.--416 sq mi.

Records available.--October 1930 to July 1931, October 1932 to September 1952. Gage-height records for flood seasons collected in this vicinity 1910-27 are contained in reports of United States Weather Bureau.

Gage.--Water-stage recorder. Datum of gage is 710.38 ft above mean sea level (levels by Michigan Department of Conservation). Prior to Oct. 21, 1938, chain and wire-weight gages at site 30 ft upstream at same datum.

Average discharge.--20 years (1932-52), 292 cfs.

Extremes.--Maximum discharge during year, 2,160 cfs July 24 (gage height, 9.22 ft); minimum, 59 cfs June 30; minimum daily, 118 cfs July 7; minimum gage height, 3.39 ft Sept. 29, 30.
1930-31, 1932-52: Maximum discharge, 4,960 cfs Mar. 8, 1946 (gage height, 12.78 ft); minimum, 12 cfs Aug. 18, 1945; minimum daily, 19 cfs Aug. 16, 1936; minimum gage height, 2.82 ft Dec. 21, 1944.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diurnal fluctuation below about 750 cfs caused by powerplant at Mount Pleasant.

Revisions (water years).--W 744: Drainage area. W 824: 1932-35.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 10 to Sept. 30)

Oct. 1 to Jan. 31		Feb. 1 to Sept. 30	
3.4	189	3.1	118
5.0	701	5.0	707
8.0	1,760	8.0	1,760

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	208	350	390	400	450	304	1,080	347	276	183	279	233
2	285	320	400	390	550	285	1,180	338	273	161	270	279
3	320	300	450	360	600	282	1,180	335	273	152	258	261
4	279	290	500	350	700	313	1,080	323	273	143	412	239
5	256	280	541	370	870	304	940	310	267	137	459	226
6	253	270	493	380	692	323	852	298	261	121	378	208
7	359	290	525	380	598	301	800	267	239	118	320	199
8	669	290	509	370	552	301	975	273	230	130	301	192
9	541	280	477	350	552	282	905	276	214	223	285	180
10	413	300	445	*330	536	298	905	279	199	230	329	183
11	362	350	397	300	506	506	975	282	189	202	341	189
12	330	500	350	320	428	769	870	276	180	161	*310	180
13	304	700	280	350	412	835	1,120	273	168	140	295	180
14	285	1,400	220	400	385	614	1,600	276	161	127	279	177
15	275	1,300	240	500	357	598	1,320	313	174	192	251	189
16	259	1,200	250	600	388	552	1,220	338	*168	258	254	189
17	253	900	270	700	397	490	*1,040	323	152	*254	239	177
18	*307	800	280	900	375	598	888	304	158	273	236	186
19	280	700	290	940	366	975	800	285	177	428	226	189
20	310	600	300	818	329	1,360	707	279	155	536	217	192
21	300	550	300	717	*323	1,460	630	279	152	784	211	189
22	300	500	300	589	326	1,320	598	279	152	676	208	177
23	350	550	300	450	329	1,320	552	*301	146	1,040	202	189
24	700	600	290	400	301	1,180	506	378	149	1,720	196	192
25	1,000	700	290	430	288	975	459	397	137	1,010	180	180
26	800	500	290	450	282	870	444	366	146	707	180	177
27	600	450	300	400	298	784	428	332	155	568	180	168
28	550	400	310	380	313	*754	397	316	152	474	180	161
29	450	*360	330	360	304	738	378	288	143	391	180	158
30	400	370	350	340	-	784	360	282	140	350	180	*158
31	370	-	380	320	-	940	-	276	-	323	199	-
Total	12,368	16,400	11,047	14,344	12,807	21,415	25,189	9,489	5,659	12,212	8,035	5,797
Mean	399	547	356	463	442	691	840	306	189	394	259	193
Cfsm	0.959	1.31	0.856	1.11	1.06	1.66	2.02	0.736	0.454	0.947	0.623	0.464
In.	1.11	1.47	0.99	1.28	1.14	1.91	2.25	0.85	0.51	1.09	0.72	0.52

Calendar year 1951: Max 1,450 Min 109 Mean 352 Cfsm 0.846 In. 11.48
Water year 1951-52: Max 1,720 Min 118 Mean 423 Cfsm 1.02 In. 13.84

Peak discharge (base, 850 cfs).--Oct. 25 (time unknown) 1,180 cfs (6.4 ft); Nov. 14 (time unknown) 1,500 cfs (7.3 ft); Jan. 18 (10 to 11 a.m.) 1,180 cfs (6.45 ft); Feb. 5 (1 a.m.) 905 cfs (5.65 ft); Mar. 13 (6 a.m.) 975 cfs (5.77 ft); Mar. 21 (1 p.m.) 1,640 cfs (7.67 ft); Apr. 2 (1 to 3 a.m.) 1,180 cfs (6.45 ft); Apr. 14 (4 to 5 a.m.) 1,840 cfs (8.18 ft); July 24 (3 to 4 a.m.) 2,160 cfs (9.22 ft).
* Discharge measurement made on this day.
Note.--No gage-height record Oct. 19 to Dec. 4, Jan. 11-18; discharge estimated on basis of 1 discharge measurement, recorded range in stage, and records for Chippewa River at Midland and Pine River at Alma. Stage-discharge relation affected by ice Dec. 12 to Jan. 10, Jan. 23 to Feb. 4.

Chippewa River near Midland, Mich.

Location.--Lat 43°35'40", long. 84°22'10", on line between sec. 24, T. 14 N., R. 1 W., and sec. 28, T. 14 N., R. 1 E., at upstream side of bridge on State Highway 30, 5 miles upstream from Pine River and 6 miles southwest of Midland.

Drainage area.--597 sq mi.

Records available.--January 1948 to September 1952.

Gage.--Wire-weight gage read twice daily. Datum of gage is 612.35 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation).

Extremes.--Maximum discharge observed during year, 3,960 cfs Nov. 14 (gage height, 5.99 ft); minimum observed, 126 cfs July 14; minimum gage height observed, 2.36 ft Sept. 12. 1948-52: Maximum discharge, 8,510 cfs Mar. 20, 1948 (computed from graph based on gage readings); maximum gage height observed, 12.43 ft Mar. 19, 1948 (ice jam); minimum daily discharge, 44 cfs Aug. 16, 1948.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Diurnal fluctuation below about 750 cfs caused by powerplant at Mount Pleasant.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-9, May 22 to July 27)

2.1	85
2.6	330
3.5	1,220
6.0	3,960

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	245	545	555	520	a600	a400	a1,500	477	a370	193	324	250
2	270	495	585	500	a800	a380	a1,600	a480	370	202	276	450
3	441	459	616	a460	a1,000	a380	a1,700	a500	370	198	300	405
4	360	459	784	a430	1,300	a400	1,490	a500	370	157	390	324
5	288	423	1,330	450	1,500	a430	a1,400	505	360	152	952	276
6	294	414	1,020	500	1,300	a450	a1,300	505	350	a140	721	255
7	288	486	1,100	520	1,100	a400	a1,500	515	330	130	477	225
8	952	486	1,310	*560	900	a380	1,870	459	310	148	405	216
9	1,040	525	984	520	850	a370	a1,700	a420	290	144	360	211
10	1,070	398	836	500	850	a450	1,540	400	270	250	a400	198
11	495	477	700	400	900	a650	1,490	400	250	220	441	216
12	441	595	637	400	750	a1,000	1,330	a380	240	180	*405	188
13	390	1,200	575	a450	650	a1,300	a2,000	a380	230	a150	352	216
14	330	3,300	360	500	550	a1,000	3,300	a400	210	126	324	198
15	330	3,190	a300	600	450	a800	*2,260	450	220	148	306	198
16	306	2,260	310	700	400	a700	1,920	470	a210	220	312	216
17	*300	1,490	330	1,000	450	a660	1,490	450	*198	255	260	198
18	338	1,150	350	1,300	450	a750	a1,300	a400	a210	318	255	216
19	414	962	360	1,500	*420	a1,100	a1,100	360	220	398	a250	225
20	450	826	370	1,200	400	a1,600	a1,000	330	210	a650	a250	225
21	477	784	370	1,000	420	a2,200	a900	a350	200	984	a240	220
22	414	626	a370	700	420	a2,100	858	370	190	*1,090	a230	216
23	405	784	370	400	400	a2,000	784	a400	a180	962	220	206
24	1,030	868	360	450	400	a1,800	710	*441	175	2,090	220	225
25	2,040	1,760	a360	550	400	a1,500	a650	a500	175	1,870	198	216
26	1,600	606	370	550	a400	*1,380	a600	470	157	1,040	202	202
27	a1,200	450	380	500	a400	a1,200	a580	450	152	1,490	193	202
28	a900	*470	400	450	a420	a1,100	a540	400	a160	565	193	184
29	805	500	430	420	a420	a1,100	a500	380	a160	505	198	180
30	710	505	470	400	-	a1,200	486	370	152	398	193	*180
31	606	-	500	380	-	a1,400	-	a370	-	360	216	-
Total	19,229	27,493	17,792	18,810	19,300	30,580	39,398	13,282	7,289	15,733	10,063	6,937
Mean	620	916	574	607	666	986	1,313	428	243	508	325	231
Cfsm	1.04	1.53	0.961	1.02	1.12	1.65	2.20	0.717	0.407	0.851	0.544	0.387
In.	1.20	1.71	1.11	1.17	1.20	1.90	2.45	0.83	0.45	0.98	0.63	0.43

Calendar year 1951: Max 3,300 Min 126 Mean 554 Cfsm 0.928 In. 12.59
Water year 1951-52: Max 3,300 Min 126 Mean 617 Cfsm 1.03 In. 14.06

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of 2 discharge measurements, weather records, and records for Chippewa River near Mount Pleasant, Pine River at Alma, and Tobacco River at Beaverton.
Note.--Stage-discharge relation affected by ice Nov. 27-29, Dec. 16 to Feb. 25.

Pine River at Alma, Mich.

Location.--Lat 43°23', long. 84°39', in SE¼ sec. 34, T. 12 N., R. 3 W., on right bank 270 ft downstream from Superior Street Bridge, on grounds of Municipal Water Works at Alma.

Drainage area.--288 sq mi.

Records available.--October 1930 to September 1952. Gage-height records for flood seasons collected in this vicinity 1910-28 are contained in reports of United States Weather Bureau.

Gage.--Water-stage recorder. Datum of gage is 718.37 ft above mean sea level, datum of 1929. Prior to Dec. 9, 1930, tape gage at Superior Street Bridge at different datum. Dec. 10, 1930, to June 15, 1938, staff gage at site 70 ft below bridge and June 16 to Oct. 25, 1938, wire-weight gage at bridge at present datum.

Average discharge.--22 years, 194 cfs.

Extremes.--Maximum discharge during year, 1,320 cfs Nov. 14 and Apr. 13 (gage height, 6.44 ft); maximum gage height, 7.18 ft Jan. 18 (ice jam); minimum discharge, 23 cfs May 19 (gage height, 0.10 ft); minimum daily, 50 cfs June 28.
1930-52: Maximum discharge, 4,400 cfs Mar. 19, 1938 (gage height, 10.81 ft); minimum daily, 2 cfs July 23, 1938.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor.

Revisions (water years).--W 744: Drainage area. W 1054: 1945(M).

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	226	311	348	300	a350	230	a500	200	168	89	a180	168
2	304	282	382	300	a400	220	a520	200	162	85	a160	220
3	341	254	390	270	a450	213	a540	187	162	85	a150	268
4	326	233	479	260	a500	247	a550	180	168	81	a230	261
5	275	206	572	260	a580	240	a520	a170	162	77	a290	187
6	233	200	528	280	a500	268	a650	a170	146	78	a270	150
7	365	156	642	280	a470	268	a500	*162	129	77	a300	144
8	594	168	618	270	a440	247	a900	162	120	75	a350	132
9	*528	240	561	260	a400	240	a700	168	114	83	a280	124
10	561	304	517	250	a380	275	a600	174	110	113	a250	118
11	539	304	*410	240	a360	840	a600	174	108	106	*254	*116
12	470	334	350	240	a350	938	a700	162	106	76	254	a110
13	364	763	a300	250	a320	938	a1,000	162	103	84	213	a110
14	318	1,230	a200	300	a280	810	1,150	162	103	84	180	a110
15	268	1,010	a200	400	a280	780	1,070	280	104	100	162	a120
16	240	990	a210	500	a290	630	920	254	*103	119	145	a120
17	242	885	a210	800	a290	539	780	120	101	127	148	a120
18	260	a800	a220	*1,200	a280	488	*508	304	90	134	145	a120
19	229	a650	a220	a1,200	a260	920	498	105	87	174	135	a120
20	400	a600	230	a1,100	a240	955	364	96	89	275	128	a120
21	296	a500	230	a800	a220	1,150	341	162	101	*341	119	a120
22	261	a400	230	a500	a210	1,150	356	162	97	a320	117	a120
23	254	a420	230	a350	a210	1,070	326	200	94	a400	118	a120
24	498	a440	230	a350	a210	885	296	275	92	a550	117	a120
25	572	a450	230	a360	a210	780	282	341	99	a450	109	a120
26	594	a300	230	a360	a220	668	261	373	118	a350	103	a110
27	680	*280	230	a330	a220	583	254	341	115	a300	104	a110
28	642	250	240	a310	*230	*550	233	261	50	a250	105	a110
29	517	280	250	a300	230	342	220	220	74	a230	99	a100
30	416	318	260	a300	-	460	213	206	88	a200	101	a100
31	356	-	280	a320	-	488	-	180	-	a190	113	-
Total	12,169	13,558	10,227	13,240	9,380	18,412	16,352	6,313	3,363	5,703	5,429	4,068
Mean	393	452	330	427	323	594	545	204	112	184	175	136
Cfsm	1.36	1.57	1.15	1.48	1.12	2.06	1.89	0.708	0.389	0.639	0.608	0.472
In.	1.57	1.75	1.32	1.71	1.21	2.38	2.11	0.82	0.43	0.74	0.70	0.53

Calendar year 1951: Max 1,230 Min 69 Mean 309 Cfsm 1.07 In. 14.58
Water year 1951-52: Max 1,230 Min 50 Mean 323 Cfsm 1.12 In. 15.27

Peak discharge (base, 700 cfs).--Nov. 14 (5 to 7 a.m.) 1,320 cfs (6.44 ft); Dec. 7 (6 to 7 p.m.) 735 cfs (4.82 ft); Jan. 18 (1 to 2 a.m.) about 1,300 cfs; Mar. 11 (11 to 12 p.m.) 1,190 cfs (6.07 ft); Mar 21 (12 p.m.) 1,230 cfs (6.18 ft); Apr. 13 (7 p.m.) 1,320 cfs (6.44 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of recorded range in stage, weather records, and records for Chippewa River near Mount Pleasant and Pine River near Midland.

Note.--Stage-discharge relation affected by ice Nov. 27-29, Dec. 11, 12, Dec. 20 to Jan. 18, Feb. 28 to Mar. 2.

Pine River near Midland, Mich.

Location.--Lat 43°33'50", long. 84°22'10", on line between sec. 36, T. 14 N., R. 1 W., and sec. 4, T. 13 N., R. 1 E., at left downstream bridge abutment on State Highway 30, 7 miles (revised) southwest of Midland and 8 miles upstream from Chippewa River.

Drainage area.--390 sq mi, approximately.

Records available.--May 1934 to September 1938, February 1948 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 623.87 ft above mean sea level (Michigan State Highway Department benchmark). May 31, 1934, to Sept. 30, 1938, staff or wire-weight gage at site 7½ miles downstream at different datum. Feb. 3, 1948, to Dec. 13, 1951, wire-weight gage, water-stage recorder, or staff gage at present site and datum.

Extremes.--Maximum discharge during year, 2,500 cfs Apr. 14 (gage height, 6.76 ft); minimum not determined.
1934-38, 1948-52: Maximum discharge, 6,360 cfs Mar. 20, 1948 (gage height, 10.00 ft, from graph based on gage readings); minimum not determined.

Remarks.--Records poor. Regulation at low and medium stages by dam at Alma, dam and powerplant at St. Louis.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	300	552	a400	410	500	250	732	238	189	120	266	114
2	400	530	a430	410	550	250	762	228	192	120	217	284
3	450	a400	453	400	600	250	756	204	224	110	204	391
4	450	a300	840	390	700	250	840	234	228	110	290	423
5	400	238	900	430	800	260	768	195	214	110	399	423
6	a350	214	700	450	700	260	960	238	256	100	347	315
7	a450	270	665	*480	650	270	732	195	238	100	427	242
8	800	198	a700	450	600	300	1,150	198	186	100	448	204
9	750	177	a700	430	500	350	1,050	224	210	120	355	224
10	720	a250	610	410	450	600	870	234	204	150	335	*169
11	700	a350	575	410	400	1,360	930	242	198	140	298	160
12	650	419	561	410	380	1,500	900	248	189	110	335	155
13	a500	630	585	430	340	1,400	1,500	259	204	110	*355	183
14	a400	1,020	224	450	310	1,360	2,360	245	192	120	323	144
15	330	1,080	250	600	290	1,220	1,640	256	189	140	228	177
16	280	990	260	900	300	1,050	*1,430	327	a180	160	234	174
17	*270	a900	280	1,100	300	870	1,180	458	a170	180	224	238
18	260	a800	290	1,300	300	840	960	248	*a160	200	169	207
19	280	756	300	1,600	250	1,430	530	238	149	250	210	214
20	a550	720	310	1,400	*200	a1,600	590	214	112	400	210	180
21	a450	635	310	1,000	200	a1,600	415	131	80	419	192	245
22	400	605	310	700	200	a1,600	399	268	91	*a400	198	210
23	494	585	320	450	210	a1,400	415	270	136	a400	142	201
24	756	a500	320	480	220	a1,200	367	327	91	387	107	228
25	870	a400	320	500	230	a1,000	327	371	124	411	112	242
26	780	351	320	470	240	a950	315	403	76	403	169	259
27	a900	351	330	450	250	930	287	355	78	359	149	174
28	a900	*395	340	420	250	810	276	*335	121	494	109	195
29	810	359	350	400	250	780	262	262	120	585	104	172
30	738	375	370	400	-	507	245	204	120	448	147	158
31	650	-	400	450	-	695	-	220	-	312	139	-
Total	17,038	15,350	13,723	18,580	11,170	27,142	23,948	8,067	4,919	7,568	7,442	6,705
Mean	550	512	443	599	385	876	798	260	164	244	240	224
Cfsm	1.41	1.31	1.14	1.54	0.987	2.25	2.05	0.667	0.421	0.626	0.615	0.574
In.	1.62	1.46	1.31	1.77	1.07	2.59	2.28	0.77	0.47	0.72	0.71	0.64

Calendar year 1951: Max 2,000 Min - Mean 416 Cfsm 1.07 In. 14.48
Water year 1951-52: Max 2,360 Min 76 Mean 442 Cfsm 1.13 In. 15.41

Peak discharge (base, 950 cfs).--Nov. 15 (5 p.m.) 1,080 cfs (5.42 ft); Jan. 19 (11 a.m.) about 2,000 cfs; Mar. 12 (12:30 a.m.) about 2,000 cfs; Mar. 21 (time unknown) about 1,800 cfs; Apr. 6 (5 a.m.) 1,290 cfs (5.15 ft); Apr. 9 (1 to 2 a.m.) 1,320 cfs (5.20 ft); Apr. 14 (6 to 9 a.m.) 2,500 cfs (6.76 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of 2 discharge measurements, weather records, and records for Pine River at Alma and Chippewa River near Mount Pleasant.

Note.--Stage-discharge relation indefinite Oct. 1-22, June 29 to July 20; stage-discharge relation affected by ice Dec. 15 to Mar. 13.

Tittabawassee River at Midland, Mich.

Location.--Lat 43°36', long. 84°15', in NE¼ sec. 28, T. 14 N., R. 2 E., on right bank half a mile downstream from Dow Chemical Co. powerplant in Midland, 1 mile downstream from Chippewa River, and 1 mile upstream from Bullock Creek.
Drainage area.--2,400 sq mi, approximately.
Records available.--March 1936 to September 1952. Gage-height records for flood seasons collected in this vicinity 1910-26, are contained in reports of United States Weather Bureau.
Gage.--Water-stage recorder. Datum of gage is 590.28 ft above mean sea level, datum of 1929.
Average discharge.--16 years, 1,465 cfs (unadjusted).
Extremes.--Maximum discharge during year, 15,400 cfs Apr. 14 (gage height, 14.07 ft); minimum, 185 cfs June 30, July 1 (gage height, -0.60 ft); minimum daily, 250 cfs June 27.
1936-52: Maximum discharge, 34,000 cfs Mar. 21, 1948 (gage height, 19.50 ft); minimum, 39 cfs Oct. 12, 1942; minimum gage height, -0.95 ft Aug. 1, 1948.
Remarks.--Records good except those below 400 cfs and those for periods of no gage-height record, which are fair. Water is diverted from river a short distance above station for industrial use; small part returned to river a quarter of a mile below station; remainder returned 1 mile below and below control. Records of daily discharge not adjusted for diversion. Discharge below about 4,000 cfs regulated by powerplants above station.
Revisions (water years).--W 1054: 1945; W 1144: 1948.

Rating table, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)

-0.5	220	4.0	2,970
0.0	405	9.0	8,290
2.0	1,430	14.0	15,200

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	620	1,620	1,980	1,670	1,870	1,130	8,840	1,130	520	262	748	797
2	897	1,600	1,820	2,300	3,680	1,230	8,070	922	808	409	805	1,550
3	1,350	1,280	2,280	2,240	5,340	1,360	6,740	658	785	505	832	1,490
4	1,290	1,070	2,720	2,040	6,090	1,850	4,940	1,210	848	414	1,590	860
5	1,120	1,240	3,760	2,090	7,630	1,920	5,630	805	935	340	2,570	776
6	962	1,240	3,160	1,740	7,520	1,940	5,860	1,040	658	342	1,500	850
7	877	1,500	3,300	1,560	5,640	1,570	5,320	1,230	618	342	1,420	594
8	1,480	1,650	4,280	*1,580	4,450	1,220	6,510	1,020	458	303	1,120	558
9	2,850	1,500	3,360	1,560	3,730	1,240	6,440	752	668	341	1,070	746
10	1,890	902	3,010	1,620	2,800	1,860	5,690	648	625	470	1,330	534
11	1,640	1,020	2,840	1,640	2,590	4,400	5,810	802	458	511	1,470	604
12	1,550	1,660	*2,480	1,720	2,450	7,300	5,170	1,170	502	474	1,320	489
13	1,090	4,280	1,870	1,540	2,200	8,620	7,740	930	532	431	*970	466
14	867	8,620	1,400	1,780	1,990	7,410	14,300	980	502	420	918	473
15	792	9,390	1,220	2,310	1,560	6,090	12,400	995	340	a450	858	a500
16	*915	7,080	942	3,560	1,600	5,430	*7,850	1,150	a450	a600	a800	a520
17	898	5,600	1,000	5,260	1,220	4,570	5,960	958	a500	570	a820	542
18	832	4,740	935	7,850	1,430	4,670	5,040	778	*a520	1,040	a800	586
19	911	4,090	882	8,620	1,400	6,530	4,140	760	515	1,380	a700	892
20	1,000	3,410	1,050	7,740	1,330	a10,500	3,760	922	482	1,640	635	572
21	1,080	1,940	1,300	6,610	1,160	a13,000	3,430	*530	338	3,080	618	522
22	1,100	2,060	1,180	5,380	1,340	a13,500	3,090	955	300	*3,670	597	625
23	1,010	2,090	1,060	4,180	1,370	a11,000	3,070	1,110	420	5,000	a700	728
24	a1,600	2,800	778	3,580	1,020	a8,500	2,180	1,100	346	5,160	794	761
25	a5,200	2,280	990	3,570	1,080	7,080	1,820	918	342	5,640	474	730
26	a5,800	1,950	1,180	3,410	980	6,040	1,340	1,350	440	3,710	398	596
27	4,520	*1,570	1,090	3,600	1,320	5,560	992	1,270	250	2,550	410	544
28	4,050	1,920	1,000	3,620	1,440	4,880	1,180	1,070	280	2,180	384	487
29	3,740	1,540	1,320	2,360	1,400	5,080	1,270	1,150	351	1,460	366	456
30	2,010	1,920	1,570	1,830	-	6,410	1,100	830	280	1,200	380	*502
31	1,880	-	1,490	1,380	-	7,410	-	692	-	792	410	-
Total	55,821	83,562	57,247	99,940	77,630	169,300	155,682	29,835	15,071	45,686	27,807	20,350
Mean	1,801	2,785	1,847	3,224	2,677	5,461	5,189	962	502	1,474	897	678
(†)	96	93	93	92	92	88	94	87	89	90	91	93

Adjusted for diversion by Dow Chemical Co.

Mean	1,897	2,878	1,940	3,316	2,769	5,549	5,283	1,049	591	1,564	988	771
Cfsm	0.790	1.20	0.808	1.38	1.15	2.31	2.20	0.437	0.246	0.652	0.412	0.321
In.	0.91	1.34	0.93	1.59	1.24	2.67	2.46	0.50	0.27	0.75	0.47	0.36

	Observed			Adjusted		
Calendar year 1951:	Max 10,700	Min 220	Mean 1,982	Mean 2,076	Cfsm 0.865	In. 11.75
Water year 1951-52:	Max 14,300	Min 250	Mean 2,289	Mean 2,381	Cfsm 0.992	In. 13.49

Peak discharge (base, 5,800 cfs).--Oct. 26 (time unknown) about 6,500 cfs; Nov. 15 (6 to 8 a.m.) 9,720 cfs (10.34 ft); Jan. 19 (9 to 11 a.m.) 8,840 cfs (9.47 ft); Feb. 5 (6 to 9 p.m.) 7,850 cfs (8.60 ft); Mar. 13 (3 to 4 p.m.) 8,730 cfs (9.42 ft); Mar. 22 (time unknown) about 14,000 cfs; Apr. 1 (12 m to 1 p.m.) 9,060 cfs (9.68 ft); Apr. 14 (6 p.m.) 15,400 cfs (14.07 ft); July 24 (12 m.) 8,070 cfs (8.82 ft).
* Discharge measurement made on this day.
† Diversion for industrial use furnished by Dow Chemical Co.
a No gage-height record; discharge estimated on basis of recorded range in stage and records for stations on nearby streams.

Saginaw River at Saginaw, Mich.

Location.--Lat 43°26'00", long. 83°56'30", in sec. 24, T. 12 N., R. 4 E., on upstream end of right pier of Genesee Street Bridge in Saginaw, 3¾ miles downstream from Tittabawassee River and 18.1 miles upstream from mouth.

Drainage area.--6,060 sq mi, approximately.

Records available.--1904, 1908, 1909, 1912, 1913, 1916, 1918, 1919, 1929, 1930, and 1942 (flood discharge for certain periods only) in Water-Supply Paper 1084; December 1942 to September 1952 (high-water periods only), no highwater 1944, 1949. Gage-height records for flood seasons collected in this vicinity 1910-20, and for entire years since 1921 are contained in reports of United States Weather Bureau.

Gage.--Staff gage read at least once daily. Datum of gage is 566.85 ft, United States Lake Survey datum, levels by United States Weather Bureau.

Extremes.--Maximum discharge observed during year, 29,600 cfs Apr. 15 (gage height, 18.65 ft).

1904-52: Maximum discharge, 68,000 cfs Mar. 29, 1904 (gage height, 24.9 ft).

Remarks.--Records fair. Considerable diversion for municipal and industrial use in metropolitan area of Saginaw.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		-		-	-	-	-					
2		-		-	-	-	-					
3		-		-	-	-	-					
4		-		-	15,400	-	-					
5		-		-	18,600	-	-					
6		-		-	18,900	-	-					
7		-		-	17,400	-	-					
8		-		-	15,400	-	16,200					
9		-		-	-	-	18,900					
10		-		-	-	-	19,800					
11		-		-	-	10,800	19,800					
12		-		-	-	15,400	18,900					
13		-		-	-	23,100	21,100					
14		-		-	-	24,100	24,800					
15		12,300		-	-	21,400	28,800					
16		16,100		*14,000	-	18,600	*27,700					
17		13,600		15,800	-	16,800	24,800					
18		-		15,400	-	15,900	*21,100					
19		-		-	-	16,600	17,400					
20		-		19,500	-	15,100	15,100					
21		-		21,400	-	19,500	-					
22		-		23,100	-	22,800	-					
23		-		15,900	-	24,600	-					
24		-		15,900	-	19,800	-					
25		-		14,200	-	19,500	-					
26		-		-	-	18,000	-					
27		-		-	-	15,700	-					
28		-		-	-	14,000	-					
29		-		-	-	12,800	-					
30		-		-	-	-	-					
31		-		-	-	-	-					

Calendar year 1951: Max 24,500 Min - Mean - Cfsm - In. -
Water year 1951-52: Max 28,800 Min - Mean - Cfsm - In. -

* Discharge measurement made on this day.

Sebewaing River (State drain) near Sebewaing, Mich.

Location.--Lat 43°43', long. 83°26', in sec. 16 (revised), T. 15 N., R. 9 E., on right bank 60 ft downstream from highway bridge on Rescure Road, 1½ miles upstream from East Fork, and 1½ miles southeast of Sebewaing.

Drainage area.--62 sq mi, approximately.

Records available.--January 1940 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 590.0 ft above mean sea level (levels by Corps of Engineers). Prior to Apr. 9, 1941, wire-weight gage at same site and datum.

Average discharge.--13 years (1939-52), 38.0 cfs.

Extremes.--Maximum discharge during year, 1,850 cfs Mar. 11 (gage height, 8.80 ft); maximum gage height, 10.98 ft Feb. 1 (ice jam); no flow July 7, 8.
1940-52: Maximum discharge not determined; maximum gage height, 12.81 ft Mar. 9, 1942 (ice jam), but may have been higher during period of no gage-height record in April 1947; no flow for long periods.

Remarks.--Records good except those for periods of ice effect or no gage-height record, and those below 1 cfs, which are poor.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 13

1.3	0	1.8	10	4.5	300
1.4	.6	2.5	51	5.0	425
1.5	1.9	3.0	86	6.0	735
1.6	3.5	3.5	132	8.0	1,510
1.7	6.1	4.0	204		

Apr. 14 to Sept. 30

1.1	0	1.6	7.4	4.0	226
1.2	.2	1.7	11	5.0	436
1.3	1.0	2.0	29	6.0	735
1.4	2.6	3.0	98		
1.5	4.6	3.5	149		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	7.3	41	749	150	13	132	7.1	9.5	a0.1	2.2	2.1
2	.3	5.8	48	1,270	700	14	108	6.2	7.1	a.1	3.1	24
3	.3	5.3	41	805	300	14	78	5.6	6.8	**.1	33	35
4	*.3	4.8	77	400	520	80	55	5.1	6.5	.1	118	15
5	.3	4.8	102	150	350	400	64	5.9	5.1	.1	78	6.8
6	.4	3.0	62	40	200	250	118	5.6	4.2	.1	33	3.9
7	1.4	2.5	78	30	170	150	340	4.2	3.3	0	18	2.8
8	4.0	3.0	62	27	140	45	665	4.2	2.6	0	9.9	1.9
9	8.4	4.8	43	25	100	35	*600	4.6	1.8	.2	7.7	1.5
10	5.3	6.5	35	24	60	150	400	4.2	1.2	.2	9.2	1.0
11	3.5	10	*31	23	40	1,510	208	4.2	.7	.1	7.7	.7
12	2.7	26	25	22	30	754	138	3.9	.6	.1	5.1	.5
13	2.1	713	20	22	*25	350	741	4.2	.6	.1	3.5	.3
14	1.9	495	13	22	20	170	682	4.4	.5	.1	*2.6	.4
15	1.6	166	10	600	15	73	305	*7.7	.4	2.1	2.1	1.3
16	1.4	*88	9	*300	11	48	137	7.4	.3	.5	1.8	*.6
17	1.3	45	8	400	10	44	91	4.9	.2	.6	1.8	.3
18	1.3	30	7	420	9	43	64	3.7	*.2	11	1.5	1.8
19	1.4	23	6.5	132	8	*315	50	3.1	.2	29	1.2	1.6
20	1.4	20	6	100	7.5	320	41	2.8	.1	19	.9	1.3
21	1.3	19	5.5	80	7.5	197	33	4.4	.1	400	.6	.8
22	1.3	25	5.5	55	7.5	134	29	4.9	.1	128	.4	.7
23	1.4	41	5.5	40	7.5	151	27	8.4	.2	*53	.2	.9
24	54	43	5.5	27	7.5	102	22	138	.2	33	.2	1.2
25	110	30	6	21	8	75	18	84	a.2	16	.2	1.0
26	51	20	6.5	20	9	80	15	52	a.2	11	.2	.6
27	32	18	9	23	10	82	13	34	a.2	19	.1	.4
28	23	17	11	24	11	100	11	24	a.2	10	.1	.2
29	16	17	12	25	12	100	9.2	21	a.2	8.0	.1	.2
30	12	24	13	22	-	104	8.0	14	a.2	5.9	.1	.2
31	10	-	15	19	-	122	-	9.9	-	3.5	.2	-
Total	351.4	1,917.8	819.0	5,917	2,945.5	6,025	5,202.2	493.6	53.7	751.0	342.7	109.0
Mean	11.3	63.9	26.4	191	102	194	173	15.9	1.79	24.2	11.1	3.63
Cfsm	0.182	1.03	0.426	3.08	1.65	3.13	2.79	0.256	0.029	0.390	0.179	0.059
In.	0.21	1.15	0.49	3.55	1.77	3.61	3.12	0.30	0.03	0.45	0.21	0.07

Calendar year 1951: Max 1,000 Min 0 Mean 46.7 Cfsm 0.753 In. 10.22
Water year 1951-52: Max 1,510 Min 0 Mean 68.1 Cfsm 1.10 In. 14.96

Peak discharge (base, 500 cfs).--Nov. 13 (7 p.m.) 892 cfs (6.44 ft); Jan. 1 (9 p.m.) 1,670 cfs (8.39 ft); Jan. 15 (time unknown) about 1,000 cfs; Feb. 1 (time unknown) about 1,200 cfs; Mar. 11 (10 to 11 p.m.) 1,850 cfs (8.80 ft); Mar. 19 (6 to 7 p.m.) 585 cfs (5.57 ft); Apr. 8 (10 p.m.) 1,110 cfs (7.01 ft); Apr. 13 (4 p.m.) 1,270 cfs (7.42 ft); July 21 (9:30 a.m.) 648 cfs (5.75 ft).

* Discharge measurement made on this day.

** Field estimate made on this day.

a No gage-height record; discharge estimated on basis of records for East Fork Sebewaing River near Sebewaing, Pigeon River near Pigeon, and Cass River at Cass City.

Note.--Stage-discharge relation affected by ice Nov. 17-22, 25-29, Dec. 12-31, Jan. 3-18, Jan. 20 to Mar. 10.

East Fork Sebewaing River (Columbia drain) near Sebewaing, Mich.

Location.--Lat 43°44', long. 83°24', on line between secs. 10 and 11, T. 15 N., R. 9 E., on right bank 10 ft downstream from highway bridge on Gettel Road, 2¼ miles upstream from mouth, and 2½ miles southeast of Sebewaing.

Drainage area.--38 sq mi, approximately.

Records available.--January 1940 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 607.00 ft above mean sea level (levels by Corps of Engineers). Prior to Apr. 1, 1941, wire-weight gage at same site and datum.

Average discharge.--12 years, 20.3 cfs.

Extremes.--Maximum discharge during year, 1,720 cfs Mar. 11 (gage height, 6.12 ft); no flow for long periods.

1940-52: Maximum discharge not determined, occurred during period of no gage-height record in April 1947; maximum gage height, 9.70 ft Mar. 15, 1943 (ice jam); no flow for long periods.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-17, Apr. 26 to May 19)

0.5	0	1.1	1.6	2.5	60
.6	.1	1.2	2.2	3.0	130
.7	.3	1.4	4.3	3.5	240
.8	.5	1.6	7.5	4.0	400
.9	.8	1.9	15	5.0	900
1.0	1.2	2.2	33	6.0	1,640

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.4	3.9	19	b200	128	6.8	114	6.4	3.8	0	0.5	1.4
2	.4	3.6	25	b300	399	7.1	55	5.9	3.3	0	.3	7.3
3	.5	3.3	19	b150	132	7.0	32	5.3	3.1	*6	5.6	16
4	*.5	2.5	50	98	340	93	25	5.0	3.1	0	20	5.1
5	.2	2.6	49	38	285	255	34	4.9	2.5	0	20	1.6
6	.1	2.4	26	22	119	176	83	4.7	2.0	0	7.1	1.0
7	.6	1.2	40	16	106	191	396	4.7	1.6	0	4.2	.7
8	a3	.6	25	14	82	25	464	4.6	1.4	0	2.7	.5
9	a5	.9	16	14	48	16	*249	4.4	.9	0	2.0	.4
10	a3.5	4.6	11	13	20	41	124	4.4	.5	.4	2.5	.4
11	a3	8.1	*b9	13	14	960	67	4.3	.2	.1	2.0	.4
12	a2.5	11	b7	12	b10	291	39	4.2	.3	0	1.4	.4
13	1.4	b150	b5	12	*b7.5	148	472	4.1	.3	0	.9	.4
14	1.4	130	4.7	12	b6	70	424	4.1	.3	0	*.5	.4
15	1.1	42	4.4	*b340	b5.5	51	148	*5.9	.2	3.0	.4	.7
16	.8	*22	4.1	134	b5	31	54	8.1	.2	1.6	.4	*.6
17	1.0	16	3.5	b200	b4.5	30	32	5.7	.1	.8	.7	.3
18	.9	b10	3.3	b210	b4.5	31	20	4.4	*0	4.9	.4	.7
19	1.4	b8	2.9	b90	b4.5	259	14	3.5	0	a9	.3	.9
20	1.8	b7.5	2.7	64	b4	*182	12	2.8	0	a6	.2	.6
21	1.6	7.1	2.7	b45	b4	101	10	2.9	0	a150	.2	.5
22	1.5	8.6	2.8	b30	b4	68	9.8	4.3	0	a40	.1	.5
23	1.9	b14	2.8	b20	b4	84	9.8	4.4	0	*14	0	.6
24	20	b11	2.8	b15	4.4	48	9.4	45	0	8.8	a0	.6
25	29	b10	2.8	11	4.6	32	8.8	25	0	5.3	0	.6
26	12	b7	3.0	11	4.7	34	7.9	13	0	3.5	0	.5
27	7.9	7.3	5.0	12	5.0	47	7.5	8.8	0	3.8	0	.4
28	6.2	7.5	5.3	14	5.3	57	7.1	7.1	0	2.8	0	.3
29	5.4	7.7	5.4	14	5.9	57	7.0	6.4	0	2.3	0	.3
30	4.7	9.8	5.7	11	-	51	6.6	4.9	0	1.5	0	.3
31	4.2	-	7.1	8.8	-	71	-	3.9	-	.9	0	-
Total	123.9	520.2	372.0	2,143.8	1,766.4	3,520.9	2,941.9	223.1	23.8	258.7	72.4	44.4
Mean	4.00	17.3	12.0	69.2	60.9	114	98.1	7.20	0.793	8.35	2.34	1.48
Cfsm	0.105	0.455	0.316	1.82	1.60	3.00	2.58	0.189	0.021	0.220	0.062	0.039
In.	0.12	0.51	0.36	2.10	1.73	3.45	2.88	0.22	0.02	0.25	0.07	0.04

Calendar year 1951: Max 414 Min 0 Mean 22.4 Cfsm 0.589 In. 7.98
Water year 1951-52: Max 960 Min 0 Mean 32.8 Cfsm 0.863 In. 11.75

Peak discharge (base, 200 cfs).--Nov. 13 (9 a.m.) 327 cfs (3.79 ft); Jan. 1 (9 p.m.) 1,140 cfs (5.33 ft); Jan. 15 (12 m.) 690 cfs (4.64 ft); Jan. 17 (11 p.m.) 670 cfs (4.60 ft); Feb. 2 (1 to 2 a.m.) 774 cfs (4.79 ft); Mar. 4 (10 p.m.) 456 cfs (4.14 ft); Mar. 11 (5:30 a.m.) 1,720 cfs (6.12 ft); Mar. 19 (9 p.m.) 525 cfs (4.31 ft); Apr. 7 (9 p.m.) 1,140 cfs (5.33 ft) Apr. 13 (6 p.m.) 840 cfs (4.91 ft); July 21 (time unknown) 404 cfs (4.01 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of weather records and records for stations on nearby streams, including Sebewaing River near Sebewaing, Pigeon River near Pigeon and Cass River at Cass City.

b Stage-discharge relation affected by ice.

Pigeon River near Pigeon, Mich.

Location.--Lat 43°48'55", long. 83°17'10", in NE¼ sec. 15, T. 16 N., R. 10 E., on upstream side of highway bridge, 0.1 mile downstream from West Branch Extension and 1 mile southwest of Pigeon.

Drainage area.--86 sq mi, approximately.

Records available.--December 1946 to September 1952 (discontinued).

Gage.--Wire-weight gage read twice daily. Altitude of gage is 607 ft (from county map).

Average discharge.--5 years (1947-52), 64.2 cfs.

Extremes.--Maximum discharge observed during year, 1,580 cfs Mar. 11 (gage height, 12.25 ft); maximum gage height observed, 12.40 ft Feb. 5 (ice jam); minimum discharge, 0.4 cfs Sept. 8.
1946-52: Maximum discharge observed, 3,700 cfs Mar. 28, 1950 (gage height, 13.95 ft); maximum gage height, 14.90 ft about Mar. 17, 1948, from high-water mark (ice jam); no flow for long periods.

Remarks.--Records fair except those for period of ice effect, which are poor.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.8	8.3	56	760	40	23	205	13	16	1.8	4.3	2.7
2	2.1	8.0	88	610	160	24	220	12	15	1.3	3.4	16
3	2.3	7.1	81	490	700	44	116	12	14	1.9	3.2	67
4	*2.3	6.5	74	360	400	81	88	11	13	4.0	6.2	41
5	2.3	6.5	310	200	800	168	88	12	11	17	50	*23
6	2.5	5	150	60	500	610	290	14	11	4.1	38	6.0
7	3.1	5	104	40	300	290	450	14	10	2.0	12	.5
8	4.9	5.5	155	36	180	155	1,050	13	7.9	1.3	6.9	.4
9	11	6	81	33	110	135	*570	13	8.5	1.7	5.4	2.8
10	9.5	7	64	31	85	120	290	12	7.9	1.7	6.2	1.7
11	7.0	8.6	*50	31	70	1,190	290	12	7.7	1.5	6.2	1.3
12	5.9	16	35	30	55	1,500	140	12	7.2	1.2	4.6	1.1
13	5.3	135	25	30	*45	1,340	450	13	7.4	1.0	4.0	1.0
14	4.5	530	18	30	35	760	1,190	14	7.2	.8	*2.7	.9
15	4.3	*310	14	150	25	420	530	*5.7	6.4	2.7	2.7	1.0
16	4.1	135	12	600	20	250	235	30	5.8	3.0	2.8	1.0
17	4.0	88	11	350	17	168	130	20	5.0	3.0	3.4	1.1
18	3.9	60	10	600	15	190	88	15	*4.3	4.6	3.7	1.2
19	4.3	40	9	250	14	*450	64	14	3.4	32	2.4	1.3
20	4.0	30	8	150	13	1,190	50	13	3.0	31	2.0	2.1
21	4.0	27	7.5	100	12	870	41	15	2.9	270	1.9	1.6
22	4.3	36	7.5	70	12	660	33	23	3.1	*420	1.7	1.4
23	4.4	70	7.5	50	12	250	34	19	3.1	135	1.5	1.4
24	13	60	7.5	37	13	290	28	47	2.6	100	1.2	1.4
25	83	45	8	28	14	140	24	104	3.2	70	1.1	1.3
26	43	30	9	28	17	130	21	78	2.8	44	1.0	1.1
27	26	25	11	30	19	135	19	47	2.6	26	1.1	1.1
28	17	24	15	35	21	175	17	34	2.4	15	1.0	.9
29	15	27	16	35	22	160	14	29	2.0	9.8	.9	.9
30	10	33	18	30	-	155	14	22	1.9	7.0	.8	.8
31	9.5	-	35	27	-	150	-	17	-	5.2	1.0	-
Total	318.3	1,794.5	1,497.0	5,311	3,726	12,223	6,779	709.7	198.3	1,219.6	183.3	185.0
Mean	10.3	59.8	48.3	171	128	394	226	22.9	6.61	39.3	5.91	6.17
Cfsm	0.120	0.695	0.562	1.99	1.49	4.58	2.63	0.266	0.077	0.457	0.069	0.072
In.	0.14	0.78	0.65	2.30	1.61	5.29	2.93	0.31	0.09	0.53	0.08	0.08

Calendar year 1951: Max 1,580 Min 0.6 Mean 74.3 Cfsm 0.864 In. 11.73
Water year 1951-52: Max 1,500 Min 0.4 Mean 93.3 Cfsm 1.08 In. 14.79

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 4-10, 18-21, 24-29, Dec. 12-31, Jan. 5 to Mar. 2.

Black River near Fargo, Mich.

Location.--Lat 43°06', long. 82°37', in sec. 32, T. 8 N., R. 16 E., on downstream side of highway bridge on Norman Road, 2⅔ miles southeast of Fargo, 4½ miles upstream from Mill Creek, and 12 miles northwest of Port Huron.

Drainage area.--475 sq mi.

Records available.--February 1944 to September 1952.

Gage.--Wire-weight gage read twice daily. Altitude of gage is 610 ft (by barometer).

Average discharge.--8 years, 357 cfs.

Extremes.--Maximum discharge during year not determined (occurred during period of ice effect); maximum gage height observed, 17.01 ft Feb. 5 (ice jam); minimum discharge, 16 cfs Oct. 14, 16-22, Sept. 27; minimum gage height, 1.73 ft Oct. 17, 18, 21.
1944-52: Maximum discharge, 14,400 cfs Apr. 5, 1947 (gage height, 16.06 ft, from floodmark), from rating curve extended above 9,500 cfs; maximum gage height observed, 18.05 ft Feb. 20, 1951 (ice jam); minimum discharge observed, 1.8 cfs Sept. 18, 19, 1946.

Remarks.--Records good except those for period of ice effect, which are poor.

Rating table, water year 1951-52, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.7	14	4.0	520
1.9	26	5.0	1,000
2.5	104	7.0	2,340
3.0	201	10.0	5,220
3.5	335	12.0	7,880

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	16	25	74	350	380	75	900	78	110	44	33	20
2	24	22	120	600	550	90	1,390	74	92	39	32	22
3	*22	24	199	1,000	1,500	230	675	70	83	37	33	23
4	18	25	700	1,100	4,500	700	925	72	76	33	35	25
5	19	23	2,020	1,000	6,000	2,000	2,420	70	72	29	33	27
6	22	23	*875	800	5,200	2,200	4,550	70	67	27	37	29
7	25	*34	430	650	4,300	1,700	4,150	68	59	23	44	24
8	25	54	363	550	3,500	950	*2,100	62	54	21	41	22
9	20	70	168	450	2,600	450	1,390	59	50	25	35	22
10	20	70	178	380	1,500	180	1,330	57	49	26	35	20
11	21	68	131	320	950	450	1,240	56	47	28	29	20
12	20	142	104	300	550	1,400	1,270	54	44	26	26	19
13	18	850	90	260	300	6,500	1,950	57	39	26	26	18
14	16	1,700	85	240	150	5,580	5,700	*54	37	25	25	18
15	17	1,030	80	700	110	4,150	2,420	62	37	22	24	18
16	16	433	75	5,500	105	975	1,030	66	35	23	25	17
17	16	250	75	5,000	100	444	540	70	*34	22	24	*18
18	16	170	75	4,500	*92	*600	323	65	33	28	28	20
19	16	136	75	3,500	85	2,660	265	58	30	72	26	19
20	16	92	80	3,000	85	3,200	245	58	30	346	25	18
21	16	89	80	2,300	80	2,420	190	65	29	*356	*24	19
22	16	92	80	1,800	80	2,180	163	70	28	275	22	19
23	18	101	85	1,400	80	1,950	192	293	28	192	20	19
24	120	107	85	1,100	80	1,880	178	1,030	28	104	20	18
25	134	120	85	800	80	825	146	3,380	28	74	19	18
26	100	96	85	650	80	625	127	1,740	26	65	18	17
27	88	93	85	520	80	520	107	725	26	57	18	16
28	67	90	85	530	75	775	101	540	23	49	19	17
29	37	88	90	550	75	950	98	245	66	43	19	18
30	34	81	100	500	-	750	86	165	56	39	18	17
31	29	-	130	430	-	675	-	125	-	37	19	-
Total	1,042	6,200	6,987	40,780	33,267	48,084	36,201	9,658	1,416	2,213	832	597
Mean	33.6	207	225	1,315	1,147	1,551	1,207	312	47.2	71.4	26.8	19.9
Cfsm	0.071	0.436	0.474	2.77	2.41	3.27	2.54	0.657	0.099	0.150	0.056	0.042
In.	0.08	0.49	0.55	3.19	2.60	3.76	2.83	0.76	0.11	0.17	0.07	0.05

Calendar year 1951: Max 5,400 Min 10 Mean 372 Cfsm 0.783 In. 10.63
Water year 1951-52: Max 6,500 Min 16 Mean 512 Cfsm 1.08 In. 14.66

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 13 to Mar. 13.

Mill Creek near Abbottsford, Mich.

Location.--Lat 43°03', long. 82°37', in NW¼ sec. 17, T. 7 N., R. 16 E., on downstream side of highway bridge, 1 mile upstream from mouth and 2 miles northeast of Abbottsford.

Drainage area.--138 sq mi.

Records available.--May 1947 to September 1952.

Gage.--Wire-weight gage read twice daily. Altitude of gage is 600 ft (by barometer). Prior to May 7, 1950, staff gage at same site and datum.

Average discharge.--5 years, 131 cfs.

Extremes.--Maximum discharge observed during year, 1,300 cfs Mar. 11 (gage height, 6.57 ft); minimum, 5.7 cfs Aug. 14, 15 (gage height, 2.39 ft).
1947-52: Maximum discharge, 3,050 cfs Mar. 20, 1948 (gage height, 9.20 ft, from floodmark), from rating curve extended above 2,500 cfs; maximum gage height observed, 10.81 ft Jan. 3, 1951 (ice jam); minimum discharge, 3.8 cfs Aug. 11, 1949 (gage height, 2.28 ft).

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 17				Jan. 18 to Sept. 30			
2.5	8.0	3.6	125	2.4	6.0	3.5	140
2.7	19	4.0	230	2.6	15	4.0	260
3.0	41	6.0	990	2.8	31	5.0	630
3.3	74			3.0	55	6.4	1,210

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a10	26	39	90	120	55	384	56	64	a15	9.6	9.6
2	12	24	46	200	230	a55	406	54	55	a13	9.6	32
3	*14	22	49	250	a350	60	328	54	51	a12	8.8	123
4	10	22	297	230	900	62	233	46	43	a11	9.6	35
5	21	22	332	200	700	336	610	47	41	a10	9.6	27
6	17	*22	*352	170	550	350	810	45	39	a9	8.8	26
7	22	29	248	150	500	275	770	41	38	8.8	8.8	17
8	22	35	152	130	200	160	*690	39	32	8.8	9.2	15
9	17	40	123	120	150	125	570	36	26	16	8.8	12
10	20	45	91	100	130	115	420	36	23	17	8.8	12
11	21	43	78	90	120	1,210	350	a35	20	10	8.8	10
12	18	56	64	80	*140	1,010	281	34	18	9.2	8.8	9.6
13	16	227	40	70	110	1,030	318	34	18	8.0	8.4	9.2
14	15	444	38	70	110	850	990	*32	17	7.6	6.4	8.8
15	14	366	35	250	115	710	810	36	15	7.2	6.4	8.8
16	14	297	35	*735	110	a500	730	34	15	7.2	9.6	8.0
17	14	187	32	815	a90	402	650	41	*15	8.0	14	*7.6
18	13	123	32	930	80	*322	470	36	14	8.0	39	7.6
19	14	89	35	790	70	710	300	33	12	8.0	41	7.2
20	14	60	35	600	65	790	184	34	11	8.8	46	6.4
21	13	55	36	500	65	770	155	36	11	*127	*32	6.4
22	14	55	37	370	60	690	130	36	10	191	26	6.4
23	15	55	38	270	55	a650	150	51	10	92	9.6	7.6
24	89	58	39	200	55	690	142	150	10	51	9.6	8.4
25	53	64	40	160	55	530	115	438	10	22	9.6	7.2
26	69	42	40	150	55	406	97	409	9.6	17	9.2	7.6
27	50	43	40	150	55	328	85	a270	10	18	7.2	7.2
28	43	45	40	180	55	336	78	176	8.8	18	7.6	7.6
29	35	40	40	180	55	328	56	127	14	14	6.4	7.6
30	33	40	45	180	-	281	61	95	18	12	6.4	7.2
31	28	-	50	140	-	281	-	78	-	10	7.6	-
Total	760	2,676	2,598	8,550	5,350	14,417	11,373	2,669	678.4	774.6	411.2	465.0
Mean	24.5	89.2	83.8	276	184	465	379	86.1	22.6	25.0	13.3	15.5
Cfsm	0.178	0.646	0.607	2.00	1.33	3.37	2.75	0.624	0.164	0.181	0.096	0.112
In.	0.20	0.72	0.70	2.30	1.44	3.89	3.06	0.72	0.18	0.21	0.11	0.13

Calendar year 1951: Max 1,700 Min 6.0 Mean 138 Cfsm 1.00 In. 13.55
Water year 1951-52: Max 1,210 Min 6.4 Mean 139 Cfsm 1.01 In. 13.66

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of records for nearby stations including North Branch Clinton River near Mount Clemens and Black River near Fargo.
Note.--Stage-discharge relation affected by ice Nov. 20-23, Dec. 14 to Jan. 15, Jan. 20 to Mar. 1, Mar. 8-10.

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Clinton River near Fraser, Mich.

Location.--Lat 42°34'40", long. 82°57'00", in NW¼ sec. 20, T. 2 N., R. 13 E., on left bank 800 ft downstream from bridge on Garfield Road, 2¾ miles north of Fraser, and 4 miles upstream from North Branch.

Drainage area.--454 sq mi.

Records available.--May 1947 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 577.71 ft above mean sea level, datum of 1929. Prior to Nov. 17, 1949, wire-weight gage at site 800 ft upstream at same datum.

Average discharge.--5 years, 417 cfs.

Extremes.--Maximum discharge during year, 3,340 cfs Mar. 11 (gage height, 14.66 ft); minimum, 66 cfs Aug. 26 (gage height, 4.54 ft).
1947-52: Maximum discharge, 8,000 cfs May 11, 1948 (gage height, 19.5 ft, from graph based on gage readings), from rating curve extended above 4,000 cfs; minimum, 64 cfs Aug. 14, 1950.

Remarks.--Records excellent except those for periods of ice effect or no gage-height record, and those below 100 cfs, which are fair.

Rating table, water year, 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-3)

4.5	64	11.0	1,210
5.0	97	13.0	1,990
6.0	218	14.0	2,660
8.0	539		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	114	183	292	a1,200	842	337	633	385	277	96	74	78
2	155	176	284	a1,700	910	330	653	361	254	92	73	225
3	163	170	270	a1,200	755	322	614	345	232	89	78	183
4	150	160	600	a900	1,860	999	557	322	*232	129	95	132
5	139	149	1,000	a700	1,840	1,360	933	314	211	100	93	105
6	137	144	673	521	1,130	673	1,210	307	197	89	80	92
7	252	385	539	485	798	485	933	277	190	85	*76	92
8	254	485	468	468	693	451	776	292	176	175	74	78
9	183	404	404	468	633	434	*693	284	176	284	77	81
10	153	417	385	451	595	404	653	277	176	119	78	89
11	140	485	361	401	653	2,360	633	270	170	101	72	86
12	136	468	345	404	576	2,180	614	262	159	92	83	87
13	137	653	*300	393	576	1,270	1,350	270	154	83	83	75
14	136	957	290	401	468	887	2,230	247	148	79	74	72
15	128	693	280	*1,750	434	798	1,580	307	132	105	71	74
16	129	*521	270	1,990	380	673	1,080	277	119	*88	150	75
17	*130	451	250	1,420	360	595	842	254	116	89	183	*86
18	127	377	270	1,660	350	614	713	247	114	97	126	116
19	127	330	270	1,080	350	1,310	633	232	108	190	120	154
20	130	322	280	1,620	350	*1,580	576	232	102	113	91	113
21	125	292	290	1,270	*340	1,270	539	300	107	393	88	106
22	115	284	310	820	320	1,100	557	*270	115	145	96	99
23	210	330	300	887	310	1,460	1,030	353	111	100	81	122
24	1,030	330	a300	653	322	1,210	693	693	110	91	78	124
25	653	284	a290	576	307	887	576	910	111	82	72	119
26	369	284	a300	1,100	322	798	521	673	106	80	69	116
27	262	300	a300	1,360	345	755	485	521	106	79	72	109
28	225	277	a290	887	345	713	451	451	98	74	75	106
29	211	270	a300	633	337	653	434	369	154	77	74	100
30	204	284	a350	540	-	614	404	314	109	85	73	96
31	197	-	a470	500	-	614	-	284	-	77	74	-
Total	6,621	10,865	11,331	28,438	17,501	28,136	23,596	10,900	4,570	3,568	2,703	3,190
Mean	214	362	366	917	603	908	787	352	152	115	87.2	106
Cfsm	0.471	0.797	0.806	2.02	1.33	2.00	1.73	0.775	0.335	0.253	0.192	0.233
In.	0.54	0.89	0.93	2.33	1.43	2.30	1.93	0.89	0.37	0.29	0.22	0.26

Calendar year 1951: Max 2,140 Min 85 Mean 427 Cfsm 0.941 In. 12.79
Water year 1951-52: Max 2,360 Min 69 Mean 414 Cfsm 0.912 In. 12.38

Peak discharge (base, 1,100 cfs).--Oct. 24 (11:30 a.m.) 1,210 cfs (11.00 ft); Dec. 5 (2 a.m.) 1,160 cfs (10.78 ft); Jan. 2 (time and discharge unknown); Jan. 15 (11 to 12 p.m.) 2,500 cfs (13.81 ft); Jan. 20 (4 p.m.) 1,890 cfs (12.75 ft); Jan. 27 (3 a.m.) 1,540 cfs (12.04 ft); Feb. 4 (6 p.m.) 2,360 cfs (13.58 ft); Mar. 4 (12 p.m.) 1,890 cfs (12.76 ft); Mar. 11 (4:30 p.m.) 3,340 cfs (14.66 ft); Mar. 19 (10 to 12 p.m.) 1,700 cfs (12.38 ft); Mar. 23 (4 to 5 p.m.) 1,700 cfs (12.36 ft); Apr. 6 (5 to 6 a.m.) 1,270 cfs (11.23 ft); Apr. 14 (7:30 a.m.) 2,430 cfs (13.67 ft); Apr. 23 (8 a.m.) 1,210 cfs (10.95 ft).

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of records for North Branch Clinton River near Mount Clemens, Clinton River at Mount Clemens, and River Rouge at Detroit.
Note.--Stage-discharge relation affected by ice Dec. 14-23, Jan. 30, 31, Feb. 16-23.

North Branch Clinton River near Mount Clemens, Mich.

Location.--Lat 42°37'45", long. 82°53'25", in NW¼ sec. 2, T. 2 N., R. 13 E., on left bank 30 ft upstream from bridge on State Highway 59, 2 miles north of Mount Clemens, and 3½ miles upstream from mouth.

Drainage area.--185 sq mi.

Records available.--May 1947 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 576.38 ft above mean sea level, datum of 1929. Prior to Nov. 15, 1949, wire-weight gage at same site and datum.

Average discharge.--5 years, 163 cfs.

Extremes.--Maximum discharge during year, 2,460 cfs Mar. 12 (gage height, 14.25 ft); minimum, 2.0 cfs July 28; minimum gage height, 3.08 ft Sept. 16.
1947-52: Maximum gage height, 17.5 ft Apr. 4 or 5, 1950, from high-water mark in gage well (backwater from Clinton River); maximum daily discharge, 4,500 cfs Apr. 4, 1950; minimum discharge observed, 0.9 cfs Sept. 1, 1948.
Flood of Apr. 5 or 6, 1947, reached a stage of 20.0 ft, from floodmark (discharge not determined).

Remarks.--Records good except those for periods of ice effect and those below 20 cfs, which are poor. Some regulation at times from mill above station.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Dec. 4, July 31 to Aug. 22)

3.1	1.0	4.0	57
3.2	2.5	7.0	401
3.3	5.0	10.0	875
3.4	8.0	12.0	1,350
3.5	14	13.0	1,700
3.6	22	14.0	2,300

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.5	36	40	130	203	65	275	63	64	12	3.2	5.0
2	9.2	34	46	250	425	65	329	56	55	12	2.5	7.1
3	18	31	49	310	413	68	257	52	48	10	4.2	25
4	26	31	120	340	1,050	290	185	49	*41	9.8	4.8	24
5	21	34	500	280	1,700	855	353	48	37	13	14	25
6	9.8	30	635	260	1,020	895	915	48	34	16	8.6	20
7	13	38	317	230	400	437	875	46	31	7.7	*9.8	14
8	28	85	191	210	220	221	473	44	26	12	6.5	6.5
9	44	115	144	190	170	173	*269	43	24	18	7.1	14
10	34	99	130	180	160	150	197	44	20	13	5.6	8.6
11	24	144	116	170	150	1,160	185	44	17	14	2.5	8.0
12	22	161	103	170	170	1,880	161	44	13	11	5.3	7.4
13	19	257	85	160	190	915	465	43	13	9.8	6.5	7.4
14	16	461	70	160	200	500	1,810	41	13	3.8	5.9	8.0
15	14	530	60	300	140	287	1,380	44	12	4.0	7.1	4.2
16	13	*329	58	*950	100	209	635	48	10	5.9	11	6.2
17	*13	173	52	1,500	90	167	293	50	12	*11	7.7	7.7
18	12	100	52	1,650	80	167	197	45	10	9.8	8.6	*7.4
19	12	72	55	1,250	75	*454	150	43	9.8	12	14	9.2
20	12	88	60	920	70	995	125	41	7.4	12	9.2	8.0
21	12	129	60	700	*65	935	108	44	7.1	9.8	12	15
22	12	58	65	450	65	715	103	*46	7.4	20	9.8	7.1
23	20	59	65	320	65	795	122	50	7.4	19	6.5	16
24	124	79	65	250	65	915	104	70	13	11	7.1	17
25	275	69	65	220	65	461	99	215	9.8	5.9	2.8	9.8
26	191	62	65	250	65	293	92	287	9.8	6.2	7.7	12
27	79	89	60	401	65	287	87	156	7.7	4.0	5.6	12
28	56	143	*60	385	65	305	80	98	7.4	2.0	5.6	9.8
29	49	39	70	293	65	317	75	83	8.6	6.5	4.5	5.9
30	44	33	80	245	-	269	70	76	6.8	5.6	6.2	8.6
31	40	-	100	185	-	233	-	70	-	2.5	5.3	-
Total	1,268.5	3,608	3,638	13,289	7,611	15,478	10,469	2,131	582.2	309.3	217.2	335.9
Mean	40.9	120	117	429	262	499	349	68.7	19.4	9.98	7.01	11.2
Cfsm	0.221	0.649	0.632	2.32	1.42	2.70	1.89	0.371	0.105	0.054	0.038	0.061
In.	0.26	0.73	0.73	2.67	1.53	3.11	2.10	0.43	0.12	0.06	0.04	0.07

Calendar year 1951: Max 2,000 Min 3.6 Mean 160 Cfsm 0.865 In. 11.78
Water year 1951-52: Max 1,880 Min 2.0 Mean 161 Cfsm 0.870 In. 11.85

Peak discharge (base, 650 cfs).--Dec. 6 (8 to 9 a.m.) 680 cfs (9.01 ft); Jan. 18 (11 p.m.) 1,960 cfs (13.51 ft); Feb. 5 (4 a.m.) 1,900 cfs (13.37 ft); Mar. 5 (9 to 10 p.m.) 1,140 cfs (11.24 ft); Mar. 12 (1:30 a.m.) 2,460 cfs (14.25 ft); Mar. 20 (5 to 6 p.m.) 1,120 cfs (11.13 ft); Mar. 24 (6 a.m.) 1,020 cfs (10.73 ft); Apr. 6 (8 p.m.) 1,120 cfs (11.12 ft); Apr. 14 (1 to 2 p.m.) 2,080 cfs (13.73 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 13 to Jan. 26, Feb. 7 to Mar. 2.

Clinton River at Mount Clemens, Mich.

Location.--Lat 42°35'45", long. 82°54'35", on left bank 20 ft downstream from bridge on Moravian Drive, a quarter of a mile downstream from North Branch, and half a mile west of Mount Clemens.

Drainage area.--733 sq mi.

Records available.--May 1934 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 570.43 ft above mean sea level, datum of 1929. May 10, 1934, to May 7, 1935, chain gage and May 8, 1935, to Jan. 11, 1939, wire-weight gage, at same site and datum. Auxiliary water-stage recorder on right bank 2 miles downstream from base gage. Mar. 15, 1938, to Jan. 3, 1952, auxiliary wire-weight gage 1¾ miles downstream from base gage.

Average discharge.--18 years, 509 cfs.

Extremes.--Maximum discharge during year, 6,520 cfs Mar. 12 (gage height, 13.85 ft); minimum not determined; minimum gage height, 5.03 ft Oct. 19.
1934-52: Maximum discharge, 21,200 cfs Apr. 6, 1947 (gage height, 23.55 ft, from floodmark); minimum not determined; minimum gage height, 2.90 ft Oct. 15, 1934.

Remarks.--Records good except those for periods of no gage-height record or indefinite stage-discharge relation, which are fair.

Revisions (water years).--W 894: 1938. W 1084: 1938, 1943, 1945-46.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	130	250	412	1,630	1,920	407	962	470	350	120	80	95
2	180	240	412	2,630	1,660	402	1,010	440	330	110	80	260
3	230	220	421	1,900	1,200	375	950	420	310	110	85	240
4	253	210	920	1,390	3,400	1,420	843	400	*280	150	100	200
5	248	210	1,780	1,220	4,240	2,600	1,450	380	260	140	110	160
6	266	370	1,430	1,030	2,440	1,480	2,280	370	250	120	95	130
7	504	575	1,010	940	1,400	964	2,060	360	230	110	*90	110
8	358	681	775	860	1,120	721	1,450	360	220	190	80	100
9	364	660	679	831	950	707	*1,140	360	210	350	85	95
10	266	614	643	803	901	649	966	350	210	200	85	110
11	214	771	626	891	927	3,720	945	340	200	140	80	110
12	179	802	544	743	851	5,140	887	330	190	120	90	100
13	170	1,020	520	664	845	2,600	2,130	340	180	110	90	95
14	160	1,710	490	671	875	1,540	4,960	330	170	100	90	90
15	150	1,500	450	2,600	800	1,210	3,720	360	150	110	110	80
16	150	*1,060	420	*3,800	600	966	2,060	350	140	110	170	85
17	a145	771	400	3,640	550	868	1,410	340	140	*100	210	85
18	*a140	619	420	4,330	500	889	1,110	320	130	110	180	*90
19	140	493	445	3,080	500	2,130	923	310	130	210	160	170
20	150	559	353	3,160	487	*2,920	807	300	120	170	140	130
21	140	614	432	2,440	514	a2,500	731	390	120	400	120	120
22	150	509	420	1,540	*431	a2,200	697	*320	130	250	110	110
23	300	454	400	1,370	431	a2,500	1,320	400	130	140	100	140
24	1,130	520	400	1,320	399	a2,500	1,080	702	130	110	95	150
25	1,040	449	380	1,400	360	a1,500	841	1,260	130	100	90	140
26	676	400	400	1,540	394	a1,300	731	1,170	120	90	85	130
27	357	420	390	2,060	418	a1,200	638	850	120	85	85	120
28	320	400	380	1,420	415	a1,100	576	625	120	80	85	120
29	300	373	400	1,340	402	a1,000	548	500	170	85	90	120
30	280	353	450	a1,000	-	993	506	450	130	95	90	110
31	260	-	600	a900	-	932	-	400	-	85	90	-
Total	9,350	17,827	17,802	53,143	29,930	49,433	39,731	14,297	5,500	4,400	3,250	3,795
Mean	302	594	574	1,714	1,032	1,595	1,324	461	183	142	105	126
Cfsm	0.412	0.810	0.783	2.34	1.41	2.18	1.81	0.629	0.250	0.194	0.143	0.172
In.	0.47	0.90	0.90	2.70	1.52	2.51	2.02	0.73	0.28	0.22	0.16	0.19

Calendar year 1951: Max 5,630 Min 105 Mean 666 Cfsm 0.909 In. 12.31
Water year 1951-52: Max 5,140 Min 80 Mean 679 Cfsm 0.926 In. 12.60

Peak discharge (base, 3,000 cfs).--Jan. 18 (6 to 7 a.m.) 4,690 cfs (11.88 ft); Feb. 5 (3 to 5 a.m.) 4,870 cfs (12.14 ft); Mar. 5 (5 to 6 a.m.) 3,000 cfs (9.94 ft); Mar. 12 (1 a.m.) 6,520 cfs (13.85 ft); Mar. 20 (time unknown) 3,000 cfs (9.9 ft); Apr. 14 (4 to 6 p.m.) 5,620 cfs (12.9 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of 1 discharge measurement, weather records, and sum of records for station near Fraser, and for North Branch Clinton River near Mount Clemens.

Note.--Stage-discharge relation indefinite Oct. 1-3, 13-16, 19-23, Oct. 28 to Nov. 5, Nov. 26, 27, Dec. 13-18, 22-31, Feb. 15-19, May 1-23, May 29 to Sept. 30; discharge estimated on basis of 5 discharge measurements, weather records, and sum of records for station near Fraser and for North Branch Clinton River near Mount Clemens.

River Rouge at Birmingham, Mich.

Location.--Lat 42°32'45", long. 83°13'25", in NW¼ sec. 36, T. 2 N., R. 10 E., on left bank 100 ft upstream from West Maple Road Bridge and 25 ft downstream from mouth of Quarton Lake outlet, in Birmingham.

Drainage area.--33 sq mi, approximately.

Records available.--June 1950 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 720 ft (by barometer).

Extremes.--Maximum discharge during year, 430 cfs Mar. 11 (gage height, about 4.1 ft), from rating table extended above 160 cfs by logarithmic plotting; minimum, 1.1 cfs Aug. 28 (gage height, 1.39 ft).
1950-52: Maximum discharge, that of Mar. 11, 1952; minimum, that of Aug. 28, 1952.

Remarks.--Records good except those below 10 cfs, which are fair. Occasional regulation by Quarton Lake above station.

Rating table, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 6-18, July 16, 17)

1.38	1.2	2.1	38
1.4	1.5	2.5	81
1.5	3.8	3.0	157
1.6	7.1	3.5	265
1.8	17	4.0	400

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.4	8.1	10	36	39	19	47	22	14	3.0	1.5	4.1
2	9.6	7.6	10	55	54	17	44	19	12	2.7	1.5	6.4
3	8.1	7.1	12	44	49	16	40	18	11	4.4	2	4.4
4	5.6	7.6	46	35	187	91	40	20	11	4.4	3.0	2.7
5	4.4	7.1	48	30	95	74	81	17	*10	3.0	2.1	2.3
6	4.4	7.1	27	26	59	39	81	14	9.1	2.1	*2.3	2.1
7	14	24	*23	23	44	29	63	14	8.1	1.9	2.1	2.1
8	10	22	20	22	41	26	*48	18	7.1	3.8	2.3	1.9
9	6.4	16	19	22	36	25	42	18	7.1	4.6	2.5	2.3
10	4.9	14	16	20	34	32	42	20	5.6	3.5	2.1	2.1
11	4.1	17	15	16	36	335	40	18	4.9	2.7	2.5	2.3
12	3.8	22	14	18	30	120	41	17	4.9	2.3	2.3	1.5
13	3.2	48	12	16	29	76	137	16	4.9	1.9	2.1	1.3
14	3.2	64	10	18	23	52	157	15	4.6	1.9	2.5	1.5
15	3.0	32	9.6	*90	20	46	95	20	4.9	1.9	2.3	1.7
16	2.7	23	9.1	79	18	40	70	16	6.0	2.1	5.2	1.9
17	2.7	17	8.1	98	18	37	55	14	2.3	2.5	6.8	2.5
18	*4.4	15	9.1	97	18	42	45	14	2.3	*5.6	4.1	*2.7
19	3.0	12	9.1	61	20	*131	41	13	2.5	6.0	2.7	1.9
20	4.1	*11	9.6	90	18	98	37	14	3.0	10	2.1	1.9
21	5.6	10	12	59	20	90	36	*20	3.5	12	2.7	1.9
22	6.0	10	12	50	*18	84	39	16	3.5	6.4	2.5	1.9
23	25	15	11	47	18	111	49	37	3.5	4.6	3.2	2.1
24	71	14	10	36	18	74	40	74	3.2	3.2	3.5	2.5
25	32	10	12	32	17	62	34	63	3.2	3.0	1.9	2.1
26	16	10	11	70	18	57	32	39	3.2	2.7	1.3	1.9
27	12	9.1	10	71	18	53	29	27	3.2	2.3	1.2	1.9
28	10	9.1	10	49	18	50	27	20	3.0	2.5	1.2	2.1
29	9.6	8.6	12	33	17	46	22	16	3.8	2.1	1.2	1.9
30	8.6	9.6	14	25	-	43	22	14	3.2	2.3	1.7	2.1
31	7.6	-	17	24	-	43	-	13	-	1.9	3.2	-
Total	311.4	487.0	467.6	1,392	1,030	2,058	1,576	676	168.6	113.3	77.6	70.0
Mean	10.0	16.2	15.1	44.9	35.5	66.4	52.5	21.8	5.62	3.65	2.50	2.33
Cfsm	0.303	0.491	0.458	1.36	1.08	2.01	1.59	0.661	0.170	0.111	0.076	0.071
In.	0.35	0.55	0.53	1.57	1.16	2.32	1.78	0.76	0.19	0.13	0.09	0.08

Calendar year 1951: Max 164 Min 1.9 Mean 23.6 Cfsm 0.715 In. 9.68
Water year 1951-52: Max 335 Min 1.2 Mean 23.0 Cfsm 0.697 In. 9.51

Peak discharge (base, 110 cfs).--Jan. 15 (7:30 p.m.) 134 cfs (2.87 ft); Jan. 17 (10 p.m.) 144 cfs (2.93 ft); Feb. 4 (10 a.m.) 235 cfs (3.38 ft); Mar. 4 (8 to 9 p.m.) 175 cfs (3.10 ft); Mar. 11 (about 12 m.) 430 cfs (about 4.1 ft); Mar. 19 (1 to 2 p.m.) 159 cfs (3.01 ft); Mar. 23 (6 to 7 a.m.) 128 cfs (2.83 ft); Apr. 13 (10:30 p.m.) 203 cfs (3.24 ft).
* Discharge measurement made on this day.

River Rouge at Detroit, Mich.

Location.--Lat 42°22'20", long. 83°15'20", in SW¼ sec. 27, T. 1 S., R. 10 E., on right bank 500 ft upstream from Plymouth Road bridge in Detroit and 4 miles upstream from Middle River Rouge.

Drainage area.--193 sq mi.

Records available.--November 1930 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 584.00 ft above mean sea level, datum of 1929. Prior to Aug. 10, 1943, chain gage and Aug. 11, 1943, to Oct. 15, 1948, wire-weight gage, at site 1 mile downstream at datum 4.10 ft lower.

Average discharge.--22 years, 111 cfs.

Extremes.--Maximum discharge during year, 2,040 cfs Mar. 11 (gage height, 13.11 ft); minimum, 3.6 cfs Sept. 16 (gage height, 2.62 ft).
1930-52: Maximum discharge, 13,000 cfs Apr. 5, 1947; maximum gage height, 23.0 ft Apr. 6, 1947, from floodmark, site and datum then in use; minimum discharge observed, 2.7 cfs Aug. 11, 1934 (gage height, 3.50 ft, site and datum then in use).

Remarks.--Records good except those for periods of ice effect, which are fair.

Revisions (water years).--W 1034: 1933(M). W 1054: 1937-39, 1943, 1945(M).

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Sept. 3-30)

2.5	4.0	4.0	114
2.6	6.5	5.0	220
2.8	14	9.0	920
3.2	36	12.0	1,630

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	26	44	85	200	208	98	208	101	76	18	10	19
2	29	42	86	646	400	91	208	93	70	16	10	19
3	*32	39	87	476	318	90	184	86	*59	20	10	20
4	26	38	345	325	1,000	466	169	82	59	25	20	13
5	23	38	680	250	920	595	391	81	51	22	20	10
6	22	42	*295	208	382	250	544	71	48	13	*14	9.6
7	62	149	214	179	258	169	364	64	41	13	12	11
8	97	258	164	164	242	149	265	82	35	63	11	8.2
9	49	179	149	159	190	144	214	88	36	32	11	7.2
10	33	164	134	154	184	134	*196	86	34	18	11	7.2
11	28	190	119	144	235	1,360	208	89	27	14	11	6.8
12	27	220	110	133	179	1,360	190	76	25	13	13	6.2
13	25	493	92	130	174	476	733	70	25	10	13	5.0
14	23	780	85	129	149	302	1,420	66	24	11	11	4.8
15	23	*442	80	*700	159	288	720	88	24	11	10	4.5
16	23	228	70	1,160	126	220	400	86	22	*14	18	4.2
17	24	174	63	820	108	190	295	69	22	13	24	5.5
18	23	149	63	1,200	102	196	235	70	18	14	32	8.2
19	23	121	63	544	101	*720	202	61	15	38	16	12
20	25	97	70	1,020	*97	760	179	61	14	55	14	11
21	24	90	75	680	98	527	159	*90	17	357	15	9.0
22	24	89	75	400	96	459	174	85	26	87	14	10
23	83	121	75	391	89	700	646	144	26	34	11	*10
24	629	124	75	242	90	476	325	459	24	25	9.3	13
25	325	92	75	220	90	332	220	663	20	20	9.0	12
26	149	94	70	578	84	302	179	318	18	17	7.9	13
27	100	88	70	760	98	272	154	184	15	16	7.2	11
28	79	81	70	382	94	242	134	134	16	14	6.0	11
29	67	76	80	228	87	228	123	107	21	14	5.5	12
30	59	80	90	196	-	208	108	86	25	13	5.8	12
31	50	-	110	174	-	202	-	76	-	11	6.0	-
Total	2,232	4,822	3,919	13,992	6,358	12,006	9,547	3,916	933	1,041	387.7	305.4
Mean	72.0	161	126	419	219	387	318	126	31.1	33.6	12.5	10.2
Cfsm	0.373	0.834	0.653	2.17	1.13	2.01	1.65	0.653	0.161	0.174	0.065	0.053
In.	0.43	0.93	0.76	2.50	1.23	2.31	1.84	0.75	0.18	0.20	0.07	0.06

Calendar year 1951: Max 1,300 Min 14 Mean 153 Cfsm 0.793 In. 10.77
Water year 1951-52: Max 1,420 Min 4.2 Mean 160 Cfsm 0.829 In. 11.26

Peak discharge (base, 800 cfs).--Nov. 14 (4 p.m.) 860 cfs (8.69 ft); Dec. 5 (4 to 5 a.m.) 920 cfs (8.99 ft); Jan. 16 (6 a.m.) 1,370 cfs (11.13 ft); Jan. 18 (7:30 a.m.) 1,420 cfs (11.29 ft); Jan. 20 (6 p.m.) 1,200 cfs (10.39 ft); Jan. 27 (3 to 4 a.m.) 940 cfs (9.09 ft); Feb. 4 (9 p.m.) 1,340 cfs (11.0 ft); Mar. 5 (2 a.m.) 840 cfs (8.63 ft); Mar. 11 (11 p.m.) 2,040 cfs (13.11 ft); Mar. 19 (8 p.m.) 1,080 cfs (9.83 ft); Mar. 23 (3 p.m.) 820 cfs (8.54 ft); Apr. 14 (9 a.m.) 1,510 cfs (11.6 ft); Apr. 23 (1 p.m.) 840 cfs (8.57 ft); May 25 (7 to 8 a.m.) 800 cfs (8.42 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 14 to Jan. 1.

Middle River Rouge near Garden City, Mich.

Location.--Lat 42°20'55", long. 83°18'45", in W½ sec. 6, T. 2 S., R. 10 E., on right bank 200 ft downstream from Inkster Road bridge, 1¾ miles northeast of Garden City, and 6¼ miles upstream from mouth.

Drainage area.--89 sq mi, approximately.

Records available.--November 1930 to September 1933 (published as "at Detroit"), June 1947 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 600.95 ft above mean sea level, datum of 1929. Nov. 21, 1930, to Sept. 30, 1933, staff gage at site 4¾ miles downstream at datum 17.48 ft lower. June 6, 1947, to Oct. 18, 1948, wire-weight gage at site 200 ft upstream at present datum.

Average discharge.--8 years (1930-33, 1947-52), 77.6 cfs.

Extremes.--Maximum discharge during year, 1,060 cfs Mar. 11 (gage height, 8.76 ft); minimum, 12 cfs Sept. 22, 29 (gage height, 1.52 ft).
1930-33, 1947-52: Maximum discharge, 2,150 cfs May 10, 1948 (gage height, 10.50 ft, from floodmark); minimum observed, 1.4 cfs Aug. 21, 24, 28, Sept. 21, 1931 (site and datum then in use).

Remarks.--Records good except those for periods of ice effect or no gage height record, which are fair.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 12 to July 19)

Oct. 1 to Mar. 10				Mar. 11 to Sept. 30			
1.7	15	3.0	106	1.6	14	3.0	106
2.0	26	4.0	208	1.8	21	4.0	208
2.5	61	8.0	765	2.2	43	8.0	765

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	16	34	60	164	113	67	116	75	56	26	14	19
2	18	34	60	328	202	62	115	71	53	23	14	30
3	*21	34	60	316	184	62	107	66	*50	28	14	30
4	20	32	192	214	608	240	102	63	49	34	17	24
5	20	28	358	174	530	296	226	62	47	25	22	20
6	19	32	*196	144	257	144	478	61	45	20	*20	20
7	43	97	144	124	164	109	257	55	44	20	19	20
8	43	121	113	119	139	90	169	68	38	24	18	16
9	32	99	101	114	122	84	139	71	38	25	17	19
10	26	97	92	109	113	192	*122	69	38	20	16	19
11	24	111	84	95	133	735	122	67	34	19	15	17
12	22	117	79	92	119	757	113	63	33	18	20	17
13	21	226	64	86	112	335	413	60	33	14	20	16
14	20	465	57	*88	89	196	700	55	34	15	17	15
15	19	*296	55	478	78	159	478	71	33	*19	17	15
16	22	164	b50	699	b70	127	257	67	31	17	22	16
17	22	124	b47	569	b65	113	174	59	33	18	23	16
18	21	a100	b47	685	b65	*115	139	58	29	20	20	18
19	22	a80	b50	400	b62	465	117	56	27	33	24	22
20	20	a70	55	765	*b62	530	104	56	25	30	20	18
21	20	a60	63	504	70	371	97	*73	28	30	22	16
22	19	a70	76	270	66	276	112	66	34	28	20	14
23	52	a95	74	220	64	374	491	80	35	23	16	18
24	276	a80	70	144	63	276	208	202	33	20	15	*17
25	257	70	69	125	65	184	139	309	30	17	14	18
26	85	70	71	348	73	159	113	169	26	16	15	17
27	64	66	68	426	71	144	99	114	24	14	16	16
28	52	60	65	250	70	132	92	90	22	14	15	15
29	44	58	68	149	67	122	85	74	26	18	15	14
30	43	59	76	104	-	113	79	63	28	16	15	15
31	40	-	92	47	-	112	-	55	-	15	15	-
Total	1,423	3,049	2,756	8,351	3,896	7,141	5,963	2,568	1,056	659	547	547
Mean	45.9	102	88.9	269	134	230	199	82.8	35.2	21.3	17.6	18.2
Cfsm	0.516	1.15	0.999	3.02	1.51	2.58	2.24	0.930	0.396	0.239	0.198	0.204
In.	0.59	1.27	1.15	3.49	1.63	2.98	2.49	1.07	0.44	0.28	0.23	0.23

Calendar year 1951: Max 800 Min 15 Mean 97.5 Cfsm 1.10 In. 14.85
Water year 1951-52: Max 765 Min 14 Mean 104 Cfsm 1.17 In. 15.85

Peak discharge (base, 500 cfs).--Nov. 14 (3 p.m.) 530 cfs (6.46 ft); Jan. 16 (6 to 7 a.m.) 790 cfs (8.12 ft); Jan. 20 (4 to 5 p.m.) 910 cfs (8.44 ft); Jan. 27 (1 to 2 a.m.) 517 cfs (6.37 ft); Feb. 4 (7 p.m.) 720 cfs (7.76 ft); Mar. 11 (10 to 11 p.m.) 1,060 cfs (8.76 ft); Mar. 19 (7 to 8 p.m.) 595 cfs (7.00 ft); Apr. 14 (8 to 11 a.m.) 720 cfs (7.83 ft); Apr. 23 (12:30 p.m.) 595 cfs (7.00 ft).
* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records and records for Lower River Rouge at Inkster, River Rouge at Birmingham, and River Rouge at Detroit.
b Stage-discharge relation affected by ice.

Lower River Rouge at Inkster, Mich.

Location.--Lat 42°18'00", long. 83°18'00", in S½ sec. 19, T. 2 S., R. 10 E., on right bank 10 ft downstream from John Daly Road Bridge, 0.6 mile northeast of Inkster, and 4¾ miles upstream from mouth.

Drainage area.--90 sq mi, approximately.

Records available.--November 1930 to September 1933 (published as "at Dearborn"), June 1947 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 593.14 ft above mean sea level, datum of 1929. Nov. 21, 1930, to Sept. 30, 1933, staff gage at site 3¼ miles downstream at datum 16.26 ft lower. June 5, 1947, to Oct. 19, 1948, wire-weight gage at present site and datum.

Average discharge.--8 years (1930-33, 1947-52), 58.9 cfs.

Extremes.--Maximum discharge during year, 1,630 cfs Jan. 20 (gage height, 10.64 ft); minimum, 0.9 cfs Aug. 25, 26, Sept. 16, 22; minimum gage height, 2.90 ft Aug. 25, 26. 1930-33, 1947-52: Maximum discharge, 3,120 cfs Apr. 4, 1950 (gage height, 12.42 ft); minimum, 0.3 cfs Sept. 2, 1933 (gage height, 1.42 ft, site and datum then in use).

Remarks.--Records good except those for periods of ice effect, which are fair.

Revisions (water years).--W 1174: 1948(M).

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 3-23)

2.9	0.9	4.0	48
3.0	2.0	5.0	160
3.1	3.8	7.0	540
3.2	6.6	10.0	1,370
3.5	20		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.5	11	30	350	57	26	52	24	14	2.5	1.4	4.1
2	7.8	9.4	32	550	174	20	47	19	11	2.4	1.3	2.7
3	*3.8	8.2	32	390	143	24	40	18	*8.2	8.6	1.4	1.7
4	6.0	7.4	349	210	880	254	40	17	7.0	16	3.3	1.9
5	4.9	6.6	651	147	421	180	356	17	6.0	5.8	2.4	1.6
6	4.1	6.6	*187	118	153	68	390	15	5.2	3.1	*1.8	1.7
7	18	94	122	98	88	45	176	12	4.4	2.0	1.7	2.0
8	19	143	78	85	87	38	100	17	4.4	2.2	1.7	1.9
9	7.0	108	64	82	63	36	71	20	4.1	1.8	1.4	1.9
10	4.1	110	53	74	69	42	*59	17	3.3	1.6	1.6	1.7
11	3.3	164	44	56	126	877	59	17	3.1	1.8	1.4	1.6
12	2.7	172	37	54	72	565	53	15	2.9	1.7	1.8	1.4
13	2.0	390	28	44	70	200	588	12	2.9	1.4	1.4	1.2
14	2.2	730	24	*59	37	122	805	11	3.3	1.3	1.4	2.0
15	2.5	*260	22	730	34	118	300	18	3.3	*1.1	1.9	1.6
16	1.8	116	21	1,110	27	77	138	18	3.3	1.3	6.0	1.3
17	2.5	77	17	648	25	64	87	12	3.1	1.7	3.3	1.9
18	2.0	58	17	614	23	*77	61	11	3.1	4.1	3.1	3.3
19	2.0	40	17	224	20	*730	40	9.4	2.9	5.5	2.2	2.7
20	2.0	33	19	1,200	*19	460	40	9.4	2.7	50	1.9	1.6
21	3.6	29	25	557	21	290	36	*18	3.3	22	2.4	1.1
22	3.1	31	28	194	20	196	38	15	5.8	8.6	2.2	1.2
23	29	76	28	154	20	370	618	25	5.8	4.1	1.6	1.6
24	290	53	28	75	21	160	217	110	5.2	2.7	1.2	*1.4
25	118	33	28	61	24	108	108	232	3.8	2.0	1.2	1.3
26	46	37	25	450	28	94	63	92	2.9	1.8	1.2	1.6
27	33	29	25	470	30	82	46	44	2.4	1.6	1.2	1.8
28	25	29	25	156	28	72	38	30	2.2	1.6	1.2	1.6
29	20	27	30	68	25	61	32	21	6.0	1.8	1.6	2.0
30	16	28	35	42	-	53	27	15	2.9	1.8	2.0	2.4
31	13	-	80	36	-	51	-	12	-	1.7	3.8	-
Total	699.9	2,916.2	2,201	9,106	2,805	5,560	4,725	922.8	138.5	165.6	62.0	55.8
Mean	22.6	97.2	71.0	294	96.7	179	158	29.8	4.62	5.34	2.00	1.86
Cfsm	0.251	1.08	0.789	3.27	1.07	1.99	1.76	0.331	0.051	0.059	0.022	0.021
In.	0.29	1.21	0.91	3.76	1.16	2.30	1.95	0.38	0.06	0.07	0.03	0.02

Calendar year 1951: Max 1,050 Min 1.4 Mean 73.1 Cfsm 0.812 In. 11.02
Water year 1951-52: Max 1,200 Min 1.1 Mean 80.2 Cfsm 0.891 In. 12.14

Peak discharge (base, 600 cfs).--Nov. 14 (3 p.m.) 805 cfs (8.08 ft); Dec. 5 (7 to 8 a.m.) 905 cfs (8.52 ft); Jan. 2 (time and discharge unknown); Jan. 16 (7 a.m.) 1,410 cfs (10.09 ft); Jan. 20 (6 p.m.) 1,630 cfs (10.64 ft); Jan. 27 (3 to 4 a.m.) 755 cfs (7.91 ft); Feb. 4 (8 p.m.) 990 cfs (8.82 ft); Mar. 12 (12:30 a.m.) 1,290 cfs (9.79 ft); Mar. 19 (9 p.m.) 1,020 cfs (8.86 ft); Apr. 5 (11 p.m.) 655 cfs (7.53 ft); Apr. 14 (4 a.m.) 1,020 cfs (8.87 ft); Apr. 23 (5 p.m.) 830 cfs (8.19 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 21 to Jan. 2, Feb. 19-25.

Huron River at Commerce, Mich.

Location (revised).--Lat 42°35'25", long. 83°29'05", on line between NE¼ and SE¼ sec. 10, T. 2 N., R. 8 E., on downstream left abutment of bridge on Commerce Road, 10 ft upstream from Hayes Creek and 0.2 mile east of Commerce. Records include flow of Hayes Creek.

Drainage area.--51 sq mi, approximately, includes that of Hayes Creek.

Records available.--March 1946 to September 1952.

Gage.--Staff gage read twice daily. Datum of gage is 910.00 ft above mean sea level, datum of 1929.

Average discharge.--6 years, 52.3 cfs.

Extremes.--Maximum discharge observed during year, 121 cfs Apr. 14 (gage height, 2.26 ft); minimum, 9.6 cfs July 13, 14; minimum gage height, 1.02 ft July 13, 14, Aug. 14, 15.
1946-52: Maximum discharge, 266 cfs Apr. 7, 1947 (gage height, 2.98 ft, from graph based on gage readings); maximum gage height, 3.10 ft May 12, 1948, from graph based on gage readings (backwater from debris); minimum discharge observed, 7.2 cfs Aug. 18, Sept. 28, 1946 (gage height, 0.84 ft).

Remarks.--Records good. Slight regulation by Union Lake operated for lake level control.

Rating tables, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Dec. 5		Dec. 6 to Sept. 30	
1.0	10	0.9	8.0
1.1	14	1.0	10
1.3	25	1.1	14
2.0	93	1.3	26
		2.3	125

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	18	37	63	51	88	64	99	52	62	13	11	28
2	20	32	65	47	92	60	99	51	61	12	12	32
3	20	31	68	47	94	57	98	48	57	12	12	29
4	*20	20	85	45	104	62	98	47	57	12	12	18
5	20	11	89	46	110	64	105	44	*57	12	13	18
6	20	*12	93	47	108	60	110	42	55	11	12	17
7	25	53	*91	45	95	56	109	40	52	11	12	17
8	30	57	91	45	80	54	*109	42	46	11	*12	16
9	28	42	84	44	101	51	106	40	40	11	12	16
10	28	38	79	45	94	53	110	40	36	12	12	17
11	28	39	73	45	96	80	105	38	33	11	12	16
12	27	42	69	42	90	84	108	36	31	10	12	16
13	21	48	63	41	86	82	114	32	28	9.6	12	16
14	21	60	54	41	84	81	120	31	26	9.6	11	16
15	24	61	54	51	84	79	106	33	25	9.8	11	17
16	24	60	52	53	82	73	107	32	24	10	13	16
17	23	59	48	62	82	70	103	31	23	10	14	16
18	23	59	43	66	80	80	100	30	20	10	13	17
19	23	61	40	77	*77	85	93	32	18	12	12	*16
20	22	56	37	76	81	90	88	34	18	13	12	16
21	22	54	41	75	80	93	81	32	17	14	13	16
22	21	55	40	76	78	96	78	32	17	12	13	16
23	22	61	40	75	76	103	77	*51	16	12	12	16
24	42	65	39	*73	75	104	71	61	15	*12	12	15
25	43	62	39	75	73	103	68	79	14	12	12	14
26	45	62	39	83	73	*103	64	81	13	12	12	15
27	43	61	39	85	72	103	60	76	13	12	11	14
28	43	61	37	85	72	100	58	72	13	12	11	14
29	43	61	37	89	69	98	55	68	14	12	11	14
30	43	62	39	90	-	95	53	63	14	11	12	13
31	41	-	41	90	-	96	-	62	-	11	15	-
Total	873	1,482	1,772	1,912	2,476	2,479	2,752	1,452	915	354.0	376	517
Mean	28.2	49.4	57.2	61.7	85.4	80.0	91.7	46.8	30.5	11.4	12.1	17.2
Cfsm	0.553	0.969	1.12	1.21	1.67	1.57	1.80	0.918	0.598	0.224	0.237	0.337
In.	0.64	1.08	1.29	1.39	1.81	1.81	2.01	1.06	0.67	0.26	0.27	0.38

Calendar year 1951: Max 135 Min 11 Mean 53.9 Cfsm 1.06 In. 14.34
Water year 1951-52: Max 120 Min 9.6 Mean 47.4 Cfsm 0.929 In. 12.67

* Discharge measurement made on this day.

Huron River at Milford, Mich.

Location.--Lat 42°34'45", long. 83°37'35", in SE¼ sec. 9, T. 2 N., R. 7 E., on right bank 200 ft upstream from bridge on General Motors Road, half a mile downstream from Sherwood Creek, and half a mile west of Milford.

Drainage area.--125 sq mi.

Records available.--September 1948 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 880.00 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 358 cfs Apr. 15 (gage height, 7.13 ft); minimum, 2.6 cfs Aug. 16; minimum daily, 13 cfs Sept. 21, 28; minimum gage height, 4.14 ft Oct. 20, 21.

1948-52: Maximum discharge, 645 cfs Apr. 5, 1950 (gage height, 8.25 ft); minimum, that of Aug. 16, 1952; minimum daily, 8.3 cfs Sept. 17, 1949; minimum gage height, 4.04 ft Dec. 17, 1949.

Remarks.--Records good. Flow below about 300 cfs regulated by powerplant 1½ miles upstream.

Rating table, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Nov. 14, June 6 to Sept. 30)

4.1	8.0
4.5	34
5.0	77
6.0	194
7.1	350

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	64	92	78	150	193	99	236	140	135	37	28	34
2	72	103	107	164	168	148	253	140	154	45	30	108
3	66	42	153	162	188	183	242	105	149	47	30	99
4	66	51	177	156	264	181	237	104	118	39	71	94
5	*73	94	203	127	287	188	226	148	120	42	63	92
6	28	*74	191	132	264	186	281	142	*135	27	52	34
7	55	90	184	162	248	176	296	118	59	46	49	44
8	121	102	139	149	237	101	*283	119	84	53	49	90
9	105	123	155	131	203	153	261	142	131	46	26	64
10	82	48	194	152	214	186	254	56	95	46	21	52
11	78	89	169	128	228	265	254	93	92	47	45	59
12	75	144	167	89	217	*314	222	132	85	39	48	53
13	28	151	159	99	214	282	272	118	86	34	46	60
14	41	174	160	154	204	249	319	105	39	18	41	18
15	92	174	85	161	186	191	343	114	38	21	46	62
16	68	165	86	203	143	216	312	122	87	34	26	57
17	62	100	165	202	158	223	283	55	56	37	29	56
18	64	114	134	229	197	203	262	80	56	34	56	54
19	61	169	109	196	*188	242	216	124	55	46	52	*54
20	36	155	126	224	158	291	229	105	56	50	*46	54
21	29	139	149	245	170	*288	226	124	32	107	51	13
22	73	79	79	235	174	274	231	116	34	87	58	56
23	82	96	68	218	125	287	222	*156	62	74	26	54
24	156	122	79	*201	134	296	204	182	38	*67	26	55
25	162	118	120	196	195	286	214	225	44	61	42	53
26	150	153	125	168	165	263	150	237	43	37	51	52
27	74	141	*110	212	173	257	151	206	51	28	44	50
28	82	133	118	239	164	260	188	184	35	41	46	13
29	132	131	88	207	155	210	175	190	28	25	44	58
30	104	141	102	196	-	237	122	133	34	42	26	51
31	96	-	130	186	-	239	-	125	-	42	29	-
Total	2,477	3,507	4,109	5,473	5,614	6,974	7,164	4,140	2,231	1,399	1,297	1,693
Mean	79.9	117	133	177	194	225	239	134	74.4	45.1	41.8	56.4
Cfsm	0.639	0.936	1.06	1.42	1.55	1.80	1.91	1.07	0.595	0.361	0.334	0.451
In.	0.74	1.04	1.22	1.63	1.67	2.07	2.13	1.23	0.66	0.42	0.39	0.50

Calendar year 1951: Max 375 Min 21 Mean 141 Cfsm 1.13 In. 15.30
Water year 1951-52: Max 343 Min 13 Mean 126 Cfsm 1.01 In. 13.70

* Discharge measurement made on this day.

Huron River near New Hudson, Mich.

Location.--Lat 42°30'45", long. 83°40'35", in NE¼ sec. 1, T. 1 N., R. 6 E., on right bank 150 ft downstream from Kent Lake Dam, 2 miles upstream from Woodruff Creek, and 3 miles west of New Hudson.

Drainage area.--143 sq mi.

Records available.--August 1948 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 868.00 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 438 cfs Apr. 16 (gage height, 3.57 ft), caused by momentary gate-opening at Kent Lake; minimum, 3.4 cfs July 18; minimum gage height, 0.75 ft May 14.
1948-52: Maximum discharge, 1,080 cfs Dec. 29, 1950 (gage height, 5.05 ft), from rating curve extended above 600 cfs by logarithmic plotting; minimum, that of July 18, 1952; minimum gage height, 0.72 ft Apr. 3, 1950.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Occasional regulation by Kent Lake.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	61	178	144	144	202	161	226	154	155	37	27	66
2	84	194	128	160	198	149	234	155	156	33	26	120
3	87	209	137	167	196	161	234	146	161	40	30	132
4	*172	137	172	170	234	174	234	137	160	49	34	128
5	252	122	196	166	280	182	243	136	146	43	52	123
6	172	127	200	155	290	182	252	140	*144	36	57	122
7	145	140	192	158	280	178	*270	142	139	30	55	93
8	135	133	191	164	260	167	290	144	115	34	50	79
9	142	135	178	158	252	156	270	145	116	37	48	88
10	135	130	174	155	223	162	270	145	115	34	42	81
11	122	113	182	156	226	226	260	122	111	33	36	75
12	114	130	179	145	226	270	260	114	106	38	45	70
13	100	156	174	133	234	290	270	98	107	30	47	70
14	72	179	170	137	223	270	310	11	97	28	47	63
15	75	198	164	162	212	234	340	37	79	22	47	51
16	89	202	a160	179	197	209	246	68	68	22	59	52
17	106	186	a150	206	179	204	166	85	79	23	51	55
18	136	154	a140	226	*182	206	243	85	66	16	49	61
19	114	*156	a140	243	188	224	243	90	61	7.4	57	*62
20	97	167	a150	260	188	252	234	106	58	15	*56	59
21	67	160	156	252	182	270	226	114	61	45	68	50
22	58	154	160	270	182	280	234	120	51	71	74	42
23	107	140	a160	260	174	280	243	*148	50	74	66	50
24	174	137	a150	234	160	280	221	179	58	*71	49	116
25	202	139	a140	*226	166	290	212	214	51	58	47	149
26	196	145	*a130	226	174	*270	191	226	54	57	51	114
27	184	148	132	216	172	260	170	221	52	45	57	92
28	132	149	130	234	173	252	168	202	47	38	58	67
29	133	145	126	234	173	234	170	196	45	30	58	55
30	218	144	118	221	-	216	178	174	40	26	50	55
31	221	-	127	209	-	219	-	156	-	30	49	-
Total	4,102	4,807	4,850	6,026	6,026	6,908	7,106	4,210	2,748	1,152.4	1,542	2,440
Mean	132	154	156	194	208	223	237	136	91.6	37.2	49.7	81.3
Cfsm	0.923	1.08	1.09	1.36	1.45	1.56	1.66	0.951	0.641	0.260	0.348	0.569
In.	1.07	1.20	1.26	1.57	1.57	1.80	1.85	1.09	0.71	0.30	0.40	0.63

Calendar year 1951: Max 390 Min 10 Mean 160 Cfsm 1.12 In. 15.18
Water year 1951-52: Max 340 Min 7.4 Mean 141 Cfsm 0.986 In. 13.45

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of 1 discharge measurement, weather records, and records for stations at Milford and near Dexter.

Ore Creek near Brighton, Mich.

Location.--Lat 42°29'40", long. 83°48'05", in NW¼ sec. 12, T. 1 N., R. 5 E., on left bank at downstream side of bridge on Hamburg Road, half a mile upstream from Ore Lake and 2½ miles southwest of Brighton.

Drainage area.--31 sq mi, approximately.

Records available.--February 1951 to September 1952.

Gage.--Staff gage read once daily. Datum of gage is 850.56 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation).

Extremes.--1951: Maximum discharge observed during period February to September, 131 cfs Feb. 28 (gage height, 16.51 ft), from rating curve extended above 86 cfs by logarithmic plotting; minimum, 5.2 cfs Aug. 14 (gage height, 14.48 ft).
1951-52: Maximum discharge observed during year, 86 cfs Apr. 15, 16 (gage height, 15.60 ft); minimum, 1.5 cfs July 16; minimum gage height, 14.10 ft Sept. 29.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Occasional regulation by lakes above station.

Rating table, Feb. 28, 1951, to Sept. 30, 1952, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 11 to Sept. 19, 1951, Nov. 14 to Dec. 3, 1951, June 30 to Aug. 7, 1952)

13.9	1.0	14.4	18
14.0	2.0	14.7	38
14.1	..0	15.0	55
14.2	7.0	15.7	91

Discharge, in cubic feet per second, February to September 1951

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						86	63	60	45	24	14	23
2						81	66	57	45	25	12	21
3						88	66	60	42	24	14	19
4						88	65	58	40	22	12	17
5						84	63	48	36	18	12	14
6						86	61	54	34	15	8.0	14
7						84	59	58	29	11	9.0	*14
8						78	58	54	29	10	8.5	14
9						74	67	50	27	*16	8.0	12
10						70	65	51	32	14	7.0	22
11						67	62	63	31	15	6.1	21
12						62	62	66	28	15	6.1	20
13						59	62	64	26	14	5.8	22
14						67	62	58	24	14	5.2	20
15						71	62	51	22	14	9.5	19
16						67	60	49	21	13	9.0	17
17						65	58	51	19	13	*9.0	16
18						62	55	51	19	13	12	14
19						64	55	49	18	13	12	12
20						61	52	55	*18	12	12	12
21						57	49	74	16	10	22	10
22						55	60	70	22	25	20	10
23						53	57	66	26	23	18	10
24						50	56	62	25	40	17	10
25						47	64	58	22	36	16	10
26						47	61	55	22	30	15	10
27						46	61	56	21	22	13	11
28					131	48	58	58	26	17	12	10
29						56	66	54	a27	24	12	11
30					-	61	62	53	26	21	11	14
31					-	61	-	48	-	18	24	-
Total					-	2,045	1,817	1,761	818	581	371.2	449
Mean					-	66.0	60.6	56.8	27.3	18.7	12.0	15.0
Cfsm					-	2.13	1.95	1.83	0.881	0.603	0.387	0.484
In.					-	2.45	2.18	2.11	0.98	0.70	0.45	0.54

Calendar year	: Max	Min	Mean	Cfsm	In.
Water year	: Max	Min	Mean	Cfsm	In.

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of records for Portage Creek near Pinckney and River Rouge at Birmingham.

Ore Creek near Brighton, Mich.--Continued

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	13	36	22	a31	48	21	48	29	a55	a15	4.3	a15
2	18	32	22	b33	46	a23	46	a25	a50	a20	a4	22
3	*17	28	23	b36	a55	24	45	a23	46	24	a3.5	22
4	16	25	45	40	61	33	44	a22	42	24	3.4	19
5	14	24	44	44	60	31	a50	a20	38	a23	3.2	17
6	13	29	43	a44	60	33	a55	19	35	a20	3.8	a15
7	31	37	43	45	60	33	*60	17	33	a17	3.2	a13
8	31	37	42	46	59	32	57	23	a30	a15	2.6	a11
9	30	36	42	45	60	a34	56	*22	29	13	5.8	a10
10	28	37	41	44	a60	36	a54	22	22	12	a7	9.0
11	26	37	39	39	54	64	a56	a20	22	8.0	9.0	8.5
12	24	37	38	40	50	61	a60	19	*19	a6	10	8.0
13	22	47	36	a40	46	64	a70	18	a18	a5	13	8.0
14	19	49	34	39	41	67	a80	17	a17	3.4	13	a7
15	18	47	32	50	40	69	86	22	a17	2.0	12	a6.5
16	17	45	b30	51	37	a60	*86	21	17	1.5	a11	a6
17	17	46	b29	62	a34	a58	86	22	17	1.7	a11	5.5
18	16	43	b27	61	*31	55	84	a20	16	a3	*12	6.4
19	16	*39	b26	64	31	62	a78	18	14	a5	10	6.7
20	15	36	b26	a70	31	61	a70	21	13	a9	8.0	a7
21	14	33	b27	74	31	*61	64	25	13	14	7.0	a7
22	13	32	b35	81	28	63	58	21	a15	a13	a6	a7
23	33	33	25	71	28	a62	a54	43	16	*11	a6	7.5
24	62	33	26	74	a26	62	a50	66	16	8.0	a5.5	8.5
25	60	32	a27	*69	25	61	48	a70	16	a8	5.2	9.0
26	55	31	28	71	25	60	43	a70	15	a8	a4.5	*8.0
27	53	26	*28	a66	24	58	a40	69	14	a10	a3.5	a8
28	50	25	26	61	24	56	38	71	a13	8.5	a3	a7
29	46	24	b27	54	24	52	35	70	a14	6.7	a3.5	6.7
30	43	23	a28	52	-	a50	a32	65	16	6.4	a6	a6
31	38	-	29	48	-	48	-	a60	-	4.9	a9	-
Total	868	1,039	990	1,645	1,199	1,554	1,733	1,050	698	326.1	209.0	297.3
Mean	28.0	34.6	31.9	53.1	41.3	50.1	57.8	33.9	23.3	10.5	6.74	9.91
Cfsm	0.903	1.12	1.03	1.71	1.33	1.62	1.86	1.09	0.752	0.339	0.217	0.320
In.	1.04	1.25	1.19	1.97	1.44	1.86	2.08	1.26	0.84	0.39	0.25	0.36

Calendar year 1951: Max - Min - Mean - Cfsm - In. -
Water year 1951-52: Max 86 Min 1.5 Mean 31.7 Cfsm 1.02 In. 13.93

* Discharge measurement made on this day.
a No gage-height record; discharge interpolated or estimated on basis of records for Portage Creek near Pinckney and River Rouge at Birmingham.
b Stage-discharge relation affected by ice.

Portage Creek near Pinckney, Mich.

Location.--Lat 42°25'40", long. 83°57'35", in sec. 34, T. 1 N., R. 4 E., on right bank at upstream side of highway bridge, 2 miles upstream from Little Portage Lake and 2¼ miles southwest of Pinckney.

Drainage area.--79 sq mi, approximately.

Records available.--November 1944 to September 1952.

Gage.--Staff gage read twice daily. Datum of gage is 860.38 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation).

Average discharge.--8 years, 62.3 cfs.

Extremes.--Maximum discharge during year, 200 cfs Jan. 29 (gage height, 3.88 ft); minimum, 5.5 cfs Aug. 27-29, 31 (gage height, 0.90 ft).
1944-52: Maximum discharge, 529 cfs Apr. 9, 10, 1947 (gage height, 5.72 ft, from graph based on gage readings); minimum observed, 0.6 cfs Oct. 5, 1946 (gage height, 0.56 ft).

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Occasional regulation by Hiland Lake 2½ miles upstream.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 29				Jan. 30 to Sept. 30			
1.3	11	3.0	78	0.9	5.5	3.0	89
2.0	32	4.0	215	1.4	16	3.5	143
2.5	48			2.0	34	4.0	215
				2.5	56		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11	76	a70	75	139	66	125	116	107	14	8.7	8.2
2	14	66	69	a80	133	61	124	109	105	13	8.6	10
3	12	70	66	82	126	60	121	105	107	16	8.4	9.1
4	14	68	74	82	136	68	118	96	105	a16	12	8.2
5	*15	63	76	111	133	71	121	91	102	a16	12	7.1
6	a17	68	77	103	135	66	126	87	96	16	10	6.9
7	a20	68	80	90	136	66	126	79	93	15	9.7	6.9
8	31	41	82	93	136	66	126	81	90	28	14	6.8
9	49	44	84	93	167	69	126	50	85	26	a12	6.6
10	42	51	84	92	151	71	126	44	*79	22	11	7.1
11	40	54	82	114	133	90	126	52	72	13	11	6.6
12	39	52	*84	100	*132	91	a140	51	67	9.5	6.9	a7
13	37	59	80	103	119	98	a150	50	60	10	6.6	a7
14	36	76	75	89	124	106	156	64	56	11	8.4	6.9
15	35	79	70	98	111	105	162	63	33	19	7.5	8.4
16	34	80	60	95	107	113	168	60	32	7.5	10	9.3
17	33	82	55	104	103	112	*178	58	32	8.0	10	8.4
18	32	87	50	120	95	113	180	56	35	8.9	*15	8.7
19	30	*90	50	125	93	123	185	*54	30	16	9.1	9.5
20	30	90	55	155	92	126	182	56	27	11	9.3	8.7
21	31	120	57	164	89	126	180	59	24	11	9.7	8.4
22	38	a110	58	164	86	126	174	56	17	*9.9	15	8.0
23	42	100	58	174	a80	139	172	62	18	9.9	a14	8.2
24	57	95	57	179	78	139	164	73	18	9.5	a13	8.4
25	52	90	a57	172	77	*137	155	103	18	9.5	12	*8.7
26	55	89	57	176	78	136	148	127	17	11	8.2	8.4
27	62	85	55	167	71	136	148	126	16	9.5	5.5	7.8
28	65	82	55	166	67	136	133	123	15	10	5.5	7.8
29	68	79	57	180	66	136	126	118	16	10	5.5	7.8
30	85	77	60	182	-	130	119	116	14	10	5.9	7.5
31	80	-	68	153	-	130	-	109	-	9.1	5.7	-
Total	1,206	2,291	2,062	3,881	3,193	3,212	4,385	2,494	1,586	405.3	300.2	238.4
Mean	38.9	76.4	66.5	125	110	104	146	80.5	52.9	13.1	9.68	7.95
Cfsm	0.492	0.967	0.842	1.58	1.39	1.32	1.85	1.02	0.670	0.166	0.123	0.101
In.	0.57	1.08	0.97	1.83	1.50	1.51	2.06	1.17	0.75	0.19	0.14	0.11

Calendar year 1951: Max 230 Min 8.0 Mean 73.5 Cfsm 0.930 In. 12.63
Water year 1951-52: Max 185 Min 5.5 Mean 69.0 Cfsm 0.873 In. 11.88

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records and records for Huron River near Dexter and Ore Creek near Brighton.
Note.--Stage-discharge relation affected by ice Dec. 13 to Jan. 1.

Huron River near Dexter, Mich.

Location.--Lat 42°23'10" (corrected), long. 83°54'40", in S½ sec. 13, T. 1 S., R. 4 E., on downstream side of highway bridge on North Territorial Road, half a mile east of Hudson Mills, 2 miles downstream from Portage Lake outlet, and 4 miles north of Dexter.

Drainage area.--506 sq mi.

Records available.--August to December 1904 (gage heights only), March 1946 to September 1952. Published as "at Dover" 1904.

Gage.--Wire-weight gage read twice daily. Datum of gage is 837.11 ft above mean sea level (levels by Michigan Department of Conservation). August to December 1904 chain gage at site 1 mile upstream at different datum.

Average discharge.--6 years, 490 cfs.

Extremes.--Maximum discharge during year, 1,070 cfs Apr. 17, 18; maximum gage height, 5.40 ft Apr. 17; minimum discharge, 103 cfs Sept. 11 (gage height, 3.14 ft).
1946-52: Maximum discharge, 3,120 cfs Apr. 9, 1947 (gage height, 8.17 ft, from graph based on gage readings); minimum observed, 56 cfs Sept. 6, 9, 10, 1946; minimum gage height, 2.97 ft Aug. 9, 14, 15, 1946.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair.

Rating table, water year 1951-52, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

3.1	95	5.0	850
3.4	160	6.0	1,440
4.0	380		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	160	444	432	412	775	468	825	610	635	a140	123	125
2	*178	444	428	444	775	500	800	570	605	a140	125	123
3	181	436	424	444	800	520	825	a520	545	a140	123	121
4	187	424	444	448	800	520	825	480	500	a140	123	123
5	197	*420	*468	530	825	510	a850	456	484	a140	123	123
6	204	388	492	a550	850	510	a900	436	468	135	123	121
7	284	396	496	560	825	500	a900	408	448	131	123	121
8	324	392	530	570	850	505	a850	408	424	127	123	117
9	348	396	a550	570	850	510	850	396	392	127	127	113
10	348	396	560	570	850	515	875	a400	364	127	129	109
11	341	404	540	555	850	585	900	a380	336	127	127	105
12	332	408	530	540	800	640	925	368	*292	127	125	125
13	316	412	510	530	*775	725	950	364	296	123	121	138
14	300	480	480	530	725	775	1,010	356	272	119	121	148
15	380	505	440	550	650	825	1,010	352	253	117	121	145
16	316	530	400	580	600	850	1,040	340	250	115	a130	142
17	288	540	360	635	590	875	*1,070	a330	236	113	a140	129
18	268	560	350	700	575	a875	1,070	304	184	115	a135	129
19	a250	555	330	750	560	875	1,040	*300	163	117	*131	131
20	a240	540	320	850	545	875	980	300	133	117	125	131
21	a240	520	330	900	535	*900	950	324	135	119	125	127
22	246	510	340	1,010	492	925	925	344	138	*115	125	127
23	280	510	350	*1,040	452	925	900	356	133	115	125	129
24	380	500	330	1,010	464	950	850	a450	135	117	125	129
25	428	424	350	1,010	480	1,010	800	a550	135	119	123	*129
26	468	476	340	1,010	472	1,010	775	615	131	121	121	133
27	484	468	340	980	468	980	725	650	135	117	125	145
28	500	456	340	950	460	950	700	675	138	117	121	152
29	492	444	350	900	460	925	675	700	a140	119	121	158
30	476	436	372	825	-	900	640	675	a140	121	123	155
31	456	-	380	775	-	850	-	650	-	123	125	-
Total	9,892	13,814	12,906	21,728	19,153	23,283	26,435	14,067	8,640	3,840	3,877	3,903
Mean	319	460	416	701	660	751	881	454	288	124	125	130
Cfsm	0.630	0.909	0.822	1.39	1.30	1.48	1.48	0.897	0.569	0.245	0.247	0.257
In.	0.73	1.02	0.95	1.60	1.41	1.71	1.94	1.03	0.64	0.28	0.28	0.29

Calendar year 1951: Max 1,550 Min 113 Mean 520 Cfsm 1.03 In. 13.96
Water year 1951-52: Max 1,070 Min 105 Mean 441 Cfsm 0.872 In. 11.88

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of records for stations at Ann Arbor and near New Hudson.
Note.--Stage-discharge relation affected by ice Dec. 14-29.

Huron River at Ann Arbor, Mich.

Location.--Lat 42°17'10", long. 83°44'00", in NW¼ sec. 28, T. 2 S., R. 6 E., on left bank 100 ft upstream from Wall Street Bridge in Ann Arbor, three-quarters of a mile downstream from Argo Dam, and 4 miles upstream from Geddes Dam.

Drainage area.--711 sq mi.

Records available.--February 1904 to September 1940, August 1948 to September 1952. Published as "at Geddes" February 1904 to December 1914 and as "at Barton" January 1914 to September 1940.

Gage.--Water-stage recorder. Datum of gage is 744.81 ft above mean sea level, datum of 1929 (levels by Michigan Department of Conservation). February 1904 to December 1914 at Geddes Dam, 4 miles downstream and January 1914 to September 1940 at Barton Dam, 3 miles upstream; flow computed from records of operation of powerplants and records of flow over dam and/or flow through undersluices.

Average discharge.--38 years (1906-40, 1948-52), 430 cfs.

Extremes.--Maximum discharge during year, 2,180 cfs Apr. 14 (gage height, 14.85 ft); minimum, 16 cfs Sept. 8, 9 (gage height, 11.42 ft); minimum daily, 129 cfs Aug. 29.
1904-40, 1948-52: Maximum daily discharge, 5,840 cfs Mar. 14, 1918; minimum daily, 4 cfs Aug. 2, Sept. 11, 1931 (plant leakage).

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Flow regulated by Argo Dam of Detroit Edison Co.

Revisions (water years).--W 874: 1938.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 6-25)

11.9	121	13.0	640
12.3	251	14.0	1,410
12.5	345	15.0	2,330

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	196	683	570	a580	1,040	595	1,110	855	827	199	130	185
2	*245	694	567	a600	1,020	594	1,100	841	763	199	155	290
3	242	690	569	a620	1,120	517	990	728	758	217	156	191
4	219	692	774	a640	1,350	762	948	755	672	210	160	215
5	215	*556	*892	a700	1,490	772	1,200	705	655	183	173	221
6	238	504	813	a760	1,310	727	1,300	642	651	162	161	224
7	397	559	809	a800	1,160	673	1,270	657	576	181	151	242
8	424	534	708	a800	1,110	608	1,310	582	489	186	171	219
9	390	547	730	a820	1,090	622	1,320	701	566	194	157	231
10	448	357	759	a820	1,060	729	1,260	645	*490	172	172	220
11	468	231	756	a800	1,120	1,740	1,260	618	382	181	180	204
12	354	403	659	a760	1,090	1,540	1,240	597	431	170	190	192
13	326	850	673	a740	1,040	1,300	1,540	588	377	163	183	190
14	362	976	661	a740	*882	1,210	2,090	479	317	174	166	181
15	466	966	618	800	798	1,090	1,900	567	321	167	155	175
16	453	840	518	900	820	1,120	*1,620	554	377	175	215	175
17	349	840	398	1,000	801	1,120	1,560	547	337	176	216	148
18	307	720	450	1,100	729	1,120	1,430	429	330	197	176	180
19	304	780	420	1,430	708	1,480	1,360	452	202	198	167	180
20	335	680	470	1,840	696	1,570	1,280	*573	231	206	*182	150
21	248	610	510	1,840	602	1,450	1,220	510	209	206	153	152
22	335	710	460	1,580	647	1,390	1,260	510	198	*210	173	177
23	394	710	480	*1,340	653	1,500	1,440	698	273	187	137	144
24	724	710	500	1,260	604	1,490	1,280	932	251	194	169	*136
25	666	670	490	1,310	580	1,300	1,220	953	195	176	157	*155
26	709	670	470	1,420	580	*1,310	1,040	974	208	194	159	149
27	715	660	460	1,560	590	1,310	1,000	1,020	222	195	159	163
28	683	560	a460	1,390	588	1,240	1,050	1,010	188	199	161	181
29	836	570	a470	1,110	591	1,180	990	948	218	196	129	184
30	716	600	a500	1,010	-	1,190	830	884	188	193	151	175
31	601	-	a540	1,050	-	1,110	-	893	-	187	207	-
Total	13,365	19,572	18,154	32,120	25,869	34,359	38,418	21,847	11,902	5,847	5,171	5,629
Mean	431	652	586	1,036	892	1,108	1,281	705	397	189	167	188
Cfsm	0.606	0.917	0.824	1.46	1.25	1.56	1.80	0.992	0.558	0.266	0.235	0.264
In.	0.70	1.02	0.95	1.68	1.35	1.80	2.01	1.14	0.62	0.31	0.27	0.29

Calendar year 1951: Max 2,330 Min 144 Mean 706 Cfsm 0.993 In. 13.49
Water year 1951-52: Max 2,090 Min 129 Mean 636 Cfsm 0.895 In. 12.14

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of records for station near Dexter and powerplant records.
Note.--Stage-discharge relation affected by ice Dec. 18-27, Jan. 15-18.

Raisin River at Monroe, Mich.

Location.--Lat 41°54'50", long. 83°23'15", on right bank 5 ft upstream from lowhead dam at municipal water-supply plant at Monroe, 4 miles upstream from mouth.

Drainage area.--1,020 sq mi, approximately.

Records available.--September 1937 to September 1952.

Gage.--Water-stage recorder and concrete control. Datum of gage is 570.00 ft above mean sea level (levels by city of Monroe).

Average discharge.--15 years, 780 cfs.

Extremes.--Maximum discharge during year, 6,900 cfs Jan. 18; maximum gage height, 10.69 ft Jan. 5 (ice jam); minimum discharge, 47 cfs Sept. 14, 18, but may have been less during period of indefinite stage-discharge relation; minimum gage height, 3.39 ft Aug. 10 (gates in dam open).
1937-52: Maximum discharge, 12,900 cfs May 19, 1945, Mar. 29, 1950; maximum gage height, 10.7 ft Feb. 1, 1949 (ice jam); minimum discharge, about 2 cfs Sept. 4, 1938, Sept. 19, 20, 1941; minimum gage height, 3.06 ft Oct. 12, 1946 (gates in dam open).

Remarks.--Records good except those for periods of ice effect or when gates in dam were open, which are poor. Some regulation by powerplant above station.

Revisions (water years).--W 954: 1938-40(m), 1941.

Rating table, water year 1951-52, except periods of ice effect or indefinite stage-discharge relation (gage height, in feet, and discharge, in cubic feet per second)

5.6	32	6.5	970
5.7	87	7.0	1,810
5.9	237	8.0	4,000
6.2	550	9.0	7,100

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*122	458	641	1,200	1,400	764	1,100	792	792	205	140	101
2	196	392	654	2,000	1,400	694	1,080	708	722	196	140	108
3	164	371	667	3,500	1,700	680	1,020	641	*628	188	140	135
4	101	349	*1,070	3,800	3,040	910	940	576	538	142	110	63
5	142	310	2,690	3,500	3,630	1,580	1,450	589	481	156	*130	128
6	156	301	2,740	2,700	3,510	1,610	2,690	550	470	196	150	94
7	156	504	2,720	2,000	3,160	1,450	3,040	492	435	180	130	87
8	213	1,000	2,420	1,600	2,800	1,100	3,040	492	403	180	140	135
9	292	1,180	1,870	1,400	2,080	895	2,820	504	414	149	130	149
10	339	1,220	1,450	1,200	1,650	880	2,400	516	382	156	100	115
11	360	1,490	1,220	1,100	1,670	2,580	*1,920	492	360	156	130	75
12	339	1,700	1,090	1,000	1,650	3,880	1,630	492	310	164	160	94
13	301	1,920	910	1,000	1,670	4,000	2,160	470	292	122	150	94
14	255	*3,040	736	1,090	1,380	3,880	3,270	481	292	149	120	58
15	246	3,160	600	2,750	1,280	3,510	3,510	492	255	*164	140	101
16	255	2,930	550	4,810	985	2,820	3,510	481	264	115	140	135
17	221	2,820	520	5,400	925	2,040	3,510	470	272	101	120	87
18	196	2,550	500	6,520	835	*1,630	2,930	435	246	120	160	52
19	246	1,850	500	5,700	750	2,530	2,280	458	229	150	180	87
20	246	1,260	520	6,180	722	3,160	1,740	*435	246	150	140	115
21	205	985	540	5,700	722	3,390	1,420	435	246	170	120	81
22	205	850	550	*4,960	708	3,390	1,220	458	229	220	160	115
23	292	850	550	4,130	680	3,510	1,280	516	255	160	180	*142
24	538	1,020	550	3,160	680	3,040	1,670	778	264	210	120	94
25	925	1,100	540	2,650	778	2,630	1,680	1,670	229	280	120	108
26	1,040	1,120	540	2,650	835	2,260	1,560	2,240	255	240	140	128
27	1,000	955	540	3,390	850	1,920	1,280	2,340	237	180	140	142
28	835	820	540	3,270	850	1,650	1,120	2,340	213	160	52	128
29	708	722	550	2,930	820	1,470	970	2,080	205	200	94	101
30	602	667	580	2,000	-	1,310	880	1,470	246	120	81	128
31	516	-	700	1,500	-	1,220	-	1,020	-	140	58	-
Total	11,412	37,894	30,248	94,790	43,160	66,383	59,120	25,913	10,411	5,219	4,015	3,180
Mean	368	1,263	976	3,058	1,488	2,141	1,971	836	347	168	130	106
Cfsm	0.361	1.24	0.957	3.00	1.46	2.10	1.93	0.820	0.340	0.165	0.127	0.104
In.	0.42	1.38	1.10	3.46	1.57	2.42	2.16	0.94	0.38	0.19	0.15	0.12

Calendar year 1951: Max 8,120 Min 94 Mean 1,193 Cfsm 1.17 In. 15.88
Water year 1951-52: Max 6,520 Min 52 Mean 1,070 Cfsm 1.05 In. 14.29

Peak discharge (base, 2,200 cfs).--11 p.m. Nov. 14 to 1 a.m. Nov. 15, 3,390 cfs (7.76 ft); Dec. 5 (1 to 4 p.m.) 2,780 cfs (7.48 ft); Jan. 4 (time unknown) about 3,800 cfs; Jan. 18 (7 to 11 a.m.) 6,900 cfs (8.93 ft); Feb. 5 (1 to 6 a.m.) 3,880 cfs (7.94 ft); Mar. 13 (7 to 9 a.m.) 4,130 cfs (8.06 ft); Mar. 23 (2 to 6 p.m.) 3,630 cfs (7.86 ft); Apr. 7 (3 to 12 p.m.) 3,040 cfs (7.62 ft); 7 p.m. Apr. 16 to 5 a.m. Apr. 17, 3,510 cfs (7.82 ft); 5 p.m. May 27 to 1 p.m. May 28, 2,360 cfs (7.28 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 15 to Jan. 13, Jan. 30 to Feb. 3. Gates in dam open. July 18 to Aug. 27; discharge computed by auxiliary rating based on measurements made during periods of open gates.

St. Joseph River near Newville, Ind.

Location.--Lat 41°23'10", long. 84°48'05", in Ohio, in SW¼ sec. 18, T. 5 N., R. 1 E., on left bank 20 ft downstream from bridge on Ohio State Highway 249 and 3½ miles northeast of Newville.

Drainage area.--614 sq mi.

Records available.--November 1946 to September 1952.

Gage.--Water-stage recorder. Prior to Oct. 22, 1947, wire-weight gage at same site and datum.

Average discharge.--6 years, 678 cfs.

Extremes.--Maximum discharge during year, 4,510 cfs Jan. 18 (gage height, 13.74 ft); minimum, 33 cfs Sept. 30 (gage height, 1.68 ft).
1946-52: Maximum discharge, 9,710 cfs Apr. 6, 1950 (gage height, 17.05 ft); minimum, 22 cfs Sept. 2-4, 1948 (gage height, 1.56 ft).

Remarks.--Records good except those for periods of ice effect, no gage-height record, or shifting control, which are fair.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 25-30, Nov. 8-11, Nov. 19 to Dec. 2, Dec. 13-14)

Oct. 1 to May 27				May 28 to Sept. 30			
2.1	57	8.0	1,210	1.7	34	9.0	1,580
3.0	161	11.0	2,520	2.5	99	11.0	2,520
5.0	530	14.0	4,770	3.6	252	12.0	3,180
				7.0	940		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	59	252	330	1,720	1,180	500	610	410	750	85	58	40
2	59	218	330	2,460	1,120	470	570	380	590	81	54	47
3	*58	195	320	a3,000	1,090	430	530	350	490	79	52	50
4	a56	181	675	a2,750	1,780	590	510	320	430	84	53	54
5	55	168	a1,100	a2,500	2,300	890	984	300	380	83	52	58
6	55	168	a1,300	a2,250	2,350	940	1,620	270	330	81	50	53
7	74	202	a1,200	a2,250	2,250	790	1,820	*252	300	74	50	48
8	106	310	a1,100	a2,000	1,950	610	1,860	234	261	70	48	46
9	174	430	890	a1,500	1,460	520	1,620	234	234	66	49	44
10	a175	*490	730	a1,000	1,040	550	1,240	270	210	64	51	*42
11	a150	670	610	a800	1,180	1,710	1,020	320	188	*64	52	41
12	a130	810	a500	a700	*1,210	2,640	890	340	188	62	60	39
13	a120	1,040	*440	a600	1,090	2,970	1,200	290	188	62	61	37
14	a110	a1,500	360	a700	890	3,180	1,950	261	218	64	60	37
15	a100	a1,750	300	a1,500	690	2,900	2,350	252	218	62	58	37
16	a90	1,660	300	a2,500	590	2,200	*2,700	243	202	62	62	35
17	82	1,500	225	3,630	570	1,540	2,700	252	181	62	74	34
18	80	1,090	225	4,430	500	1,090	2,200	252	168	62	103	37
19	77	710	225	4,430	460	*1,740	1,540	243	*148	89	75	42
20	75	510	225	4,350	460	2,200	1,020	243	132	101	62	40
21	74	410	250	4,110	480	2,300	810	261	122	101	58	41
22	75	390	300	3,550	490	2,350	690	300	116	152	54	41
23	91	460	350	3,110	500	2,350	670	410	116	400	52	37
24	261	610	350	a2,750	520	2,050	770	1,410	118	226	50	39
25	590	650	350	2,250	530	1,740	790	a2,000	123	144	46	38
26	690	550	300	2,000	530	1,420	710	a2,500	129	104	42	38
27	590	450	300	2,700	530	1,150	610	3,040	116	88	42	38
28	460	400	275	2,830	500	965	530	3,040	104	78	41	35
29	390	360	275	a2,500	490	830	480	2,640	96	71	40	34
30	350	340	350	a2,000	-	730	440	1,950	88	*66	40	34
31	290	-	760	a1,500	-	650	-	1,120	-	62	39	-
Total	5,746	18,474	15,245	74,370	28,730	44,995	35,434	24,387	6,934	2,949	1,688	1,236
Mean	185	616	492	2,399	991	1,451	1,181	787	231	95.1	54.5	41.2
Cfsm	0.301	1.00	0.801	3.91	1.61	2.36	1.92	1.28	0.376	0.155	0.089	0.067
In.	0.35	1.12	0.92	4.50	1.74	2.73	2.15	1.48	0.42	0.18	0.10	0.07

Calendar year 1951: Max 5,910 Min 55 Mean 807 Cfsm 1.31 In. 17.83
Water year 1951-52: Max 4,430 Min 34 Mean 711 Cfsm 1.16 In. 15.76

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records and records for station at Hursh.
Note.--Stage-discharge relation affected by ice Dec. 15-30.

St. Joseph River at Hursh, Ind.

Location.--Lat 41°15', long. 84°57', in sec. 12, T. 32 N., R. 13 E., near center of span on downstream side of Hurshtown Bridge, at Hursh, three-quarters of a mile upstream from small tributary, 5½ miles upstream from Cedar Creek, and 14 miles northeast of Fort Wayne.

Drainage area.--737 sq mi.

Records available.--May 1950 to September 1952.

Gage.--Wire-weight gage read twice daily. Datum of gage is 769.71 ft above mean sea level, unadjusted.

Extremes.--Maximum discharge during year, 5,440 cfs Jan. 20 (gage height, 11.30 ft); minimum, 54 cfs Sept. 30; minimum gage height, 3.44 ft Aug. 29, 31.
1950-52: Maximum discharge, 7,120 cfs Feb. 23, 1951 (gage height, 13.16 ft); minimum, that of Sept. 30, 1952; minimum gage height, that of Aug. 29, 31, 1952.

Remarks.--Records good except those for periods of ice effect, which are fair.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-5, Mar. 19-23, Sept. 28-30)

3.3	38	6.0	1,700
3.6	115	11.0	5,200
4.2	375	12.0	8,040

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	76	298	370	3,160	1,540	528	724	461	1,020	129	97	71
2	76	266	365	3,650	1,420	535	668	417	752	122	92	78
3	*76	244	355	3,440	1,380	487	619	393	612	115	86	78
4	76	222	850	3,180	2,400	661	591	360	494	122	84	84
5	78	212	1,500	3,000	2,700	990	1,380	335	429	115	84	84
6	84	208	1,580	2,820	2,640	1,060	1,820	320	387	115	84	84
7	92	217	1,540	2,700	2,520	955	2,000	*307	340	115	81	81
8	103	302	1,420	2,340	2,340	801	2,000	298	316	109	81	78
9	136	411	1,180	1,700	2,000	640	1,920	294	289	103	81	76
10	178	598	906	1,100	1,460	661	1,580	307	262	*100	81	*76
11	174	738	752	885	1,580	2,700	1,260	325	244	97	86	71
12	150	850	*661	766	1,460	3,120	1,060	355	235	92	89	68
13	136	1,060	556	696	1,380	3,180	1,500	345	235	89	92	66
14	122	1,860	411	864	1,180	3,300	2,280	312	280	89	92	66
15	109	2,000	280	2,140	899	3,300	2,640	302	298	92	92	71
16	103	*1,860	258	2,880	738	2,940	*2,700	289	271	92	112	66
17	100	1,620	248	3,790	661	2,140	2,880	298	244	92	109	64
18	100	1,340	258	4,240	612	1,540	2,760	307	226	92	109	61
19	97	955	266	4,800	542	*2,280	2,070	298	*204	118	132	66
20	97	710	258	5,360	514	2,460	1,420	298	190	154	109	66
21	95	535	302	5,040	542	2,400	1,020	316	182	154	103	64
22	89	461	375	4,320	556	2,460	843	325	166	150	95	64
23	103	584	429	3,440	542	2,760	906	435	162	640	89	64
24	276	682	435	2,880	563	2,520	1,060	2,210	158	494	89	64
25	521	745	411	2,520	570	2,140	955	3,240	158	302	84	64
26	710	710	370	3,080	570	1,780	878	3,440	158	212	81	61
27	696	584	345	4,080	577	1,420	766	3,240	158	178	78	61
28	577	556	325	3,650	570	1,180	661	3,240	150	140	76	56
29	468	435	325	3,120	542	1,020	570	3,120	140	*118	74	58
30	393	399	411	*b2,250	-	892	500	3,240	136	109	74	56
31	340	-	888	*b1,750	-	794	-	1,780	-	97	71	-
Total	6,431	21,662	18,630	89,641	34,998	53,644	42,041	31,207	8,896	4,746	2,787	2,067
Mean	207	722	601	2,892	1,207	1,730	1,401	1,007	297	153	89.9	68.9
Cfsm	0.281	0.980	0.815	3.92	1.64	2.35	1.90	1.37	0.403	0.208	0.122	0.093
In.	0.32	1.09	0.94	4.52	1.77	2.71	2.12	1.57	0.45	0.24	0.14	0.10

Calendar year 1951: Max 7,030 Min 76 Mean 974 Cfsm 1.32 In. 17.93
Water year 1951-52: Max 5,360 Min 56 Mean 865 Cfsm 1.17 In. 15.97

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

Cedar Creek at Auburn, Ind.

Location.--Lat 41°21', long. 85°03', in SW¼ sec. 29, T. 34 N., R. 13 E., near center of span on upstream side of Ninth Street Bridge in Auburn, 2 miles upstream from Peckhart ditch.

Drainage area.--93 sq mi, approximately.

Records available.--July 1943 to September 1952.

Gage.--Wire-weight gage read twice daily.

Average discharge.--9 years, 84.3 cfs.

Extremes.--Maximum discharge during year, 900 cfs Mar. 11 (gage height, 8.45 ft); minimum, 3.0 cfs Sept. 29; minimum gage height, 1.01 ft Aug. 29, 31, Sept. 29.
1943-52: Maximum discharge, 1,380 cfs Apr. 5, 1950 (gage height, 9.90 ft); minimum, 1.8 cfs Oct. 1, 1949; minimum gage height, 0.91 ft Sept. 25, 1946.

Remarks.--Records fair.

Rating tables, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Dec. 5)

Oct. 1 to Apr. 14				Apr. 15 to Sept. 30			
1.0	4.0	2.5	112	0.9	2.0	2.1	76
1.3	18	3.0	164	1.0	4.0	3.0	164
1.6	35	8.0	835	1.1	8.0	7.0	690
				1.6	40		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.4	26	34	570	175	49	68	50	78	15	7.6	4.8
2	4.8	24	34	634	170	46	63	45	62	14	7.2	13
3	4.8	22	36	401	175	47	58	42	55	17	7.2	9.2
4	*6.0	21	170	252	523	115	82	43	50	16	8.6	7.6
5	6.8	19	228	192	427	110	290	41	a45	15	12	6.0
6	6.8	17	132	148	240	76	316	38	41	14	8.6	6.0
7	23	44	102	122	186	64	198	*34	35	13	6.8	6.0
8	23	57	90	148	158	60	142	35	32	15	6.8	5.2
9	18	58	80	91	142	72	108	39	33	16	11	*5.6
10	12	102	70	77	131	113	98	45	34	a13	9.2	6.0
11	12	158	62	66	170	744	88	41	28	*11	8.6	5.2
12	11	137	56	60	164	508	87	37	38	9.8	8.6	5.2
13	11	175	47	60	127	330	312	36	36	9.2	7.2	5.2
14	11	210	44	193	101	234	522	33	79	9.8	7.6	5.6
15	10	164	a42	676	95	a180	453	36	58	9.8	7.6	6.4
16	11	*101	a42	536	79	142	*297	32	43	11	a8.0	5.6
17	11	74	a40	564	70	114	210	33	37	11	8.6	5.6
18	10	a60	a40	440	64	120	153	33	32	12	7.6	7.2
19	10	49	a40	388	62	*466	120	32	*27	26	6.4	12
20	12	43	a40	578	64	362	a100	35	30	27	6.0	9.8
21	13	39	a40	323	68	234	88	42	25	21	7.6	4.8
22	16	48	a40	240	61	186	88	41	24	43	6.0	4.4
23	41	85	a40	180	60	210	111	112	23	48	6.0	3.8
24	198	75	a40	*137	56	170	130	291	24	25	5.6	3.8
25	170	60	a38	118	55	129	100	550	23	17	5.2	3.8
26	70	46	37	416	52	119	81	578	21	13	5.2	3.6
27	51	41	*33	690	51	104	70	349	20	11	5.2	3.4
28	45	38	36	a400	52	88	65	222	19	11	5.2	3.6
29	39	34	38	252	52	80	60	153	18	11	3.8	3.4
30	30	33	72	158	-	73	56	112	18	*9.4	3.8	3.6
31	29	-	167	125	-	70	-	89	-	7.6	3.8	-
Total	920.6	2,060	2,010	9,235	3,830	5,415	4,614	3,299	1,088	501.6	218.6	175.4
Mean	29.7	68.7	64.8	298	132	175	154	106	36.3	16.2	7.05	5.85
Cfsm	0.319	0.739	0.697	3.20	1.42	1.88	1.66	1.14	0.390	0.174	0.076	0.063
In.	0.37	0.82	0.80	3.69	1.53	2.17	1.85	1.32	0.44	0.20	0.09	0.07

Calendar year 1951: Max 845 Min 4.0 Mean 98.7 Cfsm 1.06 In. 14.39
Water year 1951-52: Max 744 Min 3.4 Mean 91.4 Cfsm 0.983 In. 13.35

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records, and records for station at Cedarville.

Cedar Creek near Cedarville, Ind.

Location.--Lat 41°13', long. 85°05', in NW¼ sec. 19, T. 32 N., R. 13 E., on left bank at downstream side of bridge on State Highway 427, 2⅝ miles northwest of Cedarville, and 4 miles upstream from mouth.

Drainage area.--279 sq mi.

Records available.--October 1946 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 779.75 ft above mean sea level, unadjusted. Prior to Nov. 4, 1947, wire-weight gage at same site and datum.

Average discharge.--6 years, 313 cfs.

Extremes.--Maximum discharge during year, 2,910 cfs Jan. 27 (gage height, 8.55 ft); minimum, 30 cfs Sept. 29, minimum gage height, 1.42 ft Sept. 13, 28, 29.
1946-52: Maximum discharge, 4,870 cfs Apr. 5, 1950 (gage height, 11.67 ft); minimum, 12 cfs Oct. 3, 1949; minimum gage height, 1.38 ft Sept. 14, 1948.

Remarks.--Records good except those for periods of ice effect, which are fair.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 11				Mar. 12 to Sept. 30			
1.4	24	3.0	461	1.3	27	4.0	795
1.6	56	9.0	3,100	1.6	58	8.0	2,600
2.1	164			1.9	112		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	39	101	136	1,780	494	180	260	187	283	62	58	40
2	41	94	131	2,240	595	167	240	167	240	*59	57	44
3	39	86	131	1,500	527	164	223	154	204	64	54	57
4	*38	82	650	1,000	1,470	332	227	146	184	138	54	48
5	38	80	862	700	1,700	428	742	133	159	79	54	44
6	39	84	527	500	975	309	812	128	146	64	54	43
7	90	138	385	450	630	260	593	*115	128	59	53	42
8	80	207	303	500	527	227	461	115	115	57	52	41
9	69	*200	299	309	510	227	375	115	110	58	51	*42
10	60	322	280	270	478	329	336	156	105	57	51	40
11	53	510	250	237	795	1,660	319	151	97	54	51	39
12	49	444	220	223	578	2,160	306	130	120	52	51	38
13	46	560	184	204	478	1,220	812	120	128	51	51	37
14	42	930	b150	428	382	850	1,840	110	299	50	50	40
15	39	612	b150	1,470	325	642	1,660	115	230	51	50	45
16	41	418	b150	1,650	289	510	*990	112	161	52	50	40
17	41	312	b150	1,560	266	415	659	122	130	52	50	38
18	41	253	b150	1,470	240	444	510	151	110	51	48	39
19	41	210	b150	975	233	1,440	425	133	*97	103	48	48
20	41	174	b150	1,650	240	*1,260	355	143	95	167	47	44
21	39	156	b150	1,200	263	760	309	210	90	90	46	40
22	41	154	b150	710	237	593	280	151	88	151	46	36
23	92	299	b150	544	223	795	372	375	85	544	45	37
24	576	303	b150	*428	214	593	527	990	83	233	44	36
25	478	230	b125	378	200	461	405	1,440	81	128	43	35
26	299	207	b125	1,130	194	402	329	2,020	76	90	43	33
27	217	174	b125	2,680	187	369	273	1,220	71	90	43	32
28	177	159	b125	2,060	180	329	246	742	68	71	43	32
29	148	148	146	1,000	187	299	223	544	66	64	42	31
30	129	141	319	600	-	273	204	418	65	*62	42	32
31	114	-	670	494	-	260	-	336	-	58	41	-
Total	3,277	7,788	7,643	30,340	13,618	18,358	15,313	11,149	3,914	2,961	1,512	1,193
Mean	106	260	247	979	470	592	510	360	130	95.5	48.8	39.8
Cfsm	0.380	0.932	0.885	3.51	1.68	2.12	1.83	1.29	0.466	0.342	0.175	0.143
In.	0.44	1.04	1.02	4.04	1.82	2.45	2.04	1.39	0.52	0.39	0.20	0.16

Calendar year 1951: Max 2,820 Min 38 Mean 357 Cfsm 1.28 In. 17.36
Water year 1951-52: Max 2,680 Min 31 Mean 320 Cfsm 1.15 In. 15.61

Peak discharge (base, 2,500 cfs).--Jan. 27 (2:30 p.m.) 2,910 cfs (8.55 ft); May 12 (3 a.m.) 2,500 cfs (7.75 ft).

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

St. Joseph River near Fort Wayne, Ind.

Location.--Lat 41°10', long. 85°04', in SW¼NW¼SE¼ sec. 4, T. 31 N., R. 13 E., on right bank at upstream side of bridge on Mayhew Road, 3½ miles downstream from Cedar Creek and 8 miles northeast of Fort Wayne.

Drainage area.--1,060 sq mi.

Records available.--August 1941 to September 1952.

Gage.--Water-stage recorder. Since Sept. 15, 1944, auxiliary water-stage recorder at St. Joe Dam 5½ miles downstream from base gage.

Average discharge.--11 years, 1,058 cfs.

Extremes.--Maximum discharge during year, 7,080 cfs Jan. 20 (gage height, 12.63 ft); maximum gage height, 12.74 ft Jan. 1 (ice jam); minimum daily discharge, 97 cfs July 11. 1941-52: Maximum discharge, 12,200 cfs Apr. 7, 1950 (gage height, 17.90 ft); minimum daily, 27 cfs Aug. 21, 1941; minimum gage height, 1.40 ft Sept. 20, 29, 1941.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Some regulation at low flow by pumping plant 5½ miles below station.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	130	*452	562	4,250	2,240	756	*1,020	708	1,420	198	140	120
2	122	392	542	5,190	2,100	740	965	644	1,060	*186	140	*123
3	*129	357	528	*4,320	2,030	*698	905	604	*885	182	126	123
4	131	321	*1,470	3,600	3,920	985	876	557	749	247	140	123
5	132	297	2,640	3,120	4,650	1,470	2,320	528	658	205	114	116
6	128	288	2,170	2,800	3,760	1,420	2,960	494	587	179	125	123
7	163	341	1,960	2,560	3,360	1,290	2,800	466	523	172	122	114
8	182	510	1,840	2,240	3,120	1,090	2,640	436	480	162	130	123
9	194	637	1,570	1,780	2,720	945	2,400	447	433	157	116	108
10	235	965	1,290	1,580	2,170	1,040	2,030	514	405	155	137	108
11	253	1,340	1,110	1,160	2,640	4,480	1,620	514	364	97	123	98
12	219	1,380	965	1,040	2,320	5,640	1,420	514	378	100	140	120
13	200	1,780	800	879	1,960	4,740	2,400	514	387	108	119	137
14	192	3,200	600	1,290	1,620	4,400	4,320	471	584	116	137	123
15	175	2,880	450	3,600	1,340	4,240	4,560	452	585	122	137	116
16	160	2,400	375	4,560	1,090	3,680	4,000	438	473	101	208	113
17	160	2,030	375	5,820	985	2,800	3,840	452	397	128	176	113
18	150	1,720	375	5,820	925	2,100	3,600	517	352	166	140	123
19	150	1,340	375	5,730	836	4,000	2,880	461	312	170	158	154
20	150	1,000	375	6,810	792	4,160	1,900	475	278	296	154	151
21	150	808	450	6,450	865	3,520	1,420	611	272	247	154	134
22	150	702	550	5,370	836	3,360	1,200	566	262	345	161	151
23	200	945	600	4,320	817	3,840	1,420	764	244	911	147	123
24	400	1,060	600	3,440	792	3,440	1,900	3,760	252	937	123	134
25	800	1,020	600	3,040	817	2,800	1,520	5,550	238	531	120	120
26	1,100	1,000	550	4,920	817	2,320	1,290	5,640	231	327	137	119
27	1,100	856	500	7,170	792	1,900	1,110	4,830	238	264	116	120
28	900	723	500	6,270	792	1,570	965	4,160	217	207	114	120
29	700	648	500	4,400	756	1,380	856	3,920	215	192	108	*147
30	600	593	600	*3,920	-	1,240	*766	3,280	212	173	100	119
31	550	-	1,500	3,600	-	1,110	-	2,240	-	*137	114	-
Total	10,005	31,985	27,322	120,849	51,862	77,154	61,903	45,527	13,691	7,518	4,176	3,716
Mean	323	1,066	881	3,898	1,788	2,489	2,063	1,469	456	243	135	124
Cfsm	0.305	1.01	0.831	3.68	1.69	2.35	1.95	1.39	0.430	0.229	0.127	0.117
In.	0.35	1.12	0.96	4.24	1.82	2.71	2.17	1.60	0.48	0.26	0.15	0.13

Calendar year 1951: Max 8,600 Min 122 Mean 1,391 Cfsm 1.31 In. 17.82
Water year 1951-52: Max 7,170 Min 97 Mean 1,245 Cfsm 1.17 In. 15.99

Note.--Stage-discharge relation affected by ice Dec. 14 to Jan. 1. No gage-height record at auxiliary gage Oct. 15-31; discharge estimated on basis of weather records and records for station Hursh.

St. Marys River at Decatur, Ind.

Location.--Lat 40°51', long. 84°56', in SW¼ sec. 27, T. 28 N., R. 14 E., on right bank 10 ft downstream from bridge on U. S. Highway 27, half a mile north of city limits of Decatur, and half a mile upstream from Holthouse ditch.

Drainage area.--615 sq mi.

Records available.--November 1946 to September 1952.

Gage.--Water-stage recorder. Prior to July 27, 1948, wire-weight gage at same site and datum.

Average discharge.--6 years, 654 cfs.

Extremes.--Maximum discharge during year, 5,740 cfs Mar. 13 (gage height, 20.40 ft); minimum, 15 cfs Oct. 6 (gage height, 1.97 ft).
1946-52: Maximum discharge, 12,500 cfs Feb. 15, 1950 (gage height, 23.60 ft); minimum, 12 cfs Nov. 6, 1946 (gage height, 1.91 ft).

Remarks.--Records good except those for December to March and May, which are fair. Flow regulated by Lake St. Marys. Some diversion from or into Wabash River basin and into Miami & Erie Canal.

Revisions (water years).--W 1174: 1948.

Rating tables, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Dec. 4-14, Jan. 17-25)

Oct. 1 to Apr. 24				Apr. 25 to Sept. 30	
2.0	16	6.0	452	2.0	18
2.5	42	10.0	1,210	2.5	44
3.0	79	16.0	2,600	3.0	80
4.0	176	21.0	6,570	4.0	176

Note.--Same as preceding table above 4.0 ft.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	22	24	39	a3,500	1,910	176	233	319	176	34	26	27
2	24	20	37	a3,250	1,570	165	204	198	131	35	26	57
3	22	18	35	a3,000	1,520	154	187	149	102	46	24	36
4	*19	17	562	a2,500	2,600	385	187	123	86	154	23	27
5	18	16	*776	1,950	2,890	719	1,180	119	73	125	22	24
6	16	20	486	a1,500	2,560	538	1,420	*341	67	77	20	22
7	20	33	364	a800	2,330	520	1,170	176	60	60	19	28
8	17	32	271	a500	1,930	419	990	144	53	46	18	26
9	18	*31	452	a400	1,930	319	970	210	47	37	23	23
10	19	30	646	a300	1,880	480	890	486	44	*33	24	20
11	20	34	556	a250	1,690	3,720	757	227	*39	30	31	*19
12	22	40	503	a225	1,230	5,400	592	149	53	28	34	21
13	23	51	452	239	970	5,740	1,710	119	170	26	30	23
14	23	a1,000	305	723	700	5,200	1,930	98	221	23	27	28
15	24	a400	154	1,380	469	4,040	*1,590	90	176	22	27	34
16	23	170	215	1,090	395	2,560	1,480	90	116	20	45	39
17	23	132	187	*2,080	364	1,460	1,360	213	104	19	45	36
18	22	106	154	2,890	298	930	1,130	419	98	18	30	46
19	21	77	125	3,280	233	1,690	833	284	74	19	28	120
20	20	55	112	4,040	204	*1,380	574	326	55	21	39	154
21	18	41	258	4,040	204	1,010	371	574	48	25	48	187
22	21	40	556	3,080	239	1,270	271	452	45	52	34	239
23	50	57	538	2,020	371	1,930	1,200	435	43	238	30	187
24	66	80	435	1,110	452	1,520	3,220	1,520	95	233	38	107
25	61	71	643	833	435	1,090	3,280	1,550	192	209	35	66
26	46	65	a1,500	2,020	*312	970	3,000	1,840	100	154	30	49
27	37	59	a1,750	4,490	233	871	2,490	1,090	93	91	27	43
28	32	52	1,130	4,570	204	664	1,860	757	81	55	24	39
29	30	47	950	a3,500	192	452	1,110	646	56	*39	22	34
30	28	42	a1,500	a3,000	-	312	646	452	41	32	23	32
31	26	-	a3,000	a2,500	-	258	-	258	-	28	22	-
Total	831	2,862	18,691	65,040	30,315	46,342	36,835	13,854	2,739	2,030	894	1,793
Mean	26.8	95.4	603	2,098	1,045	1,495	1,228	447	91.3	65.5	28.8	59.8
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 5,400 Min 16 Mean 562 Cfsm - In. -
Water year 1951-52: Max 5,740 Min 16 Mean 607 Cfsm - In. -

Peak discharge (base, 3,500 cfs).--Jan. 1 (time and discharge unknown); Jan. 21 (2 a.m.) 4,180 cfs (17.43 ft); Jan. 27 (7 p.m.) 4,740 cfs (19.36 ft); Mar. 13 (12 m.) 5,740 cfs (20.40 ft).
* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of recorded range in stage, weather records, and records for station at Fort Wayne.

St. Marys River near Fort Wayne, Ind.

Location.--Lat 41°00', long. 85°08', in sec. 35, T. 30 N., R. 12 E., on left bank 130 ft downstream from highway bridge, 4 miles south of Fort Wayne, and 12 miles upstream from mouth.

Drainage area.--753 sq mi.

Records available.--November 1930 to September 1952 in reports of Geological Survey. October 1924 to October 1925 and July to September 1927 in reports of Indiana Department of Conservation.

Gage.--Water-stage recorder. Prior to Apr. 13, 1939, chain gage on highway bridge at same datum.

Average discharge.--20 years (1931-33, 1934-52), 599 cfs.

Extremes.--Maximum discharge during year, 6,570 cfs Mar. 14 (gage height, 14.69 ft); minimum, 14 cfs Sept. 12, 13 (gage height, 0.84 ft).
1930-52: Maximum discharge, 13,400 cfs May 19, 1943 (gage height, 18.79 ft); minimum observed, 3.4 cfs Oct. 19, 1934 (gage height, 0.28 ft).

Remarks.--Records good. Flow regulated by Lake St. Marys. Some diversion from or into Wabash River basin and into Miami & Erie Canal.

Revisions (water years).--W 824: Drainage area. W 974: 1942.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.6	11	5.0	955
.7	20	9.0	2,720
1.3	77	12.0	4,470
2.1	176	15.0	6,870
3.0	365		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	22	27	63	4,940	3,050	194	*402	545	240	48	30	24
2	*21	26	59	4,730	2,270	178	242	340	171	41	29	*35
3	23	23	56	4,410	2,220	*166	208	240	*140	43	27	65
4	22	19	*1,090	*3,990	3,930	273	219	190	115	*75	28	46
5	23	16	1,500	3,160	4,050	800	1,560	182	98	150	24	34
6	20	18	955	1,950	3,750	650	2,040	680	87	113	23	24
7	24	34	650	1,100	3,390	575	1,640	365	82	81	20	19
8	22	49	452	725	2,940	515	1,260	208	74	67	18	25
9	22	52	502	530	2,620	415	1,140	260	66	54	20	27
10	20	72	832	428	2,830	510	1,060	990	59	42	24	23
11	20	69	755	352	2,670	4,200	920	490	55	37	30	17
12	21	56	650	310	1,860	5,610	725	255	63	34	42	15
13	23	113	575	290	1,340	6,290	1,980	179	146	32	43	16
14	24	1,770	b450	737	955	6,470	2,780	144	812	30	36	23
15	26	478	b400	1,730	650	5,930	2,320	130	352	26	30	32
16	26	288	378	1,640	478	4,590	1,900	120	194	24	44	35
17	27	184	328	2,780	440	2,670	1,730	339	135	23	54	40
18	26	146	261	3,100	378	1,340	1,460	755	119	20	52	41
19	25	116	197	3,750	298	2,370	1,060	490	105	18	37	81
20	24	90	170	4,230	242	2,220	755	478	82	17	30	138
21	23	72	374	4,050	236	1,380	502	770	70	20	47	152
22	20	63	815	3,750	231	1,420	352	665	64	28	57	197
23	41	90	800	2,720	328	2,370	1,450	545	57	162	38	216
24	108	114	665	1,600	465	2,090	4,050	3,000	58	236	31	152
25	82	111	765	1,060	502	1,460	4,170	3,220	148	214	37	97
26	66	104	2,000	2,370	402	1,180	3,990	2,780	162	181	36	66
27	52	90	2,420	5,150	281	1,060	3,630	1,930	104	126	31	51
28	43	82	1,950	5,450	233	850	2,890	1,060	97	85	27	42
29	36	73	1,420	*5,220	210	605	1,730	815	84	58	24	*37
30	33	68	2,180	5,080	-	545	*920	635	63	42	21	35
31	*29	-	3,990	4,110	-	440	-	390	-	*34	22	-
Total	994	4,513	27,702	85,442	43,249	59,366	49,085	23,190	4,102	2,161	1,012	1,805
Mean	32.1	150	894	2,756	1,491	1,915	1,636	748	137	69.7	32.6	60.2
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 6,020 Min 16 Mean 750 Cfsm - In. -
Water year 1951-52: Max 6,470 Min 15 Mean 827 Cfsm - In. -

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

Maumee River at New Haven, Ind.

Location.--Lat 41°05', long. 85°01', in SW¼ sec. 1, T. 30 N., R. 13 E., near left bank on downstream side of highway bridge, a quarter of a mile upstream from Wabash Railroad bridge, half a mile north of New Haven, and 6 miles downstream from confluence of St. Marys and St. Joseph Rivers.

Drainage area.--1,940 sq mi.

Records available.--December 1946 to September 1952 (high-water records only).

Gage.--Wire-weight gage read twice daily. Datum of gage is 724.51 ft above mean sea level, unadjusted.

Extremes.--Maximum discharge during year, 14,100 cfs Jan. 27 (gage height, 18.60 ft).
1946-52: Maximum discharge, 19,100 cfs Feb. 16, 1950 (gage height, 21.4 ft).

Remarks.--Records good except those for periods of no gage-height record, which are fair. Discharge computed for stages above 5.0 ft only. Flow regulated at low stage by powerplants above station. Flow slightly regulated by Lake St. Marys. Some diversion from or into Wabash River basin and into Miami & Erie Canal.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		-	-	9,780	6,220	-	-	1,520	2,360	-		
2		-	-	10,300	5,100	-	-	-	1,490	-		
3		-	-	9,420	4,540	-	-	-	-	-		
4		-	3,340	8,150	6,710	-	1,580	-	-	-		
5		-	4,220	6,460	8,800	1,760	3,930	-	-	-		
6		-	*3,510	5,180	8,060	2,180	4,540	(*)	-	-		
7		-	2,740	4,380	7,520	2,060	4,220	-	-	-		
8		-	2,240	3,720	6,380	1,880	3,930	-	-	-		
9		-	2,120	2,950	5,820	1,700	3,720	-	-	-		
10		-	2,120	1,940	5,660	1,820	a3,250	1,940	-	-		
11		-	1,940	1,520	5,900	7,160	a2,750	1,430	-	-		
12		1,460	1,580	1,400	4,380	10,900	a2,500	-	-	-		
13		1,980	1,460	-	3,160	11,400	a3,000	-	-	-		
14		4,220	-	1,820	2,540	10,900	a5,500	-	1,690	-		
15		3.370	-	4,460	2,240	10,500	*7,160	-	1,700	-		
16		2,600	-	5,980	1,490	9,200	6,060	-	-	-		
17		2,240	-	9,920	1,580	6,560	5,420	-	-	-		
18		1,880	-	9,300	1,490	4,460	4,860	1,820	-	-		
19		-	-	9,810	--	6,800	4,000	-	-	-		
20		-	-	12,600	-	*6,980	3,020	-	-	-		
21		-	-	10,700	-	5,500	2,180	1,490	-	-		
22		-	-	8,800	-	4,860	1,820	1,640	-	-		
23		-	1,700	7,340	-	5,740	2,650	1,700	-	2,180		
24		-	1,700	5,100	1,460	5,420	6,060	6,670	-	1,480		
25	1,370	-	1,580	4,070	1,580	4,070	6,220	11,100	-	-		
26		-	a1,750	6,080	1,370	3,580	5,660	9,420	-	-		
27		-	a2,500	13,100	-	3,230	5,020	7,880	-	-		
28		-	a3,000	12,800	(*)	2,600	4,300	5,500	-	-		
29		-	a2,900	*10,800	-	2,240	3,090	4,860	-	-		
30		-	2,670	8,700	-	1,820	2,060	4,220	-	-		
31		-	5,300	7,160	-	1,580	-	3,300	-	-		

Peak discharge (base, 10,000 cfs).--Jan. 1 (8 p.m.) 10,700 cfs (16.36 ft); Jan. 17 (4 p.m.) 11,500 cfs (16.96 ft); Jan. 20 (7 a.m.) 12,900 cfs (17.92 ft); Jan. 27 (10 p.m.) 14,100 cfs (18.60 ft); Mar. 13 (10 a.m.) 11,500 cfs (16.98 ft); May 25 (4 p.m.) 11,400 cfs (16.90 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of weather records and records for station at Antwerp, Ohio.

Maumee River at Antwerp, Ohio

Location.--Lat 41°11'56", long. 84°44'40", in sec. 22, T. 3 N., R. 1 E., on left bank 425 ft downstream from bridge on State Highway 49, 1 mile north of Antwerp, 7 miles downstream from Indiana State line, and 10 miles upstream from Marie DeLarme Creek.

Drainage area.--2,049 sq mi.

Records available.--September 1921 to December 1935, April 1939 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 695.49 ft above mean sea level, adjustment of 1912. Prior to Sept. 13, 1925, chain gage at site 400 ft upstream at same datum.

Average discharge.--27 years, 1,723 cfs.

Extremes.--Maximum discharge during year, 14,000 cfs Jan. 28 (gage height, 16.15 ft); maximum gage height, 17.17 ft Jan. 1 (ice jam); minimum discharge, 139 cfs Oct. 5, Sept. 15; minimum gage height, 0.98 ft Sept. 15.
1921-35, 1939-52: Maximum discharge, 26,200 cfs May 20, 1943 (gage height, 20.29 ft); minimum, 24 cfs Oct. 17, 1930, June 21, 22, 1933 (gage height, 0.32 ft).

Remarks.--Records good except those for period of ice effect, which are fair. Low flow slightly regulated by powerplant at Fort Wayne, Indiana.

Revisions (water years).--W 759: Drainage area. W 1174: 1927, 1933, 1940.

Rating table, water year 1951-52, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Feb. 13 to Mar. 11)

0.9	126	5.0	2,060
1.1	172	9.0	5,380
1.5	281	13.0	9,740
2.0	446	17.0	15,500
3.0	880		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	174	602	806	11,000	7,170	1,240	1,590	1,780	2,610	347	223	153
2	167	520	712	12,100	5,980	1,180	1,470	1,380	1,780	312	220	160
3	174	482	667	11,100	5,080	1,160	1,320	1,100	1,380	278	207	229
4	162	439	1,870	9,500	7,610	1,300	1,240	1,000	1,160	281	210	213
5	153	404	4,990	7,830	9,620	1,990	3,180	880	1,000	325	220	215
6	160	380	4,450	6,180	9,380	2,690	5,580	905	880	391	205	184
7	192	432	3,490	4,630	8,160	2,370	5,280	1,270	782	*370	192	174
8	315	581	2,850	3,810	7,060	2,130	4,450	1,080	689	328	174	162
9	*231	645	2,610	3,170	6,510	1,850	*3,970	892	645	281	190	162
10	226	905	2,450	*2,530	5,980	1,740	3,650	1,350	581	275	197	153
11	245	1,350	2,290	1,990	6,730	6,570	3,250	1,780	520	248	223	144
12	281	1,590	1,990	1,680	5,780	*11,300	2,770	1,210	540	174	281	146
13	272	1,920	1,680	1,530	4,370	11,800	3,330	955	645	148	309	146
14	218	3,810	1,440	1,740	3,650	11,800	6,290	830	1,060	141	234	146
15	223	4,210	1,080	4,050	3,010	11,400	7,720	782	1,650	165	220	144
16	251	3,410	880	6,180	2,290	10,700	7,060	735	1,100	190	245	165
17	220	2,770	750	9,860	1,920	8,710	5,780	735	855	210	464	162
18	226	2,290	700	12,000	1,710	5,280	5,380	1,650	689	213	296	158
19	194	1,920	650	10,500	1,560	6,620	4,720	1,650	560	254	237	190
20	192	1,530	750	12,100	1,440	7,720	3,730	1,270	540	338	240	272
21	184	1,160	1,000	12,500	1,410	6,620	2,770	*1,470	475	347	248	240
22	197	955	1,300	11,300	1,380	4,990	2,060	1,740	446	432	303	272
23	231	980	1,900	9,740	1,350	6,180	1,990	1,500	414	2,120	251	300
24	712	1,410	1,700	7,170	1,410	6,840	6,480	5,080	418	2,060	220	341
25	1,180	1,320	1,600	4,810	1,500	5,580	7,060	11,700	418	1,210	*187	306
26	1,210	1,270	1,800	5,880	1,530	4,290	6,180	12,100	404	806	172	245
27	1,160	1,180	2,200	12,600	*1,470	3,650	5,480	9,620	482	645	174	197
28	1,100	1,060	2,900	13,800	1,350	3,170	4,810	6,950	408	520	174	177
29	955	*905	2,600	13,000	1,300	2,610	3,810	5,180	377	418	165	158
30	806	806	2,400	10,800	-	2,130	2,610	4,540	344	338	160	150
31	689	-	5,000	8,710	-	1,780	-	3,730	-	300	146	-
Total	12,700	41,236	61,505	243,790	117,710	157,390	124,990	86,844	23,852	14,465	6,987	5,864
Mean	410	1,375	1,984	7,864	4,059	5,077	4,166	2,801	795	467	225	195
Cfsm	0.200	0.671	0.968	3.84	1.98	2.48	2.03	1.37	0.388	0.228	0.110	0.095
In.	0.23	0.75	1.12	4.43	2.14	2.86	2.26	1.58	0.43	0.26	0.13	0.11

Calendar year 1951: Max 14,900 Min 153 Mean 2,530 Cfsm 1.23 In. 16.77
Water year 1951-52: Max 13,800 Min 141 Mean 2,452 Cfsm 1.20 In. 16.30

Peak discharge (base, 8,000 cfs).--Jan. 1 (time unknown) about 12,500 cfs; Jan. 21 (1 a.m.) 12,800 cfs (15.37 ft); Jan. 28 (10 a.m.) 14,000 cfs (16.15 ft); Feb. 5 (6 p.m.) 9,740 cfs (13.01 ft); Mar. 14 (3:30 a.m.) 12,000 cfs (14.81 ft); May 26 (1 a.m.) 12,900 cfs (15.50 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 17 to Jan. 1.

Bean Creek at Powers, Ohio

Location.--Lat 41°40'40", long. 84°13'50", in NE¼ sec. 24, T. 9 S., R. 1 E., on right bank at downstream side of bridge on U. S. Highway 20, 1 mile east of Powers and 2¼ miles upstream from Iron Creek.

Drainage area.--238 sq mi.

Records available.--October 1940 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 722.6 ft above mean sea level, adjustment of 1912. Prior to Jan. 18, 1941, wire-weight gage at same site and datum.

Average discharge.--12 years, 191 cfs.

Extremes.--Maximum discharge during year, 1,900 cfs Jan. 17 (gage height, 10.5 ft, from graph based on gage readings); minimum, 14 cfs Sept. 29, 30; minimum gage height, 0.57 ft Sept. 13, 14, 16, 17.
1940-52: Maximum discharge, 3,980 cfs Apr. 5, 1950 (gage height, 13.30 ft); minimum, 6.4 cfs Sept. 17, 1941.

Remarks.--Records good except those for periods of ice effect or no gage-height record or those above 1,700 cfs, which are fair.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Dec. 4-13)

Oct. 1 to Dec. 3				Dec. 4 to Sept. 30			
0.7	20	3.0	247	0.5	12	2.0	149
1.1	49	5.0	559	.8	27	4.0	449
1.5	87	8.0	1,180	1.1	50	7.0	1,000
2.0	137			1.5	90	10.0	1,730

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	26	75	120	650	325	175	250	168	188	31	22	18
2	27	69	120	1,300	357	154	236	157	168	31	21	21
3	26	60	114	1,100	390	137	215	147	149	31	21	22
4	25	55	530	851	754	381	201	137	127	31	21	22
5	24	55	851	699	965	449	628	117	118	31	22	20
6	25	55	537	a600	699	294	813	113	105	29	*21	19
7	53	110	*415	a500	537	229	*609	117	107	27	20	18
8	92	169	349	a440	449	188	501	113	90	27	19	18
9	69	147	310	a360	398	175	466	117	79	27	20	17
10	55	169	272	a300	341	182	406	139	72	26	21	17
11	47	254	236	a250	357	1,200	390	137	70	26	22	16
12	43	301	201	a230	381	1,500	349	115	71	24	24	16
13	39	559	168	a210	357	985	986	107	72	23	22	15
14	37	1,100	148	g235	302	663	1,500	105	65	22	21	16
15	35	702	140	g1,400	*236	519	1,220	105	60	24	22	17
16	35	409	130	*g1,640	201	424	927	105	54	24	29	16
17	34	301	130	*g1,550	182	349	627	102	51	26	24	15
18	33	241	120	g1,580	159	357	501	101	48	25	22	16
19	32	196	120	1,060	162	1,150	415	88	45	38	20	*18
20	32	160	130	1,380	157	1,100	357	*90	43	46	19	18
21	32	150	160	1,120	168	794	325	100	42	35	21	18
22	32	140	210	813	161	627	294	101	44	36	19	17
23	45	218	230	699	188	718	341	129	46	65	18	17
24	*222	241	220	555	222	573	381	687	44	46	17	16
25	266	186	190	483	222	449	325	1,000	43	35	17	16
26	186	158	170	537	222	415	280	889	39	31	16	15
27	142	142	160	965	201	381	250	627	37	28	16	15
28	127	132	160	737	194	333	222	424	34	27	16	15
29	112	123	170	537	194	310	201	325	34	26	16	14
30	97	124	200	432	-	280	188	264	*33	25	16	14
31	86	-	300	365	-	257	-	215	-	24	19	-
Total	2,136	6,801	7,311	23,578	9,481	15,728	14,384	7,141	2,178	947	624	512
Mean	68.9	227	236	761	327	507	479	230	72.6	30.5	20.1	17.1
Cfsm	0.289	0.954	0.992	3.20	1.37	2.13	2.01	0.966	0.305	0.128	0.084	0.072
In.	0.33	1.06	1.14	3.69	1.48	2.46	2.24	1.11	0.34	0.15	0.10	0.08

Calendar year 1951: Max 2,900 Min 24 Mean 279 Cfsm 1.17 In. 15.88
Water year 1951-52: Max 1,640 Min 14 Mean 248 Cfsm 1.04 In. 14.18

Peak discharge (base, 1,200 cfs).--Nov. 14 (5 p.m.) 1,230 cfs (8.20 ft); Jan. 2 (7 p.m.) 1,380 cfs (8.72 ft); Jan. 17 (11 p.m.) 1,900 cfs (10.5 ft); Jan. 20 (6:30 p.m.) 1,520 cfs (9.33 ft); Mar. 11 (10 p.m.) 1,820 cfs (10.27 ft); Mar. 19 (7 p.m.) 1,450 cfs (9.02 ft); Apr. 14 (4 a.m.) 1,640 cfs (9.72 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of weather records and records for Tiffin River at Stryker.

g Computed from wire-weight gage readings.

Note.--Stage-discharge relation affected by ice Nov. 3-5, 20-22, Dec. 15 to Jan. 2.

Tiffin River at Stryker, Ohio

Location.--Lat 41°30'05", long. 84°25'50", in SW¼ sec. 5, T. 6 N., R. 4 E., near right bank on downstream end of pier at remains of electric railroad bridge at west edge of Stryker, 550 ft upstream from New York Central Railway bridge.

Drainage area.--444 sq mi.

Records available.--September 1921 to September 1928, October 1940 to September 1952. Published as "near Stryker" 1921-28.

Gage.--Water-stage recorder. Datum of gage is 685.5 ft above mean sea level, adjustment of 1912. Prior to Sept. 30, 1928, chain gage at site 3 miles downstream at different datum. Oct. 13, 1940, to Jan. 17, 1941, staff gage at same site and datum.

Average discharge.--19 years, 346 cfs.

Extremes.--Maximum discharge during year, 3,460 cfs Jan. 17 (gage height, 13.06 ft); minimum, 14 cfs Sept. 28, 30.
1921-28, 1940-52: Maximum discharge, 6,640 cfs Apr. 25, 1950 (gage height, 15.45 ft); minimum, 5.0 cfs Sept. 20, 1941.
Flood of March 1913, reached stage of 16.0 ft, from floodmarks (discharge, 7,600 cfs).

Remarks.--Records good except those for periods of ice effect, which are fair.

Revisions (water years).--W 564: Drainage area. W 1144: 1922-28.

Rating tables, water year 1951-52, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 8-10, Oct. 24 to Nov. 8, Sept. 20-30)

Oct. 1 to Jan. 4				Jan. 5 to Sept. 30			
1.4	34	11.0	1,600	1.1	10	6.0	524
2.0	108	12.0	2,130	1.2	16	8.0	817
6.0	545	13.0	3,160	1.5	45	10.0	1,230
9.0	1,050			2.0	115	11.0	1,650
				4.0	290	13.0	3,350

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	40	116	236	1,160	605	321	365	231	270	40	29	22
2	43	100	230	1,680	563	290	354	213	226	38	27	25
3	44	88	225	2,000	605	255	321	195	200	43	26	26
4	44	82	641	2,280	972	354	300	183	179	54	26	26
5	43	78	1,050	2,130	1,320	619	748	171	160	42	25	25
6	43	78	*1,220	1,590	1,650	692	1,100	152	149	38	25	22
7	58	122	1,300	1,200	1,440	537	1,400	146	138	35	26	19
8	90	252	1,050	936	1,070	376	1,360	149	135	33	25	18
9	112	335	703	722	785	310	*1,100	149	119	32	24	18
10	82	324	532	605	591	321	833	171	105	33	26	18
11	64	401	435	485	662	1,110	647	187	93	31	28	18
12	57	507	379	435	737	*1,910	550	171	96	29	29	18
13	54	626	313	399	692	2,550	785	152	100	28	31	16
14	52	974	291	447	550	2,130	1,230	146	100	27	29	15
15	49	1,110	b270	1,320	399	1,590	1,910	142	92	27	27	17
16	48	1,330	b260	*2,210	365	1,200	1,980	142	82	31	35	17
17	46	1,280	b250	*3,350	310	884	1,650	142	75	34	78	16
18	46	936	b240	3,030	270	633	1,260	142	71	33	50	17
19	45	545	b240	2,730	245	990	936	138	64	49	34	18
20	45	368	258	2,640	255	1,400	633	130	58	57	28	18
21	45	302	291	2,460	290	1,910	459	*138	57	61	26	17
22	45	280	412	2,210	300	1,710	387	149	57	67	26	17
23	64	346	459	1,800	310	1,440	435	160	58	156	23	17
24	*180	483	423	1,350	354	1,290	563	294	59	120	20	17
25	379	495	368	1,100	376	1,120	550	801	55	68	*18	16
26	412	401	335	1,070	365	918	459	1,030	55	49	17	16
27	291	324	324	1,590	343	722	376	1,260	49	41	16	15
28	210	291	313	1,910	*321	605	321	1,170	45	38	16	15
29	180	258	324	1,800	321	511	280	884	42	35	15	16
30	155	236	401	1,250	-	447	250	537	*41	33	15	14
31	135	-	612	884	-	399	-	343	-	31	17	-
Total	3,201	13,068	14,385	48,773	17,066	29,544	23,542	10,018	3,030	1,433	837	549
Mean	103	436	464	1,573	588	953	785	323	101	46.2	27.0	18.3
Cfsm	0.232	0.982	1.05	3.54	1.32	2.15	1.77	0.727	0.227	0.104	0.061	0.041
In.	0.27	1.10	1.21	4.08	1.42	2.48	1.98	0.84	0.25	0.12	0.07	0.05

Calendar year 1951: Max 4,800 Min 36 Mean 521 Cfsm 1.17 In. 15.94
Water year 1951-52: Max 3,350 Min 14 Mean 452 Cfsm 1.02 In. 13.87

Peak discharge (base, 1,400 cfs).--Jan. 4 (9 a.m.) 2,360 cfs (12.26 ft); Jan. 17 (2 p.m.) 3,460 cfs (13.06 ft); Jan. 28 (7 p.m.) 1,980 cfs (11.53 ft); Feb. 6 (3 p.m.) 1,710 cfs (11.08 ft); Mar. 13 (9 a.m.) 2,640 cfs (12.26 ft); Mar. 21 (1 p.m.) 1,980 cfs (11.49 ft); Apr. 7 (10 p.m.) 1,440 cfs (10.62 ft); Apr. 15 (11 p.m.) 2,130 cfs (11.69 ft).

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

Auglaize River near Fort Jennings, Ohio

Location.--Lat 40°56'55", long. 84°15'58", in SE¼ sec. 15, T. 1 S., R. 5 E., on left bank at downstream side of bridge on U. S. Highway 224, 3½ miles northeast of Fort Jennings and 6 miles upstream from Ottawa River.

Drainage area.--333 sq mi.

Records available.--August 1921 to December 1935, October 1940 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 713.9 ft above mean sea level, adjustment of 1912. Prior to Oct. 6, 1930, chain gage at same site and datum.

Average discharge.--26 years, 301 cfs.

Extremes.--Maximum discharge during year, 6,140 cfs Mar. 12 (gage height, 15.23 ft); minimum, 5.2 cfs Sept. 1 (gage height, 1.11 ft).
1921-35, 1940-52: Maximum discharge, 9,550 cfs Feb. 15, 1950 (gage height, 17.8 ft, from high-water mark); minimum, 5.0 cfs Aug. 28, 1932 (gage height, 0.75 ft).

Remarks.--Records good except those for period of ice effect, which are fair. Some diversion from Lake St. Marys by Miami & Erie Canal into Jennings Creek, tributary to Auglaize River above station.

Revisions (water years).--W 744: 1932. W 974: 1930(M).

Rating table, water year 1951-52, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.1	5.0	2.5	119	10.0	2,190
1.2	7.0	3.0	183	13.0	3,820
1.4	13	4.0	326	15.0	5,900
1.7	31	5.0	510		
2.1	72	7.0	1,060		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14	28	41	4,070	334	112	148	164	87	28	22	6.0
2	14	24	39	3,020	602	103	141	140	73	25	20	9.6
3	14	23	38	1,160	932	99	127	120	68	27	20	23
4	14	20	137	590	2,460	155	124	106	61	40	19	20
5	14	18	*334	410	3,140	375	543	95	57	37	19	19
6	13	19	252	334	1,790	252	1,200	93	56	37	18	18
7	14	30	304	281	704	176	962	89	54	41	*16	20
8	12	37	786	238	566	145	602	93	50	40	16	23
9	13	33	842	231	1,160	138	366	83	44	35	16	22
10	14	31	1,060	238	1,030	167	281	97	45	30	18	19
11	14	36	554	210	602	2,460	231	87	42	25	19	18
12	14	35	296	183	384	5,900	210	80	44	21	24	18
13	18	40	150	166	288	4,740	604	72	49	19	24	15
14	19	122	70	286	238	1,760	1,740	69	46	19	21	12
15	16	161	55	*704	203	758	1,510	69	57	19	20	10
16	*14	183	50	678	183	458	872	61	75	19	30	*8.5
17	14	108	50	1,460	162	326	488	68	*60	18	31	7.3
18	15	74	45	*3,860	141	266	334	93	52	19	24	7.2
19	14	60	45	4,250	125	725	259	129	41	19	24	10
20	13	49	50	2,280	123	994	210	123	36	21	22	148
21	12	42	150	1,160	190	590	*176	164	33	20	27	259
22	9.1	40	300	590	266	510	156	203	32	25	25	145
23	10	50	360	652	183	1,090	359	153	32	27	18	89
24	39	60	330	478	154	1,260	3,050	196	33	30	13	54
25	36	54	320	326	140	554	3,660	311	36	93	11	36
26	26	51	600	1,220	127	350	1,740	543	31	83	9.4	29
27	25	51	1,100	4,630	*117	266	566	521	28	51	7.6	26
28	34	48	850	5,300	114	217	358	274	31	44	7.0	22
29	26	46	600	2,760	111	190	259	176	32	34	6.6	20
30	20	44	1,100	602	-	166	196	127	32	28	6.0	18
31	26	-	2,730	384	-	152	-	102	-	25	6.0	-
Total	550.1	1,617	13,638	42,751	16,569	25,454	21,472	4,701	1,417	999	559.6	1,131.6
Mean	17.7	53.9	440	1,379	571	821	716	152	47.2	32.2	18.1	37.7
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 5,500 Min 9.1 Mean 347 Cfsm - In. -
Water year 1951-52: Max 5,900 Min 6.0 Mean 358 Cfsm - In. -

Peak discharge (base, 2,700 cfs).--Jan. 1 (6 p.m.) 4,540 cfs (13.85 ft); Jan. 18 (12 p.m.) 4,850 cfs (14.08 ft); Jan. 27 (10 p.m.) 5,420 cfs (14.65 ft); Feb. 5 (8 a.m.) 3,320 cfs (12.29 ft); Mar. 12 (6 a.m.) 6,140 cfs (15.23 ft); Apr. 25 (2 a.m.) 3,980 cfs (13.20 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 13-30.

Ottawa River at Allentown, Ohio

Location.--Lat 40°45'18", long. 84°11'41", in NW¼ sec. 29, T. 3 S., R. 6 E., on left bank at upstream side of bridge on State Highway 81 at Allentown, Allen County, 0.3 mile downstream from Kessler Run.

Drainage area.--168 sq mi.

Records available.--October 1923 to December 1935, August 1943 to September 1952.

Gage.--Water-stage recorder and concrete control. Datum of gage is 789.67 ft above mean sea level, adjustment of 1912. Prior to Oct. 1, 1925, chain gage and Oct. 1, 1925 to Dec. 30, 1935, water-stage recorder, at site 35 ft downstream at same datum.

Average discharge.--21 years, 131 cfs.

Extremes.--Maximum discharge during year, 3,930 cfs Mar. 11 (gage height, 8.66 ft); minimum, 11 cfs Oct. 1, 14 (gage height, 2.38 ft).
1923-35, 1943-52: Maximum discharge, 4,760 cfs Feb. 14, 1950 (gage height, 9.17 ft); minimum, 1.4 cfs June 28, 29, 1933.
Flood of Mar. 15, 1939, reached a stage of 10.1 ft and flood of May 1943, a stage of about 10 ft (discharge not determined).

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Diurnal fluctuation and some regulation due to operation of water supply and sewage-treatment plants of city of Lima above station.

Revisions (water years).--W 744: 1927(M). W 1004: 1924. W 1144: 1944(M). W 1207: 1927.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.4	12	4.0	445
2.8	31	5.0	1,120
3.0	48	8.0	3,070
3.3	100	9.0	4,490
3.6	199		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14	24	16	a1,400	156	66	82	69	37	23	22	16
2	17	26	14	995	299	57	78	64	40	23	20	53
3	17	23	13	430	614	55	71	55	34	67	19	23
4	18	20	55	221	1,590	115	90	45	31	31	19	20
5	18	20	32	98	1,170	183	430	47	30	22	24	20
6	18	30	49	146	509	110	370	57	30	22	24	19
7	37	72	133	112	305	86	415	38	29	22	23	18
8	18	30	116	94	307	73	243	45	27	24	22	17
9	*19	26	128	*105	649	76	175	43	42	24	22	20
10	18	24	170	123	331	115	142	58	28	23	20	19
11	17	21	47	100	224	2,750	123	39	26	23	22	19
12	17	19	30	61	156	2,860	123	36	48	22	32	19
13	17	41	29	84	121	963	527	33	30	19	22	18
14	14	129	26	220	98	607	*902	33	46	19	21	18
15	13	28	a25	378	76	312	656	36	26	22	21	25
16	17	22	a20	238	b75	228	430	42	24	23	51	19
17	18	19	a20	1,460	73	163	233	64	30	23	20	19
18	18	14	a19	*1,800	69	142	167	53	30	23	17	34
19	17	14	b18	1,200	62	545	133	44	27	87	20	152
20	17	16	b20	621	*80	453	110	66	24	40	20	28
21	14	16	b50	394	108	276	96	76	24	23	26	19
22	13	16	103	265	103	353	82	51	23	32	23	18
23	18	29	187	357	80	844	1,060	42	23	*81	21	26
24	94	18	124	175	71	600	2,410	305	32	27	18	20
25	28	15	216	140	66	248	1,240	600	24	24	*17	20
26	25	22	656	1,310	61	171	469	600	24	22	20	20
27	24	*17	532	3,310	58	133	228	*183	24	22	19	19
28	24	16	276	1,570	60	113	142	118	23	19	21	17
29	19	16	115	509	60	98	109	82	21	22	22	16
30	23	16	895	a190	-	86	84	55	20	21	20	19
31	23	-	a1,800	142	-	80	-	51	-	22	17	-
Total	664	799	5,934	18,248	7,631	12,959	11,420	3,130	877	897	685	770
Mean	21.4	26.6	191	589	263	418	381	101	29.2	28.9	22.1	25.7
Cfsm	0.127	0.158	1.14	3.51	1.57	2.49	2.27	0.601	0.174	0.172	0.132	0.153
In.	0.15	0.18	1.31	4.05	1.69	2.87	2.53	0.69	0.19	0.20	0.15	0.17

Calendar year 1951: Max 2,800 Min 13 Mean 156 Cfsm 0.929 In. 12.64
Water year 1951-52: Max 3,310 Min 13 Mean 175 Cfsm 1.04 In. 14.18

Peak discharge (base, 1,600 cfs).--Jan. 1 (time and discharge unknown); Jan. 17 (8 p.m.) 1,870 cfs (6.48 ft); Jan. 27 (2 p.m.) 3,570 cfs (8.39 ft); Feb. 4 (9 a.m.) 1,700 cfs (6.14 ft); Mar. 11 (9 p.m.) 3,930 cfs (8.66 ft); Apr. 24 (4 a.m.) 2,950 cfs (7.92 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of weather records and records for Auglaize River near Fort Jennings.

b Stage-discharge relation affected by ice.

Eagle Creek near Findlay, Ohio

Location.--Lat 40°59'35", long. 83°39'05", on line between sec. 1, T. 1 S., R. 10 E., and sec. 36, T. 1 N., R. 10 E., on right bank at downstream side of highway bridge, 3¼ miles south of Findlay, Hancock County, and 4¼ miles upstream from mouth.

Drainage area.--46.5 sq mi.

Records available.--January 1947 to September 1952.

Gage.--Water-stage recorder. Prior to Jan. 1, 1949, wire-weight gage at same site and datum.

Average discharge.--5 years, 59.5 cfs.

Extremes.--Maximum discharge during year, 2,570 cfs Mar. 11 (gage height, 13.14 ft); no flow for many days.
1947-52: Maximum discharge observed, 2,920 cfs June 7, 1947 (gage height, 13.38 ft); no flow for many days.

Remarks.--Records good except those for periods of ice effect, which are fair.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.35	0	3.0	11	8.0	391
2.4	.2	4.0	42	9.0	555
2.5	.6	4.5	65	11.0	1,170
2.6	1.6	5.0	96	12.0	1,650
2.7	3.6	6.0	176	13.0	2,470

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0.1	1.6	*850	32	13	21	14	6.3	0.1		0
2	0	.1	1.3	295	97	12	18	12	5.3	0		.1
3	0	.1	1.0	125	171	*12	16	10	4.3	.8		.1
4	0	.1	*1.9	69	877	59	15	8.6	4.1	.5		0
5	0	.1	10	50	287	61	147	8.1	3.6	.2		0
6	0	.1	11	43	121	28	234	7.3	3.2	.1		0
7	0	.8	174	35	80	20	235	6.0	2.7	0		0
8	.1	5.0	88	31	80	18	86	5.8	5.0	0		0
9	.1	3.8	165	37	255	18	49	6.8	*4.8	0		0
10	.1	2.7	95	41	110	26	37	10	2.3	0		0
11	.1	1.6	36	27	77	*1,680	31	7.6	1.4	*0		0
12	.1	1.0	22	24	*42	617	30	6.0	1.4	0		0
13	.1	2.2	13	23	35	249	327	4.8	1.4	0		0
14	.1	59	8	111	25	260	*404	4.1	1.3	0		0
15	*0	30	6	129	20	100	287	5.3	1.4	0		0
16	0	10	5	57	17	58	132	4.3	1.3	0		0
17	0	5.5	5	643	15	37	64	5.5	1.0	0		0
18	0	3.8	5	981	13	34	41	5.3	.9	0		0
19	0	2.5	5	265	12	251	31	5.0	.8	0		0
20	0	1.6	6	368	15	129	25	5.8	.6	0		0
21	0	1.0	12	133	34	86	20	6.5	.5	0		0
22	0	.9	40	71	23	170	18	4.1	.5	.2		0
23	.1	1.6	50	122	20	494	179	4.8	.6	.1		0
24	.5	1.9	40	42	18	136	836	58	.5	0		0
25	.1	3.4	50	37	16	62	227	89	.4	0		0
26	.1	3.8	130	*1,090	13	96	83	68	.4	0		0
27	.1	3.4	170	1,440	14	32	45	31	.3	0	(*)	0
28	.2	4.1	100	287	14	27	31	20	.2	0		0
29	.1	2.7	65	107	14	24	23	14	.1	0		0
30	.1	2.3	180	48	-	21	18	10	.1	0		0
31	.1	-	600	33	-	20	-	7.8	-	0		-
Total	2.1	155.2	2,096.8	7,614	2,547	4,850	3,710	455.5	56.7	2.0	0	0.2
Mean	0.07	5.17	67.6	246	87.8	156	124	14.7	1.89	0.06	0	0.01
Cfsm	0.0015	0.111	1.45	5.29	1.89	3.35	2.67	0.316	0.041	0.0013	0	0.00022
In.	0.002	0.12	1.67	6.10	2.04	3.86	2.98	0.36	0.05	0.002	0	0.0002

Calendar year 1951: Max 1,240 Min 0 Mean 54.1 Cfsm 1.16 In. 15.79
Water year 1951-52: Max 1,680 Min 0 Mean 58.7 Cfsm 1.26 In. 17.18

Peak discharge (base, 800 cfs).--Jan. 1 (time and discharge unknown); Jan. 18 (10 a.m.) 1,480 cfs (11.73 ft); Jan. 27 (1 a.m.) 2,520 cfs (13.03 ft); Feb. 4 (9 a.m.) 1,090 cfs (10.82 ft); Mar. 11 (5 p.m.) 2,570 cfs (13.14 ft); Apr. 13 (12 p.m.) 885 cfs (10.18 ft); Apr. 24 (6 a.m.) 1,130 cfs (10.93 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 13 to Jan. 1, Feb. 14-17.

Blanchard River near Findlay, Ohio

Location.--Lat 41°03'21", long. 83°41'17", on east line sec. 10, T. 1 N., R. 10 E., on left bank on upstream side of highway bridge 2 miles west of Findlay, Hancock County, and 3 miles downstream from Eagle Creek.

Drainage area.--343 sq mi.

Records available.--November 1923 to December 1935, October 1940 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 754.55 ft above mean sea level. Prior to July 24, 1930, chain gage at same site and datum.

Average discharge.--23 years (1924-35, 1940-52), 247 cfs.

Extremes.--Maximum discharge during year, 7,020 cfs Jan. 27 (gage height, 13.01 ft); minimum, 2.6 cfs Sept. 21 (gage height, 0.87 ft).
1923-35, 1940-52: Maximum discharge, 10,200 cfs Feb. 15, 1950 (gage height, 14.71 ft); minimum, 0.4 cfs Aug. 26, 27, Sept. 3, 1934.
Flood of March 1913 reached a stage of 18.5 ft (discharge, 22,000 cfs, from rating curve extended above 9,500 cfs).

Remarks.--Records good except those for periods of ice effect, which are fair.

Revisions (water years).--W 974: 1942. W 1054: 1927-30, 1933(M), 1945.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-29, July 8-29)

0.8	3.0	2.5	344
.9	6.5	3.0	565
1.0	12	6.0	1,700
1.1	18	9.0	3,070
1.4	46	11.0	4,600
1.7	97	13.0	7,020
2.0	169		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.0	6.5	17	*3,980	332	93	164	119	46	15	6.2	6.3
2	4.0	6.5	17	3,310	524	81	153	101	43	13	5.8	12
3	4.0	6.5	16	1,580	875	77	126	83	39	20	5.8	5.8
4	4.8	6.5	*26	710	2,470	179	121	72	37	17	7.0	5.1
5	4.8	7.0	47	484	2,370	332	685	65	35	13	5.8	5.4
6	4.8	11	77	353	1,420	230	1,080	60	36	11	5.4	5.4
7	8.4	23	423	276	710	146	1,260	53	36	11	5.4	4.4
8	4.0	17	650	237	565	117	750	53	42	*10	5.4	4.8
9	4.8	17	650	251	1,080	95	440	66	63	10	6.5	5.4
10	4.4	15	730	292	910	119	311	75	41	11	8.0	5.8
11	4.0	11	348	211	690	3,230	254	63	31	10	8.0	7.0
12	4.0	10	172	178	*405	5,680	234	55	30	10	10	8.5
13	4.4	28	93	143	292	3,370	868	49	29	8.5	6.2	4.4
14	4.4	135	48	302	217	1,700	1,940	45	27	10	5.4	4.4
15	4.8	198	b40	670	156	945	1,940	55	27	9.5	5.4	5.4
16	*5.1	74	b40	588	b140	547	1,220	49	24	22	8.5	7.0
17	5.8	34	b35	1,810	b120	344	670	49	24	8.5	4.8	10
18	6.2	27	b35	3,020	110	307	413	48	24	6.5	5.8	18
19	7.0	17	b35	3,070	97	975	284	*48	23	7.5	4.8	19
20	7.0	18	b35	2,220	112	1,050	204	55	21	6.5	4.8	3.7
21	6.2	17	99	1,160	164	690	164	56	21	7.0	8.5	3.4
22	6.5	18	269	670	181	710	143	49	21	8.5	5.1	3.4
23	11	26	307	770	141	1,620	433	46	20	10	4.4	12
24	19	25	273	457	119	1,380	2,100	342	20	6.5	4.8	9.5
25	6.5	22	279	332	110	770	2,180	770	18	6.5	5.1	7.5
26	6.2	23	910	2,280	97	422	1,160	610	17	6.5	4.8	6.5
27	6.5	24	1,020	6,040	97	284	506	230	15	5.8	*4.8	5.8
28	6.2	19	750	4,330	95	220	303	136	15	7.0	4.8	5.1
29	5.8	20	449	1,820	95	184	201	97	16	7.0	5.8	4.4
30	6.2	18	1,240	588	-	153	151	70	16	6.2	5.4	3.7
31	6.5	-	2,620	348	-	*143	-	57	-	5.8	5.4	-
Total	186.3	880.0	11,750	42,480	14,694	26,193	46,631	3,726	857	306.8	183.9	211.1
Mean	6.01	29.3	379	1,370	507	845	1,554	120	28.6	9.90	5.93	7.04
Cfsm	0.018	0.085	1.10	3.99	1.48	2.46	4.53	0.350	0.083	0.029	0.017	0.021
In.	0.02	0.09	1.27	4.60	1.60	2.84	5.05	0.40	0.09	0.03	0.02	0.02

Calendar year 1951: Max 3,740 Min 2.6 Mean 310 Cfsm 0.904 In. 12.26
Water year 1951-52: Max 6,040 Min 3.0 Mean 405 Cfsm 1.18 In. 16.03

Peak discharge (base, 2,400 cfs).--Jan. 1 (9 p.m.) 4,420 cfs (10.75 ft); Jan. 18 (5 p.m.) 3,310 cfs (9.42 ft); Jan. 27 (3 p.m.) 7,020 cfs (13.01 ft); Feb. 4 (7 p.m.) 2,770 cfs (8.40 ft); Mar. 12 (7 a.m.) 6,440 cfs (12.64 ft).

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

Blanchard River at Glandorf, Ohio

Location.--Lat 41°02'40", long. 84°04'55", in NE¼ sec. 17, T. 1 N., R. 7 E., near center of span on upstream side of highway bridge half a mile upstream from Pike Run and three-quarters of a mile north of Glandorf, Putnam County.

Drainage area.--643 sq mi.

Records available.--August 1921 to July 1928, January 1947 to December 1951 (discontinued).

Gage.--Wire-weight gage read once daily below 5 ft and twice daily above. Aug. 30, 1921, to July 31, 1928, chain gage at same site and datum.

Average discharge.--10 years (1921-27, 1947-51), 597 cfs.

Extremes.--Maximum daily discharge during period October to December 1951, 1,900 cfs Dec. 31; minimum, 0.3 cfs Oct. 7 (gage height, 1.73 ft).
1921-28, 1947-51: Maximum discharge, 15,800 cfs Feb. 15, 1950 (gage height, 27.0 ft); minimum, that of Oct. 7, 1951.

Remarks.--Records good except those for period of ice effect, which are fair.

Revisions (water years).--W 1084: 1922, 1924, 1926-28.

Rating table, Oct. 1 to Dec. 31, 1951, except period of ice effect
(gage height, in feet, and discharge, in cubic feet per second)

1.7	0.2	3.0	91
1.8	.6	5.0	382
1.9	1.5	9.0	1,090
2.0	6.0	13.0	1,940
2.5	38		

Discharge, in cubic feet per second, October to December 1951

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.8	14	35									
2	5.1	14	33									
3	3.8	13	31									
4	2.8	11	60									
5	1.3	10	*129									
6	.4	11	129									
7	.3	37	198									
8	.4	37	668									
9	2.8	54	1,070									
10	19	41	1,170									
11	21	34	974									
12	14	30	616									
13	13	41	350									
14	12	257	100									
15	9.0	212	70									
16	*8.4	257	65									
17	8.4	177	60									
18	4.6	97	55									
19	7.8	68	55									
20	7.2	50	55									
21	6.6	33	200									
22	5.6	31	400									
23	12	54	500									
24	30	47	460									
25	29	53	430									
26	50	54	1,000									
27	35	45	1,600									
28	25	41	1,400									
29	19	55	1,300									
30	17	37	1,200									
31	17	-	1,900									
Total	395.3	1,915	16,313									
Mean	12.8	63.8	526									
Cfsm	0.020	0.099	0.818									
In.	0.02	0.11	0.94									

Calendar year 1951: Max 5,320 Min 0.3 Mean 573 Cfsm 0.891 In. 12.09
Water year : Max Min Mean Cfsm In.

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 14-31.

Town Creek near Van Wert, Ohio

Location.--Lat 40°49'30", long. 84°34'50", in sec. 36, T. 2 S., R. 2 E., on left bank at downstream side of bridge on U. S. Highway 127, 3 miles south of Van Wert, Van Wert County, and 5½ miles downstream from Roller Creek.

Drainage area.--20.4 sq mi.

Records available.--July 1945 to September 1952.

Gage.--Water-stage recorder.

Average discharge.--7 years, 22.3 cfs.

Extremes.--Maximum discharge during year, 810 cfs Mar. 11 (gage height, 9.73 ft); no flow for many days.
1945-52: Maximum discharge, 935 cfs Mar. 21, 1948, from rating curve extended above 440 cfs; maximum gage height, that of Mar. 11, 1952; no flow for many days each year.

Remarks.--Records fair except those for periods of ice effect, which are poor.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 27				Jan. 28 to Sept. 30			
1.5	0	2.5	25	1.3	0	2.5	27
1.6	.3	3.0	50	1.4	.2	3.0	52
1.7	1.4	4.0	110	1.5	.6	4.0	111
1.8	3.1	6.0	269	1.6	1.3	6.0	269
2.0	7.9	8.0	503	1.7	2.5	8.0	503
2.2	14	9.0	658	1.8	4.2	9.0	658
				2.1	12	10.0	890

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0.1	1.0	342	27	2.7	8.4	5.9	3.2	0	0	0
2	0	0	.9	120	73	2.0	6.3	5.0	2.0	0	0	.1
3	0	0	.6	51	97	2.7	5.2	3.4	1.7	.6	0	.1
4	0	0	73	31	326	37	5.5	2.7	1.5	9.5	0	.3
5	0	0	55	20	114	22	91	2.7	1.2	1.6	0	.1
6	0	0	32	15	57	12	74	36	1.2	.3	0	.1
7	0	.2	20	11	35	7.9	43	12	1.1	.1	0	0
8	0	.5	12	b10	40	7.1	23	7.6	1.0	.1	0	0
9	*0	.6	42	b9	87	9.2	16	9.2	1.0	.1	0	0
10	0	.6	26	8.8	78	30	15	57	.8	.1	0	0
11	0	1.1	16	5.7	63	714	16	22	.7	0	0	0
12	0	.6	b6	b5	27	284	16	12	1.0	0	0	0
13	0	1.9	b2.5	b5	b17	84	135	7.6	1.1	0	.3	0
14	0	31	b.8	52	b13	53	*81	5.4	1.1	0	.2	0
15	0	11	b.6	*100	b10	30	67	4.7	1.1	0	.1	0
16	0	4.4	b.5	38	b8	19	33	3.4	.9	0	19	0
17	0	2.4	b.5	*233	b6	13	21	17	.8	0	12	0
18	0	1.4	b.5	228	5.1	23	15	30	.8	0	1.6	0
19	0	.7	b.5	97	4.2	111	11	15	.5	0	.6	.4
20	0	.5	b1.5	137	*6.1	48	8.4	20	.4	0	.3	1.4
21	0	.3	b7	43	6.2	48	6.8	47	.3	0	.4	.6
22	0	.5	b17	33	4.4	86	6.6	21	.4	.2	.5	.3
23	0	9.1	b15	30	3.9	106	238	15	.4	*31	.3	.2
24	5.3	9.0	b14	12	3.7	35	281	52	.4	5.1	.2	.1
25	4.2	4.0	b30	13	3.0	21	81	130	.4	.6	*.1	.1
26	.6	4.2	b70	297	2.8	18	38	186	.3	.4	.1	.1
27	.2	*2.9	46	*560	3.6	15	20	*48	.2	.1	0	0
28	.1	2.2	25	119	3.9	12	13	21	.1	0	0	0
29	.1	1.7	18	46	3.4	9.8	9.2	11	.1	0	0	0
30	.1	1.1	118	26	-	7.9	7.1	6.8	.1	0	0	0
31	.1	-	250	16	-	8.4	-	4.7	-	0	0	-
Total	10.7	92.0	901.9	2,713.5	1,128.3	1,878.7	1,391.5	621.1	25.8	49.8	35.7	3.9
Mean	0.35	3.07	29.1	87.5	38.9	60.6	46.4	26.5	0.86	1.61	1.15	0.13
Cfsm	0.017	0.150	1.43	4.29	1.91	2.97	2.27	1.30	0.042	0.079	0.056	0.0064
In.	0.02	0.17	1.65	4.95	2.06	3.42	2.53	1.50	0.05	0.09	0.06	0.007

Calendar year 1951: Max 575 Min 0 Mean 22.7 Cfsm 1.11 In. 15.09
Water year 1951-52: Max 714 Min 0 Mean 24.7 Cfsm 1.21 In. 16.51

Peak discharge (base, 250 cfs).--Jan. 1 (1:30 p.m.) 424 cfs (7.39 ft); Jan. 18 (time unknown) about 460 cfs; Jan. 27 (6 a.m.) 785 cfs (9.57 ft); Feb. 4 (6 a.m.) 463 cfs (7.70 ft); Mar. 11 (2 p.m.) 810 cfs (9.73 ft); Apr. 23 (10:30 p.m.) 590 cfs (8.55 ft); May 25 (12 p.m.) 412 cfs (7.31 ft).
* Discharge measurement or observation of no flow made on this day.
b Stage-discharge relation affected by ice.

Auglaize River near Defiance, Ohio

Location.--Lat 41°14'15", long. 84°24'02", in NE¼ sec. 9, T. 3 N., R. 4 E., on right bank 125 ft downstream from dam and powerplant of Toledo Edison Co., a quarter of a mile upstream from Jackson ditch, and 3 miles south of Definance, Definance County.

Drainage area.--2,329 sq mi.

Records available.--May to August 1903 (gage heights only), April 1915 to December 1935, October 1940 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 660.00 ft above mean sea level, adjustment of 1912. May 20 to Aug. 8, 1903, staff gage at site 1½ miles downstream at different datum. Apr. 13, 1915, to Dec. 6, 1933, staff gage near right bank on upstream side of dam at same datum. Auxiliary tailwater staff gage near right bank on downstream side of dam at same datum.

Average discharge.--32 years (1915-35, 1940-52), 1,740 cfs.

Extremes.--Maximum discharge during year, 32,400 cfs Mar. 13 (gage height, 21.27 ft); minimum daily, 14 cfs Sept. 14, 15.

1915-35, 1940-52: Maximum discharge, 52,500 cfs Feb. 16, 1950 (gage height, 26.4 ft from graph based on hourly powerplant tailwater gage readings); minimum daily, 6 cfs Oct. 17, 1923.

Flood of March 1913 reached a stage of 38.8 ft from reading on powerplant tailwater gage at present datum (discharge, 120,000 cfs, from rating curve extended above 51,000 cfs).

Remarks.--Records good. Flow regulated by powerplant above station. Some diversion by Miami & Erie Canal from Lake St. Marys into Jennings Creek, tributary to Auglaize River above station.

Revisions (water years).--W 759: Drainage area. W 954: 1941.

Rating tables, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 13				Mar. 14 to Sept. 30			
4.6	30	6.0	675	4.5	9.0	6.0	645
4.7	44	7.0	1,550	4.6	18	7.0	1,530
4.9	90	9.0	4,080	4.8	49	9.0	4,080
5.2	198	13.0	11,000	5.0	93	13.0	11,000
5.5	351	21.0	31,600	5.3	201	19.0	26,200
				5.6	365		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	44	38	62	19,400	3,860	444	1,130	1,330	330	42	32	35
2	44	268	312	23,100	3,290	507	1,010	612	499	40	35	414
3	44	38	343	18,700	4,380	780	1,050	610	428	35	37	34
4	43	190	1,910	11,000	10,400	945	705	625	279	32	*32	34
5	43	500	3,020	6,280	14,800	*1,300	2,280	619	364	35	*29	49
6	43	433	3,220	3,570	14,200	1,820	5,310	355	269	40	31	34
7	43	491	2,830	2,520	8,520	1,550	7,300	565	46	37	32	32
8	43	190	2,640	2,100	6,110	795	6,280	428	770	32	32	32
9	41	182	2,830	1,880	5,310	795	4,530	733	47	32	26	34
10	*41	50	3,430	1,820	6,960	1,160	3,280	969	46	34	22	34
11	41	44	3,360	1,130	7,640	9,020	2,940	1,110	47	34	28	1,530
12	41	862	2,640	1,550	6,110	*22,000	2,130	944	49	32	240	1,420
13	43	495	1,550	1,550	4,830	30,500	2,550	522	256	32	44	141
14	43	1,600	957	1,660	2,110	24,600	5,470	446	278	31	42	14
15	41	1,790	660	2,760	957	13,300	9,420	244	49	402	411	14
16	40	720	705	5,310	1,300	7,470	8,340	596	980	353	34	395
17	40	654	598	9,240	1,300	4,830	5,950	532	1,330	32	34	122
18	40	48	660	13,300	1,250	3,090	4,230	657	773	32	37	49
19	37	384	256	15,500	834	3,930	3,210	1,580	*40	29	39	93
20	37	631	166	17,100	460	7,300	2,490	1,900	42	28	40	88
21	36	116	746	13,700	726	6,790	*1,530	1,040	40	127	39	156
22	34	41	1,400	*8,700	604	4,990	853	1,510	40	32	39	305
23	37	37	2,100	6,280	841	5,950	1,440	1,630	39	601	39	288
24	43	36	2,460	4,380	1,060	7,470	6,720	3,850	34	32	40	211
25	40	127	2,460	3,360	792	6,620	14,800	11,800	32	326	40	141
26	40	657	2,400	4,360	576	4,530	12,300	12,300	32	32	40	102
27	40	271	4,080	17,900	72	3,220	6,790	9,420	35	32	42	96
28	43	212	5,630	26,700	74	2,370	4,080	5,470	40	35	46	79
29	40	*159	4,830	26,200	499	1,530	2,490	3,210	39	34	46	69
30	150	70	4,380	15,300	-	1,280	1,160	1,720	39	320	46	67
31	40	-	10,200	6,450	-	1,070	-	749	-	32	42	-
Total	1,375	11,334	72,835	292,800	109,865	181,956	131,768	68,076	7,292	2,967	1,716	6,112
Mean	44.4	378	2,350	9,445	3,788	5,870	4,392	2,196	243	95.7	55.4	204
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 24,600 Min 34 Mean 2,184 Cfsm - In. -
Water year 1951-52: Max 30,500 Min 14 Mean 2,426 Cfsm - In. -

Peak discharge (base, 13,000 cfs).--Jan. 2 (1 p.m.) 23,900 cfs (18.06 ft); Jan. 20 (5 p.m.) 17,600 cfs (15.68 ft); Jan. 28 (12 p.m.) 29,600 cfs (20.34 ft); Feb. 5 (12 p.m.) 15,500 cfs (14.94 ft); Mar. 13 (7 a.m.) 32,400 cfs (21.27 ft); Apr. 25 (3 p.m.) 15,000 cfs (14.70 ft); May 25 (4 p.m.) 13,500 cfs (14.10 ft).

* Discharge measurement made on this day.

Maumee River near Defiance, Ohio

Location.--Lat 41°17'30", long. 84°16'50", in NW¼ sec. 22, T. 4 N., R. 5 E., on left bank 40 ft upstream from Independence Dam, 275 ft downstream from point of diversion to Miami & Erie Canal, 4 miles downstream from Auglaize River, and 4½ miles east of Defiance.

Drainage area.--5,530 sq mi.

Records available.--October 1924 to December 1935, March 1939 to September 1952.

Gage.--Water-stage recorder above concrete dam. Datum of gage is 659.12 ft above mean sea level. Prior to Nov. 13, 1924, staff gage at same site and datum.

Average discharge.--24 years, 4,160 cfs (not including flow in Miami & Erie Canal).

Extremes.--Maximum discharge during year, 50,900 cfs Mar. 13 (gage height, 8.96 ft); minimum, 155 cfs Sept. 16 (gage height, 1.48 ft).
1924-35, 1939-52: Maximum discharge, 87,100 cfs Feb. 16, 1950 (gage height, 13.70 ft); minimum, 18 cfs Aug. 2, 1934 (gage height, 1.24 ft).

Remarks.--Records good. Flow affected by regulation of Auglaize River at hydroelectric plant of Toledo Edison Co., 3 miles south of Definance. Diversion into Miami & Erie Canal above station not included in records; for miscellaneous discharge measurements of this canal, see page 357.

Revisions (water years).--W 974: 1926, 1927, 1929, 1930.

Rating table, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)

1.5	185	3.0	4,400
1.7	490	4.0	9,380
2.1	1,270	6.0	25,100
2.5	2,420	9.0	50,900

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	311	890	1,120	32,300	15,400	1,980	3,460	3,820	4,280	408	374	213
2	311	950	1,270	44,800	12,000	1,960	2,900	2,530	2,980	424	325	497
3	297	758	1,180	39,900	11,600	2,110	2,900	2,020	2,350	408	283	247
4	297	758	5,200	27,800	21,600	2,350	2,350	1,900	1,800	358	283	213
5	311	930	10,900	19,500	30,500	*3,740	7,390	1,640	1,590	374	*241	241
6	297	970	11,600	13,000	30,500	5,010	15,000	1,390	1,370	408	255	241
7	374	1,080	9,580	9,980	22,400	4,970	17,400	1,440	1,120	*440	255	227
8	342	1,050	7,730	7,730	17,000	3,700	13,900	1,900	1,590	440	255	213
9	424	1,230	7,470	6,700	14,200	3,180	10,900	1,640	970	391	227	199
10	*457	1,490	7,470	5,600	15,000	3,180	8,820	2,110	832	342	227	185
11	424	1,800	6,960	4,150	18,600	18,400	7,730	2,780	794	311	241	1,050
12	424	2,900	5,740	3,860	15,400	39,900	6,120	2,940	776	311	391	1,720
13	440	3,060	4,150	3,780	11,600	*49,400	8,000	1,960	910	269	391	545
14	440	7,470	2,820	4,200	7,750	44,000	14,200	1,510	1,030	213	391	213
15	391	9,100	1,920	9,660	5,100	31,400	21,600	1,390	1,370	325	490	185
16	374	6,700	1,370	16,600	4,580	22,400	20,300	1,490	2,210	508	457	312
17	374	5,460	1,200	25,100	3,900	18,200	15,800	1,490	2,380	325	311	325
18	408	4,110	1,290	33,200	3,580	12,000	12,300	1,580	1,860	241	508	199
19	358	3,700	1,090	35,100	3,220	13,800	10,300	3,620	*910	342	474	227
20	342	3,260	1,180	38,100	2,080	19,900	8,280	3,860	776	408	358	213
21	325	1,960	1,560	35,100	2,420	18,200	5,840	2,900	720	508	311	311
22	325	1,490	2,750	*26,900	2,280	13,400	4,110	3,260	665	457	311	424
23	408	1,540	4,240	21,200	2,380	16,200	*3,780	3,940	612	1,310	342	474
24	720	1,960	4,970	16,200	2,780	18,200	11,300	8,020	560	2,980	325	457
25	1,250	2,240	4,710	11,600	2,530	15,800	24,200	27,800	542	2,280	297	457
26	1,590	2,530	4,280	14,200	2,530	11,300	22,400	31,400	560	1,340	269	391
27	1,620	1,980	5,510	38,100	1,960	8,820	14,200	25,100	490	930	227	342
28	1,490	1,780	7,730	47,900	1,800	7,210	10,300	17,000	578	739	227	283
29	1,340	*1,510	7,470	47,100	1,960	5,460	7,730	10,900	508	630	227	241
30	1,250	1,270	6,960	34,100	-	4,400	4,880	8,000	457	739	213	227
31	1,010	-	14,400	21,200	-	3,740	-	5,840	-	490	199	-
Total	18,724	75,926	155,620	694,660	286,630	424,310	318,270	187,170	37,590	19,649	9,685	11,072
Mean	604	2,531	5,020	22,410	9,884	13,690	10,610	6,038	1,253	634	312	369
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 50,100 Min 297 Mean 5,995 Cfsm - In. -
Water year 1951-52: Max 49,400 Min 185 Mean 6,118 Cfsm - In. -

Peak discharge (base, 25,000 cfs).--Jan. 2 (8:30 a.m.) 47,100 cfs (8.50 ft); Jan. 20 (11 a.m.) 38,100 cfs (7.43 ft); Jan. 28 (7:30 p.m.) 50,100 cfs (8.88 ft); Feb. 5 (10 p.m.) 31,400 cfs (6.74 ft); Mar. 13 (11 a.m.) 50,900 cfs (8.96 ft); Apr. 25 (12 p.m.) 25,100 cfs (5.99 ft); May 25 (5:30 p.m.) 34,100 cfs (7.05 ft).

* Discharge measurement made on this day.

Maumee River at Waterville, Ohio

Location.--Lat 41°30'00", long. 83°42'46", on downstream side of second pier from left bank of bridge on State Highway 64 at Waterville, Lucas County, 3 miles downstream from Tontogany Creek.

Drainage area.--6,314 sq mi.

Records available.--November 1898 to December 1901, August 1921 to December 1935, March 1939 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 596.33 ft above mean sea level, adjustment of 1912. Nov. 19, 1898, to Jan. 1, 1902, wire-weight gage, Aug. 26, 1921, to July 31, 1930, chain gage, Aug. 1, 1930, to Dec. 31, 1935, water-stage recorder, and Mar. 14, 1939, to Mar. 12, 1940, chain gage all at same site and datum.

Average discharge.--27 years (1921-35, 1939-52), 4,785 cfs (does not include flow in Miami & Erie Canal; canal was abandoned in 1929 and was filled in prior to March 1939).

Extremes.--Maximum discharge during year, 54,000 cfs Jan. 28 (gage height, 11.39 ft); maximum gage height, 11.81 ft Jan. 1 (ice jam); minimum discharge, 142 cfs Sept. 16 (gage height, 1.60 ft).
1921-35, 1939-52: Maximum discharge, 94,000 cfs Feb. 16, 1950 (gage height, 14.52 ft); minimum, 32 cfs Sept. 29, 1941.

Remarks.--Records good except those for periods of ice effect, which are fair. Low flow slightly regulated by powerplants above station. Records of chemical analyses, water temperatures and suspended sediment loads for the water year 1952 are given in Water-Supply Paper 1250.

Revisions (water years).--W 759: Drainage area. W 894: 1930(M). W 1084: 1946.

Rating table, water year 1951-52, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.6	150	4.0	5,670
1.8	290	6.0	14,800
2.1	665	9.0	33,900
2.5	1,360	12.0	60,000
3.0	2,500		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	274	956	1,480	28,000	18,600	2,380	4,030	4,390	5,670	374	445	226
2	274	905	1,340	50,000	14,800	1,940	3,570	3,400	3,690	445	364	266
3	274	1,030	1,460	46,800	13,700	2,280	3,310	2,550	2,950	482	274	364
4	234	939	4,110	33,200	22,800	2,710	2,790	2,300	2,280	458	341	258
5	250	470	14,800	23,400	32,500	3,170	7,470	1,830	1,900	322	254	218
6	242	837	15,800	17,000	32,500	*4,920	16,400	1,830	1,830	332	204	210
7	441	1,480	12,700	12,700	26,200	5,480	*21,000	1,230	1,360	432	204	204
8	364	1,650	10,100	9,840	19,200	4,560	17,000	1,940	*1,280	445	234	226
9	210	1,400	9,620	8,100	17,000	3,660	13,700	1,670	1,650	384	258	218
10	311	1,870	*9,840	6,860	16,400	3,460	11,200	2,660	1,080	332	300	204
11	384	2,110	8,950	5,670	21,600	17,300	9,170	2,380	547	311	218	186
12	342	2,630	7,480	4,120	18,600	42,700	7,480	3,570	742	290	266	1,650
13	322	4,000	5,670	4,390	14,800	*50,400	8,950	2,420	727	274	395	1,420
14	364	9,390	3,690	5,100	11,200	49,500	15,300	1,650	1,080	*258	374	470
15	*353	12,000	2,630	11,500	7,060	37,100	23,400	1,540	1,080	290	384	250
16	322	9,620	1,800	17,500	5,290	25,500	22,800	1,170	1,920	273	720	206
17	311	7,060	1,600	26,900	4,560	19,200	18,000	1,520	2,660	549	374	242
18	300	5,480	1,700	38,700	3,810	15,300	14,800	1,460	2,420	374	322	353
19	364	4,220	1,400	37,900	3,660	17,000	12,200	2,520	1,380	508	408	374
20	226	3,780	1,600	43,500	2,920	21,600	10,300	3,930	696	520	395	266
21	274	3,250	2,100	*39,500	2,810	20,400	7,680	3,600	650	549	332	266
22	290	2,130	3,500	31,100	2,480	16,400	5,480	2,630	665	607	234	311
23	311	1,870	5,500	24,100	2,450	18,000	3,870	4,160	650	913	250	495
24	1,280	2,420	6,500	18,600	2,840	19,200	9,390	7,360	680	2,390	311	458
25	1,170	2,600	5,900	14,300	2,760	18,000	22,800	28,600	520	2,980	300	495
26	1,850	3,140	5,200	17,500	2,790	14,300	24,800	39,500	508	2,150	266	445
27	2,010	2,680	7,000	44,300	2,380	11,000	18,000	31,100	342	1,250	*218	408
28	2,030	2,450	9,500	53,100	2,060	8,740	12,200	21,600	432	939	204	364
29	1,560	1,990	9,200	51,300	1,960	7,060	9,620	14,300	865	696	204	290
30	1,480	1,740	8,800	39,500	-	5,290	6,660	10,300	363	607	198	234
31	1,400	-	15,000	24,100	-	4,560	-	7,270	-	607	210	-
Total	19,817	96,097	195,970	788,580	329,730	473,110	363,370	216,380	42,417	21,341	9,461	11,577
Mean	639	3,203	6,322	25,440	11,370	15,260	12,110	6,980	1,414	688	306	386
Cfsm	0.101	0.507	1.00	4.03	1.80	2.42	1.92	1.11	0.224	0.109	0.048	0.061
In.	0.12	0.57	1.15	4.65	1.94	2.79	2.14	1.28	0.25	0.13	0.06	0.07

Calendar year 1951: Max 53,100 Min 168 Mean 6,944 Cfsm 1.10 In. 14.92
Water year 1951-52: Max 53,100 Min 186 Mean 7,016 Cfsm 1.11 In. 15.15

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 16 to Jan. 2.

Portage River at Woodville, Ohio

Location.--Lat 41°26'55", long. 83°21'41", in sec. 28, T. 6 N., R. 13 E., on left bank at upstream side of bridge on U. S. Highway 20 in Woodville.

Drainage area.--433 sq mi.

Records available.--July 1928 to December 1935, October 1939 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 615.14 ft above mean sea level, adjustment of 1912. Prior to Mar. 24, 1933, chain gage, Apr. 7, 1933, to Oct. 8, 1933, staff gage, Oct. 9, 1933, to Dec. 31, 1935, water-stage recorder, and Oct. 17 to Nov. 29, 1939, wire-weight gage, all at same site and datum.

Average discharge.--20 years, 317 cfs.

Extremes.--Maximum discharge during year, 9,490 cfs Mar. 12 (gage height, 13.24 ft); minimum, 2.3 cfs Aug. 28, 29 (gage height, 1.85 ft).
1928-35, 1939-52: Maximum discharge, 11,500 cfs Feb. 15, 1950 (gage height, 14.51 ft); minimum, 0.3 cfs Aug. 28, 1931; minimum gage height, 1.60 ft July 25, 26, 1934.
Flood of March 1913 reached a stage of 17 ft, from information by local residents (discharge, 17,000 cfs, from rating curve extended above 11,500 cfs).

Remarks.--Records good except those for periods of ice effect, which are fair. Records of suspended sediment loads for the water year 1952 are given in Water-Supply Paper 1250.

Revisions (water years).--W 894: 1929, 1930. W 1207: 1933.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Nov. 14, Sept. 28-30)

Oct. 1 to Dec. 31				Jan. 1 to Sept. 30			
1.7	1.3	3.0	158	1.8	1.3	3.5	282
1.8	3.3	3.5	322	1.9	3.3	4.0	500
1.9	6.5	4.0	527	2.0	7.3	6.0	1,580
2.0	11	6.0	1,560	2.1	14	8.0	3,040
2.1	18	8.0	3,040	2.3	32	10.0	5,170
2.3	37	9.0	4,030	2.6	70	13.0	9,190
2.6	78			3.0	142		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.5	4.3	48	*6,410	545	104	190	121	102	4.9	6.9	7.6
2	4.9	3.9	43	5,890	1,210	88	198	110	80	12	5.7	15
3	4.6	3.9	*38	2,260	1,400	99	160	99	64	44	5.3	13
4	4.3	3.6	43	1,260	3,240	106	136	85	55	26	5.3	19
5	3.9	3.1	565	905	3,510	170	944	79	52	17	5.7	11
6	3.3	3.9	430	725	1,640	156	2,150	78	42	14	5.7	6.9
7	8.1	11	350	575	988	112	2,370	69	36	8.5	5.3	5.7
8	*12	52	920	450	850	99	1,370	63	32	6.1	4.9	5.3
9	17	59	868	437	1,340	95	825	63	30	4.9	4.9	4.9
10	9.3	39	1,260	455	1,490	115	570	87	27	4.1	5.3	4.1
11	6.2	25	638	310	2,080	3,140	428	110	26	4.1	5.7	2.9
12	5.5	19	381	261	*1,210	*8,740	340	78	25	4.9	8.5	3.3
13	4.6	22	183	232	750	5,660	843	62	18	4.1	11	4.5
14	4.3	753	b90	653	464	2,290	2,690	52	18	3.7	19	4.5
15	3.9	906	b70	1,580	331	1,460	2,370	48	16	3.7	*14	5.3
16	3.3	353	b65	1,400	b250	932	1,580	47	15	3.7	13	5.3
17	3.6	174	b60	2,200	b210	595	878	48	13	4.1	10	4.5
18	3.6	114	b55	5,650	168	446	575	55	12	6.1	8.5	6.6
19	3.3	60	55	4,300	147	1,950	384	52	11	13	7.3	16
20	3.3	47	60	3,510	132	2,080	275	48	*11	13	5.3	46
21	4.3	49	148	2,640	168	1,120	209	52	10	21	3.7	26
22	4.9	44	b450	1,180	147	750	175	56	9.8	14	3.3	16
23	7.9	43	b550	1,260	117	1,710	334	56	9.8	273	4.1	12
24	18	75	b480	692	113	1,400	1,410	789	9.2	276	6.5	8.5
25	40	103	b450	424	110	725	1,180	2,860	8.5	106	5.7	7.9
26	25	76	660	2,230	99	515	615	2,770	8.5	53	4.5	7.3
27	12	83	1,160	6,800	94	410	362	1,640	7.9	31	3.3	6.1
28	8.8	76	795	7,340	102	318	*254	775	6.5	20	2.5	5.3
29	6.5	76	615	2,400	106	254	193	379	5.7	14	2.3	4.9
30	6.2	59	1,210	1,020	-	209	147	212	5.3	10	2.7	4.1
31	5.2	-	b3,200	560	-	185	-	140	-	8.5	4.1	-
Total	253.3	3,340.7	15,940	66,009	23,011	36,033	24,155	11,183	766.2	1,028.4	200.0	289.5
Mean	817	111	514	2,129	793	1,162	805	361	25.5	33.2	6.45	9.65
Cfsm	0.019	0.256	1.19	4.92	1.83	2.68	1.86	0.834	0.059	0.077	0.015	0.022
In.	0.02	0.29	1.37	5.67	1.97	3.09	2.08	0.96	0.07	0.09	0.02	0.02

Calendar year 1951: Max 6,950 Min 3.1 Mean 475 Cfsm 1.10 In. 14.92
Water year 1951-52: Max 8,740 Min 2.3 Mean 498 Cfsm 1.15 In. 15.65

Peak discharge (base, 3,500 cfs).--Jan. 2 (2 a.m.) 7,200 cfs (11.60 ft); Jan. 18 (9:30 p.m.) 6,670 cfs (11.16 ft); Jan. 20 (10:30 p.m.) 4,250 cfs (9.16 ft); Jan. 28 (2 a.m.) 8,600 cfs (12.58 ft); Feb. 5 (3:30 a.m.) 4,360 cfs (9.33 ft); Mar. 12 (3 p.m.) 9,490 cfs (13.24 ft).

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

Sandusky River near Bucyrus, Ohio

Location.--Lat 40°48'13", long. 83°00'21", in NE¼ sec. 10, T. 3 S., R. 16 E., on right bank at upstream side of highway bridge, 1½ miles west of Bucyrus, Crawford County, and 12 miles downstream from Loss Creek.

Drainage area.--89.8 sq mi.

Records available.--August 1925 to November 1935, July 1938 to December 1951 (discontinued).

Gage.--Water-stage recorder. Datum of gage is 955.9 ft above mean sea level, adjustment of 1912. Prior to May 11, 1940, chain gage at same site and datum.

Average discharge.--23 years, 81.5 cfs.

Extremes.--Maximum discharge during period October to December 1951, 1,550 cfs Dec. 30 (gage height, 6.57 ft); minimum, 0.8 cfs Oct. 14; minimum gage height, 0.85 ft Oct. 14, 20, 21.
1925-35, 1938-51: Maximum discharge observed, 6,900 cfs Dec. 14, 1927 (gage height, 9.15 ft); minimum discharge, 0.4 cfs Sept. 29, 1941, July 16, 1942.
Flood of Mar. 23, 1913, reached a stage of 14.5 ft, from floodmarks.

Remarks.--Records good. Low flow slightly affected by operation of reservoirs for municipal supply of Bucyrus.

Revisions (water years).--W 744: 1925-32. W 874: 1938.

Rating table, Oct. 1 to Dec. 31, 1951, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 15-19)

0.8	1.2	2.5	143
.9	3.2	3.0	238
1.1	8.5	4.0	488
1.3	16	5.0	805
1.6	35	6.0	1,230
2.0	70		

Discharge, in cubic feet per second, October to December 1951

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.0	3.9	9.9	-								
2	2.4	3.9	12									
3	2.6	3.4	12									
4	2.6	3.0	21									
5	3.0	3.0	76									
6	3.7	12	60									
7	5.7	41	472									
8	1.8	42	430									
9	2.7	18	860									
10	3.0	12	456									
11	1.8	9.5	*146									
12	1.4	8.2	85									
13	1.4	11	56									
14	1.2	13	33									
15	1.4	26	b30									
16	1.8	17	b25									
17	2.0	19	25									
18	1.8	16	24									
19	*1.7	10	24									
20	1.8	7.3	25									
21	2.0	5.6	155									
22	2.2	6.0	420									
23	3.4	49	174									
24	8.8	90	93									
25	2.0	40	122									
26	2.8	25	791									
27	4.5	24	314									
28	4.2	17	129									
29	2.6	14	96									
30	2.8	11	905									
31	2.6	-	939									
Total	83.7	560.8	7,019.9									
Mean	2.70	18.7	226									
Cfsm	0.030	0.208	2.52									
In.	0.03	0.23	2.90									

Calendar year 1951: Max 2,060 Min 1.2 Mean 96.7 Cfsm 1.08 In. 14.60
Water year : Max Min Mean Cfsm In.

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

STREAMS TRIBUTARY TO LAKE ERIE

Sandusky River near Upper Sandusky, Ohio

Location.--Lat 40°51'02", long. 83°15'23", in sec. 21, T. 2 S., R. 14 E., on left bank at downstream side of highway bridge, three-quarters of a mile upstream from Rock Run and 2 miles northeast of Upper Sandusky, Wyandot County.

Drainage area.--299 sq mi.

Records available.--October 1921 to December 1935, January 1938 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 792.8 ft above mean sea level, adjustment of 1912. Prior to Sept. 14, 1924, chain gage at same site and datum.

Average discharge.--28 years, 251 cfs.

Extremes.--Maximum discharge during year, 7,070 cfs Jan. 27 (gage height, 9.92 ft); minimum, 1.3 cfs Oct. 6, 7; minimum gage height, 0.82 ft Aug. 31, Sept. 1.
1921-35, 1938-52: Maximum discharge, 8,900 cfs Dec. 15, 1927 (gage height, 10.5 ft); minimum, 0.9 cfs Sept. 24, 1939; minimum gage height, 0.67 ft Sept. 6, 7, 1934.
Flood in June 1937 reached a stage of 14.3 ft, from high-water marks in gage well.

Remarks.--Records good except those for periods of ice effect, which are fair.

Revisions (water years).--W 874: 1927-30, 1933.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Dec. 31				Jan. 1 to Sept. 30			
0.8	1.3	1.7	110	0.8	1.2	2.1	220
.9	3.7	2.0	187	.9	3.5	2.5	366
1.0	7.2	2.5	367	1.0	7.2	3.0	610
1.1	12	3.0	605	1.1	14	5.0	1,880
1.2	18	5.0	1,780	1.2	23	7.0	3,310
1.3	28	7.0	3,260	1.4	50	9.0	5,240
1.4	43			1.7	112	10.0	7,370

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.5	7.6	24	3,070	346	105	168	141	35	21	2.8	2.8
2	2.5	7.2	22	1,530	1,160	100	182	119	33	14	2.8	19
3	2.0	5.8	18	810	1,530	*98	173	103	29	16	2.4	38
4	1.5	5.8	31	526	2,230	131	154	91	29	18	2.8	24
5	2.0	6.8	77	384	2,020	239	269	85	*25	22	3.0	12
6	2.3	9.4	165	337	930	199	552	87	24	24	2.8	7.2
7	2.7	20	387	284	621	141	780	76	21	27	2.4	6.5
8	2.5	57	1,170	242	547	119	750	74	21	16	2.4	6.1
9	2.3	91	1,140	223	810	110	537	70	20	14	2.8	4.2
10	6.8	47	1,650	280	599	122	346	70	16	12	2.8	3.9
11	5.8	28	*710	236	410	*2,130	273	72	15	12	3.5	2.8
12	4.4	20	350	182	306	4,310	252	63	13	9.2	4.2	2.4
13	3.2	23	200	168	239	2,060	727	59	12	10	4.6	1.9
14	3.2	47	110	217	196	1,880	2,440	54	12	9.2	4.2	2.4
15	4.0	55	90	851	139	780	2,160	54	12	9.8	4.6	3.0
16	3.5	63	85	1,320	130	477	*1,500	56	12	14	7.8	2.8
17	3.5	53	80	1,810	120	333	750	58	15	16	6.5	4.2
18	2.5	33	80	3,470	120	266	467	61	18	13	5.7	9.5
19	*2.7	25	80	2,790	112	654	325	56	14	13	6.1	44
20	2.5	25	90	*1,670	124	1,200	249	63	12	10	5.7	44
21	2.3	20	160	1,110	265	638	202	68	9.8	7.2	6.1	27
22	2.5	18	330	584	276	521	168	64	10	9.2	5.7	*33
23	2.7	22	650	568	184	1,880	331	61	11	16	3.3	21
24	9.9	24	700	424	154	1,530	1,670	66	12	12	4.8	12
25	17	148	500	302	141	632	1,200	61	13	*9.2	6.8	8.5
26	19	88	900	1,810	124	397	605	66	18	6.1	4.6	7.2
27	10	57	1,400	5,720	112	291	375	81	93	5.4	4.2	5.4
28	8.6	40	1,100	5,390	110	233	266	72	38	5.0	3.0	4.6
29	6.8	37	750	1,290	107	199	205	56	41	3.5	2.4	3.5
30	5.4	30	1,100	660	-	179	165	47	34	3.3	1.9	2.8
31	8.6	-	2,500	434	-	165	-	38	-	2.8	1.9	-
Total	156.2	1,113.6	16,649	38,692	14,162	22,119	18,241	2,192	667.8	379.9	124.6	365.7
Mean	5.04	37.1	537	1,248	488	714	608	70.7	22.3	12.3	4.02	12.2
Cfsm	0.017	0.124	1.80	4.17	1.63	2.39	2.03	0.236	0.075	0.041	0.013	0.041
In.	0.02	0.14	2.08	4.81	1.76	2.76	2.26	0.27	0.08	0.05	0.02	0.05

Calendar year 1951: Max 3,950 Min 1.5 Mean 285 Cfsm 0.953 In. 12.96
Water year 1951-52: Max 5,720 Min 1.5 Mean 314 Cfsm 1.05 In. 14.30

Peak discharge (base, 2,500 cfs).--Jan. 1 (12:30 a.m.) 3,950 cfs (7.83 ft); Jan. 18 (11 p.m.) 3,950 cfs (7.80 ft); Jan. 27 (5 p.m.) 7,070 cfs (9.92 ft); Feb. 5 (1 a.m.) 2,580 cfs (5.97 ft); Mar. 12 (7 p.m.) 4,620 cfs (8.54 ft); Apr. 14 (6 p.m.) 2,510 cfs (5.92 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 19-21, Dec. 13-31, Feb. 16-18.

Sandusky River near Mexico, Ohio

Location.--Lat 41°02'39", long. 83°11'42", in sec. 13, T. 1 N., R. 14 E., on right bank on downstream side of highway bridge, 3 miles upstream from Honey Creek and 4¼ miles north of Mexico, Seneca County.

Drainage area.--776 sq mi.

Records available.--March 1923 to December 1935, July 1938 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 733.1 ft above mean sea level, adjustment of 1912. Prior to Aug. 15, 1929, chain gage at same site and datum.

Average discharge.--26 years, 585 cfs.

Extremes.--Maximum discharge during year, 11,500 cfs Jan. 29 (gage height, 17.52 ft); minimum, 11 cfs Oct. 6; minimum gage height, 1.60 ft Aug. 4.
1923-35, 1938-52: Maximum discharge observed, 15,200 cfs Mar. 22, 1927 (gage height, 19.9 ft); minimum, 1.8 cfs (during repairs to small dam above station) Oct. 31, 1942.
Flood in June 1937 reached a stage of 22.5 ft from information by local residents (discharge, 19,000 cfs, from rating curve extended above 13,000 cfs).

Remarks.--Records good except those for periods of ice effect, which are fair.

Revisions (water years).--W 714: 1929-30. W 874: 1927(M).

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 18-23)

Oct. 1 to Jan. 28				Jan. 29 to Sept. 30			
1.6	12	4.0	510	1.6	12	4.0	515
1.8	28	6.0	1,360	1.7	19	6.0	1,360
2.1	63	9.0	3,100	1.9	41	9.0	3,100
2.5	126	13.0	6,270	2.2	86	13.0	6,270
3.0	231	17.0	10,800	2.5	139	17.0	10,800
				3.0	240		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	17	29	71	6,450	1,010	240	365	338	94	67	14	14
2	17	31	63	6,450	1,460	231	379	290	83	51	13	39
3	17	34	57	4,650	2,690	*225	365	247	78	45	12	42
4	16	34	64	2,330	4,410	294	338	218	72	49	12	45
5	13	31	212	1,260	5,050	564	468	195	70	47	13	47
6	13	32	233	962	4,250	547	1,100	179	67	41	13	34
7	21	64	680	770	2,450	393	1,940	171	64	42	13	27
8	23	85	1,510	615	1,460	300	1,770	162	61	48	13	23
9	20	78	2,160	580	1,940	265	1,310	160	62	39	14	19
10	18	101	2,570	650	1,820	273	850	166	*61	34	14	18
11	18	80	2,210	580	1,260	3,910	632	156	52	29	14	18
12	18	62	*1,010	465	850	6,950	531	148	51	27	18	16
13	19	63	528	390	650	7,780	975	137	49	26	18	15
14	19	369	258	390	499	6,090	3,660	125	48	24	18	14
15	18	291	b210	876	393	3,730	4,730	130	49	23	18	14
16	16	147	b190	2,160	352	1,560	*4,410	123	42	24	19	15
17	16	113	b180	3,520	b300	1,010	2,820	119	41	25	19	15
18	13	94	b180	6,550	b270	730	1,410	121	39	28	19	17
19	*13	76	b180	7,050	263	1,390	872	121	40	31	18	52
20	16	63	b190	*6,950	258	2,390	632	119	39	29	16	80
21	17	59	b350	4,570	393	2,040	483	128	36	26	19	66
22	18	59	872	2,210	580	1,460	393	132	37	26	23	*58
23	18	64	1,510	1,610	499	2,940	408	141	37	34	22	56
24	27	75	1,610	1,210	379	3,800	2,980	321	37	26	18	51
25	34	85	1,160	810	325	3,030	3,800	483	36	27	16	39
26	41	167	2,100	3,310	282	1,560	3,170	531	33	24	15	28
27	53	132	2,960	8,330	263	850	1,660	275	40	24	14	25
28	51	105	2,890	10,100	245	615	830	193	128	18	15	22
29	41	86	1,820	10,600	242	499	564	158	100	*18	15	19
30	34	78	2,720	5,120	-	422	422	128	73	16	14	18
31	30	-	5,550	1,460	-	379	-	110	-	15	14	-
Total	705	2,787	36,298	102,978	34,843	56,467	44,267	6,025	1,719	983	493	946
Mean	22.7	92.9	1,171	3,322	1,201	1,822	1,476	194	57.3	31.7	15.9	31.5
Cfsm	0.029	0.120	1.51	4.28	1.55	2.35	1.90	0.250	0.074	0.041	0.020	0.041
In.	0.03	0.13	1.74	4.93	1.67	2.71	2.12	0.29	0.08	0.05	0.02	0.05

Calendar year 1951: Max 6,950 Min 12 Mean 718 Cfsm 0.925 In. 12.55
Water year 1951-52: Max 10,600 Min 12 Mean 788 Cfsm 1.02 In. 13.82

Peak discharge (base, 4,200 cfs).--Jan. 2 (3 a.m.) 6,850 cfs (13.60 ft); Jan. 20 (5 a.m.) 7,350 cfs (14.07 ft); Jan. 29 (5 a.m.) 11,500 cfs (17.52 ft); Feb. 5 (8 a.m.) 5,130 cfs (11.72 ft); Mar. 13 (5 p.m.) 8,110 cfs (14.80 ft); Apr. 15 (6 p.m.) 4,890 cfs (11.41 ft).

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

Sandusky River near Fremont, Ohio

Location.--Lat 41°18'28", long. 83°09'32", in sec. 17, T. 4 N., R. 15 E., on left bank at downstream side of highway bridge, 2½ miles downstream from Wolf Creek, 2.3 miles upstream from Ballville power dam, and 3½ miles southwest of Fremont.

Drainage area.--1,248 sq mi.

Records available.--November 1898 to March 1901 (published as "at Fremont"), November 1923 to December 1935, July 1938 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 626.3 ft above mean sea level, adjustment of 1912. November 1898 to Mar. 10, 1901, staff gage at site 4 miles downstream at different datum. Nov. 8, 1923, to Sept. 5, 1930, chain gage at same site and datum.

Average discharge.--26 years (1923-35, 1938-52), 967 cfs.

Extremes.--Maximum discharge during year, 19,100 cfs Jan. 27 (gage height, 8.83 ft); maximum gage height, 12.12 ft Dec. 30 (ice jam); minimum discharge, 13 cfs Aug. 6, 7, 8 (gage height, 0.89 ft).
1923-35, 1938-52: Maximum discharge, 27,300 cfs Jan. 15, 1930 (gage height, 11.1 ft); maximum gage height, that of Dec. 30, 1951; minimum discharge, 5.0 cfs Sept. 27, 28, 1941 (gage height, 0.80 ft).

Remarks.--Records good except those for periods of ice effect, which are fair. Records of chemical analyses, water temperatures and suspended sediment loads for the water year 1952 are given in Water-Supply Paper 1250.

Revisions (water years).--W 744: 1931-32. W 759: Drainage area. W 874: 1938. W 1144: 1924-30.

Rating table, water year 1951-52, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 11-24)

0.8	7	2.1	790
.9	15	2.5	1,390
1.0	34	3.0	2,370
1.1	64	5.0	7,420
1.4	201	7.0	13,200
1.7	401	9.0	19,800

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	26	46	131	11,400	1,800	409	624	584	225	121	21	28
2	24	43	112	10,200	2,310	401	624	492	185	99	19	40
3	24	46	*103	6,880	3,880	*386	614	426	165	87	17	72
4	21	46	112	3,880	8,260	417	584	371	154	99	17	68
5	19	46	250	2,290	8,540	829	801	349	131	99	17	58
6	21	49	528	1,780	6,200	934	1,860	320	126	76	15	58
7	26	80	862	1,460	3,880	744	3,270	300	117	68	14	49
8	*34	112	2,180	1,170	2,550	547	3,270	294	108	*64	14	40
9	43	112	2,920	1,060	3,270	475	2,480	280	108	68	14	34
10	32	108	3,750	1,190	3,390	475	1,660	300	99	61	14	30
11	30	131	3,270	1,050	*2,770	9,170	1,220	280	99	55	15	28
12	28	112	1,900	842	1,800	15,800	992	254	91	46	23	24
13	28	99	992	698	1,270	11,100	1,500	230	87	40	26	23
14	28	306	450	675	949	9,940	5,670	207	87	40	26	21
15	28	710	350	1,050	816	5,280	7,980	201	84	40	*26	21
16	30	386	330	2,240	665	2,790	5,670	185	80	37	26	24
17	28	242	310	5,670	594	1,840	4,630	180	80	40	28	24
18	26	185	300	12,000	538	1,360	2,590	175	72	40	28	24
19	26	149	290	*10,800	467	2,740	1,570	*170	68	49	28	42
20	24	117	310	11,100	475	3,880	1,140	191	68	55	24	72
21	26	95	450	7,420	584	3,270	868	201	68	49	26	80
22	24	91	1,500	4,000	829	2,520	710	207	68	49	28	*72
23	26	103	2,500	3,160	842	4,120	655	207	68	43	28	68
24	32	121	2,700	2,220	665	5,150	2,730	435	72	46	28	61
25	52	149	2,000	1,520	565	4,120	4,890	1,660	68	40	28	58
26	49	191	3,500	5,270	492	2,700	4,120	2,610	61	37	26	46
27	49	242	5,100	17,700	450	1,500	2,790	2,040	58	37	24	37
28	61	219	4,900	14,800	426	1,080	1,460	868	58	34	23	32
29	72	180	3,100	13,900	409	868	978	510	202	30	24	30
30	58	144	5,000	8,540	-	756	732	364	175	26	24	26
31	49	-	9,500	2,810	-	*655	-	280	-	23	24	-
Total	1,044	4,660	59,700	168,775	59,686	96,256	68,682	15,171	3,132	1,698	695	1,290
Mean	33.7	155	1,926	5,444	2,058	3,105	2,289	489	104	54.8	22.4	43.0
Cfsm	0.027	0.124	1.54	4.36	1.65	2.49	1.83	0.392	0.083	0.044	0.018	0.034
In.	0.03	0.14	1.78	5.03	1.78	2.87	2.04	0.45	0.09	0.05	0.02	0.04

Calendar year 1951: Max 12,300 Min 14 Mean 1,176 Cfsm 0.942 In. 12.80
Water year 1951-52: Max 17,700 Min 14 Mean 1,314 Cfsm 1.05 In. 14.32

Peak discharge (base, 7,000 cfs).--Jan. 1 (10 a.m.) 12,600 cfs (6.79 ft); Jan. 18 (10:30 a.m.) 12,600 cfs (6.85 ft); Jan. 27 (1:30 p.m.) 19,100 cfs (8.83 ft); Feb. 4 (10 p.m.) 9,660 cfs (5.80 ft); Mar. 12 (3:30 a.m.) 18,400 cfs (8.65 ft); Apr. 15 (4 p.m.) 8,540 cfs (5.39 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 14 to Jan. 1.

Huron River at Milan, Ohio

Location.--Lat 41°18'00", long. 82°36'30", in SE¼ sec. 4, T. 5 N., R. 22 W., near center of span on upstream side of bridge on U. S. Highway 250 a quarter of a mile northwest of Milan, Erie County, and 2 miles downstream from confluence of East and West Branches.

Drainage area.--363 sq mi.

Records available.--March 1950 to September 1952.

Gage.--Wire-weight gage read twice daily

Extremes.--Maximum discharge during year, 13,200 cfs Mar. 11 (gage height, 19.8 ft, from graph based on gage readings); minimum observed, 3.1 cfs July 21 (gage height, 5.27 ft).

1950-52: Maximum discharge, that of Mar. 11, 1952; minimum observed, 2.6 cfs Sept. 4, 1951 (gage height, 5.25 ft)

Remarks.--Records fair. Records of chemical analyses for the water year 1952 are given in Water-Supply Paper 1250.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Dec. 30				Dec. 31 to Sept. 30			
5.3	3.8	6.5	164	5.3	3.8	7.0	245
5.4	7.9	7.0	282	5.4	7.6	8.0	540
5.5	14	8.0	545	5.6	19	10.0	1,490
5.7	32	10.0	1,490	5.8	35	14.0	4,140
6.0	68	14.0	4,230	6.0	57	16.0	6,130
				6.5	134	18.0	9,350

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*10	27	60	2,830	930	125	185	111	65	35	11	17
2	12	16	53	1,280	1,550	125	174	106	56	30	9.7	35
3	10	28	45	540	1,970	125	164	96	52	26	11	31
4	7.9	38	50	410	*2,690	134	153	87	52	30	8.7	26
5	10	20	282	380	1,180	295	232	80	50	32	9.7	18
6	9.1	20	234	335	930	185	505	71	47	27	8.7	14
7	14	105	545	295	980	144	1,180	67	47	23	7.6	12
8	16	153	1,080	220	1,330	153	1,130	62	43	24	8.7	9.7
9	13	*80	1,280	270	1,610	174	505	70	41	35	11	11
10	15	63	1,230	308	780	*196	470	109	41	27	11	9.7
11	16	44	430	164	610	8,710	410	125	*33	20	10	8.7
12	10	32	222	208	335	5,270	232	78	27	18	11	8.1
13	16	48	153	320	245	1,380	1,460	73	26	19	12	9.7
14	16	380	b90	350	208	1,610	3,600	69	23	15	7.6	9.7
15	15	222	b70	380	b150	880	3,250	76	18	12	7.6	*8.1
16	13	121	b65	440	b130	505	1,330	76	18	11	19	8.7
17	13	71	b60	6,640	b110	540	*610	67	24	17	16	7.6
18	13	58	b60	4,880	b100	1,490	410	62	24	20	14	18
19	12	47	b65	780	b110	2,570	295	60	20	20	13	33
20	11	26	*b80	690	b160	1,530	220	65	25	13	11	27
21	7.1	26	b150	690	295	650	196	66	19	6.1	15	23
22	11	41	300	880	245	780	174	65	24	55	19	18
23	20	59	700	1,030	174	2,390	196	80	25	24	15	17
24	28	119	750	505	164	980	440	790	29	35	12	14
25	45	109	530	540	144	470	540	880	24	24	11	11
26	33	111	1,380	2,460	b130	335	282	1,620	76	19	9.7	11
27	26	90	1,670	*8,540	b120	335	220	350	185	24	10	9.7
28	27	65	b1,100	2,100	116	365	174	164	116	25	7.6	8.7
29	22	55	b850	880	125	208	144	125	174	17	9.2	7.6
30	22	63	b4,000	b550	-	185	125	90	50	*14	11	9.7
31	23	-	b5,000	b460	-	174	-	76	-	15	12	-
Total	516.1	2,337	22,584	40,355	17,621	33,013	19,006	5,916	1,454	712.1	349.8	451.7
Mean	16.6	77.9	729	1,302	608	1,065	634	191	48.5	23.0	11.3	15.1
Cfsm	0.046	0.215	2.01	3.59	1.67	2.93	1.75	0.526	0.134	0.063	0.031	0.042
In.	0.05	0.24	2.32	4.14	1.80	3.38	1.95	0.61	0.15	0.07	0.04	0.05

Calendar year 1951: Max 6,310 Min 4.6 Mean 368 Cfsm 1.01 In. 13.78
Water year 1951-52: Max 8,710 Min 6.1 Mean 394 Cfsm 1.09 In. 14.80

Peak discharge (base, 3,000 cfs).--Dec. 31 (time and discharge unknown); Jan. 17 (8 p.m.) 11,800 cfs (19.2 ft); Jan. 27 (5 a.m.) 12,500 cfs (19.5 ft); Feb. 4 (11 a.m.) 4,460 cfs (14.4 ft); Mar. 11 (12 p.m.) 13,200 cfs (19.8 ft); Mar. 19 (10 p.m.) 3,180 cfs (12.7 ft); Mar. 23 (2 p.m.) 3,390 cfs (13.0 ft); Apr. 13 (11 p.m.) 5,420 cfs (15.4 ft).

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Vermilion River near Vermilion, Ohio

Location.--Lat 41°22'55", long. 82°19'00", T. 6 N., R. 19 W., near center of span on downstream side of bridge on North Ridge Road, 3½ miles southeast of Vermilion, Erie County, and 4½ miles upstream from mouth.

Drainage area.--260 sq mi.

Records available.--March 1950 to September 1952.

Gage.--Wire-weight gage read twice daily.

Extremes.--Maximum discharge during year, 9,820 cfs Jan. 26 (gage height, 11.5 ft, from graph based on gage readings); minimum observed, 0.1 cfs Aug. 18, 19, Sept. 13, 14, 16-18, 30; minimum gage height observed, 2.79 ft Aug. 19, Sept. 17.
1950-52: Maximum discharge, that of Jan. 26, 1952; minimum observed, 0.1 cfs Aug. 29, 30, 1951, Aug. 18, 19, Sept. 13, 14, 16-18, 30, 1952; minimum gage height, 2.79 ft Aug. 29, 1951, Aug. 19, Sept. 17, 1952.

Remarks.--Records poor. Records of chemical analyses for the water year 1952 are given in Water-Supply Paper 1250.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.8	0.1	4.5	216
2.9	.8	5.0	400
3.0	3.3	5.5	729
3.1	8.0	6.0	1,200
3.2	15	8.0	3,670
3.5	45	10.0	6,700
4.0	108		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*1.6	18	a65	4,650	332	73	a100	52	35	12	2.3	0.4
2	1.6	18	a55	2,870	1,420	68	a130	a45	16	9.4	1.8	9.4
3	1.6	20	a50	814	1,640	75	a140	a35	8.7	8.7	.8	5.6
4	.8	b16	a60	513	*2,350	93	a110	a35	2.3	23	.7	3.3
5	1.0	b17	a100	244	2,110	260	a120	39	3.8	26	1.8	2.3
6	1.3	21	294	260	772	276	a220	38	12	24	1.8	1.8
7	4.2	84	426	230	453	a130	a650	29	15	17	.4	1.6
8	a9	157	1,640	168	426	a90	a900	26	12	15	.4	1.3
9	7.1	*157	2,610	168	579	a80	a450	31	21	21	1.3	.8
10	3.3	168	2,870	204	579	*86	a250	46	15	10	1.3	.6
11	7.5	46	1,310	191	426	2,560	a180	38	*14	7.1	1.8	.3
12	11	39	a350	a160	244	4,790	a160	29	13	3.3	5.2	.3
13	11	42	a180	146	204	3,130	816	24	14	4.2	3.3	.2
14	11	61	b90	126	146	2,740	3,530	28	9.4	2.3	3.3	.1
15	12	43	b60	332	b95	1,100	3,390	39	13	3.3	2.0	*.4
16	11	194	b55	980	b80	546	2,350	30	8.0	3.0	2.3	.1
17	11	260	b50	2,260	b70	312	*1,060	28	10	3.3	1.6	.1
18	12	230	b50	*5,700	b60	204	312	30	12	3.3	.5	.4
19	12	244	b55	2,610	b65	1,420	216	32	14	6.1	.1	84
20	11	230	*b75	1,640	85	1,870	168	39	13	2.8	.2	73
21	11	216	b200	905	276	1,990	136	32	14	.8	.5	5.2
22	13	204	a290	426	276	400	53	30	9.4	2.8	3.3	2.0
23	13	312	a400	483	146	2,110	117	24	3.3	1.8	3.3	2.3
24	14	332	a480	513	105	1,150	230	81	2.8	1.3	3.0	1.0
25	14	353	353	244	a90	276	483	168	.8	.8	1.3	.6
26	13	204	294	2,960	a80	216	260	230	5.6	.8	.8	.4
27	14	244	b1,400	6,700	a75	191	188	615	24	3.3	.7	.6
28	16	a150	b750	4,790	a70	a140	121	168	32	3.3	.4	.3
29	16	a90	a550	1,150	68	a110	94	96	30	8.7	.4	.3
30	14	a75	1,530	513	-	a100	67	66	8.0	*5.2	.5	.2
31	16	-	4,090	312	-	a95	-	47	-	4.2	.5	-
Total	295.0	4,245	20,782	43,262	13,322	26,681	16,981	2,250	391.1	237.8	47.6	198.9
Mean	9.52	142	670	1,396	459	861	566	72.6	13.0	7.67	1.54	6.63
Cfsm	0.037	0.546	2.58	5.37	1.77	3.31	2.18	0.279	0.050	0.030	0.0059	0.026
In.	0.04	0.61	2.97	6.19	1.91	3.82	2.43	0.32	0.06	0.03	0.007	0.03

Calendar year 1951: Max 4,940 Min 0.1 Mean 319 Cfsm 1.23 In. 16.64
Water year 1951-52: Max 6,700 Min 0.1 Mean 352 Cfsm 1.35 In. 18.42

Peak discharge (base, 3,200 cfs).--Dec. 9 (8 p.m.) 5,090 cfs (9.0 ft); Jan. 1 (5 a.m.) 5,390 cfs (9.2 ft); Jan. 18 (5 a.m.) 7,440 cfs (10.4 ft); Jan. 26 (12 p.m.) 9,820 cfs (11.5 ft); Mar. 12 (5 a.m.) 7,640 cfs (10.5 ft); Apr. 14 (10 p.m.) 5,700 cfs (9.4 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of weather records and records for Black River at Elyria and Huron River at Milan.

b Stage-discharge relation affected by ice.

Black River at Elyria, Ohio

Location.--Lat 41°22'50", long. 82°06'15", in T. 6 N., R. 17 W., on left bank in Cascade Park at Elyria, Lorain County, three-quarters of a mile below confluence of East and West Branches.

Drainage area.--392 sq mi.

Records available.--May 1903 to July 1906 (published as "near Elyria"), October 1944 to September 1952.

Gage.--Water-stage recorder. May 20, 1903, to July 21, 1906, staff or chain gage at site 5½ miles downstream at different datum.

Average discharge.--8 years (1944-52), 349 cfs.

Extremes.--Maximum discharge during year, 12,300 cfs Jan. 27 (gage height, 16.39 ft); minimum, 0.9 cfs Sept. 28; minimum gage height, 0.64 ft Aug. 18.
1944-52: Maximum discharge, that of Jan. 27, 1952; minimum, 0.4 cfs Oct. 5, 1945.

Remarks.--Records good except those below 10 cfs or those for periods of ice effect, which are fair. Records of chemical analyses and water temperatures for the water year 1952 are given in Water-Supply Paper 1250.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.5	1.0	2.0	145
.6	2.5	3.0	367
.7	5.0	4.0	680
.8	9.0	6.0	1,640
1.0	21	9.0	3,770
1.3	44	12.0	6,570
1.6	79	15.0	10,200

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*8.2	20	97	b5,200	299	97	124	72	40	23	4.5	3.5
2	9.0	23	82	3,240	1,310	96	168	60	34	23	4.5	15
3	8.6	22	72	1,090	1,760	92	176	51	31	22	4.2	4.0
4	8.6	19	79	560	2,630	156	140	43	29	18	13	4.0
5	8.6	20	154	408	2,420	481	143	42	27	11	6.2	3.2
6	7.0	43	210	380	925	380	283	41	25	9.6	4.2	3.6
7	16	543	1,060	328	611	204	888	38	22	12	4.2	2.6
8	9.6	481	1,880	265	611	132	1,200	39	24	10	4.5	2.4
9	9.6	*254	2,480	245	1,220	113	611	40	23	11	3.8	3.0
10	9.0	115	3,050	314	902	*151	341	58	19	9.0	3.0	3.2
11	9.0	69	1,060	271	528	5,080	240	50	20	7.4	4.7	3.5
12	8.6	48	422	210	341	6,120	210	49	22	5.4	7.8	3.5
13	6.2	49	265	172	245	1,650	1,110	46	20	4.8	4.8	3.0
14	5.4	134	131	234	180	1,250	3,770	41	21	5.8	4.5	2.3
15	8.6	172	b95	512	124	902	2,630	41	15	7.8	12	*6.2
16	10	178	b80	1,020	b110	512	1,760	38	*15	7.4	4.8	4.8
17	11	154	b75	3,110	b90	328	*760	37	15	7.4	2.5	4.8
18	11	219	b70	8,310	85	276	380	41	13	7.0	2.5	13
19	13	190	b70	4,080	88	1,630	256	37	12	9.0	3.5	10
20	8.6	136	b75	1,880	148	2,210	186	39	11	4.2	3.5	2.8
21	7.0	105	*b180	1,120	367	815	143	39	9.0	7.2	5.3	1.9
22	14	194	b400	577	408	512	118	39	8.6	8.4	4.5	2.2
23	20	720	b700	925	256	1,730	124	40	10	4.8	5.0	8.0
24	20	680	b550	611	186	1,300	278	119	12	4.2	3.0	2.4
25	16	436	b420	328	162	496	496	853	12	4.0	3.2	2.2
26	15	436	b800	2,440	131	304	341	948	25	3.8	3.8	2.2
27	16	451	b1,300	*10,200	112	225	217	444	15	4.5	4.0	2.0
28	15	251	b500	6,760	100	178	151	202	10	4.0	4.0	1.3
29	14	154	b370	1,090	94	149	113	117	20	4.8	5.1	2.0
30	17	117	b1,700	380	-	127	90	71	20	4.2	3.2	3.2
31	16	-	b4,500	b320	-	120	-	51	-	*4.0	2.4	-
Total	355.6	6,433	22,927	56,580	16,443	27,816	17,447	3,826	579.6	268.7	146.2	125.8
Mean	11.5	214	740	1,825	567	897	582	123	19.3	8.67	4.72	4.19
Cfsm	0.029	0.546	1.89	4.66	1.45	2.29	1.48	0.314	0.049	0.022	0.012	0.011
In.	0.03	0.61	2.18	5.37	1.56	2.64	1.65	0.36	0.05	0.03	0.01	0.01

Calendar year 1951: Max 5,840 Min 3.8 Mean 410 Cfsm 1.05 In. 14.19
Water year 1951-52: Max 10,200 Min 1.3 Mean 418 Cfsm 1.07 In. 14.50

Peak discharge (base, 3,200 cfs).--Dec. 10 (5 a.m.) 3,690 cfs (8.86 ft); Jan. 1 (time unknown) about 5,700 cfs; Jan. 18 (12 m.) 8,820 cfs (13.92 ft); Jan. 27 (9 p.m.) 12,300 cfs (16.39 ft); Feb. 4 (11 p.m.) 3,210 cfs (8.32 ft); Mar. 12 (6 a.m.) 7,350 cfs (12.66 ft); Apr. 14 (11 a.m.) 4,010 cfs (9.29 ft).

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

Rocky River near Berea, Ohio

Location.--Lat 41°24'22", long. 81°53'13", in T. 6 N., R. 15 W., on right bank at downstream side of highway bridge just below confluence of East and West Branches and 3 miles northwest of Berea, Cuyahoga County.

Drainage area.--269 sq mi.

Records available.--November 1923 to September 1935, September 1943 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 649.9 ft above mean sea level, datum of 1929 (Cuyahoga County benchmark). Prior to Aug. 31, 1929, chain gage and Aug. 31, 1929, to Sept. 30, 1935, staff gage, at same site and datum.

Average discharge.--21 years, 259 cfs.

Extremes.--Maximum discharge during year, 11,700 cfs Jan. 27 (gage height, 9.05 ft); minimum, 1.7 cfs Sept. 18; minimum gage height, 0.95 ft July 23.
1923-35, 1943-52: Maximum discharge observed, 17,000 cfs Aug. 7, 1935 (gage height, 10.50 ft), from rating curve extended above 8,000 cfs; maximum gage height observed, 18.6 ft June 29, 1924 (backwater caused by tornado); minimum discharge, 0.2 cfs Sept. 2, 1932, Aug. 18, 19, 22, 27, 28, 30, 31, 1933.
Maximum stage known, 20.9 ft in March 1913.

Remarks.--Records good except those for periods of ice effect, which are fair. Some regulation by small reservoirs on East Branch at low flow.

Revisions (water years).--W 1054: 1935(M).

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Dec. 31				Jan. 1 to Sept. 30			
1.1	5.0	2.0	199	0.9	0.9	2.0	206
1.2	10	2.5	466	1.0	3.6	2.5	440
1.3	19	3.0	865	1.1	9.0	3.0	750
1.5	47	4.0	1,990	1.2	17	4.0	1,750
1.7	91	5.0	3,530	1.4	42	6.0	5,240
				1.6	80	8.0	9,450
				1.8	134		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.9	24	97	3,270	283	98	122	72	49	6.0	2.9	5.0
2	6.0	28	88	1,180	1,870	95	137	63	36	9.0	2.9	19
3	*5.7	32	76	518	1,010	90	120	54	29	14	2.9	8.4
4	6.0	32	74	331	2,990	181	105	*52	35	10	3.8	5.5
5	5.5	29	144	288	*1,500	450	151	52	29	9.7	7.8	5.0
6	5.5	30	174	262	598	266	280	56	27	13	4.6	9.0
7	11	303	960	210	490	176	516	56	24	10	4.1	13
8	8.0	330	1,010	168	475	141	1,120	49	22	9.0	4.1	6.6
9	11	119	2,800	168	928	141	788	50	24	7.8	4.6	6.0
10	8.6	66	1,600	223	568	*192	361	95	21	6.6	6.0	5.0
11	7.4	47	481	165	425	5,370	298	98	20	5.5	5.0	5.0
12	8.6	45	284	144	317	2,200	244	74	16	5.0	11	4.6
13	8.6	*44	195	131	240	729	1,580	63	15	5.0	6.6	5.0
14	8.6	87	151	230	198	838	2,610	50	17	4.6	5.5	5.0
15	8.6	147	90	589	128	480	1,390	45	15	4.6	8.7	*7.2
16	8.0	97	80	502	110	331	1,060	59	*15	4.1	10	3.6
17	8.6	195	75	3,220	95	257	425	54	14	4.1	7.2	2.9
18	7.4	204	70	6,320	90	266	270	52	11	4.1	6.6	2.6
19	8.6	170	70	1,010	95	1,670	195	49	9.0	7.2	6.0	9.8
20	6.9	151	75	1,360	150	1,060	154	38	9.7	4.6	5.5	4.6
21	9.1	144	200	614	410	450	128	54	9.7	4.1	6.0	3.6
22	9.6	459	380	403	270	361	111	54	11	3.3	7.8	5.5
23	16	2,120	450	886	179	1,310	148	50	10	3.3	6.0	7.2
24	20	1,020	350	381	158	643	395	243	7.8	3.6	5.0	5.5
25	16	365	250	266	134	327	327	1,030	6.6	2.9	5.0	5.0
26	13	519	950	3,440	108	231	240	1,140	7.0	2.9	5.0	4.1
27	17	420	700	*9,220	100	179	165	335	8.2	5.5	4.6	4.1
28	23	208	*400	1,380	92	151	122	154	5.0	4.1	4.6	3.3
29	20	133	300	496	92	134	100	98	4.6	6.6	5.0	3.3
30	23	110	1,000	298	-	122	82	74	7.8	3.3	5.0	3.3
31	22	-	2,800	262	-	111	-	57	-	*2.9	5.0	-
Total	344.2	7,678	16,374	37,935	14,103	19,050	13,744	4,470	515.4	186.4	174.8	177.7
Mean	11.1	256	528	1,224	486	615	458	144	17.2	6.01	5.64	5.92
Cfsm	0.041	0.952	1.96	4.55	1.81	2.29	1.70	0.535	0.064	0.022	0.021	0.022
In.	0.05	1.06	2.26	5.25	1.95	2.64	1.90	0.62	0.07	0.03	0.02	0.02

Calendar year 1951: Max 5,810 Min 1.8 Mean 328 Cfsm 1.22 In. 16.56
Water year 1951-52: Max 9,220 Min 2.6 Mean 314 Cfsm 1.17 In. 15.87

Peak discharge (base, 4,000 cfs).--Dec. 9 (3 p.m.) 4,070 cfs (5.30 ft); Jan. 1 (7 a.m.) 4,280 cfs (5.50 ft); Jan. 18 (3 a.m.) 8,570 cfs (7.64 ft); Jan. 27 (10 a.m.) 11,700 cfs (9.05 ft); Mar. 11 (4:30 p.m.) 6,870 cfs (6.78 ft); Apr. 14 (3:30 a.m.) 4,080 cfs (5.40 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 15-31, Feb. 16-18 (no gage-height record Dec. 17-21).

Cuyahoga River at Hiram Rapids, Ohio

Location.--Lat 41°20'27", long. 81°10'01", in T. 5 N., R. 7 W., on left bank at downstream side of highway bridge at Hiram Rapids, Portage County, 0.6 mile downstream from Black Brook.

Drainage area.--147 sq mi.

Records available.--August 1927 to December 1935, October 1944 to September 1952. Published as "near Hiram", 1927-35.

Gage.--Water-stage recorder. Prior to Aug. 26, 1927, staff gage and Aug. 26, 1927, to Dec. 31, 1935, water-stage recorder, at site 2¾ miles downstream at different datum. Oct. 20, 1944, to Oct. 22, 1946, wire-weight gage at present site and datum.

Average discharge.--16 years (1927-35, 1944-52), 191 cfs (unadjusted).

Extremes.--Maximum discharge during year, 2,380 cfs Jan. 27 (gage height, 6.45 ft); minimum, 21 cfs Aug. 3, 4; minimum gage height, 1.06 ft Aug. 4.
1927-35, 1944-52: Maximum discharge, 2,760 cfs Mar. 23, 1948 (gage height, 7.00 ft); minimum, 5.1 cfs Sept. 2, 1933.

Remarks.--Records good except those for periods of ice effect, which are fair. Flow regulated by East Branch Reservoir (usable capacity, 4,140 acre-ft).

Revisions (water years).--W 1054: 1945.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Aug. 4 to Sept. 30)

1.0	19	2.5	253
1.2	28	3.0	440
1.5	52	5.0	1,500
2.0	123	7.0	2,800

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	54	35	287	1,410	601	133	157	125	198	58	23	39
2	*54	35	240	1,980	586	125	150	109	140	41	22	40
3	54	37	204	1,860	586	121	143	92	120	34	22	43
4	54	40	184	1,440	898	137	139	*81	103	31	21	45
5	53	40	184	980	1,090	179	145	73	87	29	23	44
6	52	40	184	695	*1,090	195	161	70	73	26	24	40
7	52	84	215	513	870	209	195	67	62	25	24	40
8	59	118	253	396	695	206	243	64	52	24	26	38
9	68	141	392	316	572	189	298	67	52	26	29	37
10	70	159	500	263	491	184	331	77	48	28	33	36
11	70	164	567	224	461	506	373	85	45	29	*36	36
12	68	161	540	187	420	820	353	85	42	26	42	35
13	64	150	448	164	396	1,060	365	85	40	24	45	34
14	58	*135	392	179	346	925	482	88	40	23	45	34
15	53	121	260	260	294	720	745	100	42	22	43	38
16	46	118	b180	353	240	554	952	103	43	22	48	43
17	39	120	b140	601	204	424	925	104	40	22	65	45
18	34	123	b120	1,350	171	350	745	102	36	22	80	44
19	32	123	b120	*1,740	154	432	554	91	34	24	92	50
20	30	125	b130	1,620	148	554	408	88	32	31	100	59
21	29	135	148	1,320	164	*695	305	91	32	37	96	59
22	29	133	b220	1,040	174	670	231	96	31	38	84	53
23	29	397	243	795	184	620	201	97	*36	34	68	*48
24	30	620	263	630	189	563	206	103	44	30	56	45
25	33	695	312	540	182	540	227	174	46	27	48	42
26	36	745	436	784	166	478	243	380	44	26	44	40
27	36	650	*486	1,980	154	388	231	526	39	26	41	40
28	38	531	513	2,240	145	309	204	535	34	26	39	39
29	40	428	508	1,800	137	243	171	453	32	25	38	39
30	40	353	635	1,290	-	201	148	350	36	24	38	39
31	37	-	845	870	-	171	-	260	-	24	38	-
Total	1,441	6,756	10,149	29,820	11,808	12,901	10,031	4,821	1,703	884	1,433	1,264
Mean	46.5	225	327	962	407	416	334	156	56.8	28.5	46.2	42.1
(†)	-6.1	+37.2	+25.5	-3.3	-0.3	0	0	0	-0.4	-0.1	-14.1	-19.6

Adjusted for change in reservoir contents

Mean	40.4	262	352	959	407	416	334	156	56.4	28.4	32.1	22.5
Cfsm	0.275	1.78	2.39	6.52	2.77	2.83	2.27	1.06	0.384	0.193	0.218	0.153
In.	0.32	1.99	2.76	7.52	2.99	3.26	2.53	1.22	0.43	0.22	0.25	0.17

	Observed			Adjusted			
Calendar year 1951:	Max 1,860	Min 26	Mean 248	Mean 248	Cfsm 1.69	In. 22.89	
Water year 1951-52:	Max 2,240	Min 21	Mean 254	Mean 256	Cfsm 1.74	In. 23.66	

* Discharge measurement made on this day.
† Change in contents in East Branch Reservoir, equivalent in cubic feet per second.
b Stage-discharge relation affected by ice.

Little Cuyahoga River at Mogadore, Ohio

Location.--Lat 41°03'45", long. 81°23'40", in T. 1 N., R. 10 W., on left bank at upstream side of bridge on State Highway 532, 0.8 mile north of Mogadore, Summit County, and three-quarters of a mile upstream from Fritch Lake Outlet.

Drainage area.--12.3 sq mi.

Records available.--February 1946 to September 1952.

Gage.--Water-stage recorder and concrete control.

Average discharge.--6 years, 14.9 cfs.

Extremes.--Maximum discharge during year, 136 cfs Jan. 26 (gage height, 2.98 ft); minimum, 0.8 cfs Oct. 20; minimum gage height, 0.33 ft Oct. 9, 20.
1946-52: Maximum discharge, 143 cfs June 7, 1947 (gage height, 3.15 ft); minimum, 0.5 cfs Apr. 15, 1949, Oct. 7, 8, 1950 (gage height, 0.26 ft).

Remarks.--Records good except those for periods of ice effect, which are fair. Flow regulated by Mogadore Reservoir.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.3	0.7	1.0	15
.4	1.4	1.2	25
.5	2.5	1.3	34
.6	4.1	1.6	78
.8	8.8	2.0	97

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.5	1.9	6.4	40	74	8.0	28	18	11	4.5	8.3	1.5
2	2.4	2.8	6.4	50	77	6.7	26	17	11	*4.5	5.1	2.2
3	*2.0	5.1	10	64	74	6.4	24	16	11	5.1	4.9	5.3
4	1.9	3.6	14	66	82	6.7	23	16	13	5.1	8.0	5.5
5	1.9	3.0	11	62	75	8.3	21	15	14	5.1	11	5.5
6	1.6	2.6	12	57	*73	10	20	14	13	4.4	5.8	5.8
7	1.2	4.8	21	43	71	8.5	21	*14	13	5.1	3.6	5.5
8	.9	2.0	21	30	67	7.7	21	13	18	5.1	3.2	5.1
9	.9	2.6	26	28	64	5.3	19	13	18	4.9	3.9	5.1
10	1.0	7.7	27	27	60	6.2	18	13	15	3.2	3.4	5.1
11	1.0	6.7	29	27	45	21	17	13	8.8	2.8	3.0	7.8
12	1.0	3.9	27	26	31	22	17	12	7.2	2.3	2.6	14
13	1.1	5.2	b25	24	31	30	19	12	7.0	2.0	*5.6	17
14	1.3	5.8	b25	24	29	29	21	12	8.8	4.9	14	18
15	2.1	*18	b20	28	27	27	25	12	6.7	13	7.7	14
16	2.0	50	b20	27	23	27	30	11	6.7	9.6	4.9	11
17	1.5	46	b19	44	26	27	41	9.6	9.4	6.4	3.4	10
18	1.2	41	b19	52	24	27	38	7.0	8.5	5.5	2.6	9.9
19	.9	40	b20	45	24	31	36	4.3	8.0	6.2	2.1	10
20	.9	38	24	45	27	*30	33	4.1	7.2	18	3.6	5.3
21	.9	23	26	45	27	26	31	4.3	7.0	8.8	7.4	4.5
22	1.1	4.5	26	43	25	24	30	4.1	5.8	8.0	5.8	6.6
23	1.5	6.4	26	40	25	24	30	6.6	5.1	7.0	3.2	13
24	1.9	5.5	24	40	24	32	30	9.4	6.7	12	2.3	14
25	1.7	6.4	26	38	24	40	28	10	6.4	16	1.8	*14
26	3.1	7.2	29	72	18	37	24	9.6	6.0	14	2.1	14
27	3.4	6.2	*b25	90	9.4	34	19	8.3	4.9	14	4.7	14
28	2.6	6.2	b25	75	7.2	32	18	8.0	4.5	12	4.5	13
29	1.7	6.0	27	83	7.7	31	20	8.3	5.8	12	3.0	13
30	1.7	6.2	30	80	-	29	19	13	5.8	9.4	1.9	13
31	1.9	-	36	76	-	27	-	12	-	9.4	1.7	-
Total	50.8	368.3	682.8	1,491	1,171.3	680.8	747	339.6	273.3	240.3	145.1	282.7
Mean	1.64	12.3	22.0	48.1	40.4	22.0	24.9	11.0	9.11	7.75	4.68	9.42
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 64 Min 0.9 Mean 16.3 Cfsm - In. -
Water year 1951-52: Max 90 Min 0.9 Mean 17.7 Cfsm - In. -

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

Little Cuyahoga River at Massillon Road, Akron, Ohio

Location.--Lat 41°03'35", long. 81°27'45", in T. 1 N., R. 10 W., on left bank 50 ft downstream from bridge on Massillon Road in Akron, Summit County, and 250 ft upstream from Springfield Lake Outlet.

Drainage area.--31.0 sq mi.

Records available.--February 1946 to September 1952.

Gage.--Water-stage recorder and concrete control.

Average discharge.--6 years, 33.4 cfs.

Extremes.--Maximum discharge during year, 632 cfs Jan. 26 (gage height, 3.18 ft); minimum, 4.4 cfs Oct. 21 (gage height, 0.35 ft).
1946-52: Maximum discharge, that of Jan. 26, 1952; minimum, 3.8 cfs Sept. 18, 1946 (gage height, 0.30 ft).

Remarks.--Records good except those for period of ice effect, which are fair. Flow regulated by Fritch Lake and Mogadore Reservoir.

Rating table, water year 1951-52, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.3	3.8	1.1	50
.4	6.3	1.4	102
.6	14	1.7	188
.9	31	2.1	312

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.9	6.0	15	98	107	35	57	42	21	13	15	6.9
2	8.2	6.9	14	76	151	34	57	41	20	*10	12	8.6
3	*7.9	9.7	15	79	134	35	53	39	20	20	10	10
4	7.5	7.9	24	77	198	51	51	40	19	16	14	11
5	9.0	6.6	23	76	*131	45	55	41	23	11	16	11
6	8.2	8.9	23	70	112	41	55	36	21	10	14	11
7	13	46	46	61	107	37	58	*36	19	9.7	9.7	11
8	8.5	16	44	46	102	35	60	38	24	14	8.5	9.7
9	6.9	9.3	89	47	105	33	53	38	26	24	30	9.3
10	6.6	14	55	46	94	36	48	39	24	13	26	9.3
11	6.9	14	46	42	77	176	47	38	17	9.7	13	9.7
12	6.6	10	43	40	58	72	47	36	15	8.5	12	17
13	6.6	8.9	38	39	55	76	77	35	14	7.9	*10	19
14	6.6	16	35	44	51	72	85	34	24	7.5	20	22
15	7.2	*15	b30	80	48	62	120	35	16	18	16	24
16	7.9	60	b30	54	46	60	85	25	13	16	13	16
17	6.0	58	b30	148	46	60	77	24	16	13	9.7	14
18	5.2	50	b30	144	45	60	70	22	15	14	8.2	19
19	4.9	47	b30	91	44	107	67	19	15	28	7.2	29
20	4.9	47	35	107	58	*82	62	28	14	50	6.9	11
21	4.7	39	70	72	57	67	60	36	13	53	15	8.9
22	4.7	22	58	76	50	64	58	21	15	20	13	8.2
23	4.9	51	53	76	49	77	69	19	12	16	9.3	15
24	8.1	29	42	61	49	65	76	34	14	14	7.5	16
25	6.0	21	52	58	47	70	69	51	13	23	6.6	*17
26	6.3	28	79	226	42	67	58	42	11	21	6.3	17
27	9.2	19	*55	309	30	64	50	26	11	26	8.2	16
28	9.7	16	45	123	28	61	45	21	10	20	8.2	16
29	6.6	16	44	131	35	60	46	20	28	17	8.9	16
30	6.0	15	96	118	-	57	46	23	23	16	6.9	16
31	5.7	-	110	107	-	54	-	22	-	15	6.6	-
Total	218.4	713.2	1,399	2,822	2,158	1,915	1,861	1,001	526	554.3	367.7	424.6
Mean	7.05	23.8	45.1	91.0	74.3	61.8	62.0	32.3	17.5	17.9	11.9	14.2
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 183 Min 4.7 Mean 36.6 Cfsm - In. -
Water year 1951-52: Max 309 Min 4.7 Mean 38.1 Cfsm - In. -

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

Springfield Lake Outlet at Akron, Ohio

Location.--Lat 41°03'20", long. 81°27'50", in T. 1 N., R. 10 W., on right bank in Akron, Summit County, 0.3 mile upstream from mouth, and 3 miles downstream from Springfield Lake.

Drainage area.--8.40 sq mi.

Records available.--May 1946 to September 1952.

Gage.--Water-stage recorder and concrete control.

Average discharge.--6 years, 8.03 cfs.

Extremes.--Maximum discharge during year, 172 cfs Jan. 27 (gage height, 2.53 ft); minimum, 0.2 cfs Sept. 12, 29, 30; minimum gage height, 0.25 ft Sept. 29, 30.
1946-52: Maximum discharge, that of Jan. 27, 1952; maximum gage height, 2.72 ft Feb. 14, 1948 (backwater from ice); minimum discharge, that of Sept. 12, 29, 30, 1952; minimum gage height, that of Sept. 29, 30, 1952.

Remarks.--Records fair except those for period of ice effect, which are poor. Flow regulated by Springfield Lake.

Rating table, water year 1951-52, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.3	0.2	1.3	6.6
.4	.3	1.4	10
.5	.5	1.7	26
.7	1.0	1.9	44
.9	2.0	2.1	76
1.1	3.5	2.3	117
1.2	4.6		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.6	0.6	2.2	28	24	11	14	7.9	4.3	3.3	2.2	0.5
2	.7	.7	2.0	19	38	10	14	6.9	3.8	*2.6	1.5	1.0
3	*.6	.9	1.9	15	34	11	12	5.7	3.6	6.4	.7	.7
4	.6	.6	2.7	13	58	17	11	5.9	3.4	3.2	.9	.4
5	.6	.5	3.4	12	*35	16	15	5.9	3.2	2.3	.7	.4
6	.6	1.1	3.7	11	29	13	15	5.1	3.4	2.0	.7	.5
7	1.6	7.5	7.8	9.7	28	11	16	*4.6	3.1	1.9	.7	.4
8	.8	2.7	6.6	9.0	26	11	16	4.8	2.4	2.5	.6	.3
9	.7	1.4	22	9.3	26	10	13	4.6	2.4	5.8	7.6	.4
10	.6	1.1	12	9.3	23	13	11	4.9	2.2	2.4	2.9	.4
11	.6	1.0	6.4	9.4	21	67	9.3	4.9	2.0	2.0	1.3	.3
12	.6	.9	4.6	7.6	20	31	9.7	4.5	2.0	1.7	1.4	.3
13	.6	.9	3.8	7.2	18	26	20	4.0	1.9	1.5	*1.0	.3
14	.6	1.6	2.8	8.6	17	24	28	3.7	5.4	1.6	.9	.4
15	.6	*1.1	2.2	16	16	20	37	4.6	3.0	1.7	.9	1.0
16	.6	4.2	1.8	11	15	19	30	3.9	2.4	1.5	1.1	.4
17	.6	3.3	1.6	45	14	19	23	3.9	2.1	1.5	.8	.4
18	.5	2.0	1.6	52	14	19	19	3.9	1.9	1.7	.7	.9
19	.5	1.8	1.5	28	13	36	18	4.5	1.9	5.8	.8	1.7
20	.5	1.6	1.7	28	19	*27	16	7.4	1.7	3.7	.8	.5
21	.5	1.6	4	20	19	21	14	10	1.9	3.0	1.5	.3
22	.5	3.0	6	20	16	20	11	6.9	2.1	2.0	1.0	.3
23	.5	12	5	22	14	26	13	6.6	2.0	1.5	.6	.3
24	.9	8.0	3	15	13	20	19	10	3.7	1.3	.6	.3
25	.6	4.9	5	16	12	16	19	20	2.2	1.2	.7	*.3
26	.6	6.1	8	61	11	14	15	18	2.7	1.2	.5	.3
27	.7	4.4	*4	104	10	14	12	10	2.0	2.2	.5	.3
28	.9	3.4	3	40	10	15	11	6.1	1.9	1.6	.5	.3
29	.6	2.8	3	26	10	14	11	5.4	9.3	1.2	.4	.2
30	.6	2.4	25	24	-	12	9.0	4.8	7.2	3.2	.4	.2
31	.6	-	45	22	-	14	-	4.6	-	3.2	.5	-
Total	20.1	84.1	203.3	718.1	603	597	481.0	204.0	91.1	76.7	35.4	14.0
Mean	0.65	2.80	6.56	23.2	20.8	19.3	16.0	6.58	3.04	2.47	1.14	0.47
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 60 Min 0.5 Mean 8.98 Cfsm - In. -
Water year 1951-52: Max 104 Min 0.2 Mean 8.55 Cfsm - In. -

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 14-31.

Cuyahoga River at Old Portage, Ohio

Location.--Lat 41°08'04", long. 81°32'49", on right bank 230 ft upstream from highway bridge at Old Portage, Summit County, 1¼ miles downstream from Little Cuyahoga River, and 4 miles northwest of Akron.

Drainage area.--405 sq mi.

Records available.--September 1921 to December 1935, March 1939 to September 1952.

Gage.--Water-stage recorder. Prior to Dec. 21, 1923, chain gage at same site and datum.

Average discharge.--27 years, 422 cfs.

Extremes.--Maximum discharge during year, 4,540 cfs Jan. 26 (gage height, 10.42 ft); minimum, 31 cfs Sept. 22 (gage height, 0.38 ft).
1921-35, 1939-52: Maximum discharge, that of Jan. 26, 1952; maximum gage height, 10.8 ft June 28, 1924; minimum discharge, 14 cfs Aug. 27, 1944 (gage height, 0.47 ft).

Remarks.--Records good except those for periods of ice effect, which are fair. Diurnal fluctuation caused by powerplants above station. Flow regulated by reservoirs and lakes above station. At Lake Rockwell, about 16 miles above gage, an average of 60 cfs was diverted for municipal supply of city of Akron. Sewage from city enters river below station.

Rating tables, water year 1951-52, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-27)

Oct. 1 to Jan. 25				Jan. 26 to Sept. 30			
0.7	69	5.0	1,280	0.6	59	5.0	1,340
1.0	117	7.0	2,150	1.0	134	8.0	2,710
2.0	350	8.5	3,000	2.0	382	10.1	4,270

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	76	105	530	2,050	1,570	396	508	380	396	142	86	113
2	*84	110	460	2,370	1,650	368	508	328	333	117	69	170
3	82	119	390	2,590	1,610	368	451	261	285	*396	77	120
4	78	105	377	2,370	2,030	437	423	256	240	142	138	114
5	87	103	390	1,950	2,170	565	465	301	224	129	97	97
6	84	133	418	1,460	*1,940	551	493	392	200	88	84	116
7	155	432	545	1,070	1,850	522	536	173	173	77	73	97
8	132	254	647	845	1,570	493	580	*180	137	110	73	89
9	117	266	1,000	707	1,380	465	610	176	180	241	152	91
10	123	300	1,110	618	1,200	508	610	180	137	129	141	101
11	126	310	940	516	1,030	1,610	610	182	114	100	120	93
12	123	292	908	474	893	1,650	610	155	97	94	108	91
13	117	266	814	432	827	1,530	827	157	99	81	97	101
14	105	*297	647	446	732	1,730	1,100	156	163	78	*87	99
15	103	248	502	432	625	1,490	1,450	186	135	124	104	175
16	107	345	377	768	610	1,200	1,650	206	118	126	110	133
17	95	377	b300	1,420	565	995	1,570	235	109	101	91	85
18	92	364	b280	2,480	508	859	1,450	232	90	119	71	125
19	92	364	b270	2,640	465	1,170	1,170	244	86	271	70	208
20	90	350	b300	3,000	536	*1,280	927	273	85	331	80	109
21	86	302	588	2,700	595	1,100	732	360	84	440	143	74
22	87	318	692	2,100	551	1,100	625	318	185	330	119	83
23	90	876	647	1,760	522	1,240	595	294	111	278	100	81
24	110	1,210	588	1,320	508	1,140	625	338	97	206	96	76
25	102	1,040	692	1,000	493	995	595	512	86	146	70	*76
26	97	1,040	*972	2,140	465	893	580	670	107	116	79	170
27	103	1,040	940	4,270	423	811	565	640	133	163	94	166
28	115	908	876	*3,920	409	748	522	670	91	162	102	84
29	103	768	814	3,600	382	655	478	670	315	115	88	73
30	100	632	1,210	2,710	-	590	430	580	266	99	82	84
31	98	-	1,670	1,850	-	536	-	508	-	93	87	-
Total	3,159	13,274	20,894	56,008	28,109	27,985	22,295	10,213	4,856	5,144	2,988	3,294
Mean	102	442	674	1,807	969	903	743	329	162	166	96.4	110
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 2,370 Min 62 Mean 499 Cfsm - In. -
Water year 1951-52: Max 4,270 Min 69 Mean 542 Cfsm - In. -

Peak discharge (base, 2,000 cfs).--Jan. 3 (4 p.m.) 2,640 cfs (7.91 ft); Jan. 20 (7:30 p.m.) 3,060 cfs (8.64 ft); Jan. 26 (11 p.m.) 4,540 cfs (10.42 ft); Feb. 5 (7 a.m.) 2,220 cfs (7.10 ft).
* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

Ohio Canal at Independence, Ohio

Location.--Lat 41°23'25", long. 81°37'35", in T. 6 N., R. 12 W., on right bank at upstream side of dam, 0.4 mile upstream from Rockside Road and 1 mile northeast of Independence, Cuyahoga County.

Records available.--September 1921 to May 1923, August 1927 to December 1935, October 1950 to September 1952.

Gage.--Water-stage recorder above dam. Prior to Nov. 4, 1950, staff, chain, or water-stage recorder at site 0.4 mile downstream at various datums.

Extremes.--1921-22, 1927-35, 1950-52: Maximum daily discharge, 92 cfs June 13, 15-17, 1922; minimum daily, 3.4 cfs Jan. 28, 1952.

Remarks.--Records fair except those below 40 cfs, which are poor. Water is diverted from Cuyahoga River into canal at headgates at Brecksville 6 miles upstream. Some diurnal fluctuation caused by small mill above station.

Rating table, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)

0.7	1.8	1.3	24
.8	4.0	1.7	54
1.0	10	2.1	98

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	72	75	52	57	59	71	70	66	60	63	66	61
2	*74	76	53	54	52	70	70	65	61	62	68	63
3	73	77	52	52	50	71	69	64	62	*65	69	62
4	73	76	54	50	53	74	69	63	60	68	70	62
5	72	76	54	49	66	72	72	64	60	63	71	62
6	72	76	54	48	62	71	69	66	60	63	71	62
7	75	64	60	48	*62	72	74	65	60	62	70	61
8	78	59	60	47	62	72	75	*63	61	62	71	61
9	78	78	60	48	64	74	73	62	61	65	70	61
10	78	66	58	51	60	77	71	63	63	64	71	65
11	80	64	64	51	58	72	72	63	60	63	70	72
12	80	65	57	51	58	66	72	62	59	64	71	72
13	80	70	55	50	57	65	70	62	58	64	70	73
14	80	*70	52	53	57	71	76	62	61	65	*68	74
15	78	68	52	52	55	70	75	64	60	66	69	75
16	80	65	47	52	54	68	80	63	60	69	71	74
17	78	63	44	54	53	68	74	63	61	69	72	74
18	76	72	46	48	53	68	73	64	61	69	68	74
19	75	69	45	47	52	74	72	64	62	71	68	77
20	76	65	48	47	57	66	73	65	62	68	69	78
21	76	64	61	41	57	*68	72	68	62	70	69	74
22	77	70	65	49	55	65	71	68	64	70	70	73
23	78	45	58	42	57	69	73	68	63	68	66	73
24	80	59	57	36	61	62	74	73	63	69	65	73
25	81	43	59	38	61	60	73	69	63	70	65	74
26	83	50	59	52	61	57	70	70	62	70	65	*76
27	80	57	50	88	62	58	71	63	63	69	66	76
28	78	54	*47	5.4	65	65	71	63	63	69	65	30
29	76	55	46	9.4	71	65	70	63	65	66	64	74
30	76	53	53	64	-	64	70	62	66	68	64	74
31	75	-	50	59	-	64	-	61	-	68	63	-
Total	2,388	1,944	1,672	1,490.8	1,694	2,109	2,164	2,001	1,846	2,062	2,115	2,058
Mean	77.0	64.8	53.9	48.1	58.4	68.0	72.1	64.5	61.5	68.5	68.2	68.6
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 83 Min 8.4 Mean 59.4 Cfsm - In. -
Water year 1951-52: Max 88 Min 3.4 Mean 64.3 Cfsm - In. -

* Discharge measurement made on this day.

Cuyahoga River at Independence, Ohio

Location.--Lat 41°23'44", long. 81°37'54", in T. 6 N., R. 12 W., on right bank 140 ft downstream from highway bridge on Rockside Road, 1 mile northeast of Independence, Cuyahoga County, and 3 miles downstream from Tinkers Creek.

Drainage area.--709 sq mi.

Records available.--September 1903 to July 1906, September 1921 to May 1923, September 1927 to December 1935, March 1940 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 584.14 ft above mean sea level (levels by city of Cleveland). Sept. 21, 1903, to July 21, 1906, chain gage at bridge 140 ft upstream at same datum. Sept. 28, 1921, to May 30, 1923, chain gage at bridge 140 ft upstream at datum 2.42 ft higher. Sept. 5, 1927, to Oct. 8, 1927, staff gage at present site and datum.

Average discharge.--21 years (1921-22, 1927-35, 1940-52), 733 cfs (not including flow in Ohio Canal).

Extremes.--Maximum discharge during year, 11,200 cfs Jan. 27 (gage height, 18.47 ft); minimum, 77 cfs Sept. 30 (gage height, 2.26 ft).
1921-23, 1927-35, 1940-52: Maximum discharge, that of Jan. 27, 1952; minimum, 14 cfs Nov. 30, 1930; minimum combined discharge of river and canal, 48 cfs Aug. 29, 1933.

Remarks.--Records good except those for periods of ice effect, which are fair. Diurnal fluctuation caused by powerplants above station. Flow slightly regulated by reservoirs and lakes above station. A small amount of water from Tuscarawas River is diverted into this basin at Portage Lakes. Water diverted into Ohio Canal at Brecksville, 6 miles above station, bypasses station. These records do not include flow in canal; record of diversion published as Ohio Canal at Independence (see p. 250). Records of suspended sediment loads for the water year 1952 are given in Water-Supply Paper 1250.

Revisions (water years).--W 894: 1929(M).

Rating table, water year 1951-52, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.3	82	10.0	3,530
2.5	115	14.0	6,470
3.0	247	18.0	10,600
6.0	1,420		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	111	119	960	6,830	2,460	660	780	602	602	334	150	111
2	*128	128	820	4,760	3,890	660	780	544	481	189	137	144
3	128	167	700	3,950	3,120	602	740	477	408	*312	122	209
4	124	144	720	3,470	5,620	920	660	386	348	665	115	157
5	119	111	840	2,950	4,480	1,240	880	401	310	220	207	140
6	135	126	800	2,400	3,410	1,080	980	525	275	176	150	135
7	150	1,380	1,340	1,850	*3,000	960	1,160	408	253	133	135	150
8	209	780	1,520	1,470	2,620	880	1,700	*304	211	143	126	99
9	160	433	4,100	1,240	2,680	840	1,560	310	241	303	128	108
10	137	437	2,680	1,120	2,250	880	1,240	411	223	247	274	102
11	150	447	2,050	940	2,000	*6,540	1,160	372	195	176	178	99
12	147	383	1,600	860	1,600	*4,270	1,000	310	167	157	206	99
13	137	*386	1,380	800	1,420	3,170	2,310	294	154	143	184	94
14	126	582	1,080	940	1,240	3,000	3,230	294	209	115	*147	96
15	108	422	880	1,520	1,080	2,510	3,710	372	232	133	150	122
16	122	544	680	1,560	980	2,050	3,350	337	170	173	178	160
17	126	720	563	4,470	940	1,700	2,680	351	176	161	165	116
18	113	700	b550	8,100	*860	1,560	2,200	358	154	147	115	104
19	111	641	b500	5,060	800	3,410	1,850	337	130	336	111	310
20	106	641	b600	5,220	1,000	3,060	1,520	411	133	268	106	192
21	104	582	1,750	4,200	1,340	*2,300	1,200	481	128	773	133	126
22	90	1,120	2,200	3,590	1,040	1,900	1,000	477	150	458	195	96
23	108	5,620	1,560	3,590	960	3,000	1,080	429	251	354	144	104
24	119	3,350	1,290	2,510	920	2,200	1,290	705	173	300	124	113
25	135	2,900	1,340	1,850	860	1,750	1,160	1,560	154	247	102	102
26	117	*2,680	2,950	4,750	780	1,520	1,040	1,850	137	193	104	*124
27	115	1,900	2,100	10,500	740	1,340	940	1,290	184	250	102	178
28	157	1,560	*1,700	7,800	700	1,160	860	1,120	170	211	119	179
29	128	1,290	1,520	5,620	680	1,000	760	1,000	137	209	117	90
30	128	1,120	4,070	4,270	-	900	680	860	518	165	110	102
31	122	-	5,380	2,950	-	800	-	720	-	162	102	-
Total	3,970	31,413	50,223	111,140	53,470	57,862	43,500	18,296	7,074	7,853	4,436	3,961
Mean	128	1,047	1,620	3,585	1,844	1,867	1,450	590	236	253	143	132
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 6,480 Min 90 Mean 1,069 Cfsm - In. -
Water year 1951-52: Max 10,500 Min 90 Mean 1,074 Cfsm - In. -

Peak discharge (base, 4,400 cfs).--Nov. 23 (11:30 a.m.) 6,740 cfs (14.31 ft); Dec. 9 (1 p.m.) 5,620 cfs (13.01 ft); Jan. 1 (6 a.m.) 7,400 cfs (15.04 ft); Jan. 18 (5 a.m.) 9,280 cfs (16.76 ft); Jan. 27 (8 a.m.) 11,200 cfs (18.47 ft); Feb. 4 (4 p.m.) 6,020 cfs (13.46 ft); Mar. 11 (3:30 p.m.) 7,800 cfs (15.45 ft).

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Chagrin River at Willoughby, Ohio

Location.--Lat 41°37'51", long. 81°24'13", on left bank at city waterworks 150 ft downstream from waterworks dam, 800 ft downstream from East Branch, 1 mile southeast of Willoughby, Lake County, and 5 miles upstream from mouth.

Drainage area.--251 sq mi.

Records available.--July 1925 to November 1935, October 1939 to September 1952.

Gage.--Water-stage recorder. Prior to Dec. 20, 1939, staff gage on left concrete abutment on upstream side of waterworks dam, 150 ft upstream at datum 7 ft higher.

Average discharge.--23 years, 306 cfs (unadjusted).

Extremes.--Maximum discharge during year, 10,400 cfs Jan. 26 (gage height, 12.06 ft); minimum daily, 19 cfs Sept. 13.
1925-35, 1939-52: Maximum discharge, 28,000 cfs Mar. 22, 1949 (gage height, 17.95 ft from high-water mark in well), from rating curve extended above 9,600 cfs on basis of contracted-opening determination of peak flow; minimum daily, 3.0 cfs July 25, 26, 1934.

Remarks.--Records good except those for periods of ice effect, which are fair. Water diverted at dam just above station for municipal supply of city of Willoughby. Records of chemical analyses for the water year 1952 are given in Water-Supply Paper 1250.

Revisions (water years).--W 1084: 1929(M), 1931(M).

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 23				Nov. 24 to Sept. 30			
1.8	18	3.0	348	1.7	14	3.0	376
1.9	32	4.0	839	1.9	44	4.0	1,000
2.2	93	6.0	2,530	2.2	105	7.0	3,530
2.5	168	8.0	4,580	2.5	186	10.0	6,900

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	32	42	295	4,910	590	212	239	127	112	*85	24	26
2	32	49	280	1,920	1,920	186	268	119	96	62	23	35
3	32	78	246	888	1,040	189	222	112	87	98	20	99
4	32	72	253	524	2,950	312	205	110	90	145	25	47
5	31	66	475	508	1,600	622	480	115	83	79	47	38
6	30	60	336	405	895	372	524	124	77	55	37	32
7	36	1,030	689	336	700	280	566	*101	69	45	32	28
8	82	516	700	287	610	242	1,210	112	81	40	26	26
9	82	245	2,600	276	762	246	1,280	129	94	55	23	25
10	*62	231	1,400	291	720	268	642	199	81	59	28	24
11	48	290	642	225	960	4,300	514	189	60	47	33	23
12	40	208	434	222	603	1,680	405	151	55	42	51	22
13	40	183	311	196	465	860	1,760	165	53	37	*53	19
14	40	302	196	447	299	769	2,240	202	134	37	40	20
15	38	208	170	881	230	536	2,410	225	162	37	65	35
16	38	171	150	662	200	439	1,280	225	92	37	201	44
17	36	319	140	2,590	180	350	629	159	71	37	159	35
18	34	306	140	4,690	170	332	429	142	59	38	98	35
19	32	260	130	1,270	170	*1,930	328	124	53	67	81	94
20	34	240	160	2,080	342	1,440	261	117	42	49	57	83
21	34	221	350	897	662	714	218	140	40	65	55	53
22	32	531	1,400	705	386	508	196	142	220	55	47	40
23	40	4,140	1,000	*1,140	299	1,860	497	115	293	40	38	40
24	53	2,040	600	497	280	907	776	769	119	37	35	*38
25	55	688	500	376	253	514	444	2,500	77	33	33	35
26	48	1,080	1,700	4,310	202	376	332	1,340	57	28	37	35
27	44	674	1,200	6,080	208	303	261	502	49	30	30	32
28	51	*386	800	1,420	196	264	222	276	47	32	26	32
29	55	307	600	741	202	239	174	199	44	32	24	30
30	49	295	2,500	465	-	222	151	153	90	30	22	32
31	42	-	4,500	429	-	208	-	129	-	25	22	-
Total	1,334	15,238	24,897	40,668	18,094	21,680	19,163	9,212	2,687	1,558	1,492	1,157
Mean	43.0	508	803	1,312	624	699	639	297	89.6	50.3	48.1	38.6
(†)	2.34	2.02	2.01	2.11	2.05	2.10	2.37	2.39	2.74	2.77	2.64	2.71

Adjusted for diversion

Mean	45.3	510	805	1,314	626	701	641	299	92.3	53.1	50.7	41.3
Cfsm	0.180	2.03	3.21	5.24	2.49	2.79	2.55	1.19	0.368	0.212	0.202	0.165
In.	0.21	2.26	3.70	6.04	2.68	3.22	2.84	1.37	0.41	0.24	0.23	0.18

	Observed						Adjusted					
Calendar year 1951:	Max	6,040	Min	21	Mean	399	Mean	401	Cfsm	1.60	In.	21.73
Water year 1951-52:	Max	6,080	Min	19	Mean	429	Mean	431	Cfsm	1.72	In.	23.38

Peak discharge (base, 4,000 cfs).--Nov. 23 (3:30 p.m.) 4,580 cfs (8.04 ft); Jan. 1 (6 a.m.) 5,680 cfs (8.98 ft); Jan. 18 (3 a.m.) 7,430 cfs (10.36 ft); Jan. 26 (11:30 p.m.) 10,400 cfs (12.06 ft); Mar. 11 (7 a.m.) 5,460 cfs (8.77 ft).

* Discharge measurement made on this day.

† Diversion for municipal supply of city of Willoughby, equivalent in cubic feet per second.

Note.--Stage-discharge relation affected by ice Nov. 19, 20, Dec. 15-31, Feb. 15-19.

Phelps Creek near Windsor, Ohio

Location.--Lat 41°30'55", long. 80°56'05", in T. 8 N., R. 5 W., on left bank at upstream side of bridge on State Highway 534, 1.4 miles south of Windsor, Ashtabula County, and 1½ miles upstream from mouth.

Drainage area.--26.4 sq mi.

Records available.--March 1942 to September 1952.

Gage.--Water-stage recorder. Prior to June 11, 1942, wire-weight gage at same site and datum.

Average discharge.--10 years, 35.9 cfs.

Extremes.--Maximum discharge during year, 1,460 cfs Jan. 17 (gage height, 7.50 ft); minimum, 0.2 cfs Sept. 28 (gage height, 0.35 ft).
1942-52: Maximum discharge, 2,020 cfs Mar. 22, 1948 (gage height, 8.97 ft), from rating curve extended above 1,000 cfs; no flow Aug. 20, 21, 1943, Oct. 24, 25, 1946.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Nov. 7)

Oct. 1 to Jan. 17				Jan. 18 to Sept. 30			
0.2	0.2	1.2	45	0.35	0.2	1.1	32
.3	.8	1.5	81	.4	.6	1.4	68
.4	1.9	2.0	157	.5	2.6	1.7	114
.5	4.2	4.0	523	.6	5.0	2.0	163
.7	11	6.0	999	.7	8.0	3.0	344
.9	21			.9	18	5.0	755

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.3	1.8	26	b900	b20	b12	10	4.5	3.8	0.5	0.5	0.5
2	.3	1.9	20	229	b90	b10	14	4.0	2.8	.5	.5	1.4
3	.4	1.8	17	65	134	12	11	3.5	2.3	.8	.5	1.6
4	.6	1.9	26	36	524	59	10	3.0	2.6	1.1	.9	1.6
5	.6	1.9	67	33	127	102	58	*3.8	2.3	1.1	1.4	1.2
6	.8	2.1	45	29	67	34	50	4.2	2.1	.8	1.1	1.4
7	.9	60	77	24	41	23	72	3.8	1.9	.5	.8	1.9
8	*1.1	32	69	20	46	18	100	3.8	1.6	.5	.5	1.6
9	1.9	11	419	20	88	20	92	4.0	1.6	1.1	.6	1.4
10	2.1	12	94	22	83	32	33	5.9	1.6	.6	.8	1.4
11	1.6	12	35	19	108	656	24	7.1	1.4	.5	*.8	1.2
12	1.3	8.1	20	17	47	124	18	5.9	1.1	.4	.6	1.1
13	1.1	6.1	16	15	32	74	217	5.6	.9	.3	.6	.9
14	1.0	7.0	13	75	17	61	213	7.1	1.1	.3	.6	1.2
15	1.0	9.2	b11	285	11	33	296	9.7	1.1	.4	.9	1.4
16	1.1	16	b10	81	b9	23	103	11	1.2	.4	2.2	1.1
17	1.0	32	10	644	b8	*18	36	7.4	1.4	.4	5.3	.6
18	.8	26	b9	580	b7	20	20	6.2	1.6	.5	4.2	.8
19	1.0	23	b9	118	b8	*316	14	5.0	1.9	.9	2.3	1.1
20	1.0	b19	b10	287	21	125	11	5.6	1.9	1.1	.9	2.1
21	.8	23	b35	67	64	54	8.4	15	1.9	1.4	.8	2.1
22	.9	79	220	*62	31	31	7.4	15	2.6	1.4	.5	1.1
23	.9	489	150	133	25	180	25	8.8	12	1.4	.4	*.7
24	1.0	93	60	42	27	63	58	74	*4.0	1.4	.4	.5
25	1.2	36	46	26	22	28	28	409	2.8	1.2	.4	.4
26	1.2	96	200	675	15	19	21	111	2.1	1.1	.3	.5
27	1.6	*54	170	574	b12	14	13	32	.9	1.1	.3	.5
28	1.5	28	70	95	b11	12	9.3	13	.5	1.1	.3	.4
29	1.3	24	40	38	b11	11	7.1	8.0	.5	.8	.3	.4
30	1.3	29	b300	23	-	11	5.6	5.9	.6	.5	.4	.5
31	1.6	-	b550	17	-	9.7	-	4.5	-	.5	.5	-
Total	33.2	1,235.8	2,844	5,251	1,706	2,204.7	1,584.8	807.3	64.1	24.6	30.6	32.6
Mean	1.07	41.2	91.7	169	58.8	71.1	52.8	26.0	2.14	0.79	0.99	1.09
Cfsm	0.041	1.56	3.47	6.40	2.23	2.69	2.00	0.985	0.081	0.030	0.038	0.041
In.	0.05	1.74	4.00	7.38	2.40	3.10	2.23	1.14	0.09	0.03	0.04	0.05

Calendar year 1951: Max 789 Min 0.2 Mean 41.6 Cfsm 1.58 In. 21.40
Water year 1951-52: Max 900 Min 0.3 Mean 43.2 Cfsm 1.64 In. 22.25

Peak discharge (base, 900 cfs).--Jan. 1 (time and discharge unknown); Jan. 17 (11 p.m.) 1,460 cfs (7.50 ft); Jan. 26 (11:30 p.m.) 1,400 cfs (7.33 ft); Mar. 11 (6 a.m.) 1,090 cfs (6.34 ft).
* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

Rock Creek near Rock Creek, Ohio

Location.--Lat 41°39'05", long. 80°50'10", in T. 10 N., R. 4 W., on left bank at downstream side of highway bridge, 0.4 mile downstream from Plum Creek, 1.4 miles southeast of village of Rock Creek, Ashtabula County, 1½ miles downstream from Sugar Creek, and 3 miles upstream from mouth.

Drainage area.--55.6 sq mi.

Records available.--March 1942 to September 1952.

Gage.--Water-stage recorder. Prior to June 10, 1942, chain gage at same site and datum.

Average discharge.--10 years, 85.9 cfs.

Extremes.--Maximum discharge during year, 3,370 cfs Jan. 18 (gage height, 7.03 ft); no flow for many days.
1942-52: Maximum discharge, 5,730 cfs Mar. 22, 1948 (gage height, 8.82 ft), from rating curve extended above 2,300 cfs on basis of velocity-area studies; no flow at times.

Remarks.--Records good except those for periods of ice effect, which are fair.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 4 to Nov. 7)

Oct. 1 to Nov. 21

0.3	0.1	1.0	22
.4	.3	1.3	46
.5	1.4	1.6	76
.6	4.0	2.0	121
.8	12		

Nov. 22 to Sept. 30

0.4	0	2.5	191
.5	.3	3.0	302
.6	2.4	3.5	485
.8	11	4.0	725
1.1	28	5.0	1,420
1.5	66	6.0	2,320
2.0	121		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	0.3	51	1,720	48	20	17	7.3	9.2	0.1	0	0.2
2	.2	1.4	39	587	209	23	20	6.0	6.4	0	0	.6
3	.2	4.8	28	208	248	19	20	5.2	5.2	0	0	.8
4	.2	.8	43	146	1,040	79	18	4.4	4.4	.1	0	1.6
5	.2	.5	153	106	370	172	53	*5.6	4.0	.2	0	.9
6	.1	.4	136	90	172	87	82	8.7	3.6	.1	0	.8
7	.2	75	171	68	123	51	128	8.2	2.8	0	0	.6
8	*.2	89	221	55	113	34	141	6.4	2.4	0	0	.3
9	.3	35	757	48	219	27	100	6.0	2.1	1.0	0	.2
10	.3	24	452	59	203	29	51	6.4	1.6	.6	.4	.1
11	.4	20	161	b50	172	991	32	10	1.3	.3	.6	.1
12	.4	15	96	43	105	407	24	17	.8	.3	*.9	0
13	.4	11	b60	39	77	183	239	32	.3	.3	1.0	0
14	.3	11	b40	92	47	153	426	31	.3	.2	.8	0
15	.3	10	b30	256	b25	90	686	29	.2	.1	1.6	.2
16	.3	31	b25	188	b18	61	336	35	.2	.1	2.8	.3
17	.2	85	b25	*953	b16	*42	136	21	.1	0	1.9	.1
18	.2	72	b25	1,880	b15	41	74	15	0	0	3.6	.5
19	.2	50	b25	405	b14	313	44	11	0	.3	6.8	2.1
20	.2	b45	b30	703	38	222	28	9.6	0	.3	4.8	1.0
21	.2	59	b100	245	107	115	20	61	0	.3	2.1	.6
22	.2	149	b450	209	74	75	15	91	.2	.3	1.0	.3
23	.2	1,040	b400	406	61	248	28	45	1.3	.3	.8	*.3
24	.3	373	b210	148	51	157	74	60	*4.0	.2	.8	.3
25	.4	132	b160	88	41	80	58	809	1.9	.1	.6	.2
26	.3	201	b400	896	26	51	40	391	.9	0	.3	.2
27	.3	*156	b350	2,160	22	34	26	156	.4	0	.3	.1
28	.5	89	b160	586	18	26	18	70	.2	0	.2	0
29	.5	58	b110	177	19	21	13	35	.2	0	.2	0
30	.4	59	b650	b70	-	19	9.6	20	.3	0	.1	0
31	.3	-	1,420	b55	-	17	-	14	-	0	0	-
Total	8.6	2,897.2	6,978	12,736	3,691	3,887	2,956.6	2,026.8	54.3	5.2	31.6	12.4
Mean	0.28	96.6	225	411	127	125	98.6	65.4	1.81	0.17	1.02	0.41
Cfsm	0.0049	1.71	3.98	7.26	2.24	2.21	1.74	1.16	0.032	0.0030	0.018	0.0072
In.	0.006	1.91	4.59	8.37	2.42	2.55	1.94	1.34	0.04	0.003	0.02	0.008

Calendar year 1951: Max 2,200 Min 0 Mean 108 Cfsm 1.91 In. 25.89
Water year 1951-52: Max 2,160 Min 0 Mean 96.4 Cfsm 1.70 In. 23.20

Peak discharge (base, 1,200 cfs).--Nov. 23 (12 m.) 1,260 cfs (4.80 ft); Jan. 1 (4 a.m.) 2,080 cfs (5.74 ft); Jan. 18 (1 a.m.) 3,370 cfs (7.03 ft); Jan. 27 (2:30 a.m.) 3,370 cfs (7.02 ft); Feb. 4 (10 a.m.) 1,340 cfs (4.89 ft); Mar. 11 (4 p.m.) 1,340 cfs (4.92 ft); May 25 (12 m.) 1,220 cfs (4.73 ft).

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

Mill Creek near Jefferson, Ohio

Location.--Lat 41°45'10", long. 80°48'00", in T. 11 N., R. 3 W., on right bank at downstream side of bridge on State Highway 307, $1\frac{3}{4}$ miles northwest of Jefferson, Ashtabula County, and $3\frac{1}{2}$ miles downstream from Griggs Creek.

Drainage area.--78.3 sq mi.

Records available.--March 1942 to September 1952.

Gage.--Water-stage recorder. Prior to June 10, 1942, wire-weight gage at same site and datum.

Average discharge.--10 years, 111 cfs.

Extremes.--Maximum discharge during year, 3,290 cfs Jan. 27 (gage height, 8.61 ft); no flow for many days.
1942-52: Maximum discharge, 7,010 cfs Mar. 22, 1948 (gage height, 9.95 ft); maximum gage height, 10.28 ft Dec. 4, 1950 (ice jam); no flow for many days.

Remarks.--Records fair except those for periods of ice effect, which are poor.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June.	July	Aug.	Sept.
1		0	81	2,200	33	21	16	8.2	27	0.1	0	
2		0	69	890	181	16	22	6.0	25	.1	0	
3		0	51	240	265	20	21	4.9	19	0	0	
4		0	48	149	942	48	19	4.9	15	0	0	
5		0	168	114	420	189	48	*5.8	14	0	0	
6		0	200	103	177	131	104	7.1	12	0	0	
7		20	192	81	115	76	149	13	9.2	0	0	
8	(*)	4.6	240	64	112	53	177	20	7.8	0	0	
9		77	760	54	184	46	166	16	7.1	.2	0	
10		59	797	54	220	72	102	15	5.6	.2	0	
11		56	245	49	220	1,080	62	15	4.2	.1	0	
12		48	126	41	144	541	42	17	3.6	0	*0	
13		37	70	25	106	189	260	78	3.1	0	0	
14		30	45	89	60	144	545	127	3.1	0	0	
15		25	35	277	35	99	792	106	3.1	0	0	
16		26	30	258	20	67	394	110	2.5	0	.6	
17		89	25	497	15	*44	138	81	1.8	0	.3	
18		131	25	1,920	13	35	76	52	1.4	0	1.2	
19		102	25	468	13	305	46	41	1.0	0	.4	
20		82	25	1,060	36	349	29	34	.6	0	.2	
21		68	60	424	149	160	20	36	.4	0	.2	
22		102	300	*348	116	104	14	128	.4	0	.2	
23		866	400	661	76	254	30	93	.4	0	.1	
24		598	200	267	57	214	71	96	.3	0	0	(*)
25		200	130	152	50	97	58	590	.2	0	0	
26		248	180	979	28	63	38	696	*.2	0	0	
27		*298	320	2,280	27	42	26	201	.1	0	0	
28		152	190	365	21	30	17	99	.1	0	0	
29		94	100	120	18	23	12	60	.2	0	0	
30		81	400	55	-	19	10	41	.2	0	0	
31		-	1,100	42	-	16	-	31	.2	0	0	
Total	0	3,493.6	6,637	14,326	3,853	4,547	3,504	2,842.9	168.6	0.7	3.2	0
Mean	0	116	214	462	133	147	117	91.7	5.62	0.02	0.10	0
Cfsm	0	1.48	2.73	5.90	1.70	1.88	1.49	1.17	0.072	0.00026	0.0013	0
In.	0	1.65	3.15	6.80	1.83	2.17	1.66	1.35	0.08	0.0003	0.002	0

Calendar year 1951: Max 3,500 Min 0 Mean 124 Cfsm 1.58 In. 21.38
Water year 1951-52: Max 2,280 Min 0 Mean 108 Cfsm 1.38 In. 18.69

Peak discharge (base, 1,500 cfs).--Jan. 1 (time and discharge unknown); Jan. 18 (11 a.m.) 2,580 cfs (7.79 ft); Jan. 27 (6 a.m.) 3,290 cfs (8.61 ft); Mar. 11 (6 p.m.) 1,640 cfs (7.23 ft).
* Discharge measurement or observation of no flow made on this day.
Note.--Stage-discharge relation affected by ice Dec. 13 to Jan. 1, Jan. 29, 30, Feb. 15-17.

Grand River near Madison, Ohio

Location.--Lat 41°44'26", long. 81°02'48", on downstream end of center pier of highway bridge on State Highway 528, half a mile upstream from Griswold Creek and 2 miles south of Madison, Lake County.

Drainage area.--587 sq mi.

Records available.--July 1922 to December 1935, February 1938 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 674.47 ft above mean sea level, adjustment of 1912. Prior to Jan. 20, 1939, chain gage at same site and datum.

Average discharge.--27 years, 654 cfs.

Extremes.--Maximum discharge during year, 10,100 cfs Jan. 27 (gage height, 10.28 ft); maximum gage height, 10.80 ft Dec. 30 (ice jam); minimum, 3.6 cfs Aug. 2-4 (gage height, 0.95 ft).
1922-35, 1938-52: Maximum discharge, 16,600 cfs Mar. 22, 1948 (gage height, 12.48 ft); no flow July 31, Aug. 1, 2, 1934.

Remarks.--Records good except those for period of ice effect, which are fair.

Rating tables, water year 1951-52, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 3-12, 25, 26, Aug. 15-21)

Oct. 1 to Dec. 30				Dec. 31 to Sept. 30					
1.0	4.0	3.0	397	0.9	2.1	2.0	134	6.0	2,820
1.1	8.2	3.5	630	1.0	5.6	2.5	244	8.0	5,740
1.2	17	4.0	930	1.1	11	3.0	415	10.0	9,460
1.5	55	6.0	2,740	1.2	20	3.5	660		
2.0	127	8.0	5,600	1.5	57	4.0	980		
2.5	227								

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.8	23	498	8,090	1,090	190	204	145	162	20	4.4	7.2
2	6.8	24	393	7,710	1,420	181	221	119	114	17	4.0	8.8
3	6.8	30	294	5,230	2,100	183	218	88	83	15	3.6	11
4	8.2	27	251	3,830	4,720	224	218	83	67	15	4.8	10
5	8.2	30	556	2,880	5,230	814	378	86	51	15	7.2	8.8
6	7.7	30	867	2,000	3,550	1,020	682	*95	47	15	6.1	10
7	7.7	194	965	1,300	2,760	739	1,130	98	45	14	6.6	11
8	14	512	1,330	800	2,010	530	1,460	94	44	12	6.6	10
9	*11	418	2,980	540	1,780	390	1,460	95	41	25	12	8.8
10	11	301	4,570	469	2,010	332	1,020	101	34	25	22	7.2
11	11	227	2,840	433	1,960	3,710	616	107	31	25	15	6.6
12	16	181	2,000	407	1,460	5,400	424	117	29	24	*19	6.1
13	17	141	1,560	312	1,130	3,170	1,540	150	27	24	15	6.1
14	14	122	800	469	763	2,660	3,550	247	27	20	17	6.1
15	11	112	400	1,520	482	1,960	4,750	281	27	16	43	8.8
16	9.6	108	250	2,250	354	1,170	4,280	287	26	14	96	11
17	8.9	179	210	3,060	261	698	2,760	266	25	11	68	11
18	8.9	414	190	7,520	199	500	1,980	206	25	10	143	8.8
19	8.2	431	180	6,790	183	*1,680	1,290	164	25	11	77	9.5
20	8.2	364	190	6,430	234	2,880	660	138	24	12	45	10
21	8.2	322	500	5,570	658	1,960	373	134	19	16	33	15
22	8.9	386	3,000	3,420	757	1,420	258	268	21	19	26	17
23	8.9	2,660	3,500	*3,980	616	2,200	302	487	25	18	24	18
24	8.9	3,680	1,700	2,600	545	2,200	438	691	25	17	19	*21
25	9.6	2,050	1,300	1,380	446	1,290	540	2,700	29	15	14	15
26	9.6	1,740	2,500	3,810	339	945	456	4,280	30	11	15	11
27	11	2,100	3,000	9,260	275	644	362	2,550	*24	8.8	15	9.5
28	12	*1,510	1,700	7,710	221	415	281	1,640	25	7.7	12	8.2
29	16	965	1,200	5,910	199	296	216	1,060	25	7.2	10	6.6
30	20	636	3,500	3,830	-	241	162	550	25	5.6	8.8	5.6
31	20	-	5,300	1,960	-	218	-	278	-	4.8	7.7	-
Total	334.1	19,917	48,524	111,470	37,752	40,260	32,229	17,605	1,202	470.1	799.8	303.7
Mean	10.8	664	1,565	3,596	1,302	1,299	1,074	568	40.1	15.2	25.8	10.1
Cfsm	0.018	1.13	2.67	6.13	2.22	2.21	1.83	0.968	0.068	0.026	0.044	0.017
In.	0.02	1.26	3.08	7.07	2.39	2.55	2.04	1.12	0.08	0.03	0.05	0.02

Calendar year 1951: Max 10,900 Min 2.8 Mean 874 Cfsm 1.49 In. 20.22
Water year 1951-52: Max 9,260 Min 3.6 Mean 849 Cfsm 1.45 In. 19.71

Peak discharge (base, 5,500 cfs).--Jan. 1 (9:30 p.m.) 9,660 cfs (10.06 ft); Jan. 18 (7 p.m.) 8,470 cfs (9.48 ft); Jan. 27 (4 p.m.) 10,100 cfs (10.28 ft); Feb. 5 (1 a.m.) 6,080 cfs (8.23 ft); Mar. 12 (4 a.m.) 6,250 cfs (8.28 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 14-31.

Ashtabula River near Ashtabula, Ohio

Location.--Lat 41°51'19", long. 80°45'43", on left bank at downstream side of highway bridge, 1 mile upstream from Hubbard Run, 1¼ miles southeast of Ashtabula, Ashtabula County, and 5½ miles upstream from mouth.

Drainage area.--118 sq mi.

Records available.--July 1924 to December 1935, March 1939 to November 1947, March 1950 to September 1952.

Gage.--Water-stage recorder. Prior to Aug. 27, 1924, staff gage at same site and datum.

Average discharge.--21 years, 146 cfs.

Extremes.--Maximum discharge during year, 4,450 cfs Jan. 27 (gage height, 6.30 ft); no flow July 27, 28, 30, 31, Aug. 1-3, 6.
1924-35, 1939-47, 1950-52: Maximum discharge, 10,800 cfs May 16, 1942 (gage height, 9.67 ft); no flow during most years.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor.

Revisions (water years).--W 954: 1929(M). W 974: 1942.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-6, Nov. 27-30, Jan. 17)

0.15	0	1.1	111
.2	.2	1.5	243
.3	.6	2.0	459
.4	2.3	2.5	697
.5	7.6	3.0	1,010
.6	20	4.0	1,820
.8	50	6.0	4,060

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	1.3	110	1,900	97	74	39	17	37	0.8	0	0.4
2	.3	2.0	95	1,300	235	72	48	13	30	.6	0	.6
3	.3	7.0	80	400	387	74	54	11	25	.6	0	3.6
4	.2	5.1	65	240	1,260	90	45	8.7	27	.7	.1	1.5
5	.2	4.5	100	130	605	430	90	*16	21	.6	.1	6.8
6	.2	6.4	210	110	291	216	191	*169	18	4.1	0	5.1
7	.7	44	170	95	198	135	239	97	16	1.8	.1	3.6
8	*1.5	204	230	85	191	104	267	50	16	1.5	.1	2.3
9	1.3	116	500	75	304	86	247	34	22	3.2	.1	1.3
10	1.0	68	1,000	70	338	102	148	33	16	1.5	.2	.9
11	1.0	70	400	80	312	1,220	86	33	8.7	.9	.2	.8
12	1.0	66	150	70	198	720	66	142	7.0	.6	*.4	.6
13	.9	47	100	65	177	263	394	423	4.5	.6	.6	.5
14	.7	33	70	60	119	198	751	325	4.1	.4	.4	.4
15	.6	28	60	180	b80	148	1,120	213	3.6	.4	.4	.8
16	.6	35	55	280	b65	100	574	235	2.7	.4	1.5	.9
17	.7	100	50	*396	b55	70	220	116	2.3	.4	1.0	.6
18	.9	160	55	1,480	b50	*57	124	68	1.8	.4	14	.6
19	.9	100	55	432	b60	417	76	50	1.5	.7	62	.8
20	.9	65	70	1,330	114	518	55	42	1.3	.9	17	.7
21	.7	55	200	481	348	243	45	76	1.0	.5	22	16
22	.9	65	500	229	228	160	40	184	1.3	.4	12	21
23	.9	350	800	728	135	464	55	97	1.5	.2	5.7	*12
24	1.3	900	500	252	114	334	122	108	1.0	.1	3.2	6.4
25	2.0	250	270	130	102	154	84	1,010	*.9	.1	1.8	3.6
26	1.8	130	450	1,160	84	97	54	894	.8	.1	1.0	2.3
27	1.8	*351	600	2,890	74	68	44	239	.6	0	.9	1.8
28	1.8	178	370	554	68	55	36	106	.6	0	.7	1.3
29	1.8	127	250	191	74	48	28	72	.9	.1	.6	.9
30	1.5	104	800	130	-	44	21	54	1.5	0	.5	.8
31	1.5	-	1,400	102	-	39	-	45	-	0	.4	-
Total	30.1	3,672.3	9,765	15,625	6,363	6,800	5,363	4,980.7	275.6	22.6	147.0	98.9
Mean	0.97	122	315	504	219	219	178	161	9.19	0.73	4.74	3.30
Cfsm	0.0082	1.03	2.67	4.27	1.86	1.86	1.51	1.36	0.078	0.0062	0.040	0.028
In.	0.009	1.15	3.08	4.92	2.01	2.14	1.68	1.57	0.09	0.007	0.05	0.03

Calendar year 1951: Max 4,000 Min 0 Mean 160 Cfsm 1.36 In. 18.43
Water year 1951-52: Max 2,890 Min 0 Mean 145 Cfsm 1.23 In. 16.74

Peak discharge (base, 2,600 cfs).--Jan. 1 (time and discharge unknown); Jan. 27 (7 a.m.) 4,450 cfs (6.30 ft).

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Nov. 16-26, Dec. 1 to Jan. 16; discharge estimated on basis of weather records, recorded range in stage, and records for Conneaut Creek at Amboy and other nearby stations.

Conneaut Creek at Amboy, Ohio

Location.--Lat 41°55'34", long. 80°36'18", on right bank at downstream side of highway bridge half a mile east of Amboy, Ashtabula County, 3 miles southwest of Conneaut and 6½ miles upstream from mouth.

Drainage area.--178 sq mi.

Records available.--July 1922 to December 1935, March 1950 to September 1952.

Gage.--Water-stage recorder. Prior to Aug. 17, 1924, chain gage at same site and datum.

Average discharge.--15 years, 229 cfs.

Extremes.--1950: Maximum discharge during period March to September, 3,200 cfs Apr. 5 (gage height, 5.97 ft); minimum, 8.2 cfs Aug. 26 (gage height, 1.33 ft).
1950-51: Maximum discharge during water year, 8,830 cfs Dec. 4 (gage height, 9.00 ft), from rating curve extended above 4,200 cfs on basis of velocity-area study; maximum gage height, 9.22 ft Feb. 13 (ice jam); minimum discharge, 3.0 cfs Sept. 5 (gage height, 1.15 ft).
1951-52: Maximum discharge during year, 5,140 cfs Jan. 27 (gage height, 7.07 ft); maximum gage height, 12.25 ft Dec. 31 (ice jam); minimum discharge, 3.0 cfs Aug. 3.
1922-35, 1950-52: Maximum discharge, that of Dec. 4, 1950; maximum gage height, 12.94 ft Mar. 4, 1934 (ice jam); minimum discharge, 0.2 cfs July 31, Aug. 1, 1933, Aug. 1, 2, 1934.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair.

Revisions (water years).--W 714: 1926. W 784: 1933.

Rating table, Mar. 30, 1950, to Sept. 30, 1952, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.1	2.0	3.0	428
1.2	4.5	3.5	730
1.3	8.7	4.0	1,120
1.4	15	5.0	2,080
1.5	26	6.0	3,280
2.0	114	7.0	4,960
2.5	237	9.0	8,830

Discharge, in cubic feet per second, March 1950 to September 1950

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						-	243	1,110	88	20	25	812
2						-	252	780	108	20	26	2,290
3						-	773	310	178	20	124	487
4						-	*2,080	215	1,990	28	99	156
5						-	2,460	302	1,740	26	64	93
6						-	1,370	237	316	31	44	66
7						-	443	166	160	29	29	47
8						-	295	124	106	21	21	39
9						-	243	114	86	17	18	31
10						-	204	208	93	17	17	28
11						-	178	595	120	23	24	25
12						-	*170	259	106	17	21	375
13						-	166	158	75	16	16	541
14						-	163	140	72	18	14	1,860
15						-	170	130	61	15	12	2,130
16						-	204	112	56	16	10	1,300
17						-	193	99	57	16	9.3	369
18						-	142	91	49	*18	9.9	199
19						-	124	90	47	18	15	129
20						-	153	93	44	199	47	95
21						-	237	82	40	518	40	77
22						-	178	73	32	178	*25	64
23						-	144	*81	34	90	14	54
24						-	335	156	31	63	12	45
25						-	1,260	243	26	388	9.3	42
26						-	1,580	142	26	306	9.3	36
27						-	1,070	129	*26	120	9.3	34
28						-	317	135	25	77	12	31
29						-	212	129	25	50	145	29
30						391	297	91	25	37	185	26
31						*295	-	79	-	29	93	-
Total						-	15,646	6,673	5,842	2,439	1,199.1	11,510
Mean						-	522	215	195	78.7	38.7	384
Cfsm						-	2.93	1.21	1.10	0.442	0.217	2.16
In.						-	3.27	1.40	1.23	0.51	0.25	2.41

Calendar year	: Max	Min	Mean	Cfsm	In.
Water year	: Max	Min	Mean	Cfsm	In.

* Discharge measurement made on this day.

Conneaut Creek at Amboy, Ohio--Continued

Discharge, in cubic feet per second, water year October 1950 to September 1951

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	25	42	410	65	85	*406	618	204	44	73	9.9	5.9
2	23	39	550	80	80	759	387	146	49	85	8.7	5.2
3	*20	36	3,000	350	80	353	382	120	45	90	9.9	4.5
4	21	66	7,800	4,100	80	1,300	353	106	47	57	9.3	4.5
5	21	881	*3,040	3,380	90	1,610	583	101	45	47	9.3	3.3
6	19	876	748	644	100	441	491	90	54	106	9.9	3.9
7	18	335	717	357	120	336	262	81	42	92	11	5.2
8	17	183	2,150	231	180	660	191	73	34	56	9.9	5.2
9	19	142	1,300	200	210	366	188	70	40	39	7.7	4.5
10	31	207	382	200	200	237	591	68	51	34	6.8	4.9
11	36	259	249	200	190	183	674	170	37	28	6.8	12
12	74	166	201	200	550	149	535	852	*31	24	6.3	8.2
13	195	122	178	190	2,500	140	1,580	1,170	36	21	5.6	*12
14	221	101	160	180	2,810	241	1,130	304	49	17	5.2	31
15	180	91	150	370	739	674	820	166	192	14	5.9	25
16	136	121	140	900	361	667	775	114	96	13	7.3	32
17	92	140	130	541	536	490	414	91	63	12	5.9	18
18	66	267	120	595	1,300	391	292	77	45	10	10	12
19	52	295	*110	1,300	850	489	237	68	37	9.9	11	9.3
20	42	990	95	1,040	1,000	1,220	204	63	29	9.3	8.2	7.7
21	44	3,520	90	702	1,450	936	178	57	26	8.7	6.8	6.3
22	32	1,590	85	524	2,700	524	190	56	29	12	5.6	6.3
23	29	583	90	285	792	*474	1,110	63	28	12	5.6	8.2
24	28	400	95	268	357	1,160	857	61	24	10	4.9	7.3
25	26	300	90	*321	249	917	*288	63	46	*17	4.9	14
26	25	320	80	243	231	414	*249	56	37	14	4.5	14
27	25	340	75	180	374	329	295	56	36	12	4.5	12
28	34	360	70	156	397	285	204	56	32	11	4.5	9.9
29	64	370	65	120	-	268	228	52	29	9.3	4.9	7.7
30	66	380	60	100	-	854	292	56	31	8.7	4.5	7.3
31	52	-	60	90	-	1,730	-	50	-	8.2	5.2	-
Total	1,733	13,522	22,490	18,112	18,611	19,003	14,598	4,760	1,384	960.1	220.5	307.3
Mean	55.9	451	725	584	665	613	487	154	46.1	31.0	7.11	10.2
Cfsm	0.314	2.53	4.07	3.28	3.74	3.44	2.74	0.865	0.259	0.174	0.040	0.057
In.	0.36	2.82	4.69	3.78	3.90	3.97	3.06	1.00	0.29	0.20	0.05	0.06

Calendar year 1950: Max - Min - Mean - Cfsm - In. -
Water year 1950-51: Max 7,800 Min 3.3 Mean 317 Cfsm 1.78 In. 24.18

Peak discharge (base, 2,900 cfs).--Nov. 21 (5 p.m.) 4,610 cfs (6.83 ft); Dec. 4 (12:30 p.m.) 8,830 cfs (9.00 ft); Jan. 4 (9:30 p.m.) 6,430 cfs (7.84 ft); Feb. 13 (11 p.m.) 4,270 cfs (6.63 ft); Feb. 22 (11 a.m.) 3,200 cfs (5.96 ft). * Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 24 to Dec. 3, Dec. 15 to Jan. 4, Jan. 9-16, Jan. 29 to Feb. 13.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.3	12	188	b3,200	183	a130	99	66	90	14	5.2	7.7
2	7.7	13	170	b2,400	369	a130	110	59	77	13	4.5	14
3	9.3	17	129	678	790	129	135	52	68	14	3.6	39
4	7.7	14	108	313	1,440	151	118	49	73	31	5.2	25
5	6.8	17	184	234	1,680	1,020	129	144	59	34	8.2	20
6	6.3	17	353	229	589	684	272	*479	52	20	5.9	14
7	11	94	292	201	374	292	310	275	45	14	7.3	12
8	13	420	369	158	306	196	369	151	45	13	7.7	9.3
9	*12	285	832	140	400	160	433	104	56	19	8.7	8.2
10	13	158	1,730	133	571	146	299	91	39	16	9.3	7.7
11	15	156	613	146	459	1,060	191	90	32	37	9.9	7.3
12	12	166	288	120	361	2,180	149	447	29	26	*32	6.8
13	10	118	b180	112	278	594	351	1,780	26	17	21	6.3
14	8.7	90	b130	114	204	a450	1,070	1,100	24	14	14	6.3
15	8.2	70	b110	360	b130	a330	1,300	565	23	12	28	14
16	8.2	73	b100	535	b110	a250	1,440	723	24	10	88	19
17	7.3	204	b95	361	b100	a170	464	306	21	10	120	36
18	7.3	321	b95	*1,750	b95	*144	246	188	18	9.9	101	23
19	7.7	191	b100	1,710	b110	480	176	151	16	13	47	27
20	7.3	b140	b120	1,680	138	1,480	142	124	14	12	32	146
21	6.3	b110	b360	1,740	440	597	120	184	15	11	32	84
22	6.8	110	a1,000	538	474	313	103	438	18	14	21	44
23	7.3	638	a1,500	1,020	278	472	114	234	21	13	21	28
24	9.3	1,630	a950	694	206	676	186	199	17	10	16	*20
25	11	484	a470	278	183	292	186	1,120	16	8.7	14	16
26	9.3	310	a800	1,260	158	201	135	2,400	*14	7.7	12	14
27	9.3	608	a1,100	*3,840	a130	160	112	900	14	6.8	9.9	13
28	13	*317	a600	2,380	a120	135	93	259	12	6.8	8.2	12
29	14	196	a420	472	a130	118	82	163	15	7.3	7.7	10
30	12	160	a1,400	209	-	106	73	127	14	6.8	7.7	9.9
31	12	-	b2,700	166	-	99	-	104	-	5.9	7.3	-
Total	296.1	7,139	17,486	27,171	10,806	13,345	9,007	13,072	987	446.9	715.3	699.5
Mean	9.55	238	564	876	373	430	300	422	32.9	14.4	23.1	23.3
Cfsm	0.054	1.34	3.17	4.92	2.10	2.42	1.69	2.37	0.185	0.081	0.130	0.131
In.	0.06	1.50	3.66	5.67	2.26	2.79	1.89	2.73	0.21	0.09	0.15	0.15

Calendar year 1951: Max 4,100 Min 3.3 Mean 282 Cfsm 1.58 In. 21.53
Water year 1951-52: Max 3,840 Min 3.6 Mean 276 Cfsm 1.55 In. 21.16

Peak discharge (base, 2,900 cfs).--Jan. 1 (time and discharge unknown); Jan. 27 (10 p.m.) 5,140 cfs (7.07 ft); May 26 (5 p.m.) 2,990 cfs (5.78 ft). * Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records and records for stations on nearby streams. b Stage-discharge relation affected by ice.

Cattaraugus Creek at Gowanda, N. Y.

Location.--Lat 42°27'50", long. 78°56'10", on right bank at Gowanda, Erie County, 380 ft downstream from highway bridge, 600 ft downstream from powerhouse of Niagara Mohawk Power Co., and 4.2 miles downstream from South Branch.

Drainage area.--428 sq mi.

Records available.--November 1939 to September 1952.

Gage.--Water-stage recorder.

Average discharge.--12 years (1940-52), 734 cfs.

Extremes.--Maximum discharge during year, 12,300 cfs Mar. 11 (gage height, 8.84 ft); minimum recorded, 9.5 cfs Oct. 26 (gage height, 0.90 ft); minimum daily, 62 cfs Sept. 14. 1939-52: Maximum discharge, 35,900 cfs Mar. 17, 1942 (gage height, 13.73 ft), from rating curve extended above 6,500 cfs by logarithmic plotting; minimum, about 6 cfs Aug. 21, 1941; minimum gage height, that of Oct. 26, 1951; minimum daily discharge, 52 cfs Sept. 13, 1945.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Flow regulated by several industrial plants above station. Diurnal fluctuation at low and medium flow caused by municipal powerplant above station.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 1				Jan. 1 to Sept. 30			
1.5	82	4.0	1,850	1.4	62	4.0	1,920
1.7	135	5.0	3,250	1.7	137	5.0	3,390
2.0	234	6.0	5,050	2.0	240	6.0	5,170
2.5	465	8.0	9,840	2.5	475	8.0	9,840
3.0	815			3.0	825		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	93	91	701	7,470	988	410	862	365	370	172	90	85
2	107	106	675	3,600	2,660	383	1,070	351	346	150	84	126
3	a102	134	538	1,750	1,580	380	928	332	319	156	82	135
4	a94	133	460	1,160	4,780	509	884	314	446	172	112	136
5	a90	118	507	973	3,690	991	1,050	310	*410	153	157	100
6	a88	104	471	809	1,710	707	2,350	302	332	131	124	89
7	a104	491	541	613	1,270	614	1,470	276	297	125	*106	78
8	a140	621	836	648	*1,100	529	1,290	263	268	125	99	75
9	a180	358	1,830	594	1,340	469	*1,440	*264	728	*120	138	76
10	a164	282	1,620	550	1,080	509	991	268	509	131	100	71
11	a136	304	927	493	1,040	9,000	785	457	332	131	99	70
12	a120	292	*720	510	853	*4,470	685	1,410	297	117	117	71
13	a110	267	b640	447	689	2,190	863	3,890	258	98	109	64
14	a103	706	b560	715	660	1,350	897	1,800	248	109	100	62
15	*a100	799	b520	3,570	b640	1,000	3,100	1,440	236	88	88	592
16	100	845	b480	2,230	678	846	1,560	1,260	234	99	158	486
17	105	1,210	b520	*1,190	670	771	998	769	260	105	246	184
18	98	761	b560	3,970	615	715	793	663	251	114	147	321
19	98	557	b580	1,520	544	1,700	670	548	205	137	120	817
20	88	459	b600	4,170	510	3,320	595	561	200	118	105	355
21	90	375	b2,150	1,800	542	3,680	535	1,430	186	133	263	216
22	90	458	2,680	1,200	499	3,090	499	1,220	183	151	306	206
23	84	3,540	1,810	1,300	458	2,580	1,130	691	182	116	159	149
24	95	1,880	1,370	867	448	2,060	872	684	183	109	121	152
25	*128	863	1,060	773	444	1,310	635	1,990	176	99	114	137
26	117	876	1,020	2,250	407	1,110	587	1,510	166	89	101	124
27	101	645	918	4,110	418	1,000	517	834	186	108	97	111
28	108	472	843	1,870	415	850	458	600	169	116	86	113
29	115	456	872	912	415	730	426	523	226	114	80	111
30	106	457	2,670	742	-	663	395	458	242	115	80	106
31	102	-	3,160	735	-	635	-	400	-	98	82	-
Total	3,356	18,660	32,839	53,541	31,143	48,571	29,335	26,183	8,445	3,799	3,870	5,418
Mean	108	622	1,059	1,727	1,074	1,567	978	845	282	123	125	181
Cfsm	0.252	1.45	2.47	4.04	2.51	3.66	2.29	1.97	0.659	0.287	0.292	0.423
In.	0.29	1.62	2.85	4.65	2.71	4.22	2.55	2.28	0.73	0.33	0.34	0.47

Calendar year 1951: Max 9,600 Min 75 Mean 765 Cfsm 1.79 In. 24.25
Water year 1951-52: Max 9,000 Min 62 Mean 724 Cfsm 1.69 In. 23.04

Peak discharge (base, 15,000 cfs).--No peak above base.
* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of records for other streams tributary to Lake Erie.
b Stage-discharge relation affected by ice.

Buffalo Creek at Gardenville, N. Y.

Location.--Lat 42°51'15", long. 78°45'30", on left bank in Gardenville, Erie County, 700 ft downstream from bridge on Union Road and 2 miles upstream from Cayuga Creek.

Drainage area.--145 sq mi.

Records available.--October 1938 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 604.04 ft above mean sea level, unadjusted.

Average discharge.--14 years, 192 cfs.

Extremes.--Maximum discharge during year, 9,420 cfs Mar. 11 (gage height, 7.22 ft), from rating curve extended above 4,000 cfs by logarithmic plotting; maximum gage height, 7.45 ft Jan. 1 (ice jam); minimum discharge, 4.1 cfs Aug. 3 (gage height, 0.98 ft, backwater from debris).

1938-52: Maximum discharge, 14,000 cfs Mar. 17, 1942 (gage height, 8.80 ft), from rating curve extended above 4,000 cfs by logarithmic plotting; maximum gage height, 11.90 ft Mar. 9, 1942 (ice jam); minimum discharge, 0.7 cfs Aug. 22, 24, 25, 1941; minimum gage height observed, 0.695 ft Aug. 28, 31, Sept. 3, 1939 (backwater from leaves and debris).

Remarks.--Records good except those for periods of ice effect or backwater from weeds or debris, which are fair. Diurnal fluctuation at low flow caused by mill 3.2 miles above station.

Rating tables, water year 1951-52, except periods of ice effect or backwater from weeds or debris (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 14				Nov. 14 to Sept. 30					
0.99	6.4	1.7	174	0.95	4.1	1.3	56	3.5	1,450
1.0	7.2	2.0	306	1.0	7.4	1.5	112	4.5	2,800
1.1	18	2.5	611	1.05	12	1.7	177	6.0	5,930
1.3	53	3.0	1,000	1.1	19	2.0	306		
1.5	104			1.2	35	2.5	611		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11	16	275	900	195	104	134	64	67	27	6.8	5.4
2	12	17	188	833	680	94	185	67	61	18	5.4	13
3	9.8	23	128	317	355	88	146	64	56	17	4.4	14
4	9.0	20	106	219	1,930	270	137	61	54	20	7.4	14
5	8.0	19	117	232	1,090	780	256	59	52	22	9.0	17
6	6.8	27	124	200	354	290	782	59	49	19	6.8	12
7	13	124	204	121	254	225	376	55	41	15	5.6	10
8	41	270	307	124	224	185	338	52	38	14	6.4	8.2
9	*40	104	469	118	241	155	330	50	36	15	7.8	7.8
10	32	82	392	112	215	195	192	47	52	15	15	7.4
11	23	140	195	106	249	5,850	150	67	40	14	19	7.0
12	18	124	*145	112	160	1,050	137	186	*36	12	11	6.8
13	16	110	106	118	110	464	208	*1,610	30	10	9.6	6.0
14	14	380	88	166	100	*260	273	464	28	9.2	*9.6	7.0
15	13	363	84	1,440	*98	205	1,420	432	28	8.2	8.2	56
16	12	285	80	477	106	170	381	472	26	7.0	11	134
17	12	518	86	219	122	170	219	199	25	7.4	34	53
18	12	249	88	1,580	122	205	163	140	23	*7.4	34	35
19	12	150	92	*297	116	950	140	115	22	8.2	19	93
20	12	110	98	1,480	106	1,130	121	103	24	7.8	12	78
21	11	78	160	440	110	729	*112	458	21	9.0	20	40
22	11	115	470	205	106	509	100	338	21	10	23	30
23	13	760	350	225	100	582	164	156	22	9.6	19	25
24	16	382	280	170	100	381	153	180	21	8.2	14	24
25	23	157	205	155	98	228	115	624	19	7.0	9.6	21
26	27	208	160	920	88	200	106	239	15	7.8	8.2	17
27	21	165	145	1,460	94	174	98	146	14	11	7.4	16
28	19	100	135	439	106	157	86	109	14	7.4	6.4	14
29	18	98	140	130	106	140	83	95	20	6.8	5.6	13
30	18	134	300	118	-	131	75	86	36	7.0	5.0	12
31	18	-	490	116	-	124	-	78	-	9.6	5.0	-
Total	521.6	5,328	6,207	13,549	7,735	16,195	7,180	6,875	991	366.6	365.2	796.6
Mean	16.8	178	200	437	267	522	239	222	33.0	11.8	11.8	26.6
Cfsm	0.116	1.23	1.38	3.01	1.84	3.60	1.65	1.53	0.228	0.081	0.081	0.183
In.	0.13	1.37	1.59	3.48	1.98	4.15	1.84	1.76	0.25	0.09	0.09	0.20

Calendar year 1951: Max 5,160 Min 6.8 Mean 216 Cfsm 1.49 In. 20.21
Water year 1951-52: Max 5,850 Min 4.4 Mean 181 Cfsm 1.25 In. 16.93

Peak discharge (base, 7,500 cfs).--Mar. 11 (12:45 p.m.) 9,420 cfs (7.22 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 20, 27-29, Dec. 13 to Jan. 1, Jan. 8-13, 21-26, Jan. 29 to Feb. 2, Feb. 12 to Mar. 10, Mar. 14-18. Backwater from debris Oct. 1 to Nov. 14, June 5 to July 20. Backwater from weeds and/or debris July 21 to Sept. 15, Sept. 20-30.

Cayuga Creek near Lancaster, N. Y.

Location.--Lat 42°53'20", long. 78°38'40", on right bank just upstream from low flat-crested dam in Como Lake Park, 700 ft downstream from bridge on Bowen Road, 800 ft downstream from Little Buffalo Creek, and 2 miles southeast of Lancaster, Erie County.

Drainage area.--93.3 sq mi.

Records available.--September 1938 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 672.80 ft above mean sea level, unadjusted.

Average discharge.--14 years, 125 cfs.

Extremes.--Maximum discharge during year, 5,600 cfs Mar. 11 (gage height, 8.29 ft); maximum gage height, 11.09 ft Jan. 1 (ice jam); minimum discharge, 0.1 cfs Aug. 4 (gage height, 2.68 ft).

1938-52: Maximum discharge, 7,480 cfs Mar. 17, 1942 (gage height, 9.3 ft, from graph based on gage readings); maximum gage height, 12.36 ft Mar. 9, 1942 (ice jam); practically no flow part of Aug. 8, 9, 1939, when permanent stoplogs were installed in dam.

Remarks.--Records excellent except those for periods of ice effect, which are fair.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 11				Mar. 11 to Sept. 15				Sept. 16-30			
2.85	1.2	4.0	35	2.7	0.2	4.0	40	3.0	3.1	4.0	40
2.9	1.9	4.1	44	2.8	.9	4.1	55	3.2	7.2	4.1	55
3.0	3.5	4.2	64	2.9	2.2	4.2	84	3.4	12	4.2	84
3.2	7.6	4.6	233	3.0	3.8	4.6	270	3.6	18	4.5	215
3.4	12	5.0	463	3.2	7.9	5.0	540	3.8	25	5.0	540
3.6	18	5.5	879	3.4	13	5.5	990				
3.8	25	6.0	1,480	3.6	19	6.0	1,600				
				3.8	26						

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.1	4.3	161	700	112	46	75	24	28	5.5	1.3	1.3
2	2.4	4.7	107	430	330	43	118	24	25	4.5	.6	3.2
3	2.5	7.0	59	150	170	40	77	23	22	4.7	.3	5.6
4	1.9	6.0	47	112	1,200	140	71	22	22	7.2	.3	3.8
5	1.6	5.4	49	120	680	400	309	21	21	5.3	2.0	2.7
6	1.3	7.5	55	100	170	155	579	21	19	4.0	1.4	2.1
7	5.6	68	138	70	120	120	270	19	16	3.2	1.1	1.9
8	*13	134	166	76	106	100	248	18	15	3.0	.8	1.6
9	12	50	281	62	112	86	185	18	14	3.1	4.0	1.3
10	9.0	42	229	52	100	110	114	17	12	3.6	3.0	1.2
11	7.0	74	121	45	116	*3,200	84	23	11	2.7	3.3	1.2
12	5.7	55	78	64	74	588	74	105	11	2.2	3.1	.9
13	4.7	48	*34	55	52	260	129	958	*10	1.8	2.4	.8
14	4.1	118	37	90	47	*160	180	*293	9.8	1.6	*1.8	.6
15	3.5	120	36	1,220	*46	125	957	292	9.6	1.2	1.8	55
16	3.1	85	34	257	50	100	239	344	8.6	1.0	3.1	58
17	3.1	224	35	135	56	92	139	124	8.4	1.2	14	18
18	2.8	128	37	800	56	96	101	75	7.2	*.9	7.2	14
19	2.8	64	38	*164	52	800	79	55	6.6	.8	11	64
20	3.1	38	37	859	49	1,010	65	49	7.0	1.0	6.0	33
21	2.6	30	74	215	52	474	53	385	6.8	1.4	8.2	16
22	2.6	50	290	96	48	298	*46	246	7.5	1.4	25	13
23	2.7	343	220	104	47	440	84	92	7.9	.8	11	11
24	3.9	204	130	80	46	242	71	100	7.5	.6	6.4	9.4
25	7.6	66	96	72	44	144	53	532	6.4	.5	4.2	9.1
26	7.6	112	74	660	41	122	47	159	5.3	.3	3.1	7.9
27	6.1	80	66	1,100	43	99	40	82	6.1	1.3	2.4	7.2
28	5.4	50	64	290	47	86	34	55	5.4	1.3	2.0	6.3
29	5.1	52	66	64	48	84	30	43	7.0	1.1	1.5	4.9
30	4.8	64	140	50	-	75	26	37	7.9	1.0	1.3	4.3
31	4.5	-	240	48	-	69	-	30	-	1.5	1.2	-
Total	144.2	2,333.9	3,239	8,340	4,114	9,804	4,577	4,286	351.0	69.7	134.8	359.3
Mean	4.65	77.8	104	269	142	316	153	138	11.7	2.25	4.35	12.0
Cfsm	0.050	0.834	1.11	2.88	1.52	3.39	1.64	1.48	0.125	0.024	0.047	0.129
In.	0.06	0.93	1.29	3.32	1.64	3.91	1.82	1.71	0.14	0.03	0.05	0.14

Calendar year 1951: Max 2,620 Min 0.7 Mean 134 Cfsm 1.44 In. 19.44
Water year 1951-52: Max 3,200 Min 0.3 Mean 103 Cfsm 1.10 In. 15.04

Peak discharge (base, 3,300 cfs).--Mar. 11 (10 a.m.) 5,600 cfs (8.29 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 4, 5, 19-21, 25-29, Dec. 13-16, Dec. 21 to Jan. 10, Jan. 14, 15, 17, 18, 21-26, Jan. 28 to Feb. 3, Feb. 6 to Mar. 10, Mar. 13-19.

Cazenovia Creek at Ebenezer, N. Y.

Location.--Lat 42°49'45", long. 78°46'40", on right bank 40 ft upstream from highway bridge on Ridge Road in Ebenezer, Erie County, 4.4 miles upstream from mouth, and 5 miles southeast of Buffalo.

Drainage area.--136 sq mi.

Records available.--June 1940 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 606.86 ft above mean sea level, unadjusted.

Average discharge.--12 years, 215 cfs.

Extremes.--Maximum discharge during year, 6,510 cfs Mar. 11 (gage height, 8.64 ft); minimum, 3.0 cfs July 21; minimum gage height, 0.475 ft Nov. 5.
1940-52: Maximum discharge, 11,200 cfs Mar. 17, 1942 (gage height, 13.11 ft), from rating curve extended above 5,200 cfs by logarithmic plotting; minimum, 3.3 cfs Aug. 17, 1949; minimum gage height, 0.42 ft Aug. 25, 1941, Aug. 17, 1950.

Remarks.--Records good except those for periods of ice effect or shifting control, which are fair.

Rating tables, water year 1951-52, except periods of ice effect or shifting control (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 23				Nov. 24 to Jan. 1		Jan. 2 to Sept. 30			
0.5	9.5	1.2	96	1.6	70	0.8	2.3	2.5	511
.6	15	1.6	200	1.8	121	.9	5.1	3.0	811
.7	23	2.0	354	2.0	182	1.0	10	3.5	1,190
.8	33	2.5	615	2.5	388	1.2	30	4.0	1,610
1.0	60	3.0	945	3.0	672	1.4	68	5.0	2,510
				3.5	1,020	1.6	121	6.0	3,500
				5.0	2,400	1.8	190	7.0	4,540
						2.0	271		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.5	17	266	1,800	240	108	156	63	65	20	7.0	8.3
2	12	18	186	1,000	889	100	263	59	59	17	6.4	19
3	12	e24	130	400	424	94	168	57	51	18	5.4	17
4	12	e21	108	270	2,070	430	154	51	49	23	6.3	16
5	11	e19	152	270	1,360	870	276	49	49	22	5.4	16
6	9.5	e28	130	229	458	330	670	47	45	16	7.5	11
7	16	e140	270	130	320	240	429	47	40	12	7.0	9.4
8	38	e300	313	135	280	200	380	45	37	11	5.9	8.3
9	*45	e108	541	130	333	170	482	42	37	13	25	7.8
10	33	e86	412	124	270	270	324	40	49	13	26	7.5
11	23	e145	205	116	320	*4,460	210	72	37	13	17	7.5
12	19	e130	*145	120	195	*1,190	168	326	*32	11	11	7.5
13	15	e200	104	112	130	507	274	*2,980	30	8.9	10	7.3
14	14	e500	90	225	120	*290	297	664	29	7.5	*10	7.8
15	12	e340	86	1,740	*112	225	1,310	733	28	6.7	9.2	74
16	12	e280	84	584	130	170	434	694	26	6.7	14	109
17	12	e460	90	302	135	170	254	284	26	6.7	82	38
18	11	e220	94	1,760	135	235	186	194	23	*12	38	31
19	11	150	100	*380	125	951	151	147	23	7.9	22	191
20	11	110	110	2,100	112	1,300	128	124	22	6.3	14	94
21	11	86	200	540	120	954	*109	671	20	3.4	23	45
22	11	124	620	270	116	679	98	483	20	4.9	23	33
23	12	900	400	310	110	698	257	198	23	7.3	18	27
24	14	458	310	195	106	461	203	224	20	5.9	13	30
25	22	182	220	180	104	289	138	570	19	5.1	9.7	23
26	27	322	170	1,620	94	246	121	259	12	5.1	8.9	18
27	22	225	160	1,650	98	213	101	158	14	8.4	7.8	16
28	19	130	150	540	110	179	87	112	14	6.7	8.3	15
29	18	124	155	185	110	151	77	95	25	8.1	8.3	14
30	18	150	560	140	-	134	70	82	40	11	12	13
31	19	-	800	135	-	131	-	70	-	8.9	10	-
Total	531.0	5,997	7,341	17,692	9,126	16,445	7,975	9,640	964	326.5	471.1	921.4
Mean	17.1	200	237	571	315	530	266	311	32.1	10.5	15.2	30.7
Cfsm	0.126	1.47	1.74	4.20	2.32	3.90	1.96	2.29	0.236	0.077	0.112	0.226
In.	0.15	1.64	2.01	4.84	2.50	4.50	2.18	2.64	0.26	0.09	0.13	0.25

Calendar year 1951: Max 4,670 Min 7.0 Mean 236 Cfsm 1.74 In. 23.53
Water year 1951-52: Max 4,460 Min 3.4 Mean 212 Cfsm 1.56 In. 21.19

Peak discharge (base, 5,300 cfs).--Mar. 11 (9:30 a.m.) 6,510 cfs (8.64 ft).
* Discharge measurement made on this day.
e Shifting-control method used.
Note.--Stage-discharge relation affected by ice Nov. 18-22, 27-29, Dec. 11 to Jan. 1, Jan. 3-5, 7-14, 19, 21-25, Jan. 28 to Feb. 1, Feb. 10, Feb. 12 to Mar. 4, Mar. 6-10, 14-18.

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Niagara River at Buffalo, N. Y.

Location.--Lat 42°52'40", long. 78°53'25", at head of Niagara River at Buffalo.

Drainage area.--263,500 sq mi, approximately.

Records available.--January 1905 to September 1952 (prior to October 1935, monthly discharge only).

Gage.--Flow computed by means of several United States Lake Survey gages on river.

Average discharge.--48 years (October 1904 to September 1952), 195,000 cfs (not including diversions from Lake Michigan and Erie).

Extremes.--Maximum daily discharge during year, 260,000 cfs Apr. 6; minimum daily, 187,000 cfs Nov. 6.
1905-52: Maximum monthly mean discharge, 244,000 cfs (revised) May 1929; minimum monthly, 117,000 cfs February 1936.

Remarks.--Records do not include 3,100 cfs diverted from Lake Michigan by Chicago Sanitary & Ship Canal and approximately 8,000 cfs from Lake Erie by Welland Canal in Ontario, and Black Rock Canal at Buffalo. They include about 5,000 cfs diverted into Lake Superior from Hudson Bay drainage. The first diversion from the Hudson Bay basin into Lake Superior began in 1937 from Long Lake for the purpose of floating pulpwood and was probably small. Since 1941 the diversion from Long Lake has been used for power and has averaged about 1,500 cfs. A second diversion was started in 1943 from Ogoki River into Lake Nipigon, where it is used for power at the outlet of that Lake.

Cooperation.--Records of daily discharge furnished by Corps of Engineers.

Revisions.--The monthly mean discharge for May 1929 has been revised to 244,000 cfs, superseding figure published in Water-Supply Paper 804.

Discharge, in thousands of cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	208	199	205	211	224	227	240	239	244	238	234	229
2	209	200	203	205	224	222	242	240	244	238	233	237
3	207	213	201	222	218	220	242	244	244	244	231	240
4	206	240	206	207	229	220	230	241	245	245	237	234
5	209	207	201	228	231	239	238	238	244	240	236	230
6	204	187	204	209	221	226	260	243	249	238	229	228
7	213	205	213	212	240	227	247	240	245	240	228	215
8	229	225	212	208	229	227	240	237	246	242	229	224
9	208	214	216	217	244	223	237	235	248	243	231	229
10	205	211	222	217	233	223	246	239	250	241	238	227
11	206	202	230	217	247	234	239	244	246	241	235	226
12	203	200	219	217	230	230	228	255	241	244	231	226
13	201	204	221	211	202	211	238	252	241	240	230	226
14	206	214	195	210	209	234	245	241	242	240	229	228
15	210	214	220	228	211	239	241	244	240	246	232	235
16	204	203	229	211	221	243	248	241	239	239	236	237
17	204	210	220	207	228	237	248	239	247	239	235	226
18	203	215	216	232	232	227	249	238	247	241	230	234
19	210	207	203	216	227	237	248	233	245	244	231	233
20	197	203	203	241	226	233	246	235	238	242	229	230
21	204	208	242	212	242	233	243	250	230	248	236	229
22	204	212	254	225	234	208	246	243	236	244	226	228
23	196	209	207	252	226	245	243	236	237	248	232	228
24	228	209	217	226	227	244	239	240	243	241	233	227
25	212	200	204	220	230	236	243	244	241	238	235	227
26	206	234	215	224	230	241	243	248	246	242	233	229
27	204	200	225	223	229	238	244	242	241	239	227	223
28	215	211	202	223	223	235	244	244	238	240	226	224
29	207	205	207	225	228	236	245	244	238	235	231	227
30	203	206	205	231	-	234	245	240	223	240	223	218
31	214	-	207	226	-	235	-	240	-	235	230	-
Total	6,433	6,267	6,624	6,813	6,595	7,164	7,287	7,489	7,258	7,475	7,176	6,854
Mean	208	209	214	220	227	231	243	242	242	241	231	228
Cfsm	0.789	0.793	0.812	0.835	0.861	0.877	0.922	0.918	0.918	0.915	0.877	0.865
In.	0.91	0.88	0.93	0.96	0.93	1.01	1.03	1.06	1.02	1.06	1.06	0.97

Calendar year 1951: Max 254 Min 180 Mean 216 Cfsm 0.820 In. 11.10
Water year 1951-52: Max 260 Min 187 Mean 228 Cfsm 0.865 In. 11.78

Little Tonawanda Creek at Linden, N. Y.

Location.--Lat 42°52'35", long. 78°09'45", on right bank at upstream side of highway bridge in Linden, Genesee County, and 7 miles upstream from mouth.

Drainage area.--22.0 sq mi.

Records available.--July 1912 to September 1952.

Gage.--Water-stage recorder and concrete control. Prior to Aug. 26, 1943, staff gage at same site and datum.

Average discharge.--39 years (1912-19, 1920-52), 27.5 cfs.

Extremes.--Maximum discharge during year, 1,330 cfs Mar. 11 (gage height, 9.30 ft); minimum, 0.2 cfs Sept. 13, 14, 15 (gage height, 0.165 ft).
1912-52: Maximum discharge, 2,400 cfs Apr. 22, 1916 (gage height, 14.6 ft, from floodmarks), from rating curve extended above 1,500 cfs by logarithmic plotting; minimum observed, 0.1 cfs Sept. 5-7, 1934, and several times during Aug. 4-28, 1936.

Remarks.--Records excellent except those below 2 cfs, which are good, and those for periods of ice effect, which are fair.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 11				Mar. 12 to Sept. 30			
0.25	0.4	1.5	36	0.15	0.2	1.1	19
.4	1.4	2.0	66	.2	.3	1.5	38
.5	2.5	3.0	158	.3	.8	2.5	110
.6	4.0	5.0	437	.4	1.6	3.5	219
.8	8.7	7.0	822	.5	2.9	4.0	287
1.1	18			.7	6.7		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.5	0.7	21	335	47	15	34	9.9	10	2.7	0.6	0.4
2	.6	.7	16	112	120	14	36	9.6	9.0	2.2	.5	.5
3	.6	.9	12	49	69	13	30	8.8	8.2	2.3	.5	.6
4	.5	.8	11	b37	307	33	28	8.5	7.7	3.2	.6	.5
5	.4	.8	11	34	125	90	105	8.2	7.7	2.2	.6	.5
6	.5	.8	10	28	60	b54	135	8.0	6.7	1.9	.5	.4
7	1.0	b3.0	15	b22	46	b39	65	7.2	6.0	1.8	.5	.4
8	*1.3	3.7	18	b20	40	32	54	6.9	5.4	1.7	.6	.4
9	1.0	2.7	30	20	36	28	43	6.7	5.0	1.6	.7	.4
10	.8	2.6	29	19	34	34	34	6.5	4.7	1.7	.7	.4
11	.7	3.4	19	b16	35	801	29	8.0	4.3	1.5	.7	.3
12	.7	3.2	*16	17	b28	176	25	*23	4.2	1.5	.6	.3
13	.7	2.9	b11	16	b23	*b84	38	149	*3.9	1.4	.6	.2
14	.7	6.1	b9.8	26	b21	b60	45	68	3.5	1.3	.5	.2
15	.7	9.0	b9.2	124	b20	b45	131	63	3.4	1.1	*.5	1.0
16	.6	7.2	b8.8	61	b21	b39	59	57	3.0	1.1	.8	1.1
17	.6	12	b9.0	38	b22	b36	37	30	3.0	*1.1	.8	.7
18	.6	9.5	b8.6	*183	*b22	36	29	22	2.7	1.1	.7	.8
19	.6	b7.2	b8.4	45	b20	76	24	18	2.6	1.0	.6	1.3
20	.6	b5.8	b10	95	b19	201	22	17	2.4	.9	.5	.8
21	.6	b5.0	21	53	19	175	*20	50	2.5	1.3	.6	.7
22	.6	6.1	b39	b35	18	120	18	40	2.5	1.0	.7	.7
23	.6	38	25	38	18	124	24	23	2.5	.8	.6	.8
24	.7	25	18	b26	17	85	20	33	2.7	.8	.5	.8
25	.8	13	15	b22	16	57	17	78	3.8	.8	.5	.6
26	.7	b15	16	91	16	51	16	36	3.0	.7	.5	.7
27	.7	b12	14	174	16	43	14	23	3.5	.7	.4	.6
28	.7	b9.6	14	67	15	36	13	17	2.7	.6	.4	.6
29	.7	9.8	15	b34	15	33	12	14	4.1	.7	.4	.6
30	.6	11	b50	b24	-	30	11	13	3.7	.7	.4	.5
31	.6	-	79	22	-	29	-	11	-	.6	.4	-
Total	21.0	227.5	588.8	1,883	1,265	2,693	1,168	868.3	134.4	42.0	17.5	17.8
Mean	0.68	7.58	19.0	60.7	43.6	86.9	38.9	28.0	4.48	1.35	0.56	0.59
Cfsm	0.031	0.345	0.864	2.76	1.98	3.95	1.77	1.27	0.204	0.061	0.025	0.027
In.	0.04	0.38	1.00	3.18	2.14	4.55	1.97	1.47	0.23	0.07	0.03	0.03

Calendar year 1951: Max 481 Min 0.4 Mean 30.4 Cfsm 1.38 In. 18.74
Water year 1951-52: Max 801 Min 0.2 Mean 24.4 Cfsm 1.11 In. 15.09

Peak discharge (base, 530 cfs).--Feb. 4 (5:30 a.m.) 541 cfs (5.60 ft); Mar. 11 (9:45 a.m.) 1,330 cfs (9.30 ft).
* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

Tonawanda Creek at Batavia, N. Y.

Location.--Lat 42°59'55", long. 78°11'20", on right bank 150 ft downstream from municipal dam, 500 ft upstream from Walnut Street Bridge in Batavia, Genesee County, and 3½ miles downstream from Little Tonawanda Creek.

Drainage area.--172 sq mi.

Records available.--July 1944 to September 1952.

Gage.--Water-stage recorder and concrete control. Datum of gage is 876.01 ft above mean sea level (city of Batavia benchmark).

Average discharge.--8 years, 202 cfs.

Extremes.--Maximum discharge during year, 4,480 cfs Mar. 12 (gage height, 12.58 ft); minimum, 1.1 cfs Sept. 14 (gage height, 1.08 ft, backwater from aquatic vegetation).
1944-52: Maximum discharge, 5,530 cfs Mar. 29, 1950; maximum gage height, 13.85 ft Apr. 6, 1947; minimum discharge, 1.0 cfs Aug. 17, 1949; minimum gage height, 0.59 ft July 26, 27, 1948.
Maximum stage known, 14.5 ft in March 1942, from records of city of Batavia.

Remarks.--Records good except those for periods of ice effect, backwater from aquatic vegetation or debris, or no gage-height record, which are fair. Slight regulation at low flow by plants above station.

Rating tables, water year 1951-52, except periods of ice effect or backwater from aquatic vegetation or debris (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 11				Mar. 12 to Sept. 30			
1.2	4.1	2.0	104	1.1	1.5	1.7	46
1.3	8.6	3.0	460	1.2	4.1	2.0	104
1.4	14	5.0	1,000	1.3	8.6	4.0	666
1.5	22	8.0	2,020	1.4	14	7.0	1,580
1.7	46			1.5	22	11.0	3,350

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.6	17	164	1,090	187	120	196	86	82	27	5.9	4.3
2	10	18	160	1,850	601	114	251	82	74	20	4.1	5.1
3	c9.6	22	114	612	597	114	202	78	66	18	4.7	5.9
4	8.8	26	90	b300	1,190	147	193	72	62	22	5.8	9.5
5	7.8	24	88	286	1,430	784	244	70	64	25	6.6	7.8
6	c6.0	20	95	220	679	487	900	68	59	19	6.8	5.6
7	c12	38	105	148	382	326	535	66	53	16	6.1	4.5
8	*c25	139	205	b140	294	b235	356	62	46	14	9.8	4.5
9	33	82	189	b140	278	b200	327	62	45	12	8.5	4.1
10	c26	56	359	136	243	206	*254	61	46	14	12	3.6
11	c18	62	176	95	258	2,020	208	66	37	13	7.8	2.2
12	16	70	*127	122	b205	3,330	184	c106	*34	11	9.8	2.0
13	14	61	78	117	b160	*996	202	*c600	32	9.4	8.4	1.5
14	13	83	b70	131	b145	448	270	750	29	9.1	*7.4	1.4
15	12	221	b68	622	*136	b320	675	387	28	7.8	5.9	13
16	12	104	b66	864	142	b250	645	504	27	7.4	16	66
17	12	235	b66	332	154	239	294	252	26	*7.1	23	29
18	12	163	b70	*798	154	229	223	181	25	7.1	23	21
19	11	107	b66	789	b135	421	187	150	24	7.4	18	45
20	10	79	b72	614	130	1,050	164	127	24	9.8	16	48
21	11	60	90	797	139	1,250	147	239	a21	12	14	24
22	11	78	248	b340	127	1,000	133	330	a19	12	16	17
23	11	285	235	b330	120	706	155	190	a22	11	21	16
24	13	371	167	b230	120	714	175	147	a25	8.4	14	15
25	16	147	112	174	120	378	144	500	a23	8.1	10	14
26	23	125	107	297	104	303	138	291	a35	7.1	8.1	12
27	18	129	107	1,160	114	267	122	193	a32	7.1	6.1	11
28	17	81	95	964	120	232	109	141	a26	5.7	5.5	11
29	16	104	97	b330	114	211	100	117	27	7.4	5.1	9.8
30	17	93	165	b170	-	193	93	104	39	8.4	4.3	8.6
31	17	-	562	148	-	187	-	90	-	8.4	4.5	-
Total	447.8	3,100	4,413	14,346	8,578	17,477	7,826	6,172	1,152	371.7	314.2	422.4
Mean	14.4	103	142	463	296	564	261	199	38.4	12.0	10.1	14.1
Cfsm	0.084	0.599	0.826	2.69	1.72	3.28	1.52	1.16	0.223	0.070	0.059	0.082
In.	0.10	0.67	0.95	3.10	1.85	3.78	1.69	1.33	0.25	0.08	0.07	0.09

Calendar year 1951: Max 3,760 Min 5.9 Mean 225 Cfsm 1.31 In. 17.77
Water year 1951-52: Max 3,330 Min 1.4 Mean 177 Cfsm 1.03 In. 13.96

Peak discharge (base, 1,800 cfs).--Jan. 2 (4 a.m.) 2,420 cfs (8.95 ft); Feb. 4 (9:30 p.m.) 1,870 cfs (7.63 ft); Mar. 12 (1:45 a.m.) 4,480 cfs (12.58 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated from reconstructed gage-height graph based on recorded range in stage, records for Little Tonawanda Creek at Linden, and observer's notes.

b Stage-discharge relation affected by ice.

c Backwater from debris.

Note.--Backwater from aquatic vegetation Sept. 5-30.

Barge Canal at lock 30, Macedon, N. Y.

Location.--Lat 43°04'20", long. 77°17'45", on left bank at lock 30, in Macedon, Wayne County, 500 ft downstream from headgate in old Erie Canal.
Records available.--November 1919 to December 1920, October 1950 to September 1952.
Gage.--Water-stage recorder. November 1919 to Dec. 28, 1920, staff gage at same site at different datum.
Extremes.--1919-20, 1950-52: Maximum daily discharge, 425 cfs June 14, 1951; minimum, 2 cfs Mar. 28, 1951, Mar. 26, 1952.
Remarks.--Records excellent except those for period when flow was computed at lock 29, which are fair. This record represents net diversion from Niagara and Genesee River basins into Oswego River basin through Erie division of Barge Canal. Discharge during period when canal level was drawn down, Jan. 9 to Mar. 28, made up chiefly from leakage through guard gates and runoff from small areas tributary to canal above station.
Cooperation.--Records of gate openings, lockages, and elevations of water surface in Barge Canal above and below locks 29 and 30 and record of powerplant operation at lock 29 furnished by New York State Department of Public Works.
Revisions.--Revised figures of discharge for period January to March in water year 1951 are given herewith. They supersede those published in Water-Supply Paper 1207.

Day	Discharge (cfs)	Day	Discharge (cfs)	Day	Discharge (cfs)
Jan. 8....	81	Jan. 28....	12	Mar. 7....	66
9....	66	29....	23	8....	66
10....	52	Feb. 19....	87	9....	52
11....	40	20....	131	10....	52
12....	40	21....	194	11....	40
13....	30	22....	194	12....	40
14....	28	23....	99	13....	40
15....	40	24....	33	14....	40
16....	40	25....	78	15....	51
18....	24	26....	68	16....	51
19....	30	27....	54	17....	39
20....	52	28....	44	18....	40
21....	28	Mar. 1....	40	19....	39
22....	40	2....	55	20....	79
23....	30	3....	53	21....	66
24....	30	4....	95	22....	66
25....	30	5....	102	23....	40
26....	24	6....	62	24....	49
				25....	42

Month	Cfs-days	Maximum	Minimum	Mean
January 1951.....	2,097	316	12	67.6
February.....	1,369	194	11	48.9
March.....	1,784	169	2	57.5
Water year 1951.....	82,432	425	2	226

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	362	350	334	98	38	32	95	109	134	337	343	343
2	362	356	328	100	45	28	104	252	130	334	349	352
3	372	356	258	193	54	27	102	340	122	352	343	334
4	*363	360	106	338	96	21	98	340	117	352	349	333
5	380	347	106	254	115	116	98	357	104	343	346	349
6	357	353	106	226	80	97	100	334	266	340	346	343
7	353	356	108	195	80	80	109	*334	337	337	334	352
8	347	362	108	158	51	59	102	337	328	340	343	340
9	350	356	108	125	45	40	*100	227	328	352	343	346
10	353	347	*106	96	40	39	100	136	325	343	340	343
11	374	340	106	79	38	116	100	120	331	352	340	343
12	371	355	106	49	48	136	100	125	325	346	343	349
13	359	355	106	40	29	136	112	137	325	343	*340	340
14	362	346	106	37	22	147	117	138	331	346	337	331
15	358	366	106	50	22	130	117	141	334	343	334	360
16	349	343	106	63	23	115	112	141	*325	*346	334	349
17	352	359	106	50	28	113	112	137	334	340	331	334
18	349	359	104	74	28	65	109	139	322	340	337	334
19	346	356	104	50	29	20	105	130	334	340	340	340
20	352	365	104	54	28	20	111	139	343	343	334	343
21	342	353	104	50	28	20	102	129	331	340	337	346
22	343	346	104	38	27	20	120	132	349	346	343	340
23	356	349	102	38	23	20	109	137	331	334	352	343
24	357	361	102	38	19	20	112	145	334	352	348	337
25	366	340	102	28	39	20	118	139	325	337	340	340
26	357	346	100	33	39	2	103	136	352	334	343	346
27	357	346	100	54	37	4	117	120	349	337	340	331
28	350	355	100	65	37	15	108	120	352	343	340	328
29	370	e343	100	39	37	7	111	122	346	346	346	346
30	359	e334	98	39	-	58	103	133	346	334	337	352
31	359	-	98	39	-	75	-	136	-	340	337	-
Total	11,087	10,560	3,832	2,790	1,225	1,798	3,206	5,562	8,910	10,612	10,567	10,267
Mean	358	352	124	90.0	42.2	58.0	107	179	297	342	341	342
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 425 Min 2 Mean 231 Cfsm - In. -
Water year 1951-52: Max 380 Min 2 Mean 220 Cfsm - In. -

* Discharge measurement made on this day.
e Shifting-control method used.
Note.--Water level at lock 30 drawn down Jan. 9 to Mar. 28 (doubtful gage-height record Jan. 9, Mar. 19-25); discharge computed from records of powerplant operation and bypass flow at lock 29.

Genesee River at Scio, N. Y.

Location.--Lat 42°09'50", long. 77°58'50", on left bank 0.4 mile upstream from Vandermark Creek and three-quarters of a mile upstream from Scio, Allegany County.

Drainage area.--309 sq mi.

Records available.--June 1916 to September 1952.

Gage.--Water-stage recorder. Prior to Aug. 11, 1938, staff gage and Aug. 11 to Oct. 11, 1938, water-stage recorder, at same site at datum, 1.0 ft higher.

Average discharge.--36 years, 390 cfs.

Extremes.--Maximum discharge during year, 6,450 cfs Mar. 11 (gage height, 9.00 ft); minimum, 20 cfs Aug. 4, 9, 10; minimum gage height, 0.61 ft Sept. 14.
1916-52: Maximum discharge, 12,200 cfs Nov. 25, 1950 (gage height, 11.22 ft); minimum, 5.8 cfs Sept. 4, 1939; minimum gage height, 0.18 ft Aug. 28, 1949, Aug. 16, 18, 1950.

Remarks.--Records good except those for periods of ice effect or backwater from weeds, which are fair.

Revisions.--W 759: Drainage area.

Rating tables, water year 1951-52, except for periods of ice effect, or backwater from weeds (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 1				Jan. 2 to Sept. 30			
0.6	24	3.0	577	0.5	17	3.0	630
.8	44	4.0	951	.7	34	4.0	1,100
1.0	70	5.0	1,580	1.0	70	6.0	2,560
1.5	160	7.0	3,440	1.5	174	8.0	4,740
2.0	275			2.0	300		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	36	36	331	2,550	580	200	777	228	426	52	23	27
2	36	40	350	2,450	1,000	180	1,000	213	358	46	22	28
3	35	48	323	1,510	921	175	931	193	303	45	21	30
4	34	46	341	1,100	2,510	178	850	176	*274	54	22	29
5	33	41	515	950	2,050	228	2,030	167	243	52	32	26
6	32	39	462	790	*1,280	188	3,320	162	210	43	33	25
7	32	195	525	620	1,090	180	*1,800	*145	186	*40	24	24
8	34	286	701	540	935	165	1,380	138	160	39	22	24
9	39	132	1,990	524	907	140	1,100	134	160	40	21	24
10	36	108	*1,340	465	759	*184	916	129	150	44	25	24
11	*34	110	908	377	694	3,910	832	152	127	41	38	24
12	34	103	750	368	570	3,650	689	590	118	36	30	23
13	34	91	600	325	450	1,910	1,010	577	106	34	54	23
14	33	163	410	480	370	1,310	1,540	433	100	74	*34	22
15	32	273	340	*1,530	360	992	2,740	457	94	38	28	45
16	32	303	250	1,400	376	833	1,800	429	86	35	41	73
17	31	518	230	1,250	352	715	1,330	335	88	33	90	48
18	30	327	240	4,330	324	666	1,060	419	92	33	44	40
19	29	250	250	2,030	290	746	902	338	82	34	35	108
20	29	190	250	2,030	260	1,230	772	482	75	40	30	84
21	29	155	450	1,420	260	2,650	643	929	72	39	40	55
22	28	185	780	1,040	245	2,910	546	605	70	43	96	49
23	28	1,070	540	1,060	219	2,520	532	475	70	40	54	45
24	30	992	440	740	210	2,250	468	532	69	35	42	42
25	33	580	340	600	200	1,560	436	2,010	64	33	37	40
26	36	511	320	1,160	180	1,340	417	2,130	58	29	34	38
27	34	415	290	4,480	180	1,220	349	1,250	54	29	33	37
28	33	290	270	2,160	195	1,030	314	931	52	26	31	36
29	34	280	265	1,200	200	888	282	768	56	27	29	35
30	35	270	528	820	-	772	258	610	60	30	28	35
31	34	-	1,080	680	-	694	-	492	-	24	28	-
Total	1,019	8,047	16,409	40,979	17,967	35,614	31,024	16,629	4,063	1,208	1,121	1,163
Mean	32.9	268	529	1,322	620	1,149	1,034	536	135	39.0	36.2	38.8
Cfsm	0.106	0.867	1.71	4.28	2.01	3.72	3.35	1.73	0.437	0.126	0.117	0.126
In.	0.12	0.97	1.97	4.93	2.16	4.29	3.73	2.00	0.49	0.15	0.13	0.14

Calendar year 1951: Max 5,740 Min 28 Mean 438 Cfsm 1.42 In. 19.25
Water year 1951-52: Max 4,480 Min 21 Mean 479 Cfsm 1.55 In. 21.08

Peak discharge (base, 3,800 cfs).--Jan. 18 (8 a.m.) 5,850 cfs (8.68 ft); Jan. 27 (5:30 a.m.) 5,840 cfs (8.67 ft); Mar. 11 (8:30 p.m.) 6,450 cfs (9.00 ft); Mar. 22 (12:30 a.m.) 4,270 cfs (7.67 ft); Apr. 6 (1 a.m.) 5,440 cfs (8.44 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 19-22, 25, 28, 29, Dec. 13-28, Jan. 7, 8, 24, 25, Jan. 29 to Feb. 2, Feb. 13-15, 19-21, Feb. 24 to Mar. 3, Mar. 7-9. Backwater from weeds Oct. 1 to Nov. 7, June 26 to Sept. 15.

Caneadea Creek at Caneadea, N. Y.

Location.--Lat 42°23'10", long. 78°09'45", on left bank at Caneadea, Allegany County, 800 ft upstream from small tributary and 0.6 mile upstream from mouth.

Drainage area.--61.5 sq mi.

Records available.--July 1949 to September 1952.

Gage.--Water-stage recorder.

Extremes.--Maximum discharge during year, 1,110 cfs Feb. 29 (gage height, 4.66 ft), from rating curve extended above 310 cfs by logarithmic plotting; maximum gage height, 5.73 ft Feb. 28 (ice jam); minimum discharge, 1.4 cfs Feb. 6 (gage height, 1.845 ft); minimum daily, 1.5 cfs Jan. 7-10.

1949-52: Maximum discharge, 1,590 cfs Sept. 25, 1951 (gage height, 5.00 ft), from rating curve extended above 710 cfs by logarithmic plotting; maximum gage height, that of Feb. 28, 1952; minimum discharge, 0.9 cfs Oct. 21, 1949 (gage height, 1.63 ft); minimum daily, 1.0 cfs Oct. 19, 20, 1949.

Remarks.--Records good except those for periods of ice effect, backwater from aquatic vegetation, or no gage-height record, which are fair. Flow regulated by Rushford Lake, formerly called Caneadea Reservoir (capacity, 1,106,000,000 cu ft) about 2 miles above station.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Dec. 6, Jan. 11 to Feb. 28				Dec. 6 to Jan. 11, Feb. 28 to Sept. 30			
1.87	1.6	2.4	28	1.97	1.5	2.6	44
1.9	2.0	2.6	56	2.0	1.8	2.9	101
2.0	3.7	2.8	98	2.1	3.6	3.2	191
2.1	6.8	3.0	156	2.2	7.2	3.5	325
2.2	12	3.5	376	2.3	13	4.0	615
2.3	18	4.4	1,060	2.4	20	4.6	1,060

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a300	a235	2.2	6.5	5.2	1,010	478	37	46	14	4.7	2.9
2	a290	a235	2.2	3.6	4.4	1,010	478	33	39	12	4.2	2.9
3	a260	a230	2.1	2.4	3.4	991	322	30	32	12	3.9	3.1
4	a260	a230	2.4	2.0	4.7	504	4.5	c26	55	13	4.8	2.9
5	a260	a230	2.4	1.7	2.1	4.2	8.8	25	62	12	7.7	2.8
6	a260	a230	95	1.6	1.6	3.4	7.6	*c24	*52	9.9	*6.8	2.8
7	a260	a230	315	1.5	1.8	155	5.0	22	41	8.8	6.2	2.8
8	a260	98	315	1.5	*14	467	4.2	20	35	8.3	5.6	2.9
9	a150	2.3	320	1.5	50	473	3.9	20	76	*8.0	5.4	3.0
10	a2.9	2.1	*315	1.5	73	*284	*5.3	20	106	7.2	5.6	3.0
11	*a2.9	2.0	222	140	84	13	13	26	73	5.8	4.7	3.1
12	a92	1.9	2.3	387	84	8.3	25	51	52	5.8	4.7	3.1
13	a270	1.8	94	376	82	6.6	50	94	41	5.2	4.8	3.2
14	a270	2.7	310	371	78	5.2	86	119	33	5.2	207	3.2
15	a270	2.2	300	*274	72	4.5	318	109	28	6.0	262	5.5
16	a270	4.1	300	5.3	65	4.1	286	106	27	4.1	266	3.6
17	a270	3.3	285	5.0	65	3.9	188	88	27	3.9	266	3.5
18	a260	2.5	280	11	63	4.1	122	77	24	4.5	112	3.8
19	a260	2.4	275	5.4	60	5.0	101	64	21	5.4	3.0	4.5
20	a260	2.1	165	6.4	58	6.6	88	62	17	5.2	2.9	3.6
21	a260	2.4	2.5	6.0	59	8.3	71	92	16	8.9	3.6	3.6
22	a260	2.7	2.5	6.4	244	7.7	62	92	15	8.0	3.0	3.6
23	a250	4.6	2.4	6.0	524	8.3	70	77	14	7.5	2.9	3.6
24	a250	3.0	2.4	5.4	518	6.6	71	76	15	6.1	2.9	148
25	a250	2.5	2.3	5.2	505	5.6	66	222	16	4.2	2.9	275
26	a250	2.4	2.2	9.6	757	5.6	62	303	16	3.9	2.9	266
27	a245	2.1	2.1	12	992	5.4	58	200	18	5.2	2.8	266
28	a245	2.0	2.0	6.0	996	4.8	55	131	16	5.0	2.8	262
29	a240	2.1	2.2	5.2	999	4.5	49	94	17	8.0	2.9	257
30	a240	2.3	4.0	4.7	-	4.2	43	70	16	7.2	2.9	257
31	a240	-	3.9	4.4	-	251	-	54	-	5.8	2.9	-
Total	7,257.8	1,773.5	3,633.1	1,675.8	6,465.2	5,274.9	3,201.3	2,464	1,046	226.1	1,220.5	1,808.0
Mean	234	59.1	117	54.1	223	170	107	79.5	34.9	7.29	39.4	60.3

Adjusted

Mean	87.8	89.2	126	240	142	259	164	80.4	32.1	5.49	17.0	16.8
Cfsm	1.43	1.45	2.05	3.90	2.31	4.21	2.67	1.31	0.522	0.089	0.276	0.273
In.	1.65	1.62	2.37	4.51	2.49	4.85	2.97	1.51	0.58	0.10	0.32	0.30

	Observed			Adjusted†			
Calendar year 1951:	Max 703	Min 1.8	Mean 102	Mean 95.5	Cfsm 1.55	In. 21.07	
Water year 1951-52:	Max 1,010	Min 1.5	Mean 98.5	Mean 105	Cfsm 1.71	In. 23.27	

* Discharge measurement made on this day.

† Adjusted for change in contents in Rushford Lake (records of change in contents furnished by Rochester Gas and Electric Corp.).

a No gage-height record; discharge estimated from reconstructed gage-height graph based on recorded range in stage, observer's readings, and record of operation of Rushford Lake.

c Backwater from aquatic vegetation.

Note.--Stage-discharge relation affected by ice Nov. 19-22, 25-29, Dec. 3, 12, 13, 20-31, Jan. 3, 4, 6-10, 17, 19-26, Jan. 28 to Feb. 1, Feb. 7-9, 13-15, 19, 20, Mar. 5-7, 13-17, 28, 29.

Genesee River at Portageville, N. Y.

Location.--Lat 42°34'10", long. 78°02'45", on left bank at Portageville, Wyoming County, 300 ft downstream from small tributary, 350 ft downstream from Pennsylvania Railroad bridge, and 0.7 mile upstream from Upper Falls.
Drainage area.--982 sq mi.
Records available.--August 1908 to September 1950 (published as "at St. Helena"), December 1945 to September 1952.
Gage.--Water-stage recorder at present site and datum since Dec. 16, 1945. Datum of gage is 1,082.60 ft above mean sea level (levels by Corps of Engineers). Prior to Aug. 24, 1911, chain gage and Aug. 24, 1911, to Sept. 30, 1950, water-stage recorder, at site 8 miles downstream at different datum.
Average discharge.--44 years , 1,233 cfs.
Extremes.--Maximum discharge during year, 23,200 cfs Mar. 12 (gage height, 15.08 ft); minimum, 46 cfs Sept. 14 (gage height, 2.13 ft).
1908-52: Maximum discharge, 44,400 cfs May 17, 1916 (gage height, 12.81 ft, site and datum then in use); maximum gage height, 19.28 ft Mar. 29, 1950; minimum discharge, 18 cfs Oct. 5, 17, 1913 (gage height, 1.70 ft, site and datum then in use).
Remarks.--Records good except those for periods of ice effect or no recorder record, which are fair. Diurnal fluctuation at low flow caused by powerplants. Some seasonal regulation by Rushford Lake (capacity, 1,106,000,000 cu ft).
Revisions (water years).--W 264: 1908. W 564: 1916(M). W 759: Drainage area.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.2	51	5.0	1,440
2.5	81	6.0	2,740
3.0	179	7.0	4,320
3.5	344	9.0	8,420
4.0	591	11.5	14,400
4.5	954		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	326	a294	946	9,600	1,420	1,430	1,990	612	a870	172	74	74
2	332	a306	1,200	8,430	2,770	1,360	2,500	569	765	157	71	72
3	316	a314	1,040	3,720	2,600	1,340	2,250	500	670	157	69	73
4	320	299	926	2,420	6,690	1,260	1,780	490	742	148	68	77
5	302	305	1,090	2,050	a6,410	872	4,920	491	784	146	104	80
6	300	a288	1,130	1,700	a3,290	*868	11,800	*406	*607	144	*86	67
7	322	a344	*1,470	1,370	a2,370	783	4,360	426	514	131	79	63
8	368	a1,100	3,250	1,110	a1,950	1,100	3,220	409	460	121	84	62
9	346	a644	5,130	1,200	a1,950	972	2,550	374	1,070	119	77	60
10	*214	a396	5,150	1,070	1,770	1,010	*2,000	376	1,120	*119	77	60
11	132	371	2,840	900	1,620	12,200	1,720	401	647	87	68	61
12	124	399	1,910	1,240	*1,400	14,300	1,480	990	495	82	76	61
13	230	a335	1,470	1,160	1,180	5,570	1,880	2,500	427	82	85	55
14	308	a320	1,450	1,290	964	3,370	2,660	1,830	356	101	80	55
15	312	a389	b1,350	*4,850	872	2,370	8,590	1,360	330	101	188	134
16	311	a1,160	b1,000	4,830	1,020	1,990	4,830	1,610	300	115	308	245
17	318	a2,100	b780	2,580	998	1,600	3,090	1,150	314	101	350	128
18	323	1,410	b980	10,500	902	1,500	2,290	1,040	298	99	354	134
19	302	961	b1,020	4,770	804	2,070	1,860	1,060	273	99	156	152
20	298	758	b920	4,080	741	3,970	1,600	928	247	90	119	208
21	299	589	905	3,600	777	8,130	1,380	2,040	235	125	114	220
22	300	586	2,750	2,310	764	8,680	1,230	1,740	213	122	149	168
23	299	3,730	1,560	2,320	1,130	6,440	1,320	1,280	208	98	159	144
24	307	3,280	1,350	1,690	1,140	5,990	1,310	1,110	236	88	148	129
25	314	1,920	806	1,310	1,130	3,570	1,110	3,820	253	98	118	310
26	311	1,330	917	1,590	1,170	3,020	1,080	4,730	196	82	102	314
27	299	1,170	746	10,600	1,480	2,720	972	2,810	182	94	95	312
28	294	797	724	5,380	1,460	2,200	862	1,910	170	87	88	318
29	311	757	708	2,530	1,440	1,850	758	1,500	192	82	79	306
30	293	753	1,460	b1,600	-	1,600	632	a1,270	201	86	80	302
31	a293	-	4,780	b1,350	-	1,540	-	a1,060	-	80	83	-
Total	9,124	27,405	51,738	103,150	52,212	105,675	78,024	40,819	13,376	3,413	3,788	4,442
Mean	294	914	1,669	3,327	1,800	3,409	2,601	1,317	446	110	122	148

†Adjusted for change in contents

Mean	148	944	1,678	3,514	1,720	3,498	2,658	1,318	443	108	99.8	105
Cfsm	0.151	0.961	1.71	3.58	1.75	3.56	2.71	1.34	0.451	0.110	0.102	0.107
In.	0.17	1.07	1.97	4.13	1.89	4.11	3.02	1.55	0.50	0.13	0.12	0.12

	Observed			Adjusted			
Calendar year 1951:	Max 18,000	Min 82	Mean 1,357	Mean 1,350	Cfsm 1.37	In. 18.66	
Water year 1951-52:	Max 14,300	Min 55	Mean 1,347	Mean 1,354	Cfsm 1.38	In. 18.78	

Peak discharge (base, 15,000 cfs).--Mar. 12 (12:15 a.m.) 23,200 cfs (15.08 ft); Apr. 6 (4 a.m.) 17,900 cfs (12.85 ft).
* Discharge measurement made on this day.
† Adjusted for change in contents in Rushford Lake (records of change in contents furnished by Rochester Gas and Electric Corp.
a No recorder record; discharge estimated on basis of reconstructed gage-height graph.
b Stage-discharge relation affected by ice.

Canaseraga Creek near Dansville, N. Y.

Location.--Lat 42°33'40", long. 77°42'55", on left bank just downstream from Ossian Street Bridge, half a mile downstream from Mill Creek and 1 mile west of Dansville, Livingston County.

Drainage area.--153 sq mi.

Records available.--July 1910 to December 1912, July 1915 to June 1917, October 1917 to September 1919 (published as "at Cumminsville"), March 1919 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 640.00 ft above mean sea level (levels by New York State Conservation Commission). Prior to Oct. 19, 1920, staff gage at or within 1 mile of present site at various datums. Oct. 19, 1920, to Sept. 30, 1938, water-stage recorder at present site and datum. Oct. 1, 1938, to Oct. 8, 1940, at site 0.9 mile downstream at datum 2.85 ft lower.

Average discharge.--32 years (1920-52), 150 cfs.

Extremes.--Maximum discharge during year, 3,630 cfs Mar. 11 (gage height, 10.44 ft), from rating curve extended above 1,700 cfs on basis of slope-area determination at gage height, 12.16 ft; minimum, 18 cfs Sept. 13, 14, 15; minimum gage height, 5.90 ft Oct. 3, 4.

1910-12, 1915-52: Maximum discharge at present site, 8,830 cfs July 23, 1940 (gage height, 13.1 ft, from floodmark), from rating curve extended above 900 cfs on basis of contracted-opening determination of peak flow; maximum at former site, 9,110 cfs July 23, 1940 (gage height, 9.93 ft), from rating curve extended above 2,100 cfs on basis of slope-area determination of peak flow; minimum, 10 cfs Aug. 9, 1934, Sept. 27, 28, 1941.

Remarks.--Records good except those for periods of ice effect or obstructed intake or backwater from debris, which are fair.

Revisions (water years).--W 604: 1923-24. W 759: Drainage area. W 894: 1935.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	25	27	88	1,100	b205	78	234	133	102	42	28	26
2	29	29	99	516	326	74	243	130	93	40	26	31
3	27	41	99	311	298	70	238	123	84	40	24	33
4	27	39	91	228	978	80	234	123	137	38	43	28
5	27	32	83	201	682	235	1,170	119	119	36	*71	24
6	29	30	*76	b165	402	172	1,170	*113	93	36	34	23
7	44	118	96	b125	320	*146	567	109	81	34	29	21
8	39	130	203	b120	278	120	404	106	75	33	28	21
9	c36	83	901	b116	299	110	352	102	c300	34	26	21
10	*c34	74	241	b104	259	140	*323	90	*c135	*36	34	21
11	c34	71	145	b90	*235	1,900	256	102	c90	33	29	20
12	c36	66	115	b88	204	955	225	306	c78	31	29	20
13	c32	58	b78	84	b170	544	284	c38	c66	29	29	18
14	c29	65	b64	*124	b155	381	483	192	c62	28	26	16
15	c27	90	b62	404	b145	b270	887	167	c58	28	24	60
16	c27	157	b52	296	b155	230	479	179	c54	29	29	40
17	c25	182	b41	223	140	204	352	144	c52	31	31	28
18	c25	130	b43	1,020	125	221	298	144	c50	31	50	28
19	c23	102	b45	371	116	308	265	126	c50	29	40	59
20	c23	b80	b43	419	108	647	243	130	c47	28	29	40
21	c23	b66	112	320	102	968	221	179	c47	40	38	34
22	c22	83	202	244	88	786	200	148	c47	31	42	31
23	c22	330	102	268	78	662	256	126	c47	29	33	29
24	c23	192	b78	204	78	484	221	141	c45	29	31	31
25	c23	121	b64	196	72	*378	204	398	c45	28	29	31
26	c29	115	b58	322	66	362	196	367	c43	28	28	31
27	c27	b96	b49	900	70	332	175	230	43	33	28	29
28	c25	b72	b47	451	78	280	163	175	42	28	28	29
29	c27	b68	b45	251	80	243	152	152	55	31	28	28
30	c25	74	167	b215	-	221	144	133	47	28	28	28
31	c25	-	460	b190	-	212	-	113	-	28	28	-
Total	884	2,821	4,049	9,686	6,312	11,813	10,639	5,038	2,287	999	1,000	881
Mean	28.5	94.0	131	312	218	381	355	163	76.2	32.2	32.3	29.4
Cfsm	0.186	0.614	0.856	2.04	1.42	2.49	2.32	1.07	0.498	0.210	0.211	0.192
In.	0.21	0.69	0.98	2.35	1.53	2.87	2.59	1.22	0.56	0.24	0.24	0.21

Calendar year 1951: Max 1,700 Min 22 Mean 186 Cfsm 1.22 In. 16.46
Water year 1951-52: Max 1,900 Min 18 Mean 154 Cfsm 1.01 In. 13.69

Peak discharge (base, 2,000 cfs).--Jan. 18 (3 a.m.) 2,300 cfs (9.51 ft); Mar. 11 (12:30 p.m.) 3,630 cfs (10.44 ft); Apr. 5 (9 p.m.) 3,150 cfs (10.12 ft).

* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

c Backwater from debris.

Note.--Intake obstructed Oct. 9 to Nov. 7, Dec. 7, Jan. 14, Feb. 17 to Mar. 5, Mar. 9-11; discharge computed on basis of discharge measurements, gage-height record, outside gage readings, and records for other stations in the Genesee River basin.

Genesee River at Jones Bridge, near Mount Morris, N. Y.

Location.--Lat 42°45'55", long. 77°50'25", on right bank at Jones Bridge, 1½ miles downstream from Canaseraga Creek, and 3½ miles northeast of Mount Morris, Livingston County.

Drainage area.--1,419 sq mi.

Records available.--May 1903 to April 1906, August 1908 to April 1914, July 1915 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 540.00 ft above mean sea level (levels by New York State Conservation Commission). Prior to Sept. 11, 1915, chain gage on bridge at datum 2.73 ft lower.

Average discharge.--42 years (1908-13, 1915-52), 1,602 cfs (unadjusted).

Extremes.--Maximum discharge during year, 9,500 cfs Apr. 6 (gage height, 13.67 ft); maximum gage height, 14.30 ft Dec. 31 (ice jam); minimum discharge, 48 cfs Aug. 3 (gage height, 0.62 ft); minimum daily, 84 cfs Sept. 10.
1903-6, 1908-14, 1915-52: Maximum discharge, 55,100 cfs May 17, 1916 (gage height, 25.44 ft); minimum, 18 cfs Aug. 29, 1909; minimum daily, 30 cfs Aug. 8, 1909.

Remarks.--Records good except those for periods of ice effect or doubtful gage-height record, which are fair. Diurnal fluctuation at low flow caused by powerplants. Slight seasonal regulation by Rushford Lake (capacity, 1,106,000,000 cu ft). High flows regulated by Mount Morris Reservoir (capacity, 14,700,000,000 cu ft); first effective use Nov. 24, 1951.

Revisions.--W 759: Drainage area.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	383	358	954	b7,400	1,930	1,740	2,380	924	1,700	264	138	112
2	379	354	1,300	b6,000	2,920	1,670	2,890	907	976	241	132	131
3	379	368	1,270	8,170	3,760	1,590	2,950	822	818	216	101	128
4	375	395	1,100	8,100	5,520	1,790	2,530	750	711	231	126	131
5	348	375	1,110	7,630	6,680	2,300	3,170	724	1,040	232	178	128
6	342	310	1,320	4,070	6,720	1,730	7,860	724	1,050	222	161	133
7	362	388	1,330	2,000	5,750	1,460	5,890	632	717	187	150	88
8	404	940	2,970	1,510	2,950	1,380	6,460	617	643	208	143	143
9	*433	1,140	3,450	1,550	2,800	1,440	*5,980	578	940	169	120	115
10	399	634	5,670	1,510	2,680	1,400	5,450	554	1,670	166	113	84
11	287	483	4,450	1,300	2,420	5,890	4,710	583	*1,060	171	170	97
12	216	444	2,430	1,380	2,160	7,360	2,950	825	746	158	116	699
13	208	476	*1,830	1,490	b1,650	8,020	1,590	2,560	*671	107	132	358
14	274	424	b1,650	1,440	b1,350	*7,460	1,800	*2,510	558	145	122	108
15	317	722	b1,550	3,580	b1,160	7,880	4,550	1,870	454	146	146	168
16	351	1,070	b1,300	6,240	1,300	d7,740	6,860	1,940	429	*137	240	339
17	348	2,260	b1,120	3,590	1,450	d7,020	6,610	1,720	408	160	383	269
18	352	1,900	b1,200	*6,470	1,330	d6,700	6,330	1,360	386	140	391	200
19	363	1,290	b1,200	7,220	*1,200	4,740	4,450	1,370	374	152	*396	239
20	337	971	b1,350	6,890	1,050	4,400	2,610	1,220	387	155	233	258
21	325	744	b1,700	5,730	1,070	7,410	1,960	1,700	373	162	183	279
22	344	719	b2,500	4,660	1,090	7,780	1,260	2,300	356	155	196	271
23	346	2,130	b3,000	3,280	1,160	7,920	2,060	1,760	365	164	257	220
24	340	4,170	b2,200	2,570	1,400	7,730	3,990	1,410	287	176	209	204
25	370	2,620	b1,300	1,940	1,380	7,220	2,200	2,880	290	140	190	268
26	364	1,650	b1,350	1,950	1,360	7,090	1,590	4,740	294	125	162	317
27	358	1,460	b1,000	6,180	1,640	6,430	1,480	1,610	269	135	158	349
28	340	1,010	b980	6,760	1,790	*4,010	1,400	2,590	231	141	155	337
29	349	913	b960	d6,940	1,810	2,780	1,190	3,380	196	117	137	333
30	348	895	b2,150	d4,690	-	2,420	984	2,640	252	163	121	325
31	336	-	b4,500	1,980	-	2,180	-	2,050	-	142	128	-
Total	10,677	31,613	60,194	134,220	69,480	46,680	106,134	50,250	18,651	5,227	5,587	6,831
Mean	344	1,054	1,942	4,330	2,396	4,732	3,538	1,621	622	169	180	228

Adjusted for change in contents in Rushford Lake and Mount Morris Reservoir

Mean	198	1,103	2,032	4,440	2,319	4,821	3,586	1,687	610	168	158	120
Cfsm	0.140	0.777	1.43	3.13	1.63	3.40	2.53	1.19	0.430	0.118	0.111	0.085
In.	0.16	0.87	1.65	3.61	1.76	3.92	2.82	1.37	0.48	0.14	0.13	0.09

	Observed						Adjusted†					
Calendar year 1951:	Max	12,500	Min	110	Mean	1,815	Mean	1,817	Cfsm	1.28	In.	17.38
Water year 1951-52:	Max	8,170	Min	84	Mean	1,764	Mean	1,772	Cfsm	1.25	In.	17.00

* Discharge measurement made on this day.
† Adjusted for change in contents in Rushford Lake and Mount Morris Reservoir (records of change in contents in Rushford Lake furnished by Rochester Gas and Electric Corp. and in Mt. Morris Reservoir by Corps of Engineers).
b Stage-discharge relation affected by ice.
d Doubtful gage-height record; discharge computed on basis of reconstructed gage-height graph based on records for other stations in the Genesee River basin.

Canadice Lake Outlet near Hemlock, N. Y.

Location.--Lat 42°44'25", long. 77°34'15", upstream from weir at outlet of Canadice Lake, Ontario County, 4 miles southeast of Hemlock, Livingston County.

Drainage area.--12.6 sq mi.

Records available.--April 1903 to September 1952.

Gage.--Hook gage. Datum of gage is 1,093.00 ft above mean sea level (furnished by city of Rochester). Gage readings have been reduced to elevations above mean sea level.

Average discharge.--49 years, 11.7 cfs (unadjusted).

Cooperation.--Records furnished by Department of Public Works, city of Rochester.

Monthly discharge, water year October 1951 to September 1952

Month	Mean elevation of lake (feet)	Observed discharge, in cubic feet per second	Adjusted†		
			Discharge, in cubic feet per second		Runoff in inches
			Mean	Per square mile	
October	1,095.14	11.766	-2.567	-0.204	-0.235
November	1,094.70	.024	2.571	.204	.228
December	1,094.61	12.198	7.805	.619	.714
Calendar year 1951	1,096.13	9.211	13.197	1.047	14.217
January	1,094.95	7.521	23.977	1.903	2.194
February	1,096.86	7.880	20.235	1.606	1.732
March	1,097.92	17.919	40.576	3.220	3.713
April	1,098.84	33.515	34.738	2.757	3.076
May	1,098.80	13.968	14.042	1.114	1.285
June	1,098.54	7.454	-2.077	-.165	-.184
July	1,097.30	15.294	-3.594	-.285	-.329
August	1,095.69	15.583	-3.668	-.291	-.336
September	1,094.12	14.956	-.582	-.046	-.052
Water year 1951-52	1,096.45	13.193	10.929	.867	11.806

† Adjusted for change in contents in Canadice Lake. Negative figures indicate that natural losses from Canadice Lake exceeded inflow.

Note.--Elevation of Canadice Lake: 1,095.85 ft at 12 p.m. Sept. 30, 1951; 1,093.46 ft at 12 p.m. Sept. 30, 1952; 1,090.04 ft at 12 p.m. Dec. 31, 1950; 1,094.42 ft at 12 p.m. Dec. 31, 1951.

Honeoye Creek at Honeoye Falls, N. Y.

Location.--Lat 42°57'25", long. 77°35'20", on right bank 25 ft downstream from highway bridge at Honeoye Falls, Monroe County, and 13 miles upstream from mouth.
Drainage area.--197 sq mi.
Records available.--October 1945 to September 1952.
Gage.--Water-stage recorder. Datum of gage is 609.98 ft above mean sea level (levels by Corps of Engineers).
Average discharge.--7 years, 172 cfs (adjusted for storage and diversion).
Extremes.--Maximum discharge during year, 1,610 cfs Mar. 11 (gage height, 4.45 ft); minimum, 0.39 cfs Sept. 14, 15 (gage height, 0.35 ft); minimum daily, 0.4 cfs Sept. 10-14, 30.
1945-52: Maximum discharge, 4,630 cfs Mar. 28, 1950 (gage height, 6.42 ft), from rating curve extended above 2,100 cfs by logarithmic plotting; minimum, 0.06 cfs Aug. 28, 1949; minimum gage height, 0.35 ft Aug. 28, 1949, Sept. 14, 15, 1952; minimum daily discharge, 0.1 cfs Aug. 24-28, 1949.
Remarks.--Records good except those for periods of ice effect, backwater from debris or weeds, or those below 1 cfs, which are fair. Some diversion from and regulation by Hemlock and Canadice Lakes for water supply of city of Rochester. Diurnal fluctuation at low flow caused by mills above station.

Rating tables, water year 1951-52, except periods of ice effect or backwater from weeds or debris (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 11		Mar. 12 to Sept. 30					
0.6	1.4	0.35	0.4	0.9	7.5	3.0	500
.7	2.7	.4	.5	1.1	16	3.5	810
		.5	.9	1.4	35	4.0	1,190
Note.--Same as		.6	1.6	1.8	79	5.0	2,250
following table		.7	2.7	2.1	138		
above 0.7 ft.		.8	4.7	2.5	270		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.4	2.6	9.6	216	111	b90	165	95	114	5.6	11	0.7
2	5.0	2.7	9.8	287	132	b84	174	84	88	5.4	10	.7
3	4.4	4.0	10	142	165	b78	184	76	76	4.7	8.9	.6
4	*2.4	3.7	11	b120	442	104	180	70	70	4.1	7.5	.6
5	2.2	3.8	11	b102	600	599	429	66	68	2.9	6.9	.6
6	2.0	3.7	10	b92	364	365	1,260	62	64	2.2	6.2	.5
7	3.0	5.9	11	b86	231	b195	580	60	56	1.9	6.1	.5
8	4.1	9.6	10	b82	200	b125	388	56	50	1.4	6.0	.5
9	3.1	14	12	b92	214	b112	*338	*54	44	1.3	5.5	.5
10	4.3	13	*c15	b90	200	b135	291	52	41	1.6	5.4	.4
11	4.3	12	20	b80	200	1,090	258	66	39	1.2	6.0	.4
12	4.0	10	b17	b86	b175	*1,140	217	215	36	1.1	7.2	.4
13	3.6	8.9	b14	b86	b130	426	214	290	33	1.0	6.6	.4
14	3.3	8.2	b11	87	b130	235	266	195	31	c10	5.8	.4
15	2.7	7.0	b10	143	b120	b205	635	145	27	c22	4.9	2.4
16	2.3	11	b8.6	220	b118	b185	583	190	25	*c22	5.0	2.0
17	2.1	20	6.9	*141	b110	174	402	155	*24	c21	5.7	1.1
18	1.8	27	7.2	320	b110	187	334	125	25	c20	*4.0	.7
19	1.6	24	7.5	281	*b112	364	291	110	22	c19	3.4	.8
20	1.5	20	6.9	219	b112	714	266	100	20	c21	2.8	.8
21	1.5	18	9.2	234	b114	560	231	190	17	c26	2.8	.7
22	1.4	14	11	b124	b100	436	203	185	15	27	2.6	.6
23	1.5	12	19	b122	b98	402	206	135	12	25	2.2	.6
24	1.8	13	23	b112	b92	402	206	112	11	22	1.8	.6
25	2.1	13	16	b110	b88	316	180	330	10	20	1.4	.6
26	2.1	15	14	b135	b86	262	165	420	8.0	17	1.2	.6
27	2.1	14	12	342	b82	235	146	370	6.0	16	1.0	.5
28	2.6	15	11	298	b86	214	131	300	5.4	14	.9	.5
29	2.5	12	12	b155	b92	193	117	225	5.2	13	.9	.5
30	2.6	10	15	b130	-	174	105	170	5.4	13	.9	.4
31	2.6	-	b66	b110	-	165	-	140	-	12	.8	-
Total	85.9	347.1	426.7	4,844	4,814	9,966	9,145	4,843	1,048.0	374.4	141.4	20.6
Mean	2.77	11.6	13.8	156	166	321	305	156	34.9	12.1	4.56	0.69
Adjusted†												
Mean	0.542	27.8	51.3	264	261	515	466	214	47.7	0.171	-4.87	-0.010
Cfsm	0.003	0.141	0.260	1.34	1.32	2.61	2.37	1.09	0.242	0.001	-0.025	0.000
In.	0.00	0.16	0.30	1.55	1.43	3.01	2.64	1.25	0.27	0.00	-0.03	0.00

	Observed			Adjusted†		
Calendar year 1951:	Max 1,600	Min 0.4	Mean 130	Mean 198	Cfsm 1.01	In. 13.67
Water year 1951-52:	Max 1,260	Min 0.4	Mean 98.5	Mean 153	Cfsm 0.777	In. 10.58

* Discharge measurement made on this day.
† Adjusted for diversions from and change in contents in Hemlock and Canadice Lakes; outlet of Honeoye Lake is not controled (records of diversion and change in contents furnished by Department of Public Works, city of Rochester). Negative figures of adjusted discharge or runoff indicate that losses from Hemlock, Canadice, and Honeoye Lakes exceeded inflow.
b Stage-discharge relation affected by ice.
c Backwater from debris.
Note.--Backwater from weeds May 3 to July 4.

Oatka Creek at Garbutt, N. Y.

Location.--Lat 43°00'30", long. 77°47'25", on right bank 40 ft downstream from highway bridge at Garbutt, Genesee County, and 3½ miles upstream from mouth.

Drainage area.--208 sq mi.

Records available.--October 1945 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 560.89 ft above mean sea level (levels by Corps of Engineers).

Average discharge.--7 years, 215 cfs.

Extremes.--Maximum discharge during year, 2,960 cfs Mar. 12 (gage height, 6.24 ft); minimum, 18 cfs Aug. 9 (gage height, 2.095 ft).
1945-52: Maximum discharge, 6,080 cfs Mar. 29, 1950 (gage height, 8.52 ft); minimum, 10 cfs Dec. 9, 1949 (gage height, 1.975 ft, backwater from ice and debris).

Remarks.--Records excellent except those for periods of ice effect or backwater from weeds or debris, which are good.

Rating tables, water year 1951-52, except periods of ice effect or backwater from weeds or debris (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 11		Mar. 12 to Sept. 30			
2.1	16	2.1	18	3.5	458
2.3	38	2.2	26	4.0	753
2.6	95	2.3	38	5.0	1,560
3.0	223	2.6	97	6.2	2,910
		3.0	223		

Note.--Same as following table above 3.0 ft.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	27	26	47	474	212	208	304	c140	113	43	28	26
2	27	26	58	899	378	196	322	c135	102	43	29	26
3	26	29	67	988	542	185	317	c130	95	43	28	25
4	*25	27	59	359	1,040	213	295	c125	90	44	26	24
5	25	26	52	273	1,510	736	355	c122	86	43	29	24
6	25	26	49	215	979	715	899	c118	83	41	31	23
7	32	40	50	161	526	588	941	c116	76	40	29	23
8	33	38	49	139	400	474	588	c112	70	38	28	23
9	29	30	74	145	360	416	*453	*c108	66	40	26	22
10	28	34	98	136	327	405	385	c108	62	40	26	22
11	28	29	127	b96	317	1,560	332	c116	66	38	26	22
12	28	28	86	118	304	*2,840	299	c135	62	37	26	21
13	27	28	*b60	118	235	1,940	304	c290	58	36	26	20
14	27	32	b52	118	*231	905	380	513	56	36	25	20
15	27	30	b46	230	215	709	583	451	52	36	*25	42
16	27	38	b44	440	208	641	715	390	51	36	26	32
17	27	50	b44	*370	204	600	509	320	*51	*35	28	26
18	26	53	b42	380	204	588	350	227	51	33	26	25
19	26	58	b41	600	185	680	c290	193	49	33	25	29
20	25	49	b44	469	182	989	c260	176	49	33	24	25
21	25	42	b50	b460	185	1,120	c240	208	51	44	24	24
22	25	38	b58	395	178	1,140	c220	299	51	36	24	24
23	26	42	123	313	168	948	c220	244	51	35	24	23
24	28	86	108	b215	161	812	c230	190	49	32	24	22
25	29	101	95	b175	165	684	c215	315	48	32	24	22
26	28	69	71	212	151	513	c195	393	46	30	23	21
27	26	54	b66	564	158	447	c190	252	44	30	23	21
28	26	54	b64	709	175	395	c175	186	43	29	24	21
29	26	50	63	b545	193	360	c160	153	48	28	24	21
30	25	47	69	b310	-	327	c145	135	44	28	25	20
31	25	-	132	193	-	308	-	120	-	28	26	-
Total	834	1,280	2,088	10,819	10,093	22,642	10,871	6,520	1,863	1,120	802	719
Mean	26.9	42.7	67.4	349	348	730	362	210	62.1	36.1	25.9	24.0
Cfsm	0.129	0.205	0.324	1.68	1.67	3.51	1.74	1.01	0.299	0.174	0.125	0.115
In.	0.15	0.23	0.37	1.93	1.80	4.05	1.94	1.17	0.33	0.20	0.14	0.13

Calendar year 1951: Max 2,230 Min 25 Mean 241 Cfsm 1.16 In. 15.73
Water year 1951-52: Max 2,840 Min 20 Mean 190 Cfsm 0.913 In. 12.44

Peak discharge (base, 1,500 cfs).--Feb. 5 (5:45 p.m.) 1,600 cfs (5.03 ft); Mar. 12 (8:30 p.m.) 2,960 cfs (6.24 ft).
* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.
c Backwater from weeds.
Note.--Backwater from debris Oct. 2-4, Jan. 15-19, Sept. 18-30.

Black Creek at Churchville, N. Y.

Location.--Lat 43°06'00", long. 77°53'00", on right bank at east end of Carrol Street, in Churchville, Monroe County, 60 ft downstream from main line tracks of New York Central Railroad and 1 mile upstream from small tributary.

Drainage area.--123 sq mi.

Records available.--October 1945 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 552.45 ft above mean sea level (levels by Corps of Engineers).

Average discharge.--7 years, 114 cfs.

Extremes.--Maximum discharge during year, 1,620 cfs Mar. 12 (gage height, 5.95 ft); minimum, 2.1 cfs Sept. 8 (gage height, 1.05 ft).
1945-52: Maximum discharge, 4,750 cfs Mar. 28, 1950 (gage height, 8.83 ft); minimum, 0.7 cfs Sept. 29, Oct. 1-3, 6, 7, 1950; minimum gage height, 0.98 ft, Sept. 29, 1950.

Remarks.--Records good except those for periods of backwater from ice, weeds, or debris, and those below 5 cfs, which are fair. New York Central System diverted an average of about 10,644,000 gallons each month from a point just above station for use by locomotives from Oct. 1 to May 12, inclusive, equivalent to a mean flow of about 0.5 cfs at station. Slight regulation by pumping operations above station.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.4	7.4	26	251	170	83	130	60	45	11	2.4	2.9
2	7.6	8.2	28	511	230	85	163	56	43	9.6	2.4	5.6
3	6.8	13	27	497	309	85	155	54	41	8.6	2.6	4.7
4	5.6	11	25	252	582	175	130	48	39	8.0	4.1	3.5
5	*5.4	9.4	24	151	897	548	223	45	37	6.8	6.4	3.0
6	4.3	8.2	24	123	622	588	525	44	34	6.2	5.2	3.1
7	9.4	28	27	91	339	429	532	40	28	5.6	3.6	2.8
8	19	60	33	75	222	281	332	*38	24	5.4	2.6	2.2
9	17	62	38	63	169	200	234	37	22	5.8	3.3	2.6
10	13	52	49	58	155	180	*189	36	20	5.4	5.6	10
11	10	41	*48	51	178	740	155	48	19	5.2	5.2	5.8
12	9.0	34	39	50	160	1,460	130	90	18	5.0	5.4	4.7
13	7.6	28	23	50	114	*950	134	150	17	4.3	4.7	4.4
14	7.2	31	22	60	*103	403	192	198	17	4.3	4.3	3.8
15	7.4	28	17	165	78	298	288	210	16	4.0	*4.0	11
16	6.6	30	15	280	67	205	324	167	15	3.2	10	16
17	6.2	50	15	*260	67	163	266	136	*15	*3.8	11	13
18	5.8	60	16	220	69	172	175	98	13	4.8	12	10
19	6.0	50	15	230	60	299	132	74	11	5.4	9.9	15
20	5.0	36	17	230	67	696	112	64	10	5.6	6.3	15
21	5.8	26	28	215	71	729	100	85	9.2	12	5.3	7.8
22	6.2	30	56	185	70	502	91	115	8.8	10	5.9	4.8
23	9.0	36	74	140	69	397	87	103	8.6	7.0	11	4.5
24	11	40	66	110	71	391	90	82	8.4	4.0	5.6	6.0
25	11	32	60	105	77	318	87	133	8.2	4.5	3.6	5.4
26	10	39	46	120	67	245	80	205	8.0	6.6	3.0	4.3
27	9.4	43	43	205	70	194	76	194	8.0	5.2	2.6	4.7
28	9.4	25	41	290	71	169	71	110	8.6	4.1	2.3	6.0
29	8.0	31	41	290	76	143	69	71	11	4.0	3.0	3.7
30	7.6	26	52	205	-	126	64	58	13	3.7	3.1	2.6
31	8.2	-	92	155	-	117	-	50	-	2.9	3.2	-
Total	261.9	975.2	1,127	5,688	5,300	11,371	5,336	2,899	575.8	182.0	159.6	188.9
Mean	8.45	32.5	36.4	183	183	367	178	93.5	19.2	5.87	5.15	6.30
Cfsm	0.069	0.264	0.296	1.49	1.49	2.98	1.45	0.760	0.156	0.048	0.042	0.051
In.	0.08	0.29	0.34	1.72	1.60	3.44	1.61	0.88	0.17	0.06	0.05	0.06

Calendar year 1951: Max 1,370 Min 4.3 Mean 134 Cfsm 1.09 In. 14.74
Water year 1951-52: Max 1,460 Min 2.2 Mean 93.1 Cfsm 0.757 In. 10.30

Peak discharge (base, 1,000 cfs).--Mar. 12 (5 p.m.) 1,620 cfs (5.95 ft).
* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice or debris Nov. 20 to Dec. 31, Jan. 15-24, Jan. 27-31. Backwater from weeds or debris Oct. 2 to Nov. 19, Feb. 1, May 2-13, June 7 to Aug. 16, Sept. 16-30.

Genesee River at Driving Park Avenue, Rochester, N. Y.

Location.--Lat 43°10'50" (revised), long. 77°37'40", on right bank at Rochester, Monroe County, 40 ft downstream from plant 5 of Rochester Gas & Electric Corp. and 100 ft upstream from Driving Park Avenue Bridge.

Drainage area.--2,467 sq mi.

Records available.--December 1919 to September 1952.

Gage.--Water-stage recorder.

Average discharge.--32 years (1920-52), 2,786 cfs.

Extremes.--Maximum discharge during year, 17,700 cfs Mar. 12 (gage height, 9.03 ft); minimum, 43 cfs Oct. 15 (gage height, -0.75 ft); minimum daily, 286 cfs Oct. 14.
1919-52: Maximum discharge, 33,500 cfs Apr. 2, 1940 (gage height, 14.08 ft); minimum, less than 10 cfs, occurred during low-water periods in some years when powerplant was shut down; minimum daily, 219 cfs Aug. 14, 1927.
Maximum discharge known, about 54,000 cfs Mar. 18, 1865.

Remarks.--Records good except those for periods of fragmentary or no gage-height record, which are fair. Extensive diurnal fluctuation caused by powerplants above station. New York State Barge Canal crosses river near southern boundary of Rochester. Water diverted by the canal from Lake Erie is discharged into river from the west, the canal again diverting a smaller amount of water from river to the east. Additional regulation is provided by Rushford Lake (formerly called Caneadea Reservoir) and Mount Morris Reservoir.

Revisions.--W 759: Drainage area.

Rating tables, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 27				Jan. 28 to Sept. 30			
0.4	269	3.5	3,230	0.7	389	3.0	2,410
1.0	513	5.0	7,300	1.0	528	5.0	7,300
1.5	808	6.0	9,500	1.5	844	7.0	12,000
2.5	1,680			2.5	1,750	8.5	16,100

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	776	674	1,410	4,510	3,180	3,410	4,330	2,300	3,070	758	619	557
2	684	784	1,510	8,010	3,590	3,090	4,190	2,120	2,580	904	534	535
3	724	864	1,910	7,970	4,530	3,080	4,560	1,910	1,850	748	481	524
4	730	778	1,960	8,700	7,480	3,280	4,640	1,730	1,770	858	513	543
5	*680	832	1,890	9,450	11,300	7,380	5,450	1,680	1,750	826	551	512
6	835	690	1,870	8,220	10,600	6,370	13,000	1,690	1,880	718	543	508
7	830	952	2,070	4,110	9,440	4,880	12,500	1,560	1,750	692	578	422
8	795	984	2,460	1,980	6,550	4,490	9,300	*1,460	1,290	614	588	431
9	834	1,470	4,100	1,920	4,510	3,650	9,110	1,530	1,420	656	522	449
10	806	1,690	4,800	2,340	4,460	3,570	8,580	1,500	1,780	634	559	479
11	746	1,120	*6,890	1,760	4,280	9,170	7,690	1,800	2,270	640	508	465
12	714	988	4,930	1,530	3,980	16,100	6,530	2,130	1,610	650	529	652
13	637	900	3,340	1,880	3,450	14,700	4,700	3,130	1,360	588	480	835
14	286	992	2,610	2,260	*2,130	12,000	4,270	4,290	1,250	633	402	729
15	699	917	1,920	2,980	1,940	10,200	5,710	4,360	1,170	577	544	768
16	594	1,530	1,660	5,910	2,280	10,100	9,580	3,740	*1,050	651	728	562
17	737	1,850	1,810	7,030	2,820	*9,500	9,960	3,950	1,060	656	548	716
18	772	2,770	1,350	5,550	3,140	8,580	9,140	3,170	1,190	640	*784	818
19	662	2,540	1,310	8,750	2,770	9,000	8,420	2,630	f1,080	722	767	688
20	815	1,730	1,530	8,950	2,320	9,360	5,490	2,600	930	686	852	544
21	625	1,370	2,020	8,440	2,360	10,200	4,430	2,750	906	*815	645	554
22	720	1,150	1,970	6,880	2,380	11,900	*4,010	3,650	918	682	605	714
23	653	1,500	2,420	5,360	2,320	11,600	3,060	3,850	932	a580	566	578
24	797	3,400	3,160	4,090	2,420	11,400	3,940	3,090	1,080	a560	622	591
25	924	4,340	2,660	2,570	2,780	11,000	5,340	3,310	968	a540	600	606
26	811	3,300	2,170	2,560	2,660	9,790	3,940	5,820	847	a660	656	574
27	780	2,160	1,610	5,240	2,650	9,490	3,170	5,740	903	a520	604	639
28	742	1,870	1,650	9,050	3,050	7,710	3,100	3,560	825	a480	562	731
29	786	1,560	1,470	8,100	3,180	5,220	2,820	3,980	843	a680	528	744
30	696	1,500	1,620	*8,260	-	4,670	2,610	4,360	704	493	510	752
31	792	-	2,300	5,070	-	4,550	-	3,960	-	507	516	-
Total	22,682	47,205	74,380	169,430	118,550	249,440	183,570	93,350	41,036	20,368	18,044	18,220
Mean	732	1,574	2,399	5,465	4,088	8,046	6,119	3,011	1,368	657	582	607
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 18,500 Min 286 Mean 3,131 Cfsm 1.27 In. 17.23
Water year 1951-52: Max 16,100 Min 286 Mean 2,886 Cfsm 1.17 In. 15.92

* Discharge measurement made on this day.
a No gage-height record; discharge estimated from power-output record.
f Fragmentary gage-height record; discharge computed from partly estimated gage-height record.

Cayuga Inlet near Ithaca, N. Y.

Location.--Lat 42°23'35", long. 76°32'40", on left bank half a mile upstream from Buttermut Creek and 5 miles south of Ithaca, Tompkins County.

Drainage area.--36.7 sq mi.

Records available.--March 1937 to September 1952.

Gage.--Water-stage recorder and concrete control. Datum of gage is 437.16 ft above mean sea level (levels by Corps of Engineers).

Average discharge.--15 years, 39.3 cfs.

Extremes.--Maximum discharge during year, 988 cfs Mar. 11 (gage height, 3.59 ft); minimum, 3.6 cfs Oct. 5; minimum gage height, 0.505 ft Sept. 13.
1937-52: Maximum discharge, 4,110 cfs Aug. 13, 1942 (gage height, 7.58 ft), from rating curve extended above 650 cfs on basis of slope-area determinations at gage heights 5.5 and 7.58 ft; minimum. 1.8 cfs Aug. 30, 31, Sept. 1, 2, 1939 (gage height, 0.42 ft).

Remarks.--Records good except those for periods for ice effect, which are fair.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 11				Mar. 12 to Sept. 30			
0.5	2.9	1.4	75	0.5	3.7	1.2	55
.6	5.9	1.7	150	.6	7.2	1.4	86
.8	14	2.3	366	.8	17	1.7	155
1.0	27	2.8	590	1.0	33	2.0	249
1.2	45						

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.4	6.0	15	237	72	b21	59	26	40	7.4	6.2	6.2
2	4.4	6.8	16	145	105	b20	72	24	34	6.6	6.0	11
3	4.2	17	14	96	73	20	76	23	30	6.6	6.0	10
4	4.2	10	15	79	228	24	69	22	29	7.2	5.7	6.6
5	4.2	7.8	104	63	144	39	136	21	28	9.3	38	5.6
6	4.1	6.9	69	52	94	29	140	20	24	6.3	10	5.4
7	7.1	31	*44	46	75	26	100	19	21	5.6	7.6	6.2
8	7.2	25	38	43	66	24	84	19	20	5.4	6.6	5.0
9	5.6	13	83	37	66	23	71	18	27	124	6.2	4.8
10	*5.4	10	54	36	54	30	62	18	20	152	12	4.6
11	5.6	9.0	41	32	53	*b580	63	21	16	39	8.7	4.6
12	4.8	8.0	36	34	42	226	54	130	15	21	10	4.4
13	4.6	7.6	b29	29	b33	146	78	63	14	16	9.2	4.3
14	4.6	9.6	b27	36	b32	103	118	47	13	13	7.2	4.4
15	4.4	12	b26	84	b31	82	185	*44	12	11	6.4	8.8
16	4.4	21	b23	68	35	69	115	39	12	10	15	8.1
17	4.4	21	b24	53	33	62	88	33	11	9.2	19	5.2
18	4.4	15	24	183	32	*64	72	38	*10	8.9	9.8	4.8
19	4.4	12	21	92	b29	76	63	30	11	8.6	*8.0	7.2
20	4.4	b11	21	90	*b27	130	55	42	9.9	7.8	7.2	5.4
21	4.4	b9.6	b98	63	28	217	49	84	9.4	25	8.2	5.4
22	4.4	10	64	b54	25	169	45	48	9.9	*17	8.2	6.0
23	4.6	15	48	70	23	199	*50	39	9.9	11	7.0	4.9
24	5.4	33	34	b45	23	153	43	51	9.4	8.6	6.4	4.8
25	5.9	21	30	b35	23	120	41	142	8.4	8.0	5.6	4.6
26	5.3	b19	b32	152	b22	100	38	137	7.6	7.0	5.6	4.4
27	5.2	b15	b24	276	b22	90	35	84	7.0	15	6.1	4.4
28	5.2	b13	b32	*133	23	78	32	62	6.8	8.9	5.4	4.4
29	5.2	13	b33	71	22	68	31	55	11	8.0	4.9	4.4
30	5.0	12	59	b49	-	59	28	48	9.2	7.2	5.0	4.6
31	5.0	-	86	b54	-	55	-	42	-	6.6	5.2	-
Total	152.4	420.3	1,264	2,537	1,535	3,102	2,152	1,489	485.5	597.2	272.4	170.5
Mean	4.92	14.0	40.8	81.8	52.9	100	71.7	48.0	16.2	19.3	8.79	5.68
Cfsm	0.134	0.381	1.11	2.23	1.44	2.72	1.95	1.31	0.441	0.526	0.240	0.155
In.	0.15	0.43	1.28	2.57	1.56	3.14	2.18	1.51	0.49	0.61	0.28	0.17

Calendar year 1951: Max 330 Min 3.5 Mean 39.7 Cfsm 1.08 In. 14.67
Water year 1951-52: Max 580 Min 4.1 Mean 38.7 Cfsm 1.05 In. 14.37

Peak discharge (base, 1,100 cfs).--No peak above base.
* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

Fall Creek near Ithaca, N. Y.

Location.--Lat 42°27'20", long. 76°28'30", on left bank in Forest Home, half a mile upstream from Cornell University Dam, 1½ miles northeast of Ithaca, Tompkins County, and 2 miles upstream from mouth.

Drainage area.--124 sq mi.

Records available.--July 1908 to June 1909 (gage heights only), February 1925 to September 1952.

Gage.--Water-stage recorder and concrete control. Datum of gage is 794.81 ft above mean sea level, adjustment of 1912 (levels by Corps of Engineers). July 1908 to June 1909, chain gage at bridge 1¼ miles downstream at different datum.

Average discharge.--27 years (1925-52), 187 cfs.

Extremes.--Maximum discharge during year, 2,980 cfs Mar. 11 (gage height, 4.44 ft); minimum, 14 cfs Oct. 6, 7 (gage height, 0.36 ft).
1925-52: Maximum discharge, 15,500 cfs July 8, 1935 (gage height, 9.52 ft), from average of computed flow over each of four dams; minimum, about 3 cfs Aug. 25, 1927 (gage height, 0.18 ft).

Remarks.--Records excellent except those for periods of ice effect or no gage-height record, which are fair. Cornell University diverted 60,886,000 cu ft during year from a point about 1 mile above station for water supply, equivalent to a mean discharge at station of 1.93 cfs.

Revisions (water years).--W 759: Drainage area. W 874: 1935-38.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.3	10	2.0	424
.8	48	2.5	757
1.1	81	3.0	1,200
1.3	122	3.6	1,830
1.7	266		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	17	20	80	b1,000	b180	b88	285	90	168	34	31	25
2	16	21	97	846	405	b84	351	90	148	29	29	29
3	16	48	106	434	367	b82	396	80	122	27	34	32
4	16	51	108	262	695	85	390	70	115	31	30	28
5	16	36	380	257	724	161	475	73	120	30	91	25
6	15	29	391	223	432	133	746	72	106	26	59	22
7	20	68	*204	160	314	117	454	65	110	23	40	22
8	38	175	171	b135	261	104	384	63	94	22	34	20
9	33	80	254	b150	262	95	314	60	105	149	30	19
10	*25	57	273	154	236	107	257	58	113	959	34	18
11	20	46	175	b130	219	1,800	262	66	81	252	a43	18
12	20	40	142	b135	185	1,260	236	458	74	109	a39	18
13	18	36	b108	b125	b135	564	292	459	67	76	a43	17
14	18	36	b72	142	b130	373	444	285	62	60	a36	17
15	17	63	b74	467	b122	280	607	*200	58	50	31	22
16	16	a78	b68	580	b122	229	362	240	53	45	37	73
17	20	a150	b64	252	139	212	257	165	54	40	241	37
18	20	a88	b62	997	131	*212	215	158	*51	37	77	26
19	18	a64	b60	451	116	244	185	128	45	36	*50	28
20	18	a54	b64	346	*b112	359	165	140	45	37	39	31
21	17	a49	b250	266	b116	774	145	744	43	136	37	28
22	16	a47	414	b150	104	852	134	584	44	*220	63	30
23	16	a54	206	285	106	636	*171	279	45	89	42	27
24	18	a145	156	b175	b94	665	158	208	44	60	34	24
25	21	a155	117	b130	101	466	131	581	39	50	30	22
26	22	a110	b106	249	b84	442	125	893	36	42	28	21
27	20	99	b100	1,240	92	424	115	411	33	54	26	21
28	20	b58	b96	*547	99	335	108	262	31	50	25	22
29	20	85	b112	269	94	285	101	232	37	42	24	21
30	18	76	b180	b180	-	249	95	208	46	41	23	20
31	17	-	605	b155	-	244	-	168	-	35	24	-
Total	602	2,118	5,295	10,892	6,177	11,961	8,360	7,590	2,189	2,891	1,404	763
Mean	19.4	70.6	171	351	213	386	279	245	73.0	93.3	45.3	25.4
Cfsm	0.156	0.569	1.38	2.83	1.72	3.11	2.25	1.98	0.589	0.752	0.365	0.205
In.	0.18	0.64	1.59	3.27	1.85	3.59	2.51	2.28	0.66	0.87	0.42	0.23

Calendar year 1951: Max 1,670 Min 13 Mean 180 Cfsm 1.45 In. 19.69
Water year 1951-52: Max 1,800 Min 15 Mean 165 Cfsm 1.33 In. 18.09

Peak discharge (base, 1,900 cfs).--Mar. 11 (7:45 p.m.) 2,980 cfs (4.44 ft).
* Discharge measurement made on this day.
a No gage-height record; discharge estimated from reconstructed gage-height graph based on records for nearby stations.
b Stage-discharge relation affected by ice.

Canandaigua Lake at Canandaigua, N. Y.

Location.--Lat 42°52'20", long. 77°16'20", at south end of City Pier at northern end of Canandaigua Lake, 1 mile southeast of Canandaigua, Ontario County.

Drainage area.--189 sq mi.

Records available.--November 1939 to September 1952. December 1927 to November 1939, records collected by city of Canandaigua at site on west side of E. T. Waldorf's boathouse.

Gage.--Water-stage recorder. Datum of gage is 680.76 ft above mean sea level (levels by Corps of Engineers). Prior to June 26, 1946, staff gage at E. T. Waldorf's boathouse at same datum.

Extremes.--Maximum gage height during year, 7.91 ft Apr. 10; minimum, 5.47 ft Dec. 7. 1939-52: Maximum gage height observed, 9.09 ft Apr. 12, 13, 1940; minimum observed, 4.45 ft Jan. 30, 1942.

Remarks.--Elevation of lake surface regulated by gates on east outlet and stoplogs on west outlet. West outlet, which usually carries most of lake outflow, is an artificial canal 1¼ miles long which discharges into Canandaigua Lake Outlet; spillway consists of permanent stoplog 9.8 ft long with top at elevation 683.96 ft extending across a masonry arch opening under roadway. East outlet is at head of natural outlet channel from lake; flow regulated by two gates at highway bridge half a mile downstream. The city engineer, Canandaigua, regulates storage in lake for Oswego River Watershed Corp., Fulton, by operation of gates and stoplogs on outlets. Water diverted for municipal supply of village of Newark since about December 1951. Capacity of lake not determined. Area of water surface is about 16.57 sq mi at elevation 686 ft.

Gage height, in feet, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.16	5.70	5.64	5.75	6.58	6.82	7.41	7.06	7.46	7.00	6.53	6.24
2	6.16	5.70	5.62	5.81	6.61	6.80	7.40	7.00	7.44	6.98	6.51	6.23
3	6.17	5.73	5.66	5.87	6.66	6.79	7.37	6.94	7.44	6.97	6.48	6.21
4	6.16	5.78	5.70	5.90	6.84	6.81	7.34	6.89	7.42	6.94	6.54	6.17
5	6.14	5.69	5.61	5.92	7.02	6.85	7.43	6.85	7.42	6.90	6.52	6.20
6	6.12	5.67	5.63	5.89	7.09	6.87	7.79	6.84	7.42	6.89	6.49	6.12
7	6.16	5.69	5.65	5.91	7.12	6.87	7.85	6.81	7.38	6.88	6.48	6.07
8	6.17	5.71	5.63	5.91	7.13	6.86	7.83	6.80	7.38	6.88	6.48	6.08
9	6.13	5.70	5.66	5.91	7.15	6.86	7.80	6.80	7.40	6.82	6.49	6.05
10	6.11	5.68	5.68	5.92	7.16	6.91	7.78	6.79	7.38	6.80	6.53	6.03
11	6.10	5.66	5.70	5.92	7.16	7.12	7.70	6.82	7.33	6.79	6.53	6.01
12	6.06	5.71	5.67	5.93	7.12	7.42	7.66	6.95	7.30	6.78	6.52	6.00
13	6.04	5.74	5.66	5.92	7.10	7.51	7.69	6.99	7.28	6.76	6.50	5.99
14	6.03	5.68	5.65	5.92	7.09	7.50	7.60	7.00	7.28	6.75	6.49	5.97
15	6.00	5.66	5.65	5.99	7.06	7.48	7.73	7.04	7.25	6.75	6.49	6.04
16	5.94	5.68	5.64	5.99	7.05	7.42	7.80	7.05	7.23	6.70	6.49	6.08
17	5.93	5.71	5.64	6.10	7.08	7.39	7.78	7.05	7.24	6.69	6.45	6.04
18	5.92	5.73	5.66	6.15	7.07	7.35	7.74	7.05	7.21	6.68	6.44	6.07
19	5.93	5.71	5.60	6.25	7.04	7.40	7.70	7.06	7.20	6.67	6.42	6.07
20	5.88	5.70	5.70	6.31	7.04	7.40	7.63	7.10	7.15	6.67	6.42	6.06
21	5.90	5.71	5.61	6.31	7.03	7.50	7.58	7.17	7.15	6.72	6.42	6.03
22	5.89	5.71	5.63	6.42	7.00	7.58	7.53	7.18	7.13	6.74	6.35	6.02
23	5.86	5.69	5.62	6.37	6.97	7.67	7.48	7.18	7.13	6.74	6.33	6.01
24	5.89	5.67	5.59	6.36	6.94	7.69	7.43	7.25	7.11	6.68	6.32	6.00
25	5.84	5.70	5.64	6.43	6.92	7.68	7.38	7.38	7.09	6.67	6.30	5.98
26	5.82	5.70	5.63	6.42	6.90	7.65	7.33	7.42	7.08	6.66	6.29	5.97
27	5.79	5.65	5.62	6.48	6.87	7.61	7.28	7.46	7.03	6.63	6.28	5.93
28	5.79	5.67	5.67	6.53	6.85	7.57	7.21	7.48	7.01	6.63	6.28	5.93
29	5.76	5.64	5.64	6.55	6.83	7.52	7.16	7.48	7.02	6.59	6.27	5.92
30	5.77	5.64	5.62	6.56	-	7.48	7.11	7.47	7.00	6.58	6.23	5.90
31	5.72	-	5.70	6.56	-	7.45	-	7.48	-	6.55	6.29	-
Mean	5.98	5.69	5.65	6.14	6.98	7.28	7.55	7.09	7.25	6.76	6.42	6.05
(†)	-82.8	-8.90	+20.7	+141	+49.3	+103	-59.2	+70.7	-85.5	-75.9	-39.9	-65.7

Calendar year 1951: Max 7.77 Min 5.59 Mean 6.65 (†) -12.3
Water year 1951-52: Max 7.85 Min 5.59 Mean 6.57 (†) -2.48

† Change in contents in Canandaigua Lake and since about December, diversion by village of Newark for water supply, equivalent in cubic feet per second (records of diversion furnished by village of Newark).

Canandaigua Lake Outlet at Chapin, N. Y.

Location.--Lat 42°55'00", long. 77°14'00", on left bank in Chapin, Ontario County, 500 ft upstream from highway bridge and 3 miles downstream from Canandaigua Lake.

Drainage area.--199 sq mi.

Records available.--November 1939 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 673.6 ft above mean sea level (levels by Corps of Engineers).

Average discharge.--12 years (1940-52), 155 cfs (unadjusted).

Extremes.--Maximum discharge during year, 782 cfs Apr. 5 (gage height, 4.13 ft); minimum, 16 cfs Sept. 29; minimum gage height, 1.63 ft Nov. 12.
1939-52: Maximum discharge, 1,100 cfs Mar. 17, 1942 (gage height, 4.64 ft); minimum, 4.6 cfs Sept. 17, 1948; minimum gage height, 1.15 ft Feb. 3, 1950.

Remarks.--Records good except those for periods of ice effect or backwater from weeds, which are fair. Flow regulated by Canandaigua Lake (see preceding page). Diversion for municipal supply of village of Newark began about December 1951.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	27	29	40	108	106	202	482	371	205	110	27	37
2	27	28	39	72	116	200	472	362	198	110	28	36
3	27	31	38	58	116	197	469	350	192	110	27	36
4	29	32	38	58	219	223	466	338	190	106	30	33
5	*42	28	38	58	214	280	558	294	182	104	31	32
6	41	26	39	56	243	204	604	118	174	102	27	31
7	45	28	40	54	245	192	586	98	166	100	26	29
8	44	26	38	54	248	185	583	98	156	102	27	29
9	41	24	49	52	248	b185	572	96	154	100	28	29
10	40	23	*46	50	248	208	562	94	130	78	33	26
11	37	22	45	52	251	514	541	102	116	47	31	25
12	58	30	43	52	235	*501	524	*137	106	43	31	25
13	112	49	38	52	*b230	521	524	118	112	40	*30	25
14	116	46	37	58	b230	528	511	111	116	40	44	25
15	118	44	35	88	b230	524	541	116	116	42	66	30
16	98	52	34	68	217	511	552	120	*112	*36	31	31
17	38	46	33	*62	220	498	552	113	116	36	26	27
18	32	30	34	114	220	491	545	111	110	36	24	27
19	30	42	35	78	b220	528	531	116	106	36	25	30
20	29	42	33	98	b215	555	514	132	104	36	24	26
21	35	42	80	86	214	535	498	159	102	52	26	24
22	37	44	98	86	212	541	*485	139	100	40	23	23
23	35	44	92	84	210	562	478	137	98	37	21	23
24	37	45	86	76	b210	562	466	149	98	34	20	24
25	35	44	80	80	207	558	450	221	98	32	18	23
26	33	49	110	96	207	548	437	205	98	32	26	23
27	32	44	106	122	202	538	424	198	98	32	39	20
28	32	42	100	100	202	521	412	200	102	31	39	19
29	31	42	100	90	202	511	396	205	110	31	39	17
30	31	41	106	94	-	498	384	205	112	30	37	18
31	30	-	82	108	-	491	-	205	-	27	38	-
Total	1,399	1,115	1,812	2,364	6,137	13,112	15,119	5,418	3,877	1,792	942	803
Mean	45.1	37.2	58.5	76.3	212	423	504	175	129	57.8	30.4	26.8

Adjusted for change in contents in Canandaigua Lake and diversion by village of Newark

Mean	-37.6	28.3	79.2	217	261	526	445	245	43.7	-18.1	-9.53	-38.9
Cfsm	-0.189	0.142	0.398	1.09	1.31	2.64	2.24	1.23	0.220	-0.091	-0.048	-0.195
In.	-0.22	0.16	0.46	1.26	1.41	3.05	2.49	1.42	0.25	-0.10	-0.06	-0.22

	Observed			Adjusted		
Calendar year 1951:	Max 658	Min 21	Mean 199	Mean 187	Cfsm 0.940	In. 12.74
Water year 1951-52:	Max 604	Min 17	Mean 147	Mean 145	Cfsm 0.729	In. 9.90

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.
Note.--Backwater from ice or weeds Oct. 1 to Feb. 3, June 10 to Sept. 30 (no gage-height record Dec. 1-10, June 13-16). Negative figures of adjusted discharge and runoff indicate that natural losses from Canandaigua Lake exceeded inflow. Records of diversion furnished by village of Newark.

Owasco Lake Outlet near Auburn, N. Y.

Location.--Lat 42°56'45", long. 76°36'05", on left bank 2½ miles downstream from center of Auburn, Cayuga County, and 4 miles downstream from State dam at outlet of Owasco Lake.

Drainage area.--208 sq mi.

Records available.--November 1912 to September 1952.

Gage.--Water-stage recorder and concrete control.

Average discharge.--39 years (1913-52), 286 cfs.

Extremes.--Maximum discharge during year, 879 cfs Feb. 6 (gage height, 3.21 ft); minimum, 13 cfs Oct. 20 (gage height, 1.45 ft); minimum daily, 17 cfs Oct. 21.
1912-52: Maximum discharge, 2,090 cfs Mar. 19, 1936, Apr. 9, 1940, Apr. 4, 1950; maximum gage height, 4.88 ft Mar. 19, 1936, Apr. 9, 1940; minimum discharge, about 2 cfs Dec. 5, 1936 (gage height, 1.36 ft); minimum daily, 5 cfs Nov. 11, 1934.

Remarks.--Records good except those for periods of backwater from weeds, which are fair, and those for periods of no gage-height record, which are poor. Diurnal fluctuation caused by mills in Auburn; seasonal regulation at State dam. Water supply for Auburn taken from Owasco Lake, part of which returns as sewage to outlet above gaging station.

Revisions (water years).--W 759: Drainage area. W 804: 1913(M). W 824: 1913-14, 1916, 1920(M,m), 1922(M,m), 1928(M,m), 1929, 1932(M,m).

Rating tables, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 7		Nov. 7 to Sept. 30			
1.4	8.0	1.5	25	2.5	342
1.6	33	1.6	39	2.9	619
1.8	71	1.8	76	3.2	870
2.1	152	2.1	160		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*46	46	182	218	431	320	477	463	314	186	c48	a44
2	44	47	182	205	419	309	463	463	336	132	c48	a76
3	45	52	*178	201	430	298	470	450	331	89	c47	a56
4	46	44	182	193	595	297	470	395	331	86	c58	a46
5	40	45	190	197	771	311	484	*334	331	78	c48	a41
6	40	45	184	201	805	298	470	336	331	76	c42	a38
7	48	115	190	201	791	298	*520	342	336	81	c40	40
8	43	160	186	205	768	292	520	348	336	76	c40	a41
9	38	157	193	205	751	280	513	354	352	84	c40	a40
10	37	157	193	210	721	293	520	342	348	71	c42	a39
11	36	154	197	205	*708	*412	513	348	*348	60	*c41	a56
12	37	95	193	205	660	551	506	385	372	64	c42	a48
13	31	51	193	205	566	639	499	354	372	56	a40	a40
14	30	55	197	210	467	643	513	354	363	60	a39	a37
15	32	54	a193	294	457	635	513	354	354	60	a38	a56
16	32	123	a195	*381	457	618	513	348	283	*56	a50	a48
17	30	164	a195	429	470	611	513	354	219	56	a48	a41
18	29	157	a195	388	457	596	506	336	214	64	a47	a36
19	23	167	a195	416	463	604	499	348	218	60	a45	40
20	18	178	a190	489	454	596	492	379	218	56	a43	34
21	17	178	a190	588	376	627	477	366	210	73	a44	30
22	18	178	a190	573	320	692	464	360	210	60	a43	32
23	57	187	186	542	312	717	463	366	209	58	a42	31
24	69	178	186	513	331	760	457	336	214	c54	a42	30
25	78	184	186	446	326	760	463	342	205	c52	c43	32
26	118	193	190	470	359	595	457	336	210	c50	c66	33
27	146	190	186	334	348	492	457	342	214	c50	c52	30
28	148	190	186	385	337	499	457	348	201	c56	46	29
29	143	186	182	430	331	492	463	342	210	c50	48	31
30	97	186	193	418	-	470	441	314	210	c47	49	31
31	45	-	197	436	-	470	-	320	-	c48	a45	-
Total	1,659	3,916	5,875	10,393	14,681	15,475	14,573	11,159	8,400	2,149	1,406	1,206
Mean	53.5	131	190	335	506	499	486	360	280	69.3	45.4	40.2
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 915 Min 17 Mean 290 Cfsm 1.39 In. 18.91
Water year 1951-52: Max 805 Min 17 Mean 248 Cfsm 1.19 In. 16.26

* Discharge measurement made on this day.
a No gage-height record; discharge interpolated or estimated on basis of recorded range in stage, elevations of Owasco Lake, weather records.
c Backwater from weeds.

Note.--Decrease in contents in Owasco Lake during calendar year 1951, about 316,000,000 cu ft (equivalent mean discharge, 10.02 cfs; runoff, 0.65 in.); decrease in elevation, 1.10 ft. Decrease in contents during water year 1951-52, about 184,000,000 cu ft (equivalent mean discharge, 5.81 cfs runoff, 0.38 in.; decrease in elevation, 0.64 ft). Record of elevations of Owasco Lake furnished by city of Auburn.

Seneca River at Baldwinsville, N. Y.

Location.--Lat 43°09'25", long. 76°19'55", on left bank 200 ft downstream from highway bridge in Baldwinsville, Onondaga County, and 400 ft downstream from navigation dam of New York State Barge Canal System.

Drainage area.--3,130 sq mi.

Records available.--November 1898 to December 1908 (these records, prior to construction of Barge Canal, not equivalent to later records at same site because of extensive development of Barge Canal system), November 1949 to September 1952 in reports of Geological Survey. November 1898 to September 1925 in reports of State engineer and surveyor (subsequent to December 1908, gage heights only).

Gage.--Water-stage recorder. Datum of gage is 362.60 ft above mean sea level (New York State Barge Canal datum). Prior to Dec. 31, 1908, staff gages on dam at same site at different datum. Auxiliary water-stage recorder 1,500 ft downstream from base gage at same datum.

Extremes.--Maximum daily discharge during year, 10,700 cfs Mar. 14; maximum gage height, 5.90 ft Mar. 14; minimum daily discharge, 555 cfs Sept. 6; minimum gage height, 0.81 ft Aug. 10.
1949-52: Maximum discharge (river channel only), 15,800 cfs Apr. 1, 1950 (gage height, 8.50 ft); minimum daily discharge, that of Sept. 6, 1952; minimum gage height, that of Aug. 10, 1952.

Remarks.--Records good. This record represents total discharge at Baldwinsville and includes flow in Baldwin and Barge Canals. A large amount of natural storage and some artificial regulation is afforded by the many large lakes and the Barge Canal system in river basin. Large diurnal fluctuations at low and medium flow by powerplants above station. Seneca River basin receives water from Erie division of Barge Canal through lock 32 near Pittsford. During part of year, entire flow from 45 sq mi of Mud Creek drainage area may be diverted from Chemung River basin into Keuka Lake in Oswego River basin.

Cooperation.--Records of lockages at lock 24 furnished by New York State Department of Public Works.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*1,280	1,460	1,560	3,580	4,640	4,570	6,460	2,140	6,180	1,550	2,570	811
2	1,280	1,290	1,420	5,140	4,880	4,450	6,030	1,750	5,100	1,370	2,190	1,280
3	1,350	1,300	1,560	5,720	5,630	4,440	5,610	1,690	5,010	1,720	2,060	1,360
4	1,600	1,480	1,570	5,410	6,740	4,570	5,100	1,870	4,960	1,450	1,960	1,290
5	1,640	1,550	1,800	5,080	7,800	4,820	4,720	1,910	4,860	1,150	1,260	1,060
6	1,620	1,340	*2,140	4,560	8,510	5,340	5,290	*1,850	4,650	1,090	1,020	555
7	1,380	1,450	2,120	4,290	8,790	5,670	6,550	1,740	4,120	1,170	1,140	799
8	1,800	1,760	2,240	4,000	8,380	5,550	*7,460	1,360	3,370	1,280	1,150	1,820
9	1,600	1,810	2,230	3,730	7,850	5,250	7,730	1,480	2,860	1,420	886	1,780
10	1,380	1,570	2,490	3,590	7,300	*5,200	7,050	1,280	*2,630	1,990	946	1,370
11	1,330	1,430	2,570	3,580	7,010	6,270	5,890	1,490	2,360	1,460	1,310	1,270
12	1,450	1,540	2,490	3,550	*6,640	9,640	4,910	2,030	2,200	1,130	*1,250	1,300
13	1,380	1,640	2,450	3,290	6,200	10,600	4,510	2,430	2,140	1,260	1,160	1,320
14	1,290	1,580	2,330	3,370	5,720	10,700	4,580	2,680	2,060	1,650	1,150	1,220
15	1,070	1,360	2,440	3,700	5,510	10,300	4,850	2,810	2,090	*1,550	1,160	1,970
16	963	1,630	2,250	*4,190	5,350	9,620	5,120	3,050	2,010	1,260	1,120	2,120
17	1,020	1,900	2,370	4,510	5,070	8,850	5,400	3,100	1,960	1,060	1,200	1,630
18	1,100	1,830	2,360	5,070	5,150	7,980	5,400	3,310	1,950	1,220	1,280	1,640
19	1,190	1,930	2,320	5,220	5,120	7,560	5,240	3,700	1,710	1,250	1,250	2,180
20	1,190	1,690	2,310	5,230	5,020	7,440	4,920	4,340	1,610	1,240	1,320	1,870
21	1,130	1,720	2,390	5,250	5,010	7,710	4,800	5,100	1,330	1,850	1,200	1,750
22	1,670	1,560	2,560	4,910	4,910	8,180	4,660	5,590	1,330	2,170	1,160	2,120
23	2,270	1,850	2,570	4,990	4,710	8,420	3,960	5,940	1,820	2,240	1,060	2,060
24	1,770	1,960	2,620	4,460	4,640	8,600	3,200	6,070	2,000	2,300	789	1,720
25	1,560	1,720	2,620	4,480	4,840	8,470	2,840	6,200	1,820	2,310	1,040	1,890
26	1,100	1,820	2,780	4,340	4,560	8,210	2,720	6,550	1,960	2,150	1,170	2,110
27	1,260	1,660	2,680	4,870	4,710	7,910	2,420	7,310	1,110	1,790	1,040	1,830
28	1,520	1,510	2,590	5,360	4,680	7,440	2,480	7,600	1,070	2,160	1,040	1,390
29	1,630	1,540	2,580	5,100	4,610	6,900	2,440	7,430	1,690	2,340	1,200	1,990
30	1,460	1,550	2,440	5,020	-	6,680	2,310	6,950	1,970	2,820	1,160	1,770
31	1,400	-	2,730	4,760	-	6,530	-	6,500	-	3,010	714	-
Total	43,683	48,430	71,580	140,350	169,980	223,870	144,650	117,250	79,930	52,410	38,955	47,275
Mean	1,409	1,614	2,309	4,527	5,861	7,222	4,822	3,782	2,664	1,691	1,257	1,576
Cfsm	0.450	0.516	0.738	1.45	1.87	2.31	1.54	1.21	0.851	0.540	0.402	0.504
In.	0.52	0.58	0.85	1.67	2.02	2.66	1.72	1.39	0.95	0.62	0.46	0.56

Calendar year 1951: Max 11,800 Min 788 Mean 3,935 Cfsm 1.26 In. 17.07
Water year 1951-52: Max 10,700 Min 555 Mean 3,220 Cfsm 1.03 In. 14.00

* Discharge measurement made on this day.

Onondaga Creek at Dorwin Avenue, Syracuse, N. Y.

Location.--Lat 42°59'00", long. 76°09'05", on left bank 550 ft upstream from Dorwin Avenue Bridge at Syracuse, Onondaga County, and 4 miles downstream from Onondaga Reservoir.

Drainage area.--88.9 sq mi.

Records available.--May 1951 to September 1952.

Gage.--Water-stage recorder.

Extremes.--Maximum discharge during year, 1,170 cfs Mar. 11 (gage height, 4.64 ft); from rating curve extended above 330 cfs by logarithmic plotting; minimum, 11 cfs Sept. 15 (gage height, 2.185 ft).
1951-52: Maximum discharge, that of Mar. 11, 1952; minimum, that of Sept. 15, 1952.

Remarks.--Records good except those for periods of ice effect or no gage-height record or partly obstructed intake, which are fair. High flow regulated by Onondaga Reservoir.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 11				Mar. 12 to Sept. 30			
2.3	19	3.3	246	2.2	12	3.3	257
2.4	29	3.7	436	2.3	20	3.8	495
2.6	58	4.2	770	2.6	61	4.3	850
2.9	120			2.9	127		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	30	32	97	a540	155	87	174	76	104	36	27	15
2	*30	34	113	a520	276	81	200	72	98	33	24	18
3	29	64	*97	a280	212	79	200	70	89	32	25	24
4	27	58	89	a210	272	84	210	68	87	47	23	19
5	26	45	143	185	322	198	242	64	89	37	40	17
6	29	41	158	169	235	138	409	*64	87	30	33	15
7	49	90	130	b122	195	115	*274	62	114	29	28	15
8	83	143	160	b96	169	104	227	60	82	28	31	14
9	52	85	199	b116	188	99	203	58	80	70	33	13
10	41	67	208	125	169	*108	180	54	*74	*281	28	13
11	37	60	158	111	166	720	183	69	68	105	*33	13
12	36	53	138	106	b140	818	164	208	62	56	28	13
13	33	48	b116	111	*b96	690	170	227	60	42	31	14
14	32	52	b96	*125	b88	527	193	167	54	*37	26	14
15	29	69	b90	266	b82	244	170	130	52	32	23	15
16	29	106	b78	297	b90	203	149	183	48	29	21	22
17	28	185	b82	166	104	186	135	122	54	30	31	17
18	28	123	b86	345	102	180	122	110	56	30	25	16
19	28	95	b82	235	b92	206	114	98	54	50	22	18
20	28	85	b104	212	b86	256	110	99	52	37	20	20
21	28	81	a200	b175	102	383	100	376	47	75	19	18
22	28	81	a350	b118	93	462	95	354	50	78	22	20
23	28	158	a210	185	93	384	127	193	48	42	19	18
24	28	166	a160	146	89	404	110	149	47	68	18	17
25	33	123	b140	120	91	281	98	204	44	41	17	17
26	32	111	b125	225	89	250	93	224	40	33	17	17
27	30	113	b116	526	91	231	89	170	37	32	16	18
28	29	80	b110	382	91	203	84	135	36	30	16	18
29	32	b84	b114	b170	89	180	84	127	45	37	15	16
30	33	89	a170	b120	-	167	80	117	55	29	15	15
31	32	-	a330	b125	-	161	-	104	-	27	15	-
Total	1,037	2,621	4,449	6,629	4,067	8,229	4,789	4,214	1,913	1,563	741	499
Mean	33.5	87.4	144	214	140	265	160	136	63.8	50.4	23.9	16.6
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max - Min - Mean - Cfsm - In. -
Water year 1951-52: Max 818 Min 13 Mean 111 Cfsm 1.25 In. 17.03

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records, observer's notes, and records for nearby stations.
b Stage-discharge relation affected by ice.
Note.--Partly obstructed intake May 4-10, June 11-29, July 1-9, 12-20, 22-28, 30, 31; discharge computed on basis of discharge measurements, weather records, engineers' and observer's notes, and records for nearby stations.

East Branch Fish Creek at Taberg, N. Y.

Location.--Lat 43°18'05", long. 75°37'10", on left bank at downstream side of highway bridge at Taberg, Oneida County, just downstream from Furnace Creek and 2¾ miles upstream from confluence of East and West Branches near Blossvale.

Drainage area.--189 sq mi.

Records available.--April 1923 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 491.12 ft above mean sea level, datum of 1929. Prior to Oct. 6, 1923, staff gage at same site and datum.

Average discharge.--29 years, 546 cfs (unadjusted).

Extremes.--Maximum discharge during year, 7,110 cfs Apr. 6 (gage height, 6.82 ft); minimum, 13 cfs Aug. 28 (gage height, -0.01 ft).
1923-52: Maximum discharge 13,600 cfs Oct. 2, 1945 (gage height, 10.90 ft); minimum, 4.9 cfs Aug. 15, 16, 1949.

Remarks.--Records good except those for periods of ice effect, which are fair. Diversion above station for water supply by city of Rome as shown in monthly table. Additional diversion from a reservoir (capacity, 28,600,000 cu ft; drainage area, 16.4 sq mi) on Florence Creek above station for water supply for city of Oneida amounted to 151,940,000 cu ft during the water year 1952, equivalent to a mean discharge of 4.8 cfs. Diurnal fluctuation at low flow caused by diversion and small power operations upstream.

Revisions (water years).--W 604: 1924. W 759: Drainage area. W 1034: 1944. W 1054: 1923-45.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1-25		Oct. 26 to Sept. 30			
0.7	90	0.2	24	2.0	658
1.0	165	.4	44	3.0	1,580
1.5	375	.7	90	5.0	4,230
2.1	788	1.0	164	5.7	5,320
		1.5	353		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	198	186	373	703	348	b230	1,430	262	426	64	43	40
2	165	*180	466	940	466	227	*2,690	244	484	56	44	58
3	145	504	466	781	574	212	*3,190	229	321	57	43	200
4	128	567	670	608	874	215	2,460	215	259	138	41	150
5	*121	*384	3,270	b500	1,500	215	4,180	205	244	158	94	92
6	118	286	2,090	b430	1,150	215	5,300	195	*219	100	69	69
7	221	575	1,780	b340	821	222	2,800	183	274	70	54	58
8	757	1,200	2,180	b320	615	212	1,710	180	215	56	48	47
9	632	741	1,380	b330	509	212	1,480	*170	423	348	43	40
10	414	509	1,150	b330	466	222	2,130	158	424	2,380	62	36
11	287	454	863	b280	438	954	3,470	302	282	1,130	173	34
12	221	454	703	b280	b370	1,760	1,960	1,370	233	397	134	32
13	185	410	534	b290	b300	1,410	1,590	3,730	186	207	105	30
14	159	909	b470	295	b290	1,070	2,720	2,370	156	134	76	30
15	148	1,650	b410	654	b300	789	2,450	1,140	136	100	57	71
16	136	1,280	b350	1,080	b300	601	1,790	855	118	88	87	219
17	126	1,120	b340	789	b310	490	1,740	587	153	86	367	213
18	121	703	b360	1,650	303	415	1,830	466	299	77	239	236
19	116	497	b330	*1,220	b290	368	1,770	373	192	123	*139	298
20	114	373	b330	1,170	b270	368	1,730	385	144	114	94	335
21	114	303	b470	975	b280	426	1,300	1,550	118	*240	79	198
22	111	321	993	b680	b270	554	863	1,330	111	282	128	180
23	109	972	914	680	286	580	1,090	718	105	150	107	158
24	129	1,410	789	b560	262	688	855	478	100	118	76	116
25	631	757	644	b440	b245	680	601	1,530	103	88	68	96
26	521	521	547	b470	b240	765	490	1,790	98	72	56	*86
27	330	b420	b470	830	b245	932	415	977	86	62	49	109
28	248	b370	b420	838	b240	773	363	574	72	53	27	98
29	251	404	415	b580	*b235	637	344	449	70	66	30	77
30	226	373	432	b420	-	680	299	373	76	60	42	68
31	198	-	554	b370	-	949	-	330	-	50	38	-
Total	7,380	18,833	25,163	19,833	12,777	18,071	55,040	23,718	6,127	7,124	2,712	3,474
Mean	238	628	812	640	441	583	1,835	765	204	230	87.5	116
(†)	18.6	18.0	17.1	19.0	19.1	18.8	18.0	18.1	18.4	21.4	19.7	18.4

	Observed			Adjusted for diversion				
Calendar year 1951:	Max 6,050	Min 63	Mean 621	Mean 640	Cfsm 3.39	In. 45.93
Water year 1951-52:	Max 5,300	Min 27	Mean 547	Mean 566	Cfsm 2.99	In. 40.75

Peak discharge (base, 4,900 cfs).--Apr. 6 (12:30 a.m.) 7,110 cfs (6.82 ft).
* Discharge measurement made on this day.
† Diversion, equivalent in cubic feet per second, by city of Rome for water supply (records furnished by city of Rome). For diversion by city of Oneida see "Remarks".
b Stage-discharge relation affected by ice.

Oneida Creek at Oneida, N. Y.

Location.--Lat 43°05'50", long. 75°38'20", on right bank 70 ft upstream from highway bridge at Oneida, Madison County, and 500 ft downstream from Sconondoa Creek.

Drainage area.--112 sq mi.

Records available.--October 1949 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 409.33 ft above mean sea level (Corps of Engineers datum).

Extremes.--Maximum discharge during year, 3,020 cfs Mar. 11 (gage height, 10.22 ft); minimum, 15 cfs Sept. 14, 15 (gage height, 1.38 ft).
1949-52: Maximum discharge, 7,440 cfs Mar. 28, 1950 (gage height, 13.78 ft); minimum, that of Sept. 14, 15, 1952.

Remarks.--Records good except those for periods of ice effect, which are fair. Slight diurnal fluctuation at low flow caused by small mills above station.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 11				Mar. 12 to Sept. 30			
1.6	32	3.0	277	1.4	16	2.6	189
2.0	78	5.5	897	1.7	41	4.0	554
2.5	164	7.9	1,700	2.1	89	6.3	1,120

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	43	50	162	600	200	*98	305	79	105	33	23	18
2	43	51	200	729	350	92	*374	78	114	31	22	25
3	43	141	179	404	282	88	355	72	88	28	22	24
4	*39	121	162	230	327	90	341	71	76	29	22	22
5	39	88	260	215	387	252	372	71	76	31	28	20
6	54	*75	237	200	272	168	577	70	85	28	28	18
7	87	235	216	180	223	135	368	69	*108	26	24	18
8	154	313	282	140	195	119	310	69	72	24	23	18
9	87	181	424	145	190	116	271	66	68	45	21	17
10	69	139	347	145	180	135	229	*62	64	*520	24	17
11	58	121	242	130	195	1,700	212	71	58	169	30	17
12	54	107	205	135	170	*1,110	189	209	56	83	27	16
13	47	98	165	145	140	492	205	192	51	55	32	16
14	45	99	140	160	120	363	260	158	47	44	24	16
15	45	144	*130	459	122	282	215	129	45	36	22	17
16	42	202	118	344	125	240	179	133	44	34	23	22
17	41	253	120	223	130	215	156	95	51	32	30	19
18	40	179	135	500	125	212	141	85	56	35	28	18
19	40	150	130	*270	118	232	131	76	51	51	*24	23
20	40	135	118	325	112	359	121	86	46	38	22	23
21	38	126	330	240	116	532	112	319	41	*50	21	19
22	40	119	450	180	112	512	110	268	42	44	26	24
23	37	263	280	195	108	491	147	150	43	34	22	21
24	38	371	205	170	104	542	131	112	41	31	19	21
25	50	248	175	160	98	445	112	265	38	29	19	20
26	48	220	155	400	94	430	103	307	36	27	19	*21
27	45	170	145	580	100	432	97	170	36	26	18	21
28	43	135	140	620	104	335	94	123	32	26	18	17
29	57	146	140	200	103	277	107	112	35	28	17	18
30	55	140	200	135	-	249	88	100	41	27	17	19
31	49	-	340	150	-	257	-	89	-	24	17	-
Total	1,610	4,820	6,532	8,709	4,902	11,000	6,412	3,956	1,746	1,718	712	585
Mean	51.9	161	211	281	169	355	214	128	58.2	55.4	23.0	19.5
Cfsm	0.463	1.44	1.88	2.51	1.51	3.17	1.91	1.14	0.520	0.495	0.205	0.174
In.	0.53	1.60	2.17	2.89	1.63	3.65	2.13	1.31	0.58	0.57	0.24	0.19

Calendar year 1951: Max 2,140 Min 36 Mean 210 Cfsm 1.88 In. 25.44
Water year 1951-52: Max 1,700 Min 16 Mean 144 Cfsm 1.29 In. 17.49

Peak discharge (base, 1,780 cfs).--Mar. 11 (8:45 p.m.) 3,020 cfs (10.22 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 26-28, Dec. 13 to Jan. 1, Jan. 4-14, Jan. 21 to Feb. 2, Feb. 8-28, Mar. 2, 3.

Limestone Creek at Fayetteville, N. Y.

Location.--Lat 43°01'45", long. 76°00'50", on left bank 100 ft downstream from Genesee Street Bridge at Fayetteville, Onondaga County, and 8 miles upstream from mouth.

Drainage area.--85.7 sq mi, not including 15.7 sq mi of Middle Branch Tioughnioga Creek basin, flow from which may be completely diverted into Limestone Creek basin through DeRuyter Reservoir.

Records available.--November 1939 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 427.62 ft above mean sea level (levels by Corps of Engineers).

Average discharge.--12 years (1940-52), 146 cfs.

Extremes.--Maximum discharge during year, 2,670 cfs Mar. 11 (gage height, 5.87 ft); minimum, 20 cfs Sept. 22 (gage height, 1.37 ft).
1939-52: Maximum discharge, 7,010 cfs Mar. 28, 1950 (gage height, 7.78 ft), from rating curve extended above 3,800 cfs by logarithmic plotting; minimum, 14 cfs Aug. 10, 1940, Aug. 17, 1941; minimum gage height, 1.23 ft Aug. 20, 1949.

Remarks.--Records good except those for periods of ice effect or fragmentary or no gage-height record, which are fair. Canal diverts from Limestone Creek 3 miles above station and returns water to creek 400 ft above station. Flow regulated by DeRuyter Reservoir.

Revisions (water years).--W 954: 1941.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 16, Jan. 27 to Mar. 11, May 21 to Aug. 14				Nov. 17 to Jan. 27, Mar. 12 to May 21, Aug. 14 to Sept. 30			
1.5	30	3.0	364	1.4	22	3.0	380
1.6	42	3.5	567	1.6	47	3.5	576
2.0	105	4.0	842	2.0	113	4.0	842
2.5	214	4.9	1,520	2.5	230	4.5	1,190

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	38	a41	a130	759	a190	b90	244	79	142	37	32	24
2	*38	a42	a150	646	a360	b86	261	75	134	36	32	27
3	37	79	a135	305	a260	b84	267	f74	107	36	33	26
4	36	75	*a131	233	a330	a94	261	f72	96	40	f32	25
5	36	56	246	216	a410	a180	295	*69	96	37	f36	25
6	37	50	219	198	a280	a150	402	67	86	33	38	24
7	51	183	180	b150	a235	a135	*264	66	96	32	36	22
8	93	230	219	b130	206	122	255	66	82	32	34	22
9	a58	109	294	b145	214	118	222	63	77	62	34	22
10	a48	90	280	155	192	*124	188	58	*74	425	33	22
11	a45	80	198	129	b175	1,520	196	64	69	157	*34	24
12	a43	70	176	129	b145	1,170	171	231	66	78	36	24
13	a42	66	b145	133	*b106	411	193	264	61	59	34	24
14	a40	69	b116	*144	b96	293	206	182	58	*48	33	24
15	36	111	b104	380	b94	241	164	f135	55	43	28	25
16	37	160	b94	343	109	216	148	f173	52	42	27	27
17	36	241	b98	185	116	200	135	125	55	40	31	25
18	36	142	b102	442	113	206	127	111	58	41	32	22
19	34	125	b100	228	b106	230	123	98	53	42	28	24
20	33	a112	b110	235	b104	297	117	109	55	41	27	f26
21	33	a102	b300	197	109	492	111	385	48	50	27	f25
22	34	a104	b370	137	102	531	107	282	46	52	31	25
23	34	a170	b210	243	102	477	135	155	46	43	29	25
24	34	a180	b185	180	98	512	119	130	46	43	27	24
25	38	a150	b160	151	100	345	107	250	a43	42	26	22
26	43	a140	b145	289	93	323	104	271	a40	40	26	24
27	41	a145	b135	731	95	320	100	187	a38	38	25	24
28	40	a102	b124	375	95	255	94	151	a37	36	24	22
29	45	a108	131	b190	90	219	94	148	a38	36	24	22
30	43	a112	184	b145	-	200	91	136	41	36	25	22
31	a41	-	364	b150	-	203	-	122	-	34	25	-
Total	1,280	3,444	5,535	8,073	4,725	9,844	5,301	4,398	1,995	1,811	939	719
Mean	41.3	115	179	260	163	318	177	142	66.5	58.4	30.3	24.0
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 1,580 Min 33 Mean 168 Cfsm 1.96 In. 26.58
Water year 1951-52: Max 1,520 Min 22 Mean 131 Cfsm 1.53 In. 20.86

Peak discharge (base, 2,000 cfs).--Mar. 11 (11:30 p.m.) 2,670 cfs (5.87 ft).
* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of reconstructed gage-height graph, recorded range in stage, weather records, and records for nearby stations.
b Stage-discharge relation affected by ice.
f Fragmentary gage-height record; discharge computed from partly estimated gage heights.

Chittenango Creek near Chittenango, N. Y.

Location.--Lat 43°01'25", long. 75°51'30", on right bank at highway bridge 1.6 miles upstream from Chittenango, Madison County, 12 miles upstream from Butternut Creek, and 23 miles upstream from mouth.

Drainage area.--67.7 sq mi.

Records available.--August 1950 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 489.54 ft above mean sea level, datum of 1929, supplementary adjustment of 1943.

Extremes.--Maximum discharge during year, 1,300 cfs Mar. 11 (gage height, 4.66 ft); minimum, 14 cfs Sept. 14, 29 (gage height, 1.27 ft).
1950-52: Maximum discharge, 2,600 cfs July 28, 1951 (gage height, 5.88 ft), from rating curve extended above 810 cfs by logarithmic plotting; minimum, that of Sept. 14, 29, 1952.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Slight regulation at low flow caused by mills upstream.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 1				Jan. 2 to Sept. 30			
1.4	22	2.5	215	1.2	11	2.4	190
1.7	51	3.3	525	1.4	21	3.0	380
2.0	96			1.6	39	3.9	806
				1.9	81		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	27	30	148	492	b155	*a85	348	57	111	27	24	17
2	*27	58	165	413	258	78	*358	54	109	27	24	18
3	26	121	143	229	209	76	351	51	88	26	24	18
4	*25	98	*138	185	283	83	303	49	83	28	24	16
5	25	84	230	175	319	128	348	47	83	26	26	16
6	31	*78	178	163	209	103	432	46	79	25	24	16
7	56	217	153	b135	188	94	277	46	*86	24	22	16
8	84	239	173	b118	172	88	265	45	68	24	22	15
9	48	130	242	b122	172	88	249	44	64	81	21	15
10	39	111	210	b125	165	92	232	*41	58	*374	22	15
11	35	106	158	b116	163	*766	243	48	55	119	27	15
12	33	98	143	b122	146	592	206	173	51	70	24	15
13	31	93	128	130	b120	350	201	163	47	58	24	15
14	30	102	119	137	b104	246	209	117	44	50	21	23
15	28	128	*b118	305	b106	201	185	107	43	44	21	40
16	27	175	b104	281	b112	188	168	111	40	38	22	47
17	26	200	b110	170	b114	178	133	83	46	36	27	45
18	26	119	b116	318	a108	178	107	78	49	36	*22	45
19	26	106	b112	193	a100	175	99	70	44	41	20	50
20	25	100	b104	*188	a96	208	85	95	40	36	20	45
21	24	96	b270	160	a98	332	78	229	37	*55	20	44
22	23	104	284	b135	a96	366	73	203	37	49	21	43
23	22	301	176	b165	a92	413	94	119	36	37	19	41
24	22	253	155	b145	a90	450	83	101	34	36	18	39
25	29	170	134	b130	a84	366	73	188	32	32	18	24
26	28	153	b125	254	a82	384	71	214	30	29	18	*16
27	26	138	b120	457	a88	384	67	155	29	28	18	16
28	24	119	b116	267	a90	284	65	128	28	27	17	15
29	35	132	b112	b155	a86	246	67	123	31	29	17	14
30	33	132	b155	b120	-	243	61	113	31	27	17	15
31	30	-	249	b125	-	268	-	103	-	25	16	-
Total	971	3,991	4,888	6,230	4,105	7,733	5,531	3,201	1,613	1,564	660	769
Mean	31.3	133	158	201	142	249	184	103	53.8	50.5	21.3	25.6
Cfsm	0.462	1.96	2.33	2.97	2.10	3.68	2.72	1.52	0.795	0.746	0.315	0.378
In.	0.53	2.19	2.69	3.42	2.26	4.25	3.04	1.76	0.89	0.86	0.36	0.42

Calendar year 1951: Max 1,080 Min 22 Mean 147 Cfsm 2.17 In. 29.49
Water year 1951-52: Max 766 Min 14 Mean 113 Cfsm 1.67 In. 22.67

Peak discharge (base, 1,000 cfs).--Mar. 11 (3:30 p.m.) 1,300 cfs (4.66 ft).
* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records, observer's notes, records for nearby stations, and recorded range in stage.
b Stage-discharge relation affected by ice.

Oneida Lake at Brewerton, N. Y.

Location.--Lat 43°14'20", long. 76°08'30", at west end of Oneida Lake, 100 ft west of bridge on U. S. Highway 11, at Brewerton, Onondaga County.

Drainage area.--1,353 sq mi.

Records available.--November 1951 to September 1952. April 1904 to September 1925 in reports of State engineer and surveyor, published as Oneida River at Brewerton.

Gage.--Water-stage recorder. Datum of gage is 362.00 ft above mean sea level, Barge Canal datum.

Extremes.--Maximum gage height during period November 1951 to September 1952, 9.59 ft Apr. 14; minimum, 6.72 ft Mar. 4, 10.

Remarks.--Elevation of lake surface regulated by taintor-gate dam on Oneida River at Caughdenoy and gates on Oneida Canal and Barge Canal. Capacity of lake not determined. Area of water surface is 79.8 sq mi.

Gage height, in feet, November 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		-	7.79	7.62	a8.07	7.02	8.13	7.82	8.65	8.34	8.15	8.19
2		-	7.72	7.78	a8.02	6.98	8.19	7.81	8.54	8.28	8.15	8.13
3		-	7.75	7.91	a8.02	6.95	8.34	7.76	8.53	8.28	8.13	8.08
4		-	7.70	7.97	a8.09	6.92	8.49	7.85	8.48	8.26	8.19	8.12
5		-	7.67	7.99	a8.12	6.89	8.89	7.94	8.51	8.27	8.12	8.16
6		-	7.76	7.96	a8.22	6.86	8.84	7.83	8.51	8.31	8.14	8.14
7		-	7.87	7.92	a8.28	6.84	9.06	7.86	8.48	8.34	8.12	8.13
8		7.81	7.89	7.85	8.29	6.82	9.16	7.95	8.57	8.36	8.16	8.17
9		7.96	7.97	7.79	8.27	6.79	9.16	7.98	8.55	8.47	8.15	8.14
10		8.03	8.05	7.73	8.23	6.78	9.09	8.06	8.59	8.62	8.16	8.12
11		8.04	8.16	7.68	8.16	6.84	9.01	8.26	8.47	8.89	8.11	8.12
12		8.15	8.08	7.62	8.11	7.17	9.14	8.26	8.58	9.02	8.14	8.12
13		8.14	8.04	7.56	8.05	7.53	9.30	8.34	8.61	9.07	8.10	8.13
14		8.14	8.12	7.52	7.96	7.73	9.14	8.65	8.64	9.10	8.12	8.19
15		8.17	7.82	7.53	7.88	7.83	9.09	8.89	8.56	9.03	8.14	8.17
16		8.26	d7.78	7.61	7.82	7.86	9.03	8.82	8.61	8.91	8.12	8.10
17		8.32	d7.83	7.75	7.79	7.87	8.99	9.00	8.54	8.82	8.10	8.12
18		8.28	d7.80	7.84	7.70	7.86	8.91	9.03	8.46	8.67	8.15	8.14
19		8.32	d7.74	8.02	7.64	7.87	8.84	9.08	8.37	8.53	8.16	8.10
20		8.29	d7.68	8.11	7.59	7.80	8.72	9.22	8.47	8.49	8.18	8.09
21		8.27	d7.62	8.19	7.54	7.78	8.69	9.11	8.52	8.44	8.16	8.11
22		8.18	d7.62	8.26	7.47	7.82	8.62	9.15	8.53	8.39	8.10	8.11
23		8.13	d7.66	8.16	7.41	7.88	8.47	9.13	8.49	8.39	8.06	8.13
24		8.11	d7.66	8.14	7.35	7.92	8.44	9.08	8.43	8.23	8.07	8.00
25		8.25	d7.69	8.10	7.28	7.98	8.41	9.13	8.39	8.29	8.09	7.98
26		8.07	d7.68	a8.10	7.23	8.02	8.24	9.09	8.36	8.26	8.10	7.91
27		8.06	d7.65	a8.17	7.17	8.06	8.13	9.12	8.36	8.20	8.10	7.94
28		8.09	d7.62	a8.22	7.11	8.11	8.08	9.11	8.36	8.21	8.13	7.95
29		7.96	7.58	a8.22	7.07	8.13	7.97	8.98	8.38	8.17	8.11	7.93
30		7.88	7.54	8.21	-	8.12	7.88	8.89	8.35	8.21	8.14	7.89
31		-	7.56	8.13	-	8.11	-	8.85	-	8.14	8.24	-
Mean		-	7.78	7.92	7.79	7.52	8.68	8.58	8.50	8.48	8.13	8.09
(†)		-	-216	+432	-923	+880	-197	+748	-343	-199	+49.8	-240

† Change in contents in Oneida Lake (equivalent in cubic feet per second).
a No gage-height record; mean daily gage heights estimated on basis of recorded range in stage and records from base gage on Oneida River at Caughdenoy.
d Doubtful gage-height record; mean daily gage heights estimated on basis of records from base gage on Oneida River at Caughdenoy.

Oneida River at Caughdenoy, N. Y.

Location.--Lat 43°14'45", long. 76°10'15", on left bank at point of diversion to New York State Barge Canal, 1.6 miles downstream from Oneida Lake and 2.6 miles upstream from Caughdenoy, Oswego County. Prior to Nov. 7, 1951, at site 2.5 miles downstream (present location of auxiliary water-stage recorder).

Drainage area.--1,377 sq mi.

Records available.--September 1902 to December 1909 (published as "near Euclid"), January 1910 to December 1913, and October 1947 to September 1952 in reports of Geological Survey. September 1902 to December 1909 and January 1910 to September 1925 in reports of State engineer and surveyor.

Gage.--Water-stage recorder. Datum of gage is 362.00 ft above mean sea level (New York State Barge Canal benchmark). Prior to June 4, 1907, headwater readings and June 5, 1907, to Dec. 31, 1909, staff-gage readings at Oak Orchard State Dam at different datum. Jan. 1, 1910, to Dec. 31, 1913, staff gage at site 2.5 miles downstream at different datum. Oct. 9, 1947, to Nov. 7, 1951, water-stage recorder at site 2.5 miles downstream at same datum; since Nov. 7, 1951, used as auxiliary gage. Since Nov. 9, 1951, auxiliary water-stage recorder 2.6 miles downstream and 180 ft downstream from navigation dam of New York State Barge Canal.

Average discharge.--5 years (1947-52), 2,522 cfs.

Extremes.--Maximum daily discharge during year, 6,490 cfs Apr. 13; minimum daily, 143 cfs Sept. 10, 11.

1947-52: Maximum daily discharge, 9,160 cfs Apr. 7, 1950; minimum daily, 62 cfs July 29, 1950.

Remarks.--Records excellent above and good below 1,500 cfs, except those for periods of backwater from submergence, which are fair. Discharge below 1,500 cfs computed by using gage-height record for auxiliary water-stage recorder 2.6 miles downstream. This record represents total discharge at Caughdenoy and includes flow in Oneida and Barge Canals. A large amount of natural storage by Oneida Lake. Considerable seasonal regulation by operation of gates in Oneida Canal and at navigation dam. Occasional large diurnal fluctuations caused by seiche in Oneida Lake. Water may be diverted into or received from Mohawk River basin through summit level of Barge Canal between New London and Utica. Nearly all of flow from 16 sq mi of the Tioughnioga River basin may be diverted into DeRuyter Reservoir, in Oswego River basin.

Cooperation.--Records of gate openings for navigation dam and gate openings, lockages, and elevations of water surface in Barge Canal above and below lock 23 furnished by New York State Department of Public Works.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,240	1,310	3,790	3,500	4,160	2,700	4,210	*2,530	4,920	775	*340	194
2	1,050	1,320	3,710	3,720	4,070	2,630	4,310	1,150	4,760	679	344	182
3	*1,030	1,300	3,730	3,890	4,050	2,620	*4,520	301	2,890	487	351	162
4	1,120	1,330	3,670	3,990	4,160	2,600	4,760	309	*1,580	224	336	154
5	1,580	1,320	*3,600	4,000	4,210	*2,500	5,550	286	1,020	219	337	156
6	1,040	1,360	3,710	3,940	4,360	2,490	5,400	265	1,040	222	338	158
7	1,100	1,400	3,860	3,900	*4,460	2,470	5,920	261	1,050	411	332	157
8	1,050	1,340	3,890	3,820	4,470	2,430	6,170	*261	1,040	524	334	164
9	1,060	1,450	3,740	3,760	4,410	2,400	6,180	256	1,050	523	331	149
10	1,070	1,590	3,830	3,550	4,340	2,420	*6,010	247	1,050	*537	334	143
11	1,070	1,580	4,290	3,590	4,270	2,490	5,770	243	1,020	541	328	143
12	1,070	1,610	4,150	*3,490	*4,180	2,910	6,090	238	1,020	560	325	150
13	1,070	1,610	4,130	3,410	4,100	*3,400	6,490	246	1,040	590	328	147
14	1,070	1,820	4,380	2,870	3,960	3,660	6,120	336	1,030	974	329	177
15	1,220	1,660	3,890	*3,060	*3,860	3,800	6,010	*803	1,040	1,870	*333	166
16	1,360	*a2,120	a3,760	3,490	3,800	3,800	5,850	1,160	1,040	3,500	314	431
17	1,350	a3,180	a3,840	2,940	3,750	3,850	5,740	1,160	1,030	*3,810	322	739
18	1,340	a3,190	a3,780	3,220	3,630	4,020	*5,580	1,160	1,000	3,760	323	738
19	1,340	a3,510	a3,700	4,070	3,550	*4,220	5,410	1,300	*1,020	3,750	319	611
20	1,350	a3,860	3,630	4,170	*3,510	4,130	5,160	2,000	1,010	3,750	315	485
21	1,360	a4,110	3,540	4,300	3,410	3,880	5,150	*2,880	1,040	2,300	320	490
22	1,340	3,850	3,540	4,440	3,330	3,770	5,030	4,500	1,040	1,780	265	490
23	1,320	2,440	3,590	4,240	3,260	3,860	4,740	*5,620	1,030	1,780	194	*485
24	1,320	3,120	3,580	4,210	3,180	3,920	*4,720	5,580	1,000	*1,890	197	487
25	1,300	4,420	3,620	*4,180	3,090	*4,000	4,660	5,590	999	1,310	194	480
26	1,330	4,140	3,600	4,150	3,030	4,050	4,380	5,560	929	689	187	484
27	1,320	4,150	3,550	4,250	2,920	4,110	4,250	5,360	*845	701	*186	486
28	1,330	4,220	3,540	4,360	*2,830	4,180	*3,790	*5,180	843	369	186	502
29	1,310	4,050	3,470	4,380	2,770	4,210	3,420	5,230	844	294	190	494
30	1,340	3,930	3,380	4,350	-	4,180	3,280	5,160	844	348	191	496
31	1,310	-	3,440	4,240	-	4,200	-	5,110	-	344	196	-
Total	38,160	76,290	115,950	119,480	109,120	105,900	154,670	70,282	40,064	39,511	8,919	10,300
Mean	1,231	2,543	3,740	3,854	3,763	3,416	5,156	2,267	1,335	1,275	288	343
Cfsm	0.894	1.85	2.72	2.80	2.73	2.48	3.74	1.65	0.969	0.926	0.209	0.249
In.	1.03	2.06	3.13	3.23	2.95	2.86	4.18	1.90	1.08	1.07	0.24	0.28

Calendar year 1951: Max 8,730 Min 104 Mean 3,154 Cfsm 2.29 In. 31.07
Water year 1951-52: Max 6,490 Min 143 Mean 2,428 Cfsm 1.76 In. 24.01

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for Oneida Lake at Brewerton and recorded range in stage.

Note.--Backwater from Phoenix Dam May 3-19, June 5-25, July 4, 5, 11, 25, 26, July 28 to Aug. 4, Sept. 2-5, 8-30.

Oswego River at lock 7, Oswego, N. Y.

Location.--Lat 43°27'00", long. 76°30'25", on right bank at lock 7 in Oswego, Oswego County, three-quarters of a mile upstream from mouth.
Drainage area.--5,121 sq mi.
Records available.--April 1897 to December 1901, October 1927 to September 1928, November 1933 to September 1952. Records for 1927-28 of doubtful accuracy.
Gage.--Water-stage recorder. Datum of gage is 246.00 ft above mean sea level (New York State Barge Canal datum). April 1897 to December 1901, head-gate readings and Oct. 1, 1927, to Sept. 30, 1928, water-stage recorder, at High Dam three-quarters of a mile upstream at different datum.
Average discharge.--18 years (1934-52), 6,585 cfs.
Extremes.--Maximum discharge during year, 18,700 cfs Mar. 12 (gage height, 9.00 ft), includes mean daily discharge of canals; maximum gage height, 10.32 ft Jan. 3 (backwater from Lake Ontario and/or cofferdam); minimum daily discharge, 540 cfs Aug. 31; minimum gage height, 1.47 ft Nov. 1 (backwater from Lake Ontario and/or cofferdam).
1933-52: Maximum discharge, 37,500 cfs Mar. 28, 1936, includes mean daily discharge of canals; maximum gage height, 13.46 ft Apr. 10, 1940; minimum discharge (river only), 30 cfs Nov. 6, 1944; minimum daily, 353 cfs Aug. 14, 1949; minimum gage height, 0.97 ft Aug. 24, 1934.
Remarks.--Records excellent except those for periods of backwater from Lake Ontario or cofferdam, which are good. This record represents total discharge at Oswego and includes flow in Hydraulic and Barge Canals. A large amount of natural storage and some artificial regulation is afforded by the many large lakes and the Barge Canal system in river basin. Large diurnal fluctuations at low and medium flow by powerplants above station. Oswego River basin receives water from Erie division of Barge Canal through lock 32 near Pittsford. Water may be diverted into or received from Mohawk River basin through summit level of Barge Canal between New London and Utica. During part of year entire flow from 45 sq mi of Mud Creek drainage area may be diverted from Chemung River basin into Lake Keuka in Oswego River basin. Nearly all of flow from 15.7 sq mi of the Tioughnioga River basin may be diverted into DeRuyter Reservoir, in Oswego River basin.
Cooperation.--Records of lockages at lock 7 furnished by New York State Department of Public Works, record of elevations of Lake Ontario by Corps of Engineers, daily discharge records for High Dam by Niagara Mohawk Power Corp., and those at Fulton by Oswego River Watershed Corp.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,100	2,800	6,000	9,000	10,200	7,510	12,200	3,700	11,800	2,700	3,100	700
2	2,600	2,800	5,200	12,400	10,400	6,860	12,500	4,000	11,000	2,600	2,600	1,600
3	*2,800	2,700	6,400	13,000	10,600	8,180	12,200	2,250	10,000	2,300	1,750	1,800
4	2,700	2,000	6,000	13,000	12,500	8,720	11,800	1,500	7,200	1,750	2,900	1,850
5	3,000	3,300	6,000	11,400	14,500	8,260	11,100	3,000	6,000	1,450	2,700	1,650
6	2,900	3,000	*6,400	10,800	14,500	8,380	12,300	2,450	6,200	1,550	1,400	1,080
7	1,800	3,200	7,000	10,600	15,000	8,690	13,300	*2,300	6,000	1,750	1,850	840
8	3,500	3,400	8,200	9,400	15,000	8,690	*14,300	2,200	4,900	1,850	1,800	1,350
9	3,100	3,500	7,400	8,400	14,500	8,580	15,400	1,900	*4,200	2,100	960	1,850
10	2,800	3,500	8,000	8,000	14,000	8,660	15,300	1,750	3,500	3,000	820	1,750
11	2,700	2,450	7,800	8,000	*13,500	*10,100	14,100	1,250	3,300	2,900	1,750	1,700
12	2,600	3,900	8,000	7,800	13,100	15,800	13,400	3,100	4,200	2,400	*1,750	1,500
13	2,450	3,700	7,800	7,400	11,800	18,200	12,800	3,200	3,500	1,300	1,850	920
14	1,400	3,600	7,600	7,400	10,800	17,700	12,800	3,600	3,000	3,000	1,750	960
15	3,000	3,400	7,200	*6,600	10,400	16,900	12,600	3,900	2,100	*3,200	1,350	2,050
16	2,600	3,900	6,400	8,600	9,540	15,900	12,400	4,300	3,800	3,600	1,200	2,450
17	2,400	5,200	5,800	10,000	9,420	15,300	12,200	4,700	3,400	4,800	920	2,600
18	2,450	5,400	5,600	10,600	9,770	14,500	12,200	3,900	3,000	4,900	1,700	2,500
19	2,450	6,400	6,000	11,200	9,660	14,400	12,000	5,400	3,200	5,200	1,700	2,400
20	2,450	6,600	6,600	11,400	9,450	14,200	11,500	5,800	2,600	4,600	1,700	2,600
21	1,250	6,400	6,800	11,400	9,280	14,800	11,200	7,400	2,350	5,200	1,650	1,450
22	2,800	7,200	7,000	11,000	9,160	15,300	10,400	10,000	2,050	4,600	1,700	3,000
23	3,100	6,800	7,200	10,600	8,920	15,500	10,700	12,200	2,700	4,400	1,080	2,900
24	3,300	6,200	7,400	10,200	8,450	16,100	10,100	13,000	3,000	4,000	820	2,600
25	3,100	6,000	7,200	10,000	8,640	15,900	8,200	12,500	2,900	4,200	1,800	2,400
26	2,800	7,200	8,000	9,200	8,690	15,800	8,200	13,000	2,900	3,200	1,700	2,250
27	2,500	7,000	7,600	10,400	8,190	15,200	8,000	13,500	3,000	1,600	1,400	2,250
28	1,600	6,600	7,800	11,800	8,600	14,700	7,800	13,500	1,750	3,300	1,300	1,120
29	3,500	6,400	7,400	11,600	8,250	13,500	6,400	13,000	1,700	2,350	1,000	2,450
30	3,200	6,200	6,400	11,000	-	13,100	5,400	13,000	2,700	2,600	860	2,500
31	2,900	-	7,800	10,400	-	12,300	-	12,500	-	3,100	540	-
Total	82,850	140,750	216,000	312,600	316,820	397,730	342,800	197,800	127,950	95,500	49,400	57,070
Mean	2,673	4,692	6,968	10,080	10,920	12,830	11,430	6,381	4,265	3,081	1,594	1,902
Cfsm	0.522	0.916	1.36	1.97	2.13	2.51	2.23	1.25	0.833	0.602	0.311	0.371
In.	0.60	1.02	1.57	2.27	2.30	2.89	2.49	1.44	0.93	0.69	0.36	0.41

Calendar year 1951: Max 22,600 Min 1,250 Mean 8,087 Cfsm 1.58 In. 21.43
Water year 1951-52: Max 18,200 Min 540 Mean 6,386 Cfsm 1.25 In. 16.97

* Discharge measurement made on this day.
Note.--Backwater from Lake Ontario and/or cofferdam Oct. 1 to Feb. 11, Apr. 25 to Sept. 30 (no river gage-height record Oct. 1-3, Nov. 27-29, Dec. 17-26, Jan. 7-9, 16-19, Jan. 29 to Feb. 1, Feb. 7-9, May 31 to June 9; discharge estimated on basis of 4 discharge measurements, records of stage of Lake Ontario, and power-plant records at Fulton and High Dam).

Black River Canal (flowing south) near Boonville, N. Y.

Location.--Lat 43°27'20", long. 75°19'25", gage 1 on left bank at lock 69, 2 miles south of Boonville, Oneida County, and gage 2 on right bank of Lansingkill spillway, 100 ft downstream from spillway headgates, 600 ft upstream from lock 70, and half a mile upstream from lock 69.

Records available.--September 1915 to September 1942 (canal seasons only), October 1942 to September 1952.

Gage.--Two water-stage recorders and concrete controls. Datum of gage 1 is 1,105.56 ft above mean sea level, datum of 1929. Prior to June 7, 1929, station was operated as a slope station on summit level of canal.

Extremes.--1915-52: Maximum daily discharge recorded, 323 cfs Nov. 30, 1915; practically no flow at times when no water is being diverted.

Remarks.--Records good. Record shows combined flow at gages 1 and 2 and represents total diversion from Black River at Forestport, through Forestport feeder, into Mohawk River basin. Discharge during period Nov. 17 to May 8, when no water was diverted, made up of leakage through headgates and runoff from area draining into canal above station.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*67	46	4.1	3.4	2.3	1.8	3.3	1.6	19	37	18	76
2	67	47	4.0	3.7	2.5	1.8	3.8	1.6	20	36	18	78
3	66	61	4.1	2.8	2.6	1.8	3.8	1.6	17	38	18	70
4	66	68	4.7	2.6	3.6	1.8	3.5	1.5	14	53	18	40
5	66	60	56	2.6	4.3	1.8	3.6	1.5	*13	37	22	68
6	65	55	25	2.6	3.7	1.8	3.6	1.4	13	29	23	75
7	72	72	31	2.5	3.0	1.8	*3.2	1.2	9.8	34	21	75
8	73	96	38	2.4	2.6	1.8	3.9	*24	4.1	36	19	73
9	48	81	15	2.4	2.6	1.8	3.8	43	41	46	19	72
10	66	67	14	2.3	2.5	1.8	3.7	47	50	73	20	70
11	70	61	9.0	2.3	2.4	2.9	3.7	51	47	15	24	54
12	69	58	7.5	2.2	2.3	4.5	3.3	70	46	6.6	37	53
13	68	57	6.7	2.2	2.3	4.1	2.9	100	42	17	*42	52
14	67	73	4.6	2.1	2.2	3.7	3.3	77	40	40	40	46
15	67	103	4.3	2.9	2.1	3.3	3.0	50	40	40	40	48
16	67	81	4.1	3.7	2.1	2.6	2.8	60	39	36	40	57
17	67	100	3.3	*2.7	2.1	2.5	2.6	69	39	45	45	68
18	66	65	3.0	4.0	2.0	2.3	2.7	54	40	*49	38	71
19	66	39	2.9	3.3	2.1	2.2	2.7	55	39	51	37	79
20	66	23	2.8	3.2	2.0	2.2	2.7	55	37	49	39	81
21	66	12	3.6	3.2	2.0	2.2	2.5	86	36	45	39	80
22	65	3.6	5.5	2.6	1.9	2.2	2.4	68	37	30	38	*79
23	65	4.3	5.3	2.6	1.9	2.3	2.4	30	36	22	38	77
24	53	5.8	5.2	2.7	1.9	2.9	2.4	18	36	20	37	76
25	60	5.4	5.0	2.6	1.9	3.3	2.3	37	36	23	36	68
26	57	5.0	4.7	2.6	1.8	3.5	2.3	57	36	23	37	60
27	50	4.7	4.6	3.2	*1.8	3.7	2.1	40	36	20	51	56
28	48	4.6	3.9	3.2	1.8	3.5	1.9	27	36	19	67	52
29	47	4.5	2.8	2.7	1.8	3.4	1.8	21	36	19	71	54
30	*47	4.2	2.7	2.6	-	3.4	1.8	19	38	18	76	54
31	46	-	2.7	2.4	-	3.4	-	18	-	18	78	-
Total	1,933	1,367.1	290.1	86.3	68.1	82.1	87.8	1,186.4	972.9	1,024.6	1,146	1,962
Mean	62.4	45.6	9.36	2.78	2.35	2.65	2.93	38.3	32.4	33.1	37.0	65.4
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 135 Min 0.2 Mean 29.2 Cfsm - In. -
Water year 1951-52: Max 103 Min 1.2 Mean 27.9 Cfsm - In. -

* Discharge measurement made on this day.

Black River near Boonville, N. Y.

Location.--Lat 43°30'35", long. 75°18'25", on left bank at downstream side of highway bridge, three-quarters of a mile upstream from Sugar River and 2 miles northeast of Boonville, Oneida County.

Drainage area.--295 sq mi.

Records available.--February 1911 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 935.50 ft above mean sea level, datum of 1929, supplementary adjustment of 1943. Prior to Sept. 27, 1933, chain gage and staff gage at same site and datum.

Average discharge.--41 years, 685 cfs (unadjusted).

Extremes.--Maximum discharge during year, 5,870 cfs Apr. 6; maximum gage height, 9.69 ft Apr. 6; minimum discharge, 120 cfs Oct. 20, 23; minimum gage height, 3.89 ft Sept. 10; minimum daily discharge, 140 cfs Oct. 20.
1911-52: Maximum discharge, 12,400 cfs Mar. 28, 1913 (gage height, about 12.5 ft, from floodmarks); minimum observed, about 5 cfs Aug. 26, 1918 (gage height, 2.40 ft); minimum daily, 7 cfs Aug. 26, 1918.

Remarks.--Records excellent except those for periods of ice effect or fragmentary or no gage-height record, which are good. Flow slightly regulated by several headwater reservoirs. Forestport feeder diverts water from State Pond at Forestport. That portion of diverted water which does not pass down Black River Canal (flowing south) returns to Black River below station through Mill Creek sluiceway.

Revision (water years).--W 759: Drainage area. W 784: 1934. W 1084: 1912(M), 1913, 1917-19(M), 1922(M), 1924(M), 1926(M), 1928(M), 1930(M), 1933(M).

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 6				Apr. 6 to Sept. 30			
4.0	140	6.0	1,060	4.0	147	6.0	1,010
4.6	302	7.0	1,970	4.5	282	8.0	2,990
5.2	557	8.1	3,350	5.0	467	9.6	5,600

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	249	276	584	840	620	400	1,270	641	593	248	165	285
2	237	283	605	1,080	760	380	2,310	602	597	217	161	273
3	*234	507	632	1,000	840	380	3,350	583	542	190	161	471
4	220	894	649	840	978	380	*3,120	578	488	370	165	372
5	204	632	2,050	760	1,510	400	3,300	555	*467	380	302	251
6	199	507	3,130	680	1,520	410	5,410	532	442	273	357	206
7	232	655	2,430	560	1,190	380	4,640	493	455	a211	302	180
8	416	1,140	2,740	520	962	370	2,960	*451	438	a188	242	161
9	416	1,090	2,470	540	836	370	2,270	434	623	a226	206	152
10	320	816	1,940	560	800	380	2,480	422	828	a3,100	231	149
11	261	684	1,340	480	720	860	3,380	455	651	*a3,000	430	163
12	226	644	1,050	460	660	1,900	3,060	757	583	1,210	*422	158
13	199	599	840	460	620	2,230	2,400	1,840	501	597	343	161
14	186	760	*680	500	600	1,890	2,640	2,140	410	422	273	175
15	174	1,500	620	700	580	1,210	*3,210	1,400	350	343	228	195
16	164	1,610	560	*1,220	580	874	2,870	981	318	343	240	254
17	160	1,800	520	1,040	580	738	2,640	834	315	305	945	257
18	153	1,290	490	1,400	540	666	2,650	742	322	*276	1,020	251
19	151	900	460	1,950	540	644	2,690	677	292	295	516	295
20	140	713	460	1,490	520	627	2,680	636	254	315	322	365
21	144	578	640	1,230	490	644	2,640	1,410	236	374	260	292
22	144	573	1,250	960	480	707	2,140	2,040	225	506	225	*231
23	147	732	1,400	880	470	764	2,140	1,460	225	430	203	190
24	188	976	1,160	1,000	450	927	2,180	988	f222	471	185	168
25	381	862	980	800	430	955	1,520	1,040	f242	430	175	161
26	456	732	820	760	420	948	1,070	1,710	282	292	190	165
27	356	684	700	1,120	*410	1,150	903	1,460	251	236	239	175
28	323	594	600	1,440	410	1,090	804	1,070	214	214	203	185
29	334	627	540	980	400	934	752	828	a190	200	170	182
30	*320	599	560	760	-	888	693	708	a206	192	215	158
31	276	-	720	660	-	1,020	-	612	-	178	357	-
Total	7,610	24,257	33,620	27,670	19,916	25,516	74,172	29,079	11,762	16,032	9,453	6,681
Mean	245	809	1,085	893	687	823	2,472	938	392	517	305	223
Cfsm	0.831	2.74	3.68	3.03	2.33	2.79	8.38	3.18	1.33	1.75	1.03	0.756
In.	0.96	3.06	4.24	3.49	2.51	3.22	9.35	3.67	1.48	2.02	1.19	0.84

Calendar year 1951: Max 6,060 Min 138 Mean 821 Cfsm 2.78 In. 37.76
Water year 1951-52: Max 5,410 Min 140 Mean 781 Cfsm 2.65 In. 36.03

Peak discharge (base, 3,900 cfs).--Apr. 6 (12:45 p.m.) 5,870 cfs (9.47 ft).
* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of weather records, high-water mark in well, and gage-height record at Forestport feeder dam.
f Fragmentary gage-height record; discharge computed from partly estimated gage heights.
Note.--Stage-discharge relation affected by ice Dec. 13 to Jan. 19, Jan. 22 to Feb. 3, Feb. 10 to Mar. 12.

Middle Branch Moose River at Old Forge, N. Y.

Location.--Lat 43°42'50", long. 74°58'10", on left bank in Old Forge, Herkimer County, 400 ft downstream from State dam and 1¼ miles upstream from North Branch Moose River.

Drainage area.--52 sq mi, approximately.

Records available.--November 1911 to September 1952.

Gage.--Staff gage read twice daily. Datum of gage is 1,690.63 ft above mean sea level, datum of 1929.

Average discharge.--40 years (1912-52), 105 cfs.

Extremes.--Maximum daily discharge during year, 300 cfs May 14; maximum gage height observed, 3.35 ft May 14; minimum daily discharge, 9.9 cfs Apr. 1.
1911-52: Maximum daily discharge, 862 cfs Mar. 23, 1921, from rating curve extended above 450 cfs by logarithmic plotting; minimum daily, about 0.1 cfs many times when gates in dam were closed.

Remarks.--Records good except those for periods of backwater or doubtful gage-height record, which are fair. On days when gate openings are changed, discharge is computed from gage readings and record of gate operations. Flow regulated by Fulton Chain of Lakes since about 1880.

Rating table, water year 1951-52, except period of backwater (gage height, in feet, and discharge, in cubic feet per second)

1.7	9.9	2.5	100
1.9	24	3.0	206
2.2	55	3.4	314

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	271	11	13	83	127	231	9.9	28	48	55	31	29
2	271	11	16	86	123	231	11	28	121	25	31	29
3	*d271	11	17	90	123	234	11	29	98	25	30	121
4	d257	11	19	90	125	244	*11	30	28	25	30	171
5	257	11	22	90	127	244	d11	30	d28	25	30	171
6	257	11	39	90	131	244	13	30	*29	25	30	171
7	257	11	49	90	131	244	75	31	141	25	30	171
8	257	11	63	86	133	231	194	32	98	26	29	c210
9	209	11	80	83	135	231	114	*53	39	27	29	c225
10	104	12	78	82	135	231	14	64	68	130	29	c225
11	104	12	d80	77	135	231	15	65	125	171	*29	c225
12	106	12	d80	76	135	231	16	147	125	114	29	c220
13	108	12	d80	71	135	231	16	207	125	32	29	c165
14	106	12	*d80	68	135	231	14	300	123	32	29	c145
15	138	12	83	129	133	231	14	285	63	*31	29	c145
16	244	11	83	171	153	218	14	170	28	d31	29	c145
17	244	12	83	*d171	206	218	14	87	28	d31	30	c145
18	231	12	83	160	206	218	14	64	28	31	29	c145
19	231	12	83	160	206	218	14	64	28	31	29	c145
20	231	12	86	160	206	218	15	64	28	32	29	c145
21	231	12	97	160	206	206	16	131	28	32	29	c145
22	218	12	100	160	224	206	17	254	28	32	29	c145
23	218	12	108	160	257	206	19	285	28	32	29	c145
24	206	12	110	160	244	194	19	208	28	32	29	*c145
25	149	12	102	150	244	194	19	171	30	32	29	c145
26	11	12	97	150	244	194	19	171	30	31	29	d150
27	11	12	97	150	231	182	19	224	30	31	29	d150
28	12	12	93	139	*231	182	19	222	30	31	29	d150
29	12	12	90	139	231	159	19	121	87	31	29	d150
30	12	12	88	137	-	90	62	70	121	31	29	150
31	*d11	-	86	131	-	26	-	30	-	31	29	-
Total	5,245	350	2,285	3,749	5,052	6,449	837.9	3,695	1,839	1,270	909	4,623
Mean	169	11.7	73.7	121	174	208	27.9	119	61.3	41.0	29.3	154
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 520 Min 11 Mean 111 Cfsm 2.13 In. 29.07
Water year 1951-52: Max 300 Min 9.9 Mean 99.2 Cfsm 1.91 In. 25.96

* Discharge measurement made on this day.
c Backwater from log.
d Doubtful gage-height record; discharge computed on basis of record for adjacent days, reservoir elevations, engineers' inspections, and record of gate operation at Old Forge Dam.

Note.--Increase in combined storage in Old Forge and Sixth Lake Reservoirs during calendar year 1951, about 179,000,000 cu ft (equivalent mean discharge, 5.7 cfs; runoff, 1.48 in); decrease during water year 1951-52, about 54,100,000 cu ft (equivalent mean discharge, 1.7 cfs; runoff, 0.45 in).

Middle Branch Moose River near McKeever, N. Y.

Location.--Lat 43°37'45", long. 75°04'55", on right bank half a mile upstream from confluence with South Branch and 1½ miles northeast of McKeever, Herkimer County.

Drainage area.--148 sq mi.

Records available.--October 1925 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 1,530.29 ft above mean sea level, datum of 1929.

Average discharge.--27 years, 330 cfs.

Extremes.--Maximum discharge during year, 1,030 cfs Apr. 9 (gage height, 5.13 ft); maximum gage height, 5.77 ft Dec. 28 (backwater from ice); minimum discharge, 76 cfs Aug. 9, 10, 16 (gage height, 2.27 ft).
1925-52: Maximum discharge, 2,100 cfs Apr. 27, 1926 (gage height, 6.6 ft); maximum gage height, 7.15 ft Jan. 18, 1938 (ice jam); minimum discharge, 27 cfs Aug. 18, 1946 (gage height, 1.73 ft).

Remarks.--Records good except those for periods of ice effect, which are fair. Flow regulated to some extent by Fulton Chain of Lakes since about 1880.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 8				Apr. 9 to Sept. 30			
2.5	98	3.5	318	2.2	68	3.5	318
3.0	187	4.5	704	2.5	104	4.5	704
		5.0	960	3.0	189	5.2	1,070

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	385	104	240	360	350	360	256	375	324	248	87	80
2	382	101	248	380	340	360	347	324	359	185	86	84
3	*382	134	230	385	330	350	434	292	382	152	85	112
4	382	148	141	372	330	360	*479	269	321	150	85	196
5	379	160	299	360	390	370	618	213	264	148	91	225
6	369	160	372	340	400	360	848	142	*245	140	87	223
7	372	182	420	320	410	350	828	200	267	132	83	218
8	382	284	502	300	390	340	960	202	343	124	79	253
9	379	399	521	290	380	330	1,020	*196	289	156	77	286
10	300	318	560	280	370	337	890	209	251	471	86	289
11	230	286	540	260	360	400	843	216	289	506	*100	286
12	215	269	490	270	350	480	802	262	318	521	95	283
13	208	253	450	270	330	467	802	416	304	404	89	272
14	201	278	*410	280	320	441	792	517	292	304	81	225
15	198	318	380	280	310	420	767	587	272	253	77	218
16	262	340	330	380	320	402	747	574	196	*223	82	223
17	327	362	320	*440	360	385	738	456	165	198	111	221
18	330	352	330	450	370	375	723	379	156	179	118	216
19	324	346	330	440	360	375	709	346	150	175	118	225
20	318	320	320	460	350	366	714	301	148	165	105	221
21	315	300	360	450	350	368	728	372	142	203	95	216
22	309	270	410	430	360	375	742	490	133	198	98	213
23	315	286	450	420	390	372	742	600	127	160	104	207
24	304	309	470	420	380	382	709	613	117	143	108	*204
25	318	309	490	400	370	396	667	545	145	133	107	209
26	220	300	480	410	380	375	609	537	138	126	104	209
27	130	290	450	430	380	382	541	554	148	120	100	209
28	115	270	410	430	*380	379	479	613	154	107	94	202
29	114	250	380	420	370	366	438	562	165	89	90	196
30	108	240	360	390	-	334	460	467	235	89	94	191
31	*104	-	350	370	-	278	-	382	-	89	85	-
Total	8,677	7,938	12,043	11,487	10,480	11,633	20,430	12,191	6,839	6,291	2,901	6,412
Mean	280	265	388	371	361	375	681	393	228	203	93.6	214
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 1,400 Min 88 Mean 355 Cfsm 2.40 In. 32.55
Water year 1951-52: Max 1,020 Min 77 Mean 321 Cfsm 2.17 In. 29.47

Peak discharge (base, 1,200 cfs).--No peak above base.
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 20-22, Nov. 26 to Dec. 1, Dec. 10 to Jan. 2, Jan. 5 to Mar. 9, Mar. 11, 12 (no gage-height record Jan. 30 to Feb. 3, Feb. 5-24).

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Moose River at McKeever, N. Y.

Location.--Lat 43°36'40", long. 75°06'35", on left bank half a mile west of McKeever, Herkimer County, and 2 miles downstream from South Branch.

Drainage area.--365 sq mi.

Records available.--June 1900 to December 1922 (published as "at Moose River"), May 1922 to September 1952.

Gage.--Water-stage recorder at present site and datum since Nov. 3, 1922. Datum of gage is 1,479.92 ft above mean sea level, datum of 1929. June 5, 1900, to Dec. 31, 1922 staff gage at site 2½ miles downstream at various datums. May 28 to Nov. 2, 1922, staff gage at present site at datum 1 ft higher.

Average discharge.--44 years (1907-13, 1914-52), 841 cfs.

Extremes.--Maximum discharge during year, 5,750 cfs Apr. 6 (gage height, 9.33 ft); minimum, 138 cfs Sept. 1, 2 (gage height, 1.84 ft).
1900-1952: Maximum discharge, 18,700 cfs June 3, 1947 (gage height, 17.45 ft, from floodmark), result of failure of dam; minimum, about 42 cfs July 21, 23, 25-27, 1913.

Remarks.--Records good except those for periods of ice effect, which are fair. Flow regulated to some extent by Fulton Chain of Lakes since about 1880.

Revisions (water years).--W 624: 1922(M). W 729: Drainage area. W 874: 1928.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1-9		Oct. 10 to Sept. 30			
2.9	476	1.8	129	5.0	1,620
3.4	692	2.5	320	7.0	3,260
		3.5	733	9.0	5,390

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	589	257	600	904	1,020	580	793	994	671	372	158	138
2	563	257	611	1,200	1,000	560	1,600	804	830	301	153	149
3	538	446	620	1,240	1,020	540	2,700	699	819	251	149	228
4	*525	1,050	553	1,070	1,060	540	*2,450	629	676	248	144	327
5	509	760	1,680	966	1,490	560	2,500	553	580	257	168	340
6	488	540	3,120	900	1,570	560	5,290	446	*524	257	161	317
7	488	575	2,180	780	1,330	520	4,190	482	567	231	170	298
8	551	1,480	3,030	660	1,150	500	2,810	491	690	212	156	310
9	669	1,620	2,300	640	1,060	500	2,290	*462	662	245	144	344
10	571	1,070	1,840	600	1,000	520	2,360	458	680	1,280	158	340
11	450	825	1,510	540	960	800	3,450	458	643	2,090	*214	340
12	401	723	1,260	560	880	1,500	2,850	655	647	1,250	240	337
13	368	662	1,000	580	780	1,800	2,300	1,780	611	771	220	320
14	347	826	*820	580	700	1,550	2,340	2,010	532	536	188	282
15	330	2,300	720	651	640	1,220	3,120	1,640	474	427	168	272
16	368	1,860	640	1,090	620	1,040	2,710	1,400	379	*365	163	291
17	435	1,550	640	1,190	640	900	2,580	1,130	323	320	381	291
18	435	1,220	660	*1,340	660	800	2,970	910	304	291	507	288
19	427	960	640	1,680	640	720	3,370	793	294	294	354	307
20	416	788	620	1,500	600	680	4,070	690	288	285	260	323
21	408	700	740	1,350	600	660	4,020	1,270	272	416	212	317
22	405	714	1,160	1,220	580	700	2,670	1,940	254	567	206	307
23	420	787	1,300	1,300	620	740	3,400	1,690	242	412	206	291
24	405	1,500	1,220	1,300	620	800	3,450	1,360	228	317	198	*279
25	486	1,300	1,100	1,240	600	860	2,130	1,180	440	294	188	282
26	545	989	994	1,220	580	799	1,680	1,550	589	260	175	282
27	390	800	920	1,390	600	921	1,460	1,460	420	228	168	288
28	323	640	880	1,520	*600	943	1,320	1,260	351	204	158	279
29	298	600	820	1,370	580	846	1,230	1,080	320	180	147	272
30	276	580	778	1,200	-	748	1,200	899	361	170	163	263
31	*260	-	783	1,080	-	719	-	733	-	165	149	-
Total	13,684	28,379	35,739	32,861	24,200	25,126	79,303	31,906	14,671	13,496	6,226	8,702
Mean	441	946	1,153	1,060	834	811	2,643	1,029	489	435	201	290
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 6,550 Min 205 Mean 932 Cfsm 2.55 In. 34.68
Water year 1951-52: Max 5,290 Min 138 Mean 859 Cfsm 2.35 In. 32.02

Peak discharge (base, 5,500 cfs).--Apr. 6 (2:30 p.m.) 5,750 cfs (9.33 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 5, 6, 21, Nov. 27 to Dec. 1, Dec. 3, 13-23, 27-29, Jan. 6-14, 21-26, Jan. 30 to Feb. 4, Feb. 9 to Mar. 25, Apr. 2, 3.

Independence River at Donnattsburg, N. Y.

Location.--Lat 43°44'50", long. 75°20'05", on right bank at downstream side of highway bridge on Donnattsburg, Lewis County, 1¼ miles downstream from Chase Lake Outlet and 5 miles upstream from mouth.

Drainage area.--91.7 sq mi.

Records available.--July 1942 to September 1952.

Gage.--Water-stage recorder. Prior to Sept. 16, 1949, wire-weight gage at same site and datum.

Average discharge.--10 years, 204 cfs.

Extremes.--Maximum discharge during year, 2,060 cfs Apr. 6 (gage height, 7.18 ft); minimum, 20 cfs Aug. 9 (gage height, 2.95 ft).
1942-52: Maximum discharge, 3,410 cfs Oct. 2, 1945 (gage height, 8.8 ft, from graph based on gage readings); minimum observed, 18 cfs Sept. 17, 1948, Aug. 4, 5, 1949 (gage height, 2.85 ft).

Remarks.--Records good except those for periods of ice effect or fragmentary gage-height record, which are fair.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.9	16	4.5	358
3.0	24	5.0	578
3.2	46	6.0	1,150
3.6	105	6.9	1,810
4.0	194		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	145	*84	147	280	140	78	326	122	143	44	30	28
2	116	82	163	378	140	76	673	113	200	40	28	32
3	*102	136	178	362	152	74	1,080	107	176	37	26	118
4	90	262	189	278	194	74	935	102	139	44	f26	134
5	80	211	359	219	339	79	824	98	*126	60	f24	84
6	73	161	578	184	335	82	1,740	95	113	59	26	62
7	78	198	440	160	262	82	*1,270	91	124	45	24	47
8	128	539	493	150	205	80	675	*90	137	43	24	40
9	171	521	449	155	176	78	475	85	145	44	22	36
10	150	335	374	130	159	76	516	80	173	632	26	32
11	124	255	296	100	152	140	848	80	137	1,180	37	28
12	107	216	240	104	139	300	761	116	120	471	*46	26
13	93	194	*186	106	112	450	493	323	109	211	52	26
14	84	224	150	106	104	440	489	415	91	126	47	24
15	78	473	135	134	102	310	633	362	78	90	37	26
16	72	507	116	*260	98	220	544	288	69	*74	40	32
17	69	512	108	270	102	178	444	231	60	62	137	50
18	66	382	114	282	98	159	436	186	59	52	201	52
19	60	275	106	328	96	145	440	152	62	52	110	67
20	58	211	106	282	94	137	423	132	58	56	70	82
21	58	160	165	231	98	137	382	235	51	72	54	72
22	56	165	330	211	94	181	288	419	49	66	78	62
23	56	195	430	200	92	197	285	394	46	59	100	*52
24	58	340	340	170	90	219	339	268	46	49	73	44
25	112	313	300	150	88	219	255	231	83	44	54	39
26	163	240	270	165	88	208	208	442	120	40	45	38
27	137	185	250	250	*84	272	176	449	91	37	37	45
28	113	150	235	320	82	252	156	282	66	40	32	46
29	100	161	220	215	80	216	145	211	54	37	30	45
30	91	152	210	180	-	191	134	171	49	34	32	39
31	86	-	230	155	-	231	-	143	-	32	28	-
Total	2,974	7,839	7,907	6,515	3,995	5,581	16,393	6,513	2,976	3,932	1,596	1,508
Mean	95.9	261	255	210	138	180	546	210	99.2	127	51.5	50.3
Cfsm	1.05	2.85	2.78	2.29	1.50	1.96	5.95	2.29	1.08	1.38	0.562	0.549
In.	1.21	3.18	3.21	2.64	1.62	2.26	6.65	2.64	1.21	1.59	0.65	0.61

Calendar year 1951: Max 2,370 Min 38 Mean 213 Cfsm 2.32 In. 31.51
Water year 1951-52: Max 1,740 Min 22 Mean 185 Cfsm 2.02 In. 27.47

Peak discharge (base, 1,200 cfs).--Apr. 6 (4 p.m.) 2,060 cfs (7.18 ft); July 11 (5 a.m.) 1,430 cfs (6.42 ft).

* Discharge measurement made on this day.
f Fragmentary gage-height record; discharge computed from partly estimated gage heights.
Note.--Stage-discharge relation affected by ice Nov. 21, 22, 27, 28, Dec. 15 to Jan. 1, Jan. 7-14, 16, 17, Jan. 23 to Feb. 2, Feb. 8, Feb. 13 to Mar. 3, Mar. 11-16.

Stillwater Reservoir (Beaver River) near Beaver River, N. Y.

Location.--Lat 43°53'50", long. 75°03'05", in gatehouse at Stillwater Dam, 2½ miles upstream from Moshier Creek and 7½ miles west of Beaver River post office, Herkimer County.
Drainage area.--172 sq mi.
Records available.--February 1925 to September 1952.
Gage.--Float-tape gage read once daily and prior to reservoir gate changes. Datum of gage is at mean sea level, adjustment of 1912.
Extremes.--Maximum elevation during year, 1,679.40 ft May 21, 22 (contents 4,652,000,000 cu ft); minimum, 1,666.01 ft Nov. 7 (contents, 1,596,000,000 cu ft).
1925-52: Maximum elevation 1,679.73 ft June 3, 1947 (contents, 4,748,000,000 cu ft); minimum since first filling, 1,644.80 ft Mar. 25-27, 1940 (reservoir empty).
Remarks.--Records good. Reservoir originally formed about 1885; enlarged at various times and in 1924 enlarged to a usable capacity of 4,623,000,000 cu ft between elevations 1,650.3 and 1,679.3 ft above mean sea level. Elevation of gate sill of lowest outlet, 1,642.3 ft. Capacity below elevation 1,650.3 ft, about 90,000,000 cu ft. Reservoir is used to regulate flow of Beaver and Black Rivers for control of floods, for power development, and for general welfare of the public. Record of contents herein represents those above elevation 1,650.3 ft.
Cooperation.--Record of gate opening and reservoir elevations furnished by Board of Black River Regulating District.

Elevation, in feet, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	70.47	66.34	69.12	72.35	73.31	71.35	69.78	79.33	79.36	78.30	77.58	72.79
2	70.33	66.20	69.17	72.44	73.33	71.19	70.09	79.30	79.38	78.20	77.40	72.63
3	70.19	66.13	69.23	72.56	73.37	71.01	70.61	79.28	79.37	78.13	77.23	72.52
4	70.06	66.17	69.25	72.65	73.41	70.85	71.10	79.30	79.34	78.19	77.07	72.40
5	69.91	66.11	69.39	72.73	73.51	70.76	71.51	79.32	79.30	78.23	76.90	72.22
6	69.75	66.04	69.69	72.78	73.60	70.60	72.35	79.27	79.28	78.26	76.74	72.06
7	69.63	66.03	69.91	72.82	73.67	70.44	73.13	79.17	79.27	78.29	76.56	71.89
8	69.54	66.15	70.18	72.84	73.72	70.28	73.61	79.10	79.26	78.15	76.40	71.72
9	69.45	66.41	70.48	72.86	73.78	70.12	73.96	79.03	79.25	78.04	76.22	71.52
10	69.33	66.54	70.68	72.87	73.81	69.95	74.36	78.95	79.25	78.36	76.05	71.33
11	69.21	66.63	70.84	72.77	73.84	69.85	74.91	78.89	79.22	78.90	75.92	71.1
12	69.07	66.72	70.96	72.65	73.80	69.90	75.47	78.86	79.21	79.14	75.78	70.97
13	68.93	66.77	71.06	72.54	73.70	69.91	75.88	78.89	79.17	79.25	75.63	70.79
14	68.76	66.84	71.13	72.42	73.58	70.05	76.26	79.06	79.13	79.32	75.46	70.62
15	68.63	67.13	71.22	72.32	73.44	70.21	76.75	79.24	79.07	79.31	75.30	70.43
16	68.49	67.41	71.28	72.30	73.32	70.34	77.16	79.33	79.03	79.30	75.12	70.27
17	68.33	67.65	71.32	72.26	73.21	70.45	77.53	79.38	78.96	79.27	75.12	70.09
18	68.19	67.79	71.36	72.28	73.11	70.48	77.90	79.36	78.91	79.15	75.04	69.96
19	68.04	67.89	71.44	72.40	72.98	70.49	78.26	79.33	78.85	79.10	74.89	69.89
20	67.88	67.97	71.46	72.50	72.85	70.52	78.49	79.33	78.76	79.03	74.73	69.69
21	67.71	68.02	71.56	72.63	72.73	70.50	78.71	79.40	78.68	78.96	74.56	69.49
22	67.55	68.05	71.71	72.69	72.59	70.48	78.86	79.40	78.59	78.85	74.46	69.32
23	67.39	68.12	71.83	72.81	72.45	70.46	78.98	79.36	78.51	78.75	74.29	69.15
24	67.24	68.36	71.94	72.87	72.31	70.43	79.11	79.35	78.42	78.62	74.13	68.97
25	67.16	68.58	72.03	72.91	72.15	70.39	79.15	79.36	78.52	78.50	73.99	68.76
26	67.11	68.75	72.12	72.95	72.01	70.32	79.18	79.35	78.53	78.38	73.83	68.56
27	66.97	68.89	72.17	73.07	71.84	70.19	79.26	79.34	78.53	78.24	73.67	68.41
28	66.88	68.97	72.22	73.18	71.68	70.07	79.34	79.34	78.49	78.13	73.50	68.22
29	66.73	69.03	72.25	73.26	71.58	69.95	79.35	79.34	78.43	78.03	73.32	68.04
30	66.61	69.08	72.29	73.29	-	69.82	79.35	79.32	78.37	77.92	73.17	67.83
31	66.47	-	72.32	73.30	-	69.69	-	79.33	-	77.75	73.00	-

Note.--Add 1,600 ft to obtain elevations above mean sea level.

Monthly elevation and contents, water year October 1951 to September 1952

Date	Elevation (feet)†	Contents (millions of cubic feet)	Change in contents during month (equivalent mean cubic feet per second)
Sept.30	1,670.52	2,448	-
Oct. 31	1,666.38	1,659	-295
Nov. 30	1,669.11	2,163	+194
Dec. 31	1,672.34	2,840	+253
Calendar year 1951..	-	-	+29.4
Jan. 31	1,673.31	3,061	+82.5
Feb. 29	1,671.43	2,641	-168
Mar. 31	1,669.75	2,290	-131
Apr. 30	1,679.34	4,635	+905
May 31	1,679.35	4,638	+1.12
June 30	1,678.32	4,343	-114
July 31	1,677.64	4,154	-70.6
Aug. 31	1,672.86	2,958	-447
Sept.30	1,667.71	1,897	-409
Water year 1951-52..	-	-	-17.4

† Reservoir elevations at 12 p.m. obtained by interpolation.

Beaver River below Stillwater Dam, near Beaver River, N. Y.

Location.--Lat 43°53'50", long. 75°03'05", in gatehouse at Stillwater Dam, 2½ miles upstream from Moshier Creek and 7½ miles west of Beaver River post office, Herkimer County.

Drainage area.--172 sq mi.

Records available.--May 1908 to September 1952.

Gage.--Float-tape gage read once daily and prior to reservoir gate changes. Datum of gage is at mean sea level, adjustment of 1912. Prior to Nov. 14, 1929, staff gage at site 1,000 ft downstream at same datum.

Average discharge.--44 years, 366 cfs (unadjusted).

Extremes.--Maximum daily discharge during year, 918 cfs May 26; minimum daily, 15 cfs Mar. 14-16, Apr. 1-6.
1908-52: Maximum discharge, about 3,700 cfs May 3, 1926; practically no flow at times when gates in dam are closed.

Remarks.--Records good. Flow completely regulated by Stillwater Reservoir (see preceding page). Discharge determined from ratings for gates and spillway of Stillwater Dam.

Cooperation.--Record of gate openings and reservoir elevations furnished by Board of Black River Regulating District.

Revisions.--W 714: Drainage area.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	456	422	205	218	289	583	15	373	449	366	589	547
2	456	420	205	218	289	581	15	314	516	363	535	544
3	455	418	205	219	289	578	15	231	506	278	581	544
4	453	420	205	219	289	578	15	203	494	28	581	542
5	453	418	206	219	291	575	15	326	377	28	581	539
6	452	418	207	220	291	575	15	485	319	29	579	539
7	450	352	208	220	291	570	16	482	319	361	579	539
8	450	192	209	220	291	570	16	478	318	526	574	534
9	449	194	209	220	292	567	16	476	318	526	574	534
10	449	195	211	438	292	567	16	474	318	231	572	532
11	446	195	212	547	394	567	16	473	317	42	572	527
12	446	195	212	544	608	567	16	473	317	48	572	527
13	446	196	212	544	606	280	16	274	315	51	569	525
14	444	197	212	542	606	15	16	146	313	170	567	524
15	443	197	213	542	603	15	17	189	311	228	567	520
16	440	198	214	542	603	15	17	330	310	226	564	520
17	440	200	214	542	601	175	19	461	309	372	564	517
18	439	200	214	392	600	290	24	501	325	462	564	517
19	437	201	214	285	600	290	354	382	380	*433	564	517
20	437	201	214	287	600	292	490	476	378	458	561	514
21	434	201	215	287	597	292	497	785	374	456	561	512
22	434	201	215	287	597	357	502	831	373	454	557	512
23	431	201	216	288	594	392	505	717	371	451	557	509
24	430	202	217	288	594	392	508	634	369	447	554	509
25	428	204	217	288	591	511	509	825	371	445	554	507
26	428	204	217	288	591	622	337	918	372	441	554	506
27	428	205	217	288	591	622	220	728	371	436	552	502
28	428	205	217	288	586	619	322	594	370	435	550	501
29	424	205	217	289	586	619	384	497	369	433	549	499
30	424	205	218	289	-	616	384	380	368	516	547	497
31	422	-	218	289	-	215	-	330	-	593	547	-
Total	13,652	7,462	6,585	10,347	14,052	13,507	5,307	14,786	10,917	10,333	17,541	15,656
Mean	440	249	212	334	485	436	177	477	364	333	566	522

Adjusted for change in Stillwater Reservoir contents

Mean	146	443	465	416	317	305	1,082	478	250	263	119	113
Cfsm	0.849	2.58	2.70	2.42	1.84	1.77	6.29	2.78	1.45	1.53	0.692	0.657
In.	0.98	2.87	3.12	2.79	1.99	2.04	7.02	3.20	1.62	1.76	0.80	0.73

	Observed			Adjusted			
Calendar year 1951:	Max 1,760	Min 14	Mean 364	Mean 393	Cfsm 2.28	In. 31.04	
Water year 1951-52:	Max 918	Min 15	Mean 383	Mean 365	Cfsm 2.12	In. 28.92	

* Discharge measurement made on this day.

Beaver River at Croghan, N. Y.

Location.--Lat 43°53'50", long. 75°24'15", on left bank 1,000 ft upstream from Black Creek and half a mile west of Croghan, Lewis County.

Drainage area.--294 sq mi.

Records available.--September 1930 to September 1952.

Gage.--Water-stage recorder.

Average discharge.--22 years, 576 cfs.

Extremes.--Maximum discharge during year, 1,540 cfs May 28 (gage height, 4.15 ft); minimum, 33 cfs Oct. 14; minimum gage height, 0.985 ft June 29; minimum daily, 63 cfs July 13.
1930-52: Maximum discharge, 4,310 cfs May 13, 1943 (gage height, 6.47 ft); minimum, about 18 cfs Feb. 24, 1936 (gage height, 0.89 ft); minimum daily, 35 cfs May 13, 1934.

Remarks.--Records excellent except those for periods of fragmentary gage-height record, which are good. Flow almost completely regulated by Stillwater Reservoir (see p.298). Between Stillwater Dam and this station flow is further regulated by nine powerplant ponds. Diurnal fluctuation at low and medium flow.

Revisions.--W 759: Drainage area.

Rating tables, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 11				Mar. 12 to Sept. 30			
1.6	128	3.0	693	1.2	63	2.5	442
2.0	242	3.7	1,160	1.5	117	3.0	693
2.5	435			2.0	252	3.7	1,160

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	469	*676	367	408	526	644	576	447	602	445	688	662
2	*590	637	205	744	450	622	909	485	512	480	656	674
3	600	502	457	512	143	683	985	350	756	489	220	682
4	592	380	486	524	574	676	1,010	123	*663	218	485	655
5	616	505	540	462	654	668	*1,030	397	759	188	648	650
6	652	687	505	216	548	677	1,160	403	748	110	649	667
7	424	714	522	483	551	647	1,080	*406	542	209	465	180
8	482	929	530	507	650	706	999	423	115	590	606	428
9	670	750	361	508	576	658	753	414	485	630	498	583
10	643	468	587	709	485	719	355	363	472	797	*354	700
11	658	295	645	672	566	1,160	341	111	508	852	413	673
12	523	461	552	671	708	1,120	322	473	512	650	540	656
13	410	489	*587	469	820	902	102	723	484	63	666	646
14	165	463	583	523	770	795	355	747	473	365	660	175
15	497	469	439	*763	f700	704	491	707	192	501	673	466
16	616	719	330	859	672	713	741	700	472	*434	722	590
17	650	877	559	665	655	653	768	685	573	500	714	672
18	659	515	503	885	654	695	753	307	525	443	525	666
19	629	656	493	825	627	711	723	449	666	480	661	751
20	357	806	505	545	661	662	677	720	646	89	662	461
21	136	760	557	661	649	742	748	629	575	495	658	196
22	480	191	457	695	f700	749	697	851	240	597	713	421
23	527	459	281	920	659	723	717	1,020	467	635	658	*554
24	590	400	485	706	663	740	704	1,090	553	652	662	647
25	719	270	221	683	677	730	697	1,130	555	640	657	646
26	634	512	489	709	*637	742	713	1,020	484	428	641	675
27	403	498	505	321	669	774	692	1,110	471	144	670	655
28	371	564	496	655	665	784	513	1,080	385	408	673	175
29	485	594	471	614	666	778	518	1,020	123	413	678	435
30	514	520	274	694	-	778	478	849	405	433	687	582
31	644	-	557	643	-	807	-	791	-	616	655	-
Total	16,405	16,766	14,549	19,251	17,975	23,162	20,607	20,023	14,963	13,994	18,857	16,623
Mean	529	559	469	621	620	747	687	646	499	451	608	554
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 2,190 Min 73 Mean 596 Cfsm 2.03 In. 27.51
Water year 1951-52: Max 1,160 Min 63 Mean 582 Cfsm 1.98 In. 26.97

* Discharge measurement made on this day.
f Fragmentary gage-height record; discharge computed on basis of powerplant records.

Deer River at Copenhagen, N. Y.

Location.--Lat 43°53'55", long. 75°39'40", on left bank at powerplant half a mile northeast of Copenhagen, Lewis County, 3¾ miles downstream from Cobb Creek, and 7 miles upstream from mouth.

Drainage area.--89 sq mi, approximately.

Records available.--September 1929 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 963.41 ft above mean sea level, datum of 1929.

Average discharge.--23 years, 220 cfs.

Extremes.--Maximum discharge during year, 2,700 cfs Apr. 6 (gage height, 5.70 ft); minimum, 2.9 cfs Sept. 14 (gage height, 0.31 ft).
1929-52: Maximum discharge, 14,400 cfs Sept. 1, 1941 (gage height, 12.08 ft), from rating curve extended above 3,900 cfs on basis of computation of peak flow over dam; maximum gage height, 13.18 ft Jan. 31, 1947 (ice jam); minimum discharge, 0.7 cfs Aug. 12, 1940 (gage height, 0.17 ft); minimum daily, 0.8 cfs July 22 to Aug. 2, 1933.

Remarks.--Records good except those for periods of ice effect, which are fair. Prior to September 1949, diurnal fluctuation at low and medium flow caused by powerplant.

Revisions (water years).--W 759: Drainage area. W 784: 1934.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 2				Apr. 3 to Sept. 30					
0.8	23	2.5	364	0.3	2.7	1.3	71	3.0	600
1.1	46	3.0	569	.5	8.2	1.6	120	4.0	1,220
1.5	99	4.0	1,180	.7	17	2.0	216	4.9	1,930
2.0	209	4.7	1,750	1.0	38	2.5	381		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	43	58	235	900	130	56	1,130	64	114	14	7.6	6.6
2	*36	*56	429	1,000	512	54	1,750	58	115	12	7.0	17
3	32	206	265	490	360	56	1,400	55	99	12	6.6	31
4	28	206	245	320	987	62	941	51	*78	47	6.0	26
5	25	161	643	220	1,040	66	*1,620	48	70	39	6.3	17
6	23	132	583	180	477	79	1,890	47	61	27	*7.0	12
7	55	974	780	125	315	77	844	*44	56	20	7.6	9.8
8	191	924	712	116	220	75	541	43	50	15	18	7.6
9	259	433	477	120	173	75	457	41	158	21	12	6.0
10	159	296	382	106	155	76	580	39	164	288	12	5.4
11	104	290	256	88	140	980	839	51	103	279	14	4.9
12	75	233	*181	90	120	1,400	509	261	78	128	19	4.4
13	56	204	150	98	104	862	416	1,620	57	64	15	3.9
14	47	745	130	100	94	542	635	1,040	45	41	17	3.4
15	42	801	118	748	92	375	580	445	37	*31	27	5.5
16	39	485	100	670	88	248	416	312	33	24	27	18
17	35	413	96	357	90	180	340	208	31	19	80	36
18	33	280	100	868	88	145	323	157	30	16	112	43
19	31	193	94	452	86	129	306	124	28	23	48	60
20	29	155	94	379	84	125	273	123	26	26	28	84
21	29	120	310	306	86	224	230	599	23	80	23	65
22	28	130	551	191	84	368	184	477	22	66	23	58
23	28	1,150	405	180	83	336	271	270	21	34	16	*45
24	33	664	346	150	82	409	213	169	22	23	12	*33
25	206	325	287	135	79	340	159	428	28	17	10	34
26	193	201	248	145	*75	415	130	615	25	14	9.0	39
27	127	150	205	300	74	458	105	355	20	14	7.9	51
28	94	135	185	316	74	309	91	202	17	33	7.0	50
29	89	145	180	212	64	272	81	143	16	*11	6.4	33
30	79	145	190	155	-	323	71	114	16	10	16	23
31	65	-	270	119	-	529	-	93	-	8.6	7.9	-
Total	2,313	10,410	9,247	9,636	6,056	9,645	17,325	8,296	1,683	1,456.6	615.3	832.5
Mean	74.6	347	298	311	209	311	578	268	56.1	47.0	19.8	27.8
Cfsm	0.838	3.90	3.35	3.49	2.35	3.49	6.49	3.01	0.630	0.528	0.222	0.312
In.	0.97	4.35	3.86	4.03	2.53	4.03	7.24	3.47	0.70	0.61	0.26	0.35

Calendar year 1951: Max 2,790 Min 13 Mean 248 Cfsm 2.79 In. 37.81
Water year 1951-52: Max 1,890 Min 3.4 Mean 212 Cfsm 2.38 In. 32.40

Peak discharge (base, 2,500 cfs).--Apr. 2 (5:15 p.m.) 2,520 cfs (5.52 ft); Apr. 6 (12:15 a.m.); 2,700 cfs (5.70 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 21, 22, 27-30, Dec. 13-21, Dec. 27 to Jan. 14, Jan. 23-27, Feb. 10-22, Feb. 27 to Mar. 2, Mar. 5, 11, 17, 18.

Black River at Watertown, N. Y.

Location.--Lat 43°59'05", long. 75°55'30", on downstream side of right abutment of Vanduzee Street Bridge at Watertown, Jefferson County, and 3½ miles upstream from Philomel Creek.

Drainage area.--1,876 sq mi.

Records available.--July 1920 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 374.88 ft above mean sea level, datum of 1929, supplementary adjustment of 1943. Prior to Sept. 3, 1921, staff gage at same site and datum.

Average discharge.--32 years, 3,935 cfs.

Extremes.--Maximum discharge during year, 21,700 cfs Apr. 7 (gage height, 8.26 ft); minimum, 48 cfs Sept. 7 (gage height, -0.03 ft); minimum daily, 680 cfs Sept. 7.
1920-52: Maximum discharge, 33,900 cfs Apr. 9, 1928 (gage height, 10.6 ft); minimum, 10 cfs Sept. 2, 1934 (gage height, -0.19 ft); minimum daily, 137 cfs Sept. 4, 1939.
Maximum discharge known, about 39,700 cfs in April 1869 (from New York State Museum Bulletin 85).

Remarks.--Records excellent except those for periods of ice effect or doubtful gage-height record, which are good. Appreciable regulation by Stillwater Reservoir, Fulton Chain of Lakes, and other reservoirs. Extensive diurnal fluctuation at low and medium flow caused by mills and powerplants in and above Watertown. During canal season water is diverted out of basin through Forestport feeder and Black River Canal (flowing south).

Revisions.--W 759: Drainage area.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 6		Apr. 7 to Sept. 30	
1.5	1,190	1.0	647
2.0	1,860	2.0	1,820
3.0	3,650	3.0	3,510
5.0	8,940	5.0	8,550
7.2	17,000	8.0	20,400

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,300	1,880	3,800	5,020	3,840	b2,500	6,920	3,620	3,610	1,270	1,240	1,350
2	*2,260	*1,860	3,820	7,770	4,090	b2,500	8,620	3,130	3,240	1,380	1,250	1,650
3	2,100	1,920	4,060	7,380	4,530	2,480	10,200	2,740	3,360	1,490	1,050	1,610
4	2,060	2,650	3,950	6,660	5,120	2,480	11,800	2,340	*3,250	1,510	1,160	1,770
5	1,890	3,700	4,520	6,020	7,920	2,510	14,300	2,390	2,970	1,030	1,270	2,140
6	1,960	3,550	6,720	5,250	7,440	2,490	16,800	2,350	2,710	1,300	1,230	2,120
7	1,720	3,360	7,830	b4,600	7,180	2,520	*20,200	*2,190	2,540	1,190	1,360	680
8	2,110	6,540	9,220	b4,000	6,800	2,590	20,200	2,160	2,190	1,370	1,300	*1,150
9	2,910	6,830	9,880	3,420	6,160	2,540	16,200	2,060	2,190	1,390	1,280	1,310
10	3,000	6,350	10,200	3,310	5,130	2,530	12,700	2,020	3,070	2,150	1,080	1,350
11	2,700	5,420	9,940	3,460	4,580	3,800	10,800	1,780	3,070	5,080	1,280	1,510
12	2,250	4,620	*8,730	3,100	4,000	9,310	10,800	2,220	2,810	6,400	1,380	1,460
13	1,870	3,970	7,210	2,840	b3,300	9,400	11,300	4,780	2,550	6,140	*1,630	1,450
14	1,580	3,730	5,270	2,790	b3,200	9,100	10,900	7,120	2,330	4,750	1,690	1,370
15	1,460	5,470	3,380	*3,140	3,260	8,880	*10,200	7,120	2,000	3,160	1,570	1,190
16	1,660	6,510	b3,000	5,810	3,190	8,280	10,200	6,890	1,730	2,320	1,570	1,270
17	1,770	7,500	b3,300	5,990	3,040	7,240	10,400	6,300	1,840	*1,890	1,520	1,480
18	1,730	7,530	b3,300	6,740	3,040	6,070	9,950	5,130	1,780	1,730	2,040	1,760
19	1,770	7,090	b2,700	6,980	3,060	5,100	9,410	4,110	1,740	1,550	2,880	1,840
20	1,820	6,010	b2,800	6,890	b3,000	4,340	9,040	3,490	1,760	1,460	2,410	1,850
21	1,230	4,800	2,920	6,770	2,970	4,120	9,160	3,760	1,700	1,220	1,860	1,730
22	1,320	3,600	3,910	6,690	2,830	5,030	9,320	5,510	1,450	2,030	1,680	1,340
23	1,550	3,970	4,830	6,320	2,890	5,240	9,250	6,350	1,160	2,280	1,620	*1,520
24	1,650	6,260	5,190	5,550	2,770	5,780	8,730	6,490	1,520	2,230	1,510	1,620
25	1,820	5,780	5,420	b5,000	2,700	6,100	8,370	6,350	1,520	1,990	1,420	1,520
26	2,780	5,340	d5,600	4,880	*2,720	6,600	7,980	6,650	1,590	1,790	1,440	1,500
27	2,820	4,260	d5,200	4,720	2,680	7,120	6,980	6,920	1,800	1,370	1,460	1,530
28	1,830	3,140	d4,500	4,860	2,620	6,950	5,700	6,760	1,700	1,180	1,390	1,420
29	2,000	3,220	d4,000	5,370	2,550	6,490	4,600	6,090	1,390	1,300	1,430	1,090
30	1,960	3,480	d3,800	b5,000	-	6,050	4,020	5,110	1,120	1,300	1,430	1,280
31	1,910	-	d3,900	4,470	-	6,180	-	4,280	-	1,280	1,150	-
Total	61,790	140,340	162,700	160,800	116,610	162,320	315,050	138,210	65,690	66,530	46,580	44,860
Mean	1,993	4,678	5,248	5,187	4,021	5,236	10,500	4,458	2,190	2,146	1,503	1,495
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 26,500 Min 1,110 Mean 4,469 Cfsm 2.38 In. 32.33
Water year 1951-52: Max 20,200 Min 680 Mean 4,048 Cfsm 2.16 In. 29.35

Peak discharge (base, 17,000 cfs).--Apr. 7 (6 p.m.) 21,700 cfs (8.26 ft).
* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.
d Doubtful gage-height record; discharge computed on basis of powerplant records at Black River.

East Branch Oswegatchie River at Cranberry Lake, N. Y.

Location.--Lat 44°13'15", long. 74°51'00", on right bank 900 ft downstream from dam at outlet of Cranberry Lake, at village of Cranberry Lake, St. Lawrence County.

Drainage area.--144 sq mi.

Records available.--May 1923 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 1,458.23 ft above mean sea level, datum of 1929. Prior to Oct. 1, 1938, staff gage at site 80 ft upstream at same datum.

Average discharge.--29 years, 292 cfs (unadjusted).

Extremes.--Maximum discharge during year, 856 cfs May 26 (gage height, 6.21 ft); minimum, 22 cfs Apr. 16 (gage height, 3.14 ft); minimum daily, 28 cfs May 12.
1923-52: Maximum discharge, 1,940 cfs May 13, 1943 (gage height, 7.70 ft); minimum daily, about 3 cfs Apr. 9-16, 1931.

Remarks.--Records excellent except those for periods of fragmentary or no gage-height record, which are good. Since 1867, flow almost completely regulated by Cranberry Lake (total capacity, 2,530,000,000 cu ft).

Rating tables, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Feb. 1				Feb. 2 to Sept. 30			
3.9	84	5.0	316	3.2	25	4.5	181
4.2	128	5.7	595	3.5	45	5.0	316
4.5	183			4.0	98	6.2	850

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	206	94	266	447	577	476	*229	33	485	192	202	195
2	*211	94	266	447	567	472	229	32	414	209	206	195
3	208	97	275	*447	562	*468	211	32	318	206	*214	195
4	208	f100	301	447	562	464	124	32	259	206	214	192
5	208	102	298	447	562	460	64	32	210	204	212	192
6	208	102	278	443	562	456	38	32	195	204	229	190
7	208	106	253	439	558	456	35	33	170	204	237	190
8	208	109	255	435	558	452	42	33	159	204	237	190
9	208	112	255	435	553	452	39	32	*184	204	234	190
10	208	a115	255	435	553	448	34	30	197	206	234	190
11	208	a117	309	435	549	352	34	30	199	206	234	190
12	208	a120	*389	435	544	232	a34	28	199	206	234	202
13	208	123	389	435	*544	232	a35	147	188	206	232	222
14	206	126	389	435	540	232	a36	206	177	206	232	222
15	206	131	389	431	535	234	*36	264	177	206	232	222
16	206	136	385	431	531	234	39	291	177	206	212	222
17	218	145	385	431	527	234	37	288	177	206	190	222
18	191	149	385	431	527	234	37	279	177	206	190	222
19	181	a152	385	431	527	234	38	222	177	206	190	197
20	181	a156	423	431	522	234	40	197	177	206	190	193
21	181	a158	455	431	518	234	40	218	a177	206	190	216
22	181	a159	455	431	510	234	38	313	a177	206	190	216
23	181	a161	451	467	505	232	38	437	a177	206	190	216
24	181	a163	451	509	501	229	38	505	a177	206	190	216
25	181	165	451	509	501	229	38	691	a177	206	190	216
26	181	180	451	509	497	229	38	828	177	204	192	216
27	181	261	451	509	493	229	37	822	179	202	195	216
28	179	261	451	505	489	229	37	762	179	202	195	216
29	*173	264	451	505	485	229	37	635	179	202	195	216
30	135	264	451	533	-	229	34	489	179	202	*195	• 216
31	96	-	447	577	-	229	-	485	-	202	195	-
Total	5,944	4,422	11,495	14,233	15,459	9,588	1,786	8,458	6,194	6,343	6,472	6,193
Mean	192	147	371	459	533	309	59.5	273	206	205	209	206

Adjusted for change in contents of Cranberry Lake

Mean	93.5	294	322	339	316	239	682	354	166	152	49.7	69.9
Cfsm	0.649	2.04	2.24	2.35	2.19	1.66	4.74	2.46	1.15	1.06	0.345	0.485
In.	0.75	2.28	2.58	2.71	2.37	1.91	5.28	2.83	1.29	1.22	0.40	0.54

	Observed			Adjusted		
Calendar year 1951:	Max 1,400	Min 94	Mean 292	Mean 295	Cfsm 2.05	In. 27.83
Water year 1951-52:	Max 828	Min 28	Mean 264	Mean 256	Cfsm 1.78	In. 24.16

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of record of gate openings and reconstructed gage-height graph.
f Fragmentary gage-height record; discharge computed from partly estimated gage-height record and recorded range in stage.
Note.--Elevation of surface of Cranberry Lake, 1,483.80 ft at 12 p.m. Sept. 30, 1951; 1,482.75 ft at 12 p.m. Sept. 30, 1952; 1,483.40 ft at 12 p.m. Dec. 31, 1950; 1,483.75 ft at 12 p.m. Dec. 31, 1951.

East Branch Oswegatchie River near Oswegatchie, N. Y.

Location.--Lat 44°13'25", long. 75°04'35", on left bank 300 ft downstream from Flat Rock hydroelectric plant of Niagara Mohawk Power Corp. and 2¾ miles north of Oswegatchie, St. Lawrence County.

Drainage area.--263 sq mi.

Records available.--October 1924 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 1,016.52 ft above mean sea level, datum of 1929, supplementary adjustment of 1943.

Average discharge.--27 years (1925-52), 524 cfs.

Extremes.--Maximum discharge during year, 1,670 cfs May 23 (gage height, 4.95 ft); minimum, 5.3 cfs June 18, 23, July 8, Aug. 21; minimum daily, 138 cfs May 4.
1924-52: Maximum discharge, 4,090 cfs Apr. 12, 1947 (gage height, 6.98 ft); maximum gage height, 7.1 ft Apr. 6, 1928; minimum discharge, probably less than 1 cfs during complete shutdown of powerplant; minimum daily, 1 cfs July 25, 1926.

Remarks.--Records excellent except those for periods of shifting control, which are good. Extensive diurnal fluctuation at low and medium flow caused by powerplant; since 1867, seasonal flow regulated to some extent by Cranberry Lake (total capacity, 2,530,000,000 cu ft).

Revisions.--W 759: Drainage area.

Rating table, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)

2.0	131	3.5	642
2.5	247	4.0	942
3.0	415	4.5	1,300

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	279	281	487	759	824	582	588	201	977	292	273	e243
2	*327	291	458	1,100	800	288	*853	205	561	340	246	e226
3	306	287	513	*852	361	652	1,040	176	887	477	*242	e234
4	326	232	585	737	788	*697	1,270	138	553	313	260	e236
5	357	221	588	783	818	614	1,070	182	502	318	266	e225
6	328	219	614	772	930	652	979	272	464	270	234	e234
7	400	274	717	679	824	650	1,140	183	287	304	272	e224
8	306	560	652	591	1,020	634	808	179	285	299	283	e281
9	339	221	640	622	885	307	538	173	351	274	273	e211
10	306	321	694	619	861	395	449	170	*288	443	236	e236
11	364	278	667	605	878	711	516	168	421	419	218	e295
12	320	320	*686	625	648	915	518	*155	353	357	277	e270
13	280	246	645	457	*858	856	422	358	296	295	312	e227
14	301	316	677	629	845	751	580	477	275	361	252	e245
15	306	473	615	582	854	807	731	530	295	374	255	e219
16	319	527	479	829	817	799	539	559	281	366	272	*e211
17	317	448	631	722	306	628	492	394	376	361	267	e214
18	201	350	605	1,020	728	722	503	341	212	367	250	e229
19	268	397	664	847	757	374	308	326	296	328	234	293
20	276	348	590	817	733	597	300	293	288	317	234	228
21	209	422	452	766	734	598	376	597	276	253	208	215
22	208	400	347	809	594	549	382	812	233	323	229	236
23	213	390	635	625	569	387	314	829	246	335	219	300
24	249	422	674	1,060	346	664	316	674	221	288	226	456
25	349	602	714	881	726	662	316	778	226	316	217	313
26	451	461	690	842	719	627	403	890	338	303	230	357
27	297	509	651	837	698	705	276	834	438	320	230	346
28	280	442	657	854	694	932	356	1,290	234	296	248	355
29	*280	494	623	862	626	670	309	1,050	301	301	*220	326
30	276	521	620	863	-	281	195	1,170	306	302	e205	314
31	277	-	650	707	-	872	-	887	-	280	e241	-
Total	9,315	11,273	18,919	23,753	21,241	19,578	16,887	15,291	11,067	10,192	7,629	7,999
Mean	300	376	610	766	732	632	563	493	369	329	246	267
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 2,410 Min 186 Mean 522 Cfsm 1.98 In. 26.95
Water year 1951-52: Max 2,290 Min 138 Mean 473 Cfsm 1.80 In. 24.48

* Discharge measurement made on this day.
e Shifting-control method used.

West Branch Oswegatchie River near Harrisville, N. Y.

Location.--Lat 44°11'10", long. 75°19'55", on right bank on downstream side of highway bridge half a mile northeast of Geers Corners, 1½ miles downstream from Jenny Creek and 4 miles downstream from Harrisville, Lewis County.

Drainage area.--258 sq mi.

Records available.--July 1916 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 738.51 ft above mean sea level, datum of 1929. Prior to Nov. 30, 1933, staff gage at same site and datum.

Average discharge.--36 years, 512 cfs.

Extremes.--Maximum discharge during year, 2,580 cfs Apr. 7 (gage height, 5.75 ft); minimum, 34 cfs Sept. 13 (gage height, 0.95 ft).
1916-52: Maximum discharge, 6,920 cfs Jan. 9, 1930 (gage height, 9.6 ft); minimum, 25 cfs Sept. 1, 1934 (gage height, 0.86 ft).

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Diurnal fluctuations, principally during low flow, caused by pulp mill at Harrisville.

Revisions (water years).--W 759: Drainage area. W 784: 1934.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1-26		Oct. 27 to Sept. 30			
1.5	95	1.0	38	3.0	483
2.0	183	1.4	76	4.0	1,080
2.4	287	2.0	172	5.7	2,540
		2.5	299		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	195	172	418	570	b400	224	*667	293	481	196	*61	46
2	*164	166	418	889	b420	b205	952	284	673	155	54	77
3	165	187	452	*1,110	b480	b200	1,440	252	732	121	45	89
4	147	281	470	1,030	578	*204	1,760	249	602	114	55	121
5	138	a330	498	842	882	230	1,680	240	470	139	54	96
6	134	a370	569	702	1,060	255	1,850	241	387	133	52	89
7	108	a420	615	548	1,040	255	2,480	222	341	132	50	60
8	130	a520	678	b480	868	244	2,190	228	318	123	47	84
9	219	a800	732	b410	684	229	1,710	211	302	97	45	66
10	228	a868	757	b380	566	232	1,330	215	*263	166	47	64
11	207	763	708	b340	518	429	1,160	200	226	434	50	63
12	197	656	*607	b320	b470	b860	1,180	289	226	566	61	52
13	178	563	b470	308	*b440	b1,160	1,170	*499	231	552	67	38
14	a160	519	b380	305	b350	b1,120	1,120	815	191	397	47	48
15	a145	652	b340	371	b310	b960	1,110	994	185	272	57	50
16	a135	815	b310	694	b290	b740	1,120	1,000	176	176	45	57
17	a125	966	b280	862	b280	b540	1,040	882	157	164	67	85
18	a130	994	b270	1,020	b290	470	917	708	142	131	126	73
19	a120	862	b270	1,080	b280	437	835	586	115	125	149	90
20	a110	647	b260	1,120	b270	415	763	479	138	123	122	168
21	a106	477	b300	b960	b270	432	744	492	116	126	110	149
22	106	449	466	b820	269	515	708	678	101	131	113	156
23	101	479	566	b660	269	570	667	789	125	109	126	141
24	104	708	592	b600	251	618	634	763	100	104	89	126
25	146	875	581	b540	264	619	586	720	215	81	105	107
26	269	862	533	b500	245	593	524	889	398	61	79	109
27	252	b660	503	578	238	646	391	1,040	365	74	71	107
28	241	b540	457	657	238	677	380	1,050	309	73	62	115
29	234	498	421	b660	228	633	351	875	249	70	*64	135
30	*209	475	406	b560	-	550	328	656	206	63	66	*98
31	193	-	432	b440	-	572	-	528	-	71	53	-
Total	5,096	17,574	14,759	20,356	12,748	15,834	31,787	17,367	8,540	5,279	2,239	2,759
Mean	164	586	476	657	440	511	1,060	560	285	170	72.2	92.0
Cfsm	0.636	2.27	1.84	2.55	1.71	1.98	4.11	2.17	1.10	0.659	0.280	0.357
In.	0.73	2.53	2.13	2.93	1.84	2.28	4.58	2.50	1.23	0.76	0.32	0.40

Calendar year 1951: Max 4,240 Min 97 Mean 519 Cfsm 2.01 In. 27.29
Water year 1951-52: Max 2,480 Min 38 Mean 422 Cfsm 1.64 In. 22.23

Peak discharge (base, 3,300 cfs).--No peak above base.
* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of recorded range in stage, weather records, and records for Oswegatchie River near Heuvelton and East Branch of Oswegatchie River near Oswegatchie.
b Stage-discharge realtion affected by ice.

Oswegatchie River near Heuvelton, N. Y.

Location.--Lat 44°36'00", long. 75°22'45", on right bank 1½ miles downstream from Beaver Creek and 2½ miles upstream from Heuvelton, St. Lawrence County.

Drainage area.--973 sq mi.

Records available.--June 1916 to September 1952.

Gage.--Water stage recorder. Datum of gage is 288.85 ft above mean sea level, datum of 1929, supplementary adjustment of 1943. Prior to Sept. 16, 1916, staff gage at same site and datum.

Average discharge.--36 years, 1,693 cfs.

Extremes.--Maximum discharge during year, 6,540 cfs Mar. 13 (gage height, 5.57 ft); minimum, 299 cfs Sept. 2 (gage height, 0.88 ft).
1916-52: Maximum discharge, 15,800 cfs Apr. 9, 1947 (gage height, 9.26 ft); maximum gage height, 9.33 ft Apr. 9, 1947 (ice jam); minimum discharge, 130 cfs Aug. 17, 1949 (gage height, 0.47 ft).

Remarks.--Records excellent except those for periods of ice effect, which are fair. Since 1867, seasonal flow slightly regulated by Cranberry Lake (total capacity, 2,530,000,000 cu ft); slight diurnal fluctuation at low and medium flow caused by powerplants. During high stages on Grass River, part of flow of that stream may pass through Upper Lake, Indian Creek, and Lower Lake, and enter Oswegatchie River at Rensselaer Falls, 4½ miles above station.

Revisions.--W 759: Drainage area.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.9	307
1.3	531
2.0	1,120
3.0	2,270
5.5	6,400

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	587	559	1,620	2,530	1,890	1,190	2,280	978	2,140	646	396	354
2	559	552	1,700	4,430	2,400	1,100	*3,000	781	1,950	624	375	335
3	*498	594	*1,680	5,040	2,750	958	3,530	716	2,090	587	380	407
4	479	580	1,660	4,690	3,240	858	4,010	773	1,990	616	380	380
5	505	624	1,680	4,060	4,770	1,010	4,550	624	1,850	545	365	380
6	573	692	1,890	3,390	4,740	1,250	5,410	580	1,540	538	345	391
7	580	764	2,050	b2,800	4,200	*1,260	*5,720	616	1,190	524	340	425
8	616	1,150	2,280	b2,350	3,610	1,260	5,470	601	1,100	492	335	407
9	624	1,960	2,320	b2,050	3,090	1,230	5,180	700	978	512	345	335
10	654	2,310	2,340	b1,800	2,710	1,170	4,400	668	*858	668	391	340
11	692	2,500	2,310	b1,600	2,360	2,180	3,500	638	798	798	402	340
12	692	2,410	2,190	b1,550	*b2,200	5,360	2,860	692	740	1,100	419	321
13	624	2,090	b2,000	b1,550	b2,000	6,340	2,570	*849	692	1,120	391	326
14	566	1,960	b1,700	1,510	b1,750	5,380	2,810	1,210	740	1,100	375	335
15	531	2,430	b980	1,810	b1,750	4,300	3,060	1,690	676	1,080	375	354
16	552	2,580	b1,300	3,280	b1,650	3,400	3,000	2,150	624	867	386	*335
17	531	2,880	b1,300	3,680	b1,550	2,780	2,790	2,180	616	790	396	370
18	524	3,000	b1,200	4,080	1,510	2,310	2,480	2,010	587	661	380	365
19	512	2,720	b1,200	4,500	1,200	2,020	2,260	1,690	580	676	354	391
20	486	2,220	b1,240	4,430	1,310	2,240	1,970	1,470	518	566	359	436
21	454	1,830	b1,300	4,090	1,390	2,540	1,680	1,420	492	594	391	448
22	380	1,570	b1,550	3,450	1,390	2,620	1,630	1,520	460	531	436	419
23	391	1,530	b1,650	b2,800	1,350	2,600	1,630	1,840	466	492	431	466
24	407	1,760	1,530	b2,450	1,240	2,470	1,570	1,990	466	466	402	524
25	425	1,910	1,880	b2,150	1,100	2,460	1,440	2,270	492	486	375	492
26	460	2,050	2,040	b2,150	978	2,710	1,360	2,760	573	*512	380	512
27	587	b2,150	b1,900	2,220	1,200	2,780	1,280	3,020	608	479	391	552
28	740	b1,700	b1,750	2,390	1,250	2,750	1,190	3,020	815	413	*380	545
29	756	b1,500	b1,700	b2,300	1,210	2,760	1,020	2,900	903	413	386	538
30	*716	1,670	1,780	b2,150	-	2,740	1,040	2,750	732	425	354	486
31	631	-	1,880	b1,950	-	2,390	-	2,430	-	402	359	-
Total	17,332	52,245	53,600	89,230	61,788	76,416	84,690	47,536	28,264	19,723	11,774	12,309
Mean	559	1,742	1,729	2,878	2,131	2,465	2,823	1,533	942	636	380	410
Cfsm	0.575	1.79	1.78	2.96	2.19	2.53	2.90	1.58	0.968	0.654	0.391	0.421
In.	0.66	2.00	2.05	3.41	2.36	2.92	3.24	1.82	1.08	0.75	0.45	0.47

Calendar year 1951: Max 8,800 Min 380 Mean 1,798 Cfsm 1.85 In. 25.08
Water year 1951-52: Max 6,340 Min 321 Mean 1,516 Cfsm 1.56 In. 21.21

Peak discharge (base, 7,100 cfs).--No peak above base.
* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.

St. Lawrence River at Ogdensburg, N. Y.

Location.--Lat 44°42'25", long. 75°28'35", at Ogdensburg.

Drainage area.--298,100 sq mi, approximately, including that of Oswegatchie River.

Records available.--January 1919 to September 1952 (prior to October 1935, monthly discharge only).

Gage.--Flow computed by means of several United States Lake Survey gages on river. Discharge measurements made downstream from Galops Rapids and include flow of Oswegatchie River.

Average discharge.--34 years (October 1918 to September 1952), 230,000 cfs (does not include diversion from Lake Michigan).

Extremes.--Maximum daily discharge during year, 317,000 cfs June 9; minimum daily, 241,000 cfs Nov. 7.
1919-52: Maximum monthly mean discharge, 308,000 cfs June 1952; minimum monthly, 152,000 cfs February 1936.

Remarks.--Records do not include 3,100 cfs diverted from Lake Michigan by Chicago Sanitary & Ship Canal. They include about 5,000 cfs diverted into Lake Superior from Hudson Bay drainage. The first diversion from Hudson Bay basin into Lake Superior began in 1937 from Long Lake for the purpose of floating pulpwood and was probably small. Since 1941 the diversion from Long Lake has been used for power and has averaged about 1,500 cfs. A second diversion was started in 1943 from Ogoki River into Lake Nipigon where it is used for power at the outlet of that lake. Water diverted from Lake Erie by Welland Canal and Niagara River by New York State Barge (old Erie) Canals, except that lost by seepage and evaporation, is discharged into Lake Ontario.

Cooperation.--Records of daily discharge furnished by Corps of Engineers.

Discharge, in thousands of cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	261	245	253	261	263	267	283	302	310	300	293	280
2	260	246	249	254	262	270	286	303	311	303	293	279
3	259	252	249	259	259	264	292	304	310	302	289	282
4	262	261	251	256	261	266	289	300	311	306	290	282
5	259	256	250	256	270	274	279	300	312	303	297	280
6	258	245	250	253	268	272	296	306	314	301	290	277
7	247	241	255	253	268	272	295	301	311	298	290	269
8	273	258	259	252	270	272	293	302	311	300	287	273
9	260	255	253	254	272	271	294	301	317	301	288	278
10	256	256	253	254	273	270	297	297	315	299	290	275
11	258	252	259	256	275	279	300	298	313	299	291	275
12	255	248	254	258	268	280	295	309	311	301	288	275
13	255	254	252	255	251	272	291	316	310	298	288	274
14	257	255	248	251	249	277	294	306	309	299	287	267
15	259	260	243	262	258	279	292	305	309	301	287	275
16	256	250	253	262	264	281	300	308	304	299	289	278
17	255	251	265	257	265	280	304	304	311	298	288	277
18	254	254	249	270	268	278	302	305	312	300	285	278
19	258	253	250	260	270	277	306	304	312	302	288	278
20	251	251	249	269	266	283	304	302	308	298	286	277
21	252	251	254	260	268	281	301	307	306	299	389	276
22	255	257	280	255	269	276	303	307	304	300	281	274
23	251	256	256	264	269	271	304	307	304	302	282	270
24	253	255	256	252	267	286	302	305	306	299	281	273
25	261	251	251	258	269	285	303	309	305	298	284	274
26	256	254	252	260	270	283	302	311	306	300	283	276
27	255	249	257	260	269	290	302	309	302	298	281	271
28	256	254	252	259	269	287	298	309	300	300	280	274
29	254	254	258	261	270	286	301	313	299	291	282	272
30	254	253	256	262	-	286	300	310	296	294	272	268
31	262	-	250	262	-	284	-	308	-	294	279	-
Total	7,962	7,577	7,866	8,005	7,720	8,599	8,910	9,468	9,249	9,283	8,878	8,257
Mean	257	253	254	258	266	277	297	305	308	299	286	275
Cfsm	0.862	0.849	0.852	0.865	0.892	0.929	0.996	1.02	1.03	1.00	0.959	0.923
In.	0.99	0.95	0.98	1.00	0.96	1.07	1.11	1.18	1.15	1.16	1.11	1.03

Calendar year 1951: Max 302 Min 200 Mean 269 Cfsm 0.902 In. 12.24
Water year 1951-52: Max 317 Min 241 Mean 278 Cfsm 0.933 In. 12.69

Grass River at Pyrites, N. Y.

Location.-- Lat 44°31'30", long. 75°11'50", on left bank 1,000 ft downstream from lower bridge in Pyrites, St. Lawrence County, and half a mile upstream from Harrison Creek.

Drainage area.--335 sq mi.

Records available.--August 1924 to September 1952.

Gage.--Water-stage recorder.

Average discharge.--28 years, 597 cfs.

Extremes.--Maximum discharge during year, 3,270 cfs Apr. 7 (gage height, 7.28 ft); maximum gage height, 8.31 ft Mar. 12 (backwater from ice); minimum daily discharge, 71 cfs Sept 15.
1924-52: Maximum discharge, about 8,300 cfs Nov. 18, 1927 (gage height, 13.0 ft, from floodmark); minimum daily, 59 cfs Aug. 29 to Sept. 1, 1934.

Remarks.--Records good except those for periods of ice effect or fragmentary, doubtful, or no gage-height record, which are fair. Diurnal fluctuation at extremely low flow caused by powerplant above station.

Revisions.--W 759: Drainage area.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.1	67
1.6	184
2.4	449
4.0	1,180
7.0	3,070

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	190	198	499	450	360	250	895	401	590	310	95	90
2	176	192	550	1,000	560	240	*1,470	376	837	245	90	130
3	*168	234	*599	1,100	600	260	2,020	358	720	203	86	209
4	160	327	578	*1,000	840	*290	2,000	344	562	187	83	248
5	149	350	620	800	1,350	380	1,970	338	479	176	96	195
6	150	290	729	680	1,180	450	2,780	331	427	162	76	152
7	152	401	738	580	900	430	*3,060	331	387	144	76	127
8	211	f835	808	490	660	390	2,260	348	362	134	78	110
9	290	f950	779	410	560	380	1,740	344	334	136	73	104
10	287	f738	729	350	500	360	1,480	321	307	226	73	88
11	251	f645	615	320	420	1,000	1,500	334	*277	675	78	84
12	215	603	520	300	*330	1,900	1,610	466	271	612	90	80
13	196	542	380	280	280	1,400	1,410	*761	277	591	84	80
14	181	f534	310	270	260	1,000	1,530	1,020	252	457	86	76
15	165	752	270	370	250	760	1,580	985	224	317	84	71
16	160	851	230	840	250	580	1,420	813	204	230	90	95
17	152	915	210	720	290	500	1,180	706	190	195	115	115
18	147	779	220	1,250	300	470	1,020	615	170	173	144	127
19	147	d615	220	1,140	290	520	910	530	160	173	143	194
20	134	d483	190	980	270	640	842	468	157	181	122	348
21	140	d394	240	780	320	756	789	556	157	179	d111	314
22	137	d385	280	540	300	832	724	856	147	165	162	237
23	142	d534	310	520	290	761	734	910	140	152	338	195
24	150	922	330	420	280	747	747	738	143	140	268	173
25	198	880	330	380	290	684	671	855	225	*125	187	147
26	272	756	310	360	280	671	591	1,280	412	113	144	142
27	287	580	280	420	260	813	534	1,360	729	108	130	154
28	271	540	250	430	250	789	495	1,060	930	99	106	198
29	252	520	235	400	250	693	460	779	607	95	*d91	170
30	*f236	499	225	350	-	628	430	615	416	97	103	150
31	f221	-	270	320	-	729	-	522	-	97	88	-
Total	5,987	17,242	12,854	18,250	12,970	20,303	38,852	19,721	11,093	6,897	3,590	4,603
Mean	193	575	415	589	447	655	1,295	636	370	222	116	153
Cfsm	0.576	1.72	1.24	1.76	1.33	1.96	3.87	1.90	1.10	0.663	0.346	0.457
In.	0.66	1.91	1.43	2.03	1.44	2.25	4.31	2.19	1.23	0.77	0.40	0.51

Calendar year 1951: Max 4,700 Min 126 Mean 615 Cfsm 1.84 In. 24.90
Water year 1951-52: Max 3,060 Min 71 Mean 471 Cfsm 1.41 In. 19.13

Peak discharge (base, 3,600 cfs).--No peak above base.
* Discharge measurement made on this day.
d Doubtful gage-height record; discharge computed from reconstructed gage-height graph.
f Fragmentary gage-height record; discharge computed from partly estimated gage heights.
Note.--Stage-discharge relation affected by ice Nov. 5, 6, 27-29, Dec. 12 to Mar. 20. No gage-height record Dec. 15 to Jan. 3; discharge estimated on basis of 1 discharge measurement, weather records, and records for St. Regis River at Brasher Center.

Raquette River at Piercefield, N. Y.

Location.--Lat 44°14'05", long. 74°34'20", on left bank half a mile downstream from dam of International Paper Co. at Piercefield, St. Lawrence County, and 1½ miles upstream from Dead Creek.

Drainage area.--722 sq mi.

Records available.--August 1908 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 1,502.12 ft above mean sea level, datum of 1929, supplementary adjustment of 1943. Prior to Dec. 31, 1912, staff or chain gage at same site (datum of chain gage lowered 2 ft Jan. 1, 1911, to present datum).

Average discharge.--44 years, 1,286 cfs.

Extremes.--Maximum discharge during year, 4,380 cfs Apr. 24 (gage height, 9.48 ft); minimum, 48 cfs Sept. 20 (gage height, 1.70 ft); minimum daily, 52 cfs Sept. 18.
1908-52: Maximum discharge, 8,240 cfs May 16, 1943 (gage height, 12.09 ft); minimum, 4.1 cfs Oct. 12, 1947 (gage height, 0.61 ft), caused by construction work above station; minimum daily, 4.1 cfs Oct. 12, 1947.

Remarks.--Records excellent except those for periods of fragmentary or no gage-height record, which are good. Seasonal distribution of flow appreciably modified by natural storage in lakes and ponds above station. Extensive diurnal fluctuation by powerplant at Piercefield.

Revisions (water years).--W 604: 1924. W 759: Drainage area.

Rating table, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)

1.7	48	5.0	825
2.0	74	6.0	1,340
2.5	130	8.0	2,850
3.0	210	9.5	4,400
4.0	464		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*331	339	1,380	1,090	1,250	1,020	*1,220	3,420	2,280	936	618	594
2	400	320	1,370	*1,220	1,120	1,080	1,330	3,260	2,220	799	474	532
3	480	382	1,360	1,550	985	*1,190	1,450	3,080	2,180	710	680	404
4	479	447	1,340	1,520	1,020	1,400	1,550	2,920	2,140	584	*622	372
5	490	503	1,300	1,450	1,080	1,530	1,670	2,800	2,020	584	468	437
6	356	505	1,220	1,380	1,100	1,470	1,940	2,570	1,780	680	476	407
7	407	589	1,220	1,330	1,150	1,430	2,290	*2,370	1,660	615	529	422
8	437	660	1,480	1,170	1,170	1,380	2,420	2,220	1,590	598	452	418
9	397	856	1,750	898	1,300	1,340	2,630	1,910	*1,560	594	524	333
10	407	856	2,090	834	1,410	1,300	2,840	1,720	1,530	684	706	273
11	405	960	*2,450	808	1,350	1,300	3,080	1,640	1,480	898	766	103
12	405	1,080	2,280	848	1,220	1,290	3,310	*1,690	1,440	a1,020	741	63
13	393	1,350	1,940	861	1,270	1,270	3,470	1,760	1,290	a1,080	684	61
14	393	1,640	1,550	879	*1,020	1,250	3,610	1,890	1,070	852	450	64
15	423	1,620	1,450	1,130	848	1,230	3,710	2,060	852	821	485	74
16	404	1,440	a1,490	1,560	856	1,200	3,820	2,030	1,010	729	381	70
17	390	1,270	a1,490	1,490	894	1,180	3,880	2,020	1,210	618	332	*104
18	383	1,290	a1,510	1,380	922	1,150	3,960	1,980	1,360	615	427	52
19	327	1,320	a1,740	1,250	931	1,130	4,040	1,950	1,150	669	388	111
20	280	1,450	a1,650	1,080	1,090	1,120	4,060	1,800	737	654	601	164
21	238	a1,690	a1,670	1,090	1,390	990	4,150	1,720	577	643	601	301
22	174	a1,530	1,620	1,090	1,340	906	4,220	1,820	505	723	684	281
23	233	a1,370	1,620	1,120	1,280	1,090	4,270	1,980	532	990	601	279
24	381	1,370	1,610	1,130	1,240	1,090	4,310	2,100	821	829	587	372
25	145	1,380	1,580	1,120	1,210	1,190	4,300	2,210	1,120	633	594	362
26	268	1,420	1,550	1,120	1,040	1,400	4,240	2,290	1,270	636	604	296
27	197	1,410	*1,500	1,150	737	1,370	4,140	2,340	1,180	643	604	295
28	299	f1,400	a1,370	1,280	806	1,340	3,990	2,370	1,070	f651	598	437
29	267	1,400	a1,150	1,400	936	1,290	3,810	2,380	1,030	f894	594	284
30	275	1,390	a1,080	1,340	-	1,250	3,570	2,360	990	832	*594	446
31	307	-	a1,140	1,280	-	1,210	-	2,320	-	643	594	-
Total	10,771	33,237	47,950	36,848	31,967	38,386	97,280	68,980	39,654	22,857	17,459	8,411
Mean	347	1,108	1,547	1,189	1,102	1,238	3,243	2,225	1,322	737	563	280
Cfsm	0.481	1.53	2.14	1.65	1.53	1.71	4.49	3.08	1.83	1.02	0.780	0.388
In.	0.55	1.71	2.47	1.90	1.65	1.98	5.01	3.55	2.04	1.18	0.90	0.43

Calendar year 1951: Max 5,920 Min 145 Mean 1,362 Cfsm 1.89 In. 25.62
Water year 1951-52: Max 4,310 Min 52 Mean 1,240 Cfsm 1.72 In. 23.37

Peak discharge (base, 4,200 cfs).--Apr. 24 (11:30 a.m.) 4,380 cfs (9.48 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of daily tape-gage readings, recorded range in stage, and reconstructed gage-height record.

f Fragmentary gage-height record; discharge computed on basis of partly estimated gage heights and recorded range in stage.

Raquette River at Raymondville, N. Y.

Location.--Lat 44°50'20", long. 74°58'45", on right bank 250 ft upstream from old highway bridge at Raymondville, St. Lawrence County, 0.3 mile downstream from Trout Brook, 0.4 mile downstream from powerplant of Niagara Mohawk Power Corp., and 18 miles upstream from mouth.

Drainage area.--1,131 sq mi.

Records available.--November 1943 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 183.33 ft above mean sea level, datum of 1929.

Average discharge.--8 years (1944-52), 2,079 cfs.

Extremes.--Maximum discharge during year, 5,500 cfs Apr. 15 (gage height, 5.43 ft); minimum, 4.4 cfs Oct. 15 (gage height, 0.50 ft); minimum daily, 7.0 cfs Oct. 15.
1943-52: Maximum discharge, 10,300 cfs June 8, 1947 (gage height, 7.57 ft); maximum gage height, 7.75 ft Mar. 29, 1950 (backwater from ice); minimum discharge, that of Oct. 15, 1951; minimum gage height, 0.42 ft July 13, 1950; minimum daily, that of Oct. 15, 1951.

Remarks.--Records excellent except those for periods of ice effect, which are fair. Extensive diurnal fluctuation caused by power and industrial operations. Seasonal distribution of flow appreciably modified by natural storage in lakes and ponds above station.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 15				Apr. 16 to Sept. 30			
0.5	4.4	1.3	176	1.1	105	3.0	1,490
.6	10	1.8	436	1.5	263	4.0	2,920
.7	20	2.5	1,010	2.0	557	5.3	5,230
.8	34	3.5	2,220	2.5	970		
1.0	77	5.4	5,440				

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	140	354	2,090	1,800	1,850	1,760	2,470	4,220	2,990	1,670	1,000	445
2	288	726	*2,190	2,200	2,500	1,020	2,800	3,870	3,170	1,630	691	701
3	*580	474	2,160	2,300	2,300	1,330	*2,830	3,630	2,950	1,480	860	944
4	692	384	2,090	2,250	2,700	1,490	2,880	3,220	2,970	766	1,000	734
5	666	646	2,160	*2,400	3,400	1,480	3,610	3,070	2,780	855	833	864
6	356	620	2,220	2,300	2,350	*1,370	5,090	3,190	2,690	1,230	784	758
7	324	1,200	2,380	2,150	2,150	1,460	4,850	3,220	2,590	1,060	760	474
8	874	1,620	2,360	1,900	2,030	1,460	4,770	2,920	2,270	1,130	654	708
9	926	1,670	2,290	1,750	1,950	1,470	4,560	2,920	2,220	1,240	300	714
10	835	1,810	2,270	1,650	1,880	1,470	4,320	2,480	2,130	1,270	264	792
11	869	1,350	2,500	1,600	*1,840	2,130	4,270	2,280	*1,970	1,500	480	660
12	879	1,560	2,740	1,600	1,650	4,300	4,510	2,560	1,820	1,060	394	665
13	282	1,780	3,070	1,650	1,550	2,810	4,740	2,900	1,630	1,160	560	146
14	463	1,820	2,590	1,650	1,650	2,320	5,190	*3,320	1,580	1,250	318	128
15	7.0	1,870	2,300	1,850	1,750	2,030	5,270	3,090	1,720	1,410	494	556
16	274	2,330	2,100	2,600	1,800	1,880	5,170	2,990	1,690	1,320	284	686
17	716	3,070	2,000	2,350	1,800	1,860	5,090	3,070	1,680	1,190	332	648
18	980	2,560	2,000	2,710	1,810	1,830	5,050	2,920	1,540	1,310	538	468
19	843	2,190	2,100	2,530	1,770	1,940	4,990	2,530	1,400	1,080	316	610
20	1,020	1,870	1,900	2,300	1,770	2,080	4,950	2,510	1,170	1,360	276	137
21	286	1,820	2,050	2,100	1,780	2,270	4,950	2,730	1,240	1,200	285	125
22	751	2,000	2,300	2,000	1,770	2,350	4,890	2,810	954	1,130	540	508
23	686	2,070	2,450	2,050	1,770	2,500	4,830	2,820	954	1,160	876	260
24	566	2,120	2,400	2,100	1,880	2,490	4,810	2,820	966	1,190	672	184
25	466	2,300	2,300	1,900	1,770	2,460	4,850	3,040	870	*1,080	536	482
26	566	2,330	2,250	1,850	1,770	2,450	4,790	3,780	926	562	1,170	362
27	299	2,250	2,150	1,900	1,720	2,520	4,810	3,870	1,210	336	1,030	110
28	267	1,950	2,050	2,000	1,730	2,440	4,770	3,630	1,660	1,030	*924	122
29	641	1,850	1,900	2,050	1,760	2,400	4,620	3,300	1,680	932	843	686
30	645	2,010	1,800	1,900	-	2,420	4,400	3,110	1,890	938	731	678
31	*706	-	1,750	1,800	-	2,470	-	3,110	-	977	619	-
Total	17,893.0	50,626	68,910	63,190	56,450	64,260	135,130	95,930	55,310	35,506	19,364	15,355
Mean	577	1,688	2,223	2,038	1,947	2,073	4,504	3,095	1,844	1,145	625	512
Cfsm	0.510	1.49	1.97	1.80	1.72	1.83	3.98	2.74	1.63	1.01	0.553	0.453
In.	0.59	1.66	2.27	2.08	1.86	2.11	4.44	3.15	1.82	1.17	0.64	0.50

Calendar year 1951: Max 7,790 Min 7.0 Mean 2,086 Cfsm 1.84 In. 25.03
Water year 1951-52: Max 5,270 Min 7.0 Mean 1,852 Cfsm 1.64 In. 22.29

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 27-29, Dec. 15 to Jan. 17, Jan. 20 to Feb. 7, Feb. 12-17.

St. Regis River at Brasher Center, N. Y.

Location.--Lat 44°51'50", long. 74°46'45", on left bank, 600 ft upstream from highway bridge at Brasher Center, St. Lawrence County, and 6½ miles downstream from confluence of East and West Branches at Winthrop.

Drainage area.--616 sq mi.

Records available.--August 1910 to November 1917, January 1919 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 217.23 ft above mean sea level, datum of 1929. Prior to June 24, 1916, chain gage at site 600 ft downstream at different datum. June 24, 1916, to Nov. 10, 1917, and Jan. 1, 1919, to Aug. 19, 1920, staff gage at present site and datum.

Average discharge.--39 years (1910-13, 1914-17, 1919-52), 1,058 cfs.

Extremes.--Maximum discharge during year, 5,140 cfs Apr. 6 (gage height, 9.06 ft); maximum gage height, 9.22 ft Mar. 12 (backwater from ice); minimum discharge, 137 cfs Aug. 11 (gage height, 5.71 ft); minimum daily, 142 cfs Aug. 10.
1910-17, 1919-52: Maximum discharge, 16,800 cfs Apr. 6, 1937 (gage height, 12.82 ft); maximum gage height recorded, about 15.3 ft Apr. 6, 1937 (ice jam); minimum discharge observed, about 34 cfs Aug. 8, 1917 (gage height, 5.25 ft); minimum daily, 37 cfs Aug. 8, 1917.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Slight diurnal fluctuation caused by power operations above station.

Revisions (water years).--W 1114: 1910.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

5.7	132	7.0	1,340
5.9	244	8.0	2,910
6.3	556	9.0	5,000

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	327	*a370	*960	780	720	490	1,350	857	1,080	612	238	190
2	320	327	1,030	1,400	1,550	450	2,400	804	1,310	503	226	278
3	320	366	1,030	1,700	1,130	470	*3,100	740	1,460	436	220	312
4	*320	603	994	1,510	1,430	520	3,020	740	1,330	512	214	264
5	312	660	1,010	*1,310	2,180	600	2,990	700	1,160	452	208	244
6	327	631	1,210	1,150	1,670	*720	4,860	710	982	380	202	238
7	357	710	1,250	1,000	1,340	740	4,350	825	891	342	196	232
8	411	1,290	1,260	880	1,170	700	3,630	825	857	320	250	214
9	436	1,690	1,200	780	982	660	3,180	891	814	305	184	208
10	452	1,420	1,130	700	a914	640	3,120	730	740	390	142	202
11	428	1,310	970	640	868	1,100	3,690	730	*660	804	168	196
12	395	1,200	840	580	750	3,000	3,840	1,310	494	1,020	184	190
13	364	1,070	600	520	600	1,900	3,160	2,240	494	914	179	190
14	342	1,040	500	490	560	1,450	3,330	*2,240	594	720	184	179
15	327	1,400	420	720	520	1,060	3,430	1,990	494	521	179	184
16	320	1,480	360	1,500	470	860	3,080	1,680	460	428	196	214
17	312	1,530	350	1,200	540	820	2,620	1,430	419	387	251	266
18	305	1,340	360	1,940	580	780	2,350	1,260	395	357	232	174
19	298	1,140	370	1,960	560	793	2,230	1,100	380	436	232	396
20	292	900	310	1,640	520	868	2,100	947	372	512	226	530
21	285	720	360	1,350	560	1,210	1,990	970	357	512	226	603
22	285	700	440	980	600	1,240	1,840	1,370	350	436	342	436
23	292	1,000	430	860	540	1,070	1,780	1,690	342	387	312	372
24	327	1,450	500	740	500	1,070	1,750	1,540	350	357	312	334
25	380	1,550	540	680	560	1,050	1,600	1,590	715	*320	271	312
26	452	1,250	540	660	540	994	1,400	2,260	836	298	232	298
27	494	1,100	490	740	520	1,220	1,240	2,230	1,250	271	214	320
28	a490	860	440	800	500	1,100	1,110	1,860	1,340	271	*196	320
29	a460	840	410	720	490	1,000	1,010	1,530	1,010	258	196	312
30	a430	880	400	620	-	940	925	1,300	782	251	184	285
31	*a400	-	450	580	-	1,080	-	1,130	-	238	179	-
Total	11,260	30,827	21,154	31,130	23,864	30,595	76,475	40,219	22,718	13,950	6,775	8,493
Mean	363	1,028	682	1,004	823	987	2,549	1,297	757	450	219	283
Cfsm	0.589	1.67	1.11	1.63	1.34	1.60	4.14	2.11	1.23	0.731	0.356	0.459
In.	0.68	1.86	1.28	1.88	1.44	1.85	4.62	2.43	1.37	0.84	0.41	0.51

Calendar year 1951: Max 8,200 Min 285 Mean 1,083 Cfsm 1.76 In. 23.88
Water year 1951-52: Max 4,860 Min 142 Mean 867 Cfsm 1.41 In. 19.17

Peak discharge (base, 5,600 cfs).--No peak above base.
* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of recorded range in stage, weather records, and record for Grass River at Pyrites.
Note.--Stage-discharge relation affected by ice Nov. 20 to Dec. 1, Dec. 12 to Jan. 3, Jan. 7-17, Jan. 21 to Feb. 1, Feb. 13 to Mar. 18, Mar. 29 to Apr. 3.

Salmon River at Chasm Falls, N. Y.

Location.--Lat 44°45'20", long. 74°13'10", on right bank a quarter of a mile downstream from powerplant of Niagara Mohawk Power Corp. at Chasm Falls, Franklin County, and 3 miles downstream from Duane Stream.

Drainage area.--132 sq mi.

Records available.--July 1925 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 1,011.52 ft above mean sea level, datum of 1929, supplementary adjustment of 1943.

Average discharge.--27 years, 227 cfs.

Extremes.--Maximum discharge during year, 995 cfs Apr. 11 (gage height, 3.16 ft); minimum, 14 cfs Aug. 15 (gage height, 0.49 ft); minimum daily, 46 cfs Aug. 16.
1925-52: Maximum discharge, 2,890 cfs Apr. 25, 1926 (gage height, 5.0 ft); minimum, 14 cfs Feb. 12, 1943, Aug. 15, 1952; minimum daily, 28 cfs Sept. 4, 1934.

Remarks.--Records good. Diurnal fluctuation at low and medium flow caused by powerplant. A small diversion from tributary stream above station is used as water supply for village of Malone.

Revisions (water years).--W 729: 1931(m). W 759: Drainage area.

Rating tables, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1-30		Oct. 31 to Sept. 30			
1.2	92	0.9	46	2.0	328
1.6	193	1.2	88	2.5	567
		1.5	152	3.1	949

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	114	153	*233	215	161	134	222	218	222	108	78	76
2	113	137	250	308	193	116	504	206	350	105	78	79
3	116	198	209	216	175	125	*506	207	273	101	75	98
4	*105	216	197	179	211	128	*425	195	239	89	75	88
5	107	164	238	208	265	127	382	188	236	86	74	79
6	102	173	225	209	240	130	776	204	194	84	72	83
7	118	239	182	*175	203	*130	713	239	209	82	71	78
8	137	293	219	183	192	129	*635	220	180	84	73	71
9	136	245	193	183	188	127	612	215	184	84	72	75
10	120	218	217	188	174	123	694	217	161	190	71	73
11	120	218	224	168	*176	211	927	208	162	237	94	74
12	114	218	245	166	166	311	843	312	*178	147	80	73
13	114	200	215	167	134	294	664	426	168	120	86	74
14	109	152	226	167	171	251	688	*389	142	114	75	74
15	106	249	222	188	144	193	783	337	137	102	103	74
16	107	216	199	243	136	174	658	300	124	93	46	172
17	104	192	209	183	138	177	567	269	128	87	103	209
18	108	185	228	258	145	187	556	246	114	88	95	*210
19	164	210	202	255	143	186	546	225	112	191	81	200
20	95	213	164	227	132	178	540	205	111	149	80	131
21	99	234	208	187	138	171	499	267	109	124	79	150
22	101	246	240	170	138	200	430	384	101	114	103	180
23	101	250	223	196	142	187	412	367	97	*103	82	210
24	117	292	202	189	129	195	376	304	104	97	81	216
25	176	195	180	167	135	175	320	340	196	88	76	190
26	115	197	185	173	133	175	284	483	167	86	75	166
27	105	233	164	182	129	192	255	404	193	84	*74	150
28	106	233	156	188	134	183	237	354	138	80	73	128
29	100	269	166	155	129	173	213	288	127	83	80	104
30	168	230	174	150	-	163	203	261	120	82	66	98
31	*145	-	174	145	-	189	-	236	-	77	74	-
Total	3,642	6,468	6,369	5,988	4,694	5,434	15,470	8,714	4,976	3,359	2,445	3,683
Mean	117	216	205	193	162	175	516	281	166	108	78.9	123
Cfsm	0.886	1.64	1.55	1.46	1.23	1.33	3.91	2.13	1.26	0.818	0.598	0.932
In.	1.03	1.82	1.79	1.69	1.32	1.53	4.36	2.46	1.40	0.95	0.69	1.04

Calendar year 1951: Max 1,510 Min 95 Mean 237 Cfsm 1.80 In. 24.30
Water year 1951-52: Max 927 Min 46 Mean 195 Cfsm 1.48 In. 20.08

* Discharge measurement made on this day.

Chateaugay River near Chateaugay, N. Y.

Location.--Lat 44°54'35", long. 74°05'10", on right bank 150 ft downstream from dam of International Hydroelectric Corp., 1 mile south of Chateaugay, Franklin County, and 5 miles upstream from Marble River.

Drainage area.--112 sq mi.

Records available.--September to December 1908, October 1926 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 847.04 ft above mean sea level, datum of 1929, supplementary adjustment of 1943. September to December 1908, staff gage a quarter of a mile upstream at different datum.

Average discharge.--26 years (1926-52), 176 cfs.

Extremes.--Maximum discharge during year, 545 cfs Mar. 11 (gage height, 3.71 ft); minimum, 57 cfs Nov. 11 (gage height, 1.16 ft); minimum daily, 71 cfs Sept. 7.
1908, 1926-52: Maximum discharge, 2,060 cfs Apr. 8, 1928 (gage height, 7.3 ft), from rating curve extended above 970 cfs by logarithmic plotting; minimum, 6 cfs Nov. 20, 1928 (gage height, 0.23 ft); minimum daily, 26 cfs July 8, 1934.

Remarks.--Records good except those for periods of ice effect, which are fair. Flow regulated by Upper and Lower Chateaugay Lakes. Considerable diurnal fluctuation at all stages caused by power operations.

Revisions.--W 759: Drainage area.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to May 26		May 27 to Sept. 30	
1.5	93	1.3	62
2.0	161	1.7	110
3.0	352	2.2	188
3.7	542	2.9	329

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	103	*99	154	210	190	190	216	125	286	86	84	74
2	104	99	149	185	195	185	317	124	255	85	84	75
3	103	116	142	175	206	170	251	121	212	86	84	74
4	*103	106	142	170	231	165	*236	121	199	89	84	72
5	98	109	143	175	225	155	278	121	166	86	84	72
6	99	108	143	175	205	149	306	125	168	85	83	72
7	100	125	143	180	200	150	264	142	174	83	83	71
8	101	125	142	*180	202	*139	272	128	169	79	82	72
9	99	113	142	175	201	135	299	124	171	79	82	72
10	98	108	140	180	201	133	318	122	168	99	81	72
11	98	98	140	180	*202	274	357	128	171	84	81	72
12	97	122	135	200	200	252	396	162	*169	81	82	72
13	98	126	135	205	200	202	406	199	150	81	81	72
14	98	135	135	200	195	204	474	202	127	79	81	72
15	98	133	130	215	195	206	517	*259	127	81	82	74
16	98	133	130	195	190	202	514	286	120	92	84	74
17	98	132	135	205	205	197	511	268	116	86	84	72
18	97	129	135	225	200	196	505	201	113	82	83	*77
19	94	128	130	200	195	199	511	199	110	89	82	90
20	94	126	130	200	185	197	502	199	103	83	82	75
21	94	130	155	195	190	199	502	234	103	89	84	75
22	94	145	150	190	190	192	496	280	103	*88	82	78
23	97	169	140	190	200	182	488	272	96	86	82	78
24	97	148	140	190	200	179	434	272	106	86	82	78
25	99	135	140	195	200	171	388	292	106	88	78	78
26	95	135	135	205	200	174	370	303	106	90	77	79
27	97	130	135	210	200	179	226	316	96	90	*75	78
28	97	135	140	210	195	169	136	311	86	86	72	77
29	100	140	150	205	195	164	135	301	86	85	85	75
30	99	*143	155	195	-	172	126	290	86	84	76	74
31	99	-	160	190	-	177	-	286	-	84	72	-
Total	3,046	3,783	4,375	6,005	5,793	5,658	10,751	6,513	4,248	2,651	2,518	2,246
Mean	98.3	126	141	194	200	183	358	210	142	85.5	81.2	74.9
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 685 Min 94 Mean 189 Cfsm 1.69 In. 22.88
Water year 1951-52: Max 517 Min 71 Mean 157 Cfsm 1.40 In. 19.12

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 25-29, Dec. 11 to Feb. 2, Feb. 6, 7, Feb. 12 to Mar. 5, Mar. 7 (no gage-height record Feb. 23-29). Decrease in storage in Chateaugay Lakes during calendar year 1951, about 79,500,000 cu ft (equivalent mean discharge, 2.52 cfs; runoff, 0.31 in.); decrease in elevation, 0.60 ft. Decrease in storage during water year 1951-52, about 18,500,000 cu ft (equivalent mean discharge, 0.59 cfs; runoff, 0.07 in.); decrease in elevation, 0.14 ft.

Great Chazy River at Perry Mills, N. Y.

Location.--Lat 45°00'00", long. 73°30'05", on left bank 500 ft upstream from highway bridge at Perry Mills, Clinton County, and 7½ miles upstream from Corbeau Creek.

Drainage area.--247 sq mi.

Records available.--September 1928 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 164.93 ft above mean sea level, datum of 1929, supplementary adjustment of 1943.

Average discharge.--24 years, 268 cfs.

Extremes.--Maximum discharge during year, 2,990 cfs Apr. 6 (gage height, 7.22 ft); minimum, 30 cfs Oct. 1 (gage height, 1.90 ft); minimum daily, 41 cfs Oct. 1.
1928-52: Maximum discharge, 6,000 cfs Apr. 7, 1937 (gage height, 9.74 ft); maximum gage height, 11.5 ft, from floodmark, Mar. 9, 1946 (ice jam); minimum discharge, about 0.8 cfs Sept. 18, 1932 (gage height, 1.33 ft); minimum daily, 10 cfs Sept. 18, 1932.

Remarks.--Records good except those for periods of ice effect, which are poor. Diurnal fluctuation at low and medium flow caused by sawmill immediately upstream. Slight regulation by Chazy Lake, from which Clinton Prison at Dannemora obtains its water supply.

Revisions (water years).--W 714: 1930.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.0	40	4.0	639
2.2	66	5.0	1,200
2.5	120	7.0	2,770
3.0	248		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	41	*108	140	235	160	160	800	147	224	106	105	109
2	55	89	216	380	245	155	1,850	153	481	91	100	108
3	69	129	225	330	300	150	2,130	155	389	79	102	118
4	*71	195	209	250	280	145	*1,710	154	257	79	101	104
5	67	133	201	220	440	*170	1,400	151	225	80	102	101
6	68	100	209	200	370	175	*2,690	152	200	72	102	100
7	52	86	200	175	310	175	1,930	202	230	63	100	102
8	70	290	191	*180	280	175	1,270	226	252	54	99	98
9	83	308	166	165	*260	165	959	187	208	54	100	100
10	78	200	163	165	250	160	1,120	163	210	70	102	104
11	60	156	145	160	240	320	1,550	156	169	159	93	105
12	79	141	140	155	240	520	998	204	*214	106	102	101
13	87	97	135	165	195	460	721	503	194	86	102	99
14	102	118	140	155	220	370	836	374	135	77	97	98
15	98	177	150	170	190	240	1,300	*280	133	66	98	101
16	100	182	124	320	165	190	816	250	112	62	101	104
17	101	221	125	260	170	190	673	181	108	46	113	100
18	103	171	130	320	180	200	763	164	154	52	63	102
19	102	105	130	420	180	205	757	151	131	89	80	113
20	101	100	135	350	170	190	727	140	89	*120	86	132
21	100	91	140	260	170	200	618	225	117	86	100	118
22	100	84	160	180	175	300	427	490	116	77	102	100
23	99	145	190	185	175	320	350	480	106	69	100	99
24	106	349	210	190	170	300	323	339	100	62	104	108
25	132	253	190	180	160	320	267	276	211	57	99	112
26	130	180	175	160	170	330	233	556	272	54	96	112
27	103	160	175	170	165	400	179	494	434	*54	*97	108
28	62	160	165	180	170	430	172	311	234	53	99	106
29	83	170	165	175	165	430	173	268	159	98	97	105
30	111	*139	175	160	-	520	154	250	122	114	110	102
31	113	-	180	145	-	820	-	214	-	106	110	-
Total	2,726	4,837	5,199	6,760	6,365	8,885	27,896	7,996	5,966	2,441	3,062	3,169
Mean	87.9	161	168	218	219	287	930	258	199	78.7	98.8	106
Cfsm	0.356	0.652	0.680	0.883	0.887	1.16	3.77	1.04	0.805	0.319	0.400	0.429
In.	0.41	0.73	0.78	1.02	0.96	1.34	4.20	1.20	0.90	0.37	0.46	0.48

Calendar year 1951: Max 4,360 Min 39 Mean 283 Cfsm 1.15 In. 15.58
Water year 1951-52: Max 2,690 Min 41 Mean 233 Cfsm 0.943 In. 12.85

Peak discharge (base, 2,500 cfs).--Apr. 6 (11:45 a.m.) 2,990 cfs (7.22 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 27-29, Dec. 12 to Apr. 2 (no gage-height record Mar. 8-18).

Saranac River at Plattsburg, N. Y.

Location.--Lat 44°40'50", long. 73°28'20", on right bank in Plattsburg, Clinton County, 600 ft downstream from Imperial Paper & Color Corp. dam, 3 miles upstream from mouth, and 5½ miles downstream from Mead Brook.

Drainage area.--608 sq mi.

Records available.--March 1903 to September 1930, October 1943 to September 1952. Published as "near Plattsburg" 1903-30.

Gage.--Water-stage recorder. Datum of gage is 155.74 ft above mean sea level, datum of 1929, supplementary adjustment of 1943. Prior to Nov. 12, 1919, staff gage and Nov. 12, 1919, to Sept. 30, 1930, water-stage recorder, at site 1.5 miles upstream at different datum.

Average discharge.--34 years (1905-30, 1943-52), 834 cfs.

Extremes.--Maximum discharge during year, 4,510 cfs Apr. 6 (gage height, 7.48 ft); minimum, 28 cfs Oct. 21 (gage height, 1.675 ft); minimum daily, 112 cfs Sept. 15.
1903-30, 1943-52: Maximum discharge, 11,500 cfs Apr. 8, 1928, from computation of flow over dam and through waste gates and powerplant; minimum daily, 15 cfs Aug. 4, 1908.

Remarks.--Records excellent except those for periods of ice effect or fragmentary gage-height record, which are good. Slight regulation by storage in Lower Saranac Lake and elsewhere. Considerable diurnal fluctuation caused by power and industrial operations. During year, city of Plattsburg diverted an estimated average of 4 cfs of flow of Mead and West Brooks, tributaries above station, for municipal supply.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 8		Nov. 9 to Sept. 30			
2.7	205	2.3	112	4.5	1,060
3.5	500	2.8	224	5.5	1,930
4.4	1,000	3.5	486	6.8	3,490

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	377	335	804	850	654	b700	916	721	1,250	453	412	243
2	462	*417	858	1,010	828	b580	1,800	772	1,520	425	295	160
3	389	506	846	974	760	b620	2,020	738	1,180	426	233	287
4	474	815	830	837	935	b640	1,620	670	1,130	498	297	281
5	*390	752	784	778	1,040	b680	*1,550	700	1,030	440	329	320
6	366	708	920	605	925	727	3,340	722	915	430	375	272
7	448	585	843	b660	778	791	2,220	784	911	476	379	225
8	284	975	786	b700	815	*805	1,890	868	777	290	325	227
9	440	989	712	*b620	*762	758	1,830	740	907	291	282	245
10	431	669	771	b760	662	726	2,390	576	892	668	240	337
11	444	709	743	b720	730	818	3,360	569	817	772	328	279
12	466	766	698	b680	748	979	2,650	961	881	421	383	395
13	344	732	b680	658	678	908	2,270	1,430	f760	398	407	241
14	387	788	b520	739	b700	903	2,670	1,010	*f700	440	331	315
15	233	909	b620	766	b680	801	3,350	978	671	359	282	112
16	344	886	b420	919	b700	666	2,550	*1,040	776	403	295	284
17	380	837	b660	870	657	786	2,460	1,210	775	366	214	346
18	344	748	b760	922	679	842	2,610	1,060	657	297	301	300
19	427	776	b740	931	759	789	2,470	1,020	388	*432	346	315
20	320	750	b660	835	757	790	2,320	673	436	447	396	301
21	293	688	b800	861	741	787	2,100	1,140	358	533	291	229
22	353	542	866	620	745	957	1,880	1,430	493	396	298	280
23	378	729	868	608	715	933	1,780	1,270	445	345	316	232
24	317	1,010	720	653	624	909	1,270	1,050	578	412	247	295
25	447	825	810	559	672	802	894	1,110	550	381	338	316
26	363	727	749	b580	757	825	875	1,910	598	373	*248	288
27	360	717	778	600	799	981	869	1,840	696	270	298	243
28	291	711	672	747	827	1,010	813	1,410	698	438	279	284
29	316	f800	774	661	713	913	894	1,420	558	398	336	300
30	408	*f780	778	521	-	834	786	1,060	379	346	354	173
31	431	-	751	585	-	963	-	820	-	382	201	-
Total	11,707	22,181	23,221	22,829	21,840	25,223	58,447	31,702	22,726	13,006	9,656	8,125
Mean	378	739	749	736	753	814	1,948	1,023	758	420	311	271
Cfsm	0.622	1.22	1.23	1.21	1.24	1.34	3.20	1.68	1.25	0.691	0.512	0.446
In.	0.72	1.36	1.42	1.40	1.34	1.54	3.58	1.94	1.39	0.80	0.59	0.50

Calendar year 1951: Max 4,430 Min 204 Mean 874 Cfsm 1.44 In. 19.51
Water year 1951-52: Max 3,360 Min 112 Mean 740 Cfsm 1.22 In. 16.58

* Discharge measurement made on this day.
b Stage-discharge relation affected by ice.
f Fragmentary gage-height record; discharge computed from partly estimated gage heights.

West Branch Ausable River near Newman, N. Y.

Location.--Lat 44°18'40", long. 73°55'00", on right bank 4 miles northeast of Newman, Essex County, and 4 miles downstream from Lake Placid Outlet.

Drainage area.--116 sq mi.

Records available.--June 1916 to December 1917, July 1919 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 1,620.76 ft above mean sea level, datum of 1929, supplementary adjustment of 1943. Prior to July 14, 1927, staff gage at same site and datum.

Average discharge.--33 years (1919-52), 220 cfs.

Extremes.--Maximum discharge during year, 2,250 cfs Apr. 6 (gage height, 6.63 ft); minimum, 32 cfs Aug. 3, 4, 9, 10 (gage height, 2.35 ft); minimum daily, 36 cfs Aug. 10. 1916-17, 1919-52: Maximum discharge, 10,800 cfs Sept. 22, 1938 (gage height, 12.20 ft), from rating curve extended above 3,500 cfs by logarithmic plotting; practically no flow Sept. 13, 1920 (gage height, 1.60 ft), caused by closing gates in logging dam; minimum daily, 7.2 cfs July 29, 1920.

Remarks.--Records good except those for periods of ice effect, which are fair. Diurnal fluctuation at low and medium flow caused by mills above station.

Revisions (water years).--W 604: 1924(M).

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 6				Apr. 7 to Sept. 30			
2.5	46	4.0	457	2.4	36	3.7	327
2.8	88	5.0	988	2.7	70	4.7	811
3.3	201	6.1	1,780	3.1	145	5.6	1,390

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	89	99	157	166	124	86	155	357	330	90	41	77
2	82	*89	181	310	145	76	620	272	574	77	40	81
3	80	484	166	256	140	72	635	233	360	75	39	164
4	99	518	152	197	140	76	436	195	268	66	41	118
5	88	276	518	169	185	86	555	188	251	66	44	84
6	*56	198	813	162	175	88	*1,770	186	215	62	45	73
7	57	278	499	128	150	84	812	246	416	57	42	62
8	152	1,120	628	124	*140	82	508	235	339	57	40	58
9	169	496	389	120	135	78	433	239	275	54	41	52
10	133	308	288	*122	130	*76	545	267	222	163	36	51
11	109	249	230	114	125	140	899	361	199	177	55	48
12	98	210	235	116	122	500	598	965	329	104	53	48
13	86	185	155	120	106	360	492	987	*264	81	54	37
14	84	199	125	122	102	250	913	566	200	68	49	51
15	77	508	114	141	112	180	1,240	433	165	60	47	54
16	78	331	106	230	114	140	677	395	141	*60	50	45
17	79	270	118	173	116	140	595	*313	134	55	594	52
18	65	222	125	269	120	135	740	257	156	53	200	*48
19	73	189	118	283	118	130	868	237	129	69	111	56
20	63	154	140	218	120	125	1,380	252	122	74	75	79
21	68	145	175	169	120	140	987	558	101	65	70	56
22	64	143	300	125	118	160	656	606	98	61	212	63
23	66	266	243	165	112	155	1,290	517	87	58	144	61
24	67	472	204	160	104	170	754	391	89	58	100	62
25	310	312	179	135	104	155	521	604	132	42	*77	58
26	243	271	174	140	98	156	457	662	117	48	64	54
27	161	205	159	155	94	187	480	453	163	46	55	60
28	132	185	136	160	92	152	536	337	153	47	52	56
29	109	191	150	130	88	128	584	302	98	47	50	54
30	105	162	139	116	-	126	538	264	75	50	190	51
31	94	-	144	120	-	142	-	235	-	50	114	-
Total	3,236	8,735	7,260	5,115	3,549	4,575	21,674	12,113	6,202	2,140	2,825	1,913
Mean	104	291	234	165	122	148	722	391	207	69.0	91.1	63.8
Cfsm	0.897	2.51	2.02	1.42	1.05	1.28	6.22	3.37	1.78	0.595	0.785	0.550
In.	1.04	2.80	2.33	1.64	1.14	1.47	6.95	3.88	1.99	0.69	0.91	0.61

Calendar year 1951: Max 3,000 Min 55 Mean 237 Cfsm 2.04 In. 27.73
Water year 1951-52: Max 1,770 Min 36 Mean 217 Cfsm 1.87 In. 25.45

Peak discharge (base, 2,000 cfs).--Apr. 6 (8 a.m.) 2,250 cfs (6.63 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 21, 27, 28, Dec. 11-22, Jan. 8-13, 16, Jan. 22 to Mar. 24, Apr. 1, 2.

Black Brook at Black Brook, N. Y.

Location.--Lat 44°26'50", long. 73°44'45", on right bank three-quarters of a mile south of hamlet of Black Brook, Clinton County, and 1½ miles upstream from mouth.

Drainage area.--49.4 sq mi.

Records available.--September 1924 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 888.48 ft above mean sea level, datum of 1929, supplementary adjustment of 1943. Prior to Oct. 24, 1936, staff gage at same site and datum.

Average discharge.--28 years, 50.2 cfs.

Extremes.--Maximum discharge during year, 459 cfs Apr. 6 (gage height, 4.67 ft); minimum, 5.1 cfs Aug. 20 (gage height, 1.43 ft).
1924-52: Maximum discharge, 1,050 cfs Apr. 6, 1937 (gage height, 6.95 ft), from rating curve extended above 450 cfs by logarithmic plotting; minimum, 0.8 cfs July 2, Aug. 29, 1931.

Remarks.--Records excellent except those for periods of ice effect, which are fair. Flow regulated by Fern Lake and Taylor Pond.

Revisions.--W 759: Drainage area.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 6				Apr. 7 to Sept. 30			
1.6	12	3.0	150	1.5	7.2	2.5	80
2.0	36	4.2	356	1.6	11	3.0	141
2.5	86			1.7	16	4.1	332
				2.0	34		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	29	18	27	26	31	21	66	47	74	32	25	46
2	29	18	36	34	35	20	114	30	105	31	26	47
3	33	*49	40	44	37	18	167	26	89	31	26	51
4	39	90	34	47	39	17	186	25	75	31	25	48
5	38	50	34	41	48	21	172	25	73	30	25	46
6	*36	36	35	36	48	19	355	25	67	29	25	46
7	36	34	34	33	40	21	277	35	63	30	25	46
8	54	74	34	30	*35	37	*187	37	58	29	25	45
9	47	71	33	28	34	40	172	32	57	30	25	45
10	44	51	31	27	31	*26	224	26	54	37	26	46
11	44	42	27	*27	29	41	313	26	53	39	33	46
12	31	36	25	27	27	52	231	61	53	35	36	46
13	27	32	23	29	24	40	175	128	*49	33	36	46
14	25	30	22	31	22	35	181	84	45	31	35	46
15	23	33	21	34	23	32	283	58	39	29	34	46
16	21	35	21	38	25	31	205	*52	36	29	36	46
17	20	40	22	36	28	33	165	46	36	*28	44	46
18	19	36	22	40	27	36	161	40	37	27	24	46
19	18	32	21	45	27	39	156	36	35	38	7.2	50
20	17	29	20	39	26	40	144	32	33	33	22	54
21	20	27	23	34	27	41	131	63	33	30	33	53
22	15	26	28	32	26	51	114	87	32	30	40	54
23	17	27	29	38	26	52	108	72	32	28	34	55
24	18	46	27	35	24	52	101	60	32	28	34	56
25	31	45	26	32	25	52	96	67	46	27	*33	54
26	32	37	25	34	24	53	92	113	39	26	32	55
27	26	33	24	39	24	63	89	102	40	26	32	55
28	22	*31	24	39	23	62	87	76	36	26	42	52
29	20	29	23	36	21	58	84	72	34	26	46	52
30	20	27	23	32	-	57	82	67	34	26	48	51
31	18	-	24	30	-	64	-	61	-	26	46	-
Total	869	1,164	838	1,073	856	1,224	4,918	1,711	1,489	931	980.2	1,475
Mean	28.0	38.8	27.0	34.6	29.5	39.5	164	55.2	49.6	30.0	31.6	49.2
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 485 Min 10 Mean 55.6 Cfsm 1.13 In. 15.29
Water year 1951-52: Max 355 Min 7.2 Mean 47.9 Cfsm 0.970 In. 13.19

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 12, 13, 20-22, 27-30, Dec. 3, 4, Dec. 13 to Feb. 4, Feb. 6-8, Feb. 11 to Mar. 5, Mar. 10-18.

East Branch Ausable River at Au Sable Forks, N. Y.

Location.--Lat 44°26'20", long. 73°40'55", on left bank 700 ft upstream from upper highway bridge in Au Sable Forks, Essex County, and half a mile upstream from confluence with West Branch.

Drainage area.--198 sq mi.

Records available.--September 1924 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 545.37 ft above mean sea level, datum of 1929. Prior to Sept. 21, 1938, staff gage at lower highway bridge in Au Sable Forks 400 ft upstream from confluence with West Branch at datum 3.54 ft lower.

Average discharge.--28 years, 309 cfs.

Extremes.--Maximum discharge during year, 5,890 cfs Apr. 6 (gage height, 7.28 ft); minimum, 34 cfs Aug. 10 (gage height, 1.01 ft).
1924-52: Maximum discharge, 20,100 cfs Sept. 22, 1938 (gage height, 12.91 ft), from rating curve extended above 5,800 cfs by logarithmic plotting on basis of velocity-area studies; minimum observed, 20 cfs Aug. 11, 14, 28, 1934.

Remarks.--Records excellent except those for periods of ice effect, which are fair. Diurnal fluctuation at low flow caused by powerplants above station.

Revisions.--W 759: Drainage area.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 6				Apr. 7 to Sept. 30			
1.2	57	3.5	1,050	1.0	33	3.0	689
1.5	105	4.5	1,870	1.3	68	4.0	1,410
2.0	233	6.1	3,870	1.7	143	5.3	2,760
2.5	438			2.2	295		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	100	109	230	260	205	116	294	630	564	87	38	71
2	91	*103	260	370	260	100	1,200	459	957	77	37	67
3	85	792	230	310	240	96	1,210	372	589	71	36	149
4	81	826	220	260	245	102	812	326	412	65	37	150
5	74	431	594	230	310	116	1,330	288	351	63	35	109
6	*70	276	1,230	240	280	120	3,760	273	288	57	41	85
7	71	334	806	190	235	114	1,430	347	450	54	42	73
8	172	1,860	1,020	170	*205	112	*983	322	356	52	38	64
9	253	831	662	175	195	108	795	322	295	52	36	59
10	182	504	478	185	180	*104	975	376	242	91	37	54
11	149	373	330	*175	170	200	1,460	484	217	288	44	51
12	126	298	280	170	160	720	983	1,910	303	183	60	48
13	109	254	190	180	140	450	808	1,960	*256	124	54	44
14	98	270	145	170	135	350	1,310	1,100	202	90	50	41
15	92	867	130	190	145	300	2,080	756	168	73	44	41
16	87	591	120	300	150	250	1,110	*677	141	61	43	42
17	82	458	130	220	155	230	1,030	520	128	54	627	56
18	79	351	140	330	160	200	1,420	421	143	*51	329	52
19	76	268	130	340	155	190	1,640	368	121	60	197	52
20	74	221	135	280	150	180	2,660	355	117	68	125	84
21	70	175	170	225	150	210	1,800	909	103	60	94	79
22	71	195	410	170	150	280	1,220	914	96	59	138	68
23	73	322	330	250	145	250	2,210	763	87	51	139	60
24	71	620	280	250	140	270	1,310	558	86	45	101	59
25	335	370	250	180	135	260	907	903	125	48	*79	59
26	296	310	235	215	130	270	756	1,450	119	44	65	54
27	211	235	220	260	130	310	801	894	139	42	57	53
28	164	*145	195	260	125	250	894	596	111	39	51	52
29	142	260	200	210	120	230	934	445	96	42	49	49
30	122	240	200	160	-	227	941	363	99	44	121	45
31	113	-	205	185	-	254	-	295	-	42	101	-
Total	3,819	12,889	10,155	7,110	5,100	6,969	39,063	20,356	7,341	2,237	2,945	1,970
Mean	123	430	328	229	176	225	1,302	657	245	72.2	95.0	65.7
Cfsm	0.621	2.17	1.66	1.16	0.889	1.14	6.58	3.32	1.24	0.365	0.480	0.332
In.	0.72	2.42	1.91	1.34	0.96	1.31	7.34	3.82	1.38	0.42	0.55	0.37

Calendar year 1951: Max 5,190 Min 61 Mean 351 Cfsm 1.77 In. 24.08
Water year 1951-52: Max 3,760 Min 35 Mean 328 Cfsm 1.66 In. 22.54

Peak discharge (base, 3,700 cfs).--Apr. 6 (4 a.m.) 5,890 cfs (7.28 ft); May 12 (9:30 p.m.) 4,000 cfs (6.19 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 21, 22, Nov. 25 to Dec. 4, Dec. 11 to Mar. 27.

Ausable River near Au Sable Forks, N. Y.

Location.--Lat 44°27'05", long. 73°38'35", on left bank 1¾ miles downstream from confluence of East and West Branches at Au Sable Forks, Clinton County.

Drainage area.--448 sq mi.

Records available.--August 1910 to September 1952. Prior to September 1924, published as "at Au Sable Forks."

Gage.--Water-stage recorder at present site since September 1924. Datum of gage is 505.65 ft above mean sea level, datum of 1929. August 1910 to September 1925, chain gage at site 1½ miles upstream at different datum.

Average discharge.--28 years (1924-52), 680 cfs.

Extremes.--Maximum discharge during year, 8,350 cfs Apr. 6 (gage height, 7.14 ft); minimum, 106 cfs Sept. 16 (gage height, 1.15 ft).
1910-52: Maximum discharge, 24,200 cfs Sept. 22, 1938 (gage height, 11.65 ft), from rating curve extended above 9,100 cfs on basis of slope-area determination at gage height, 11.39 ft; maximum gage height, about 14.0 ft Mar. 27, 1934 (ice jam); practically no flow July 21, 1912, result of unusual regulation.

Remarks.--Records excellent except those for periods of ice effect or fragmentary or no recorder record, which are fair. Slight regulation since 1905, principally by Taylor Pond and Fern Lake. Diurnal fluctuation at low and medium flow caused by powerplants above station.

Revisions (water years).--W 854: 1925(M), 1934(maximum gage height).

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 6				Apr. 7 to Sept. 30			
1.4	190	4.0	2,230	1.2	118	3.0	1,110
1.8	348	5.0	3,700	1.5	211	4.0	2,200
2.4	687	6.5	6,710	2.0	419	5.6	4,790
3.0	1,160			2.5	716		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	271	292	480	540	430	260	622	1,180	1,040	247	132	251
2	263	*271	540	800	500	240	2,030	876	1,900	240	124	229
3	253	1,200	520	700	470	220	2,400	716	1,190	218	121	348
4	274	1,720	490	600	480	235	1,730	649	856	201	126	374
5	*255	921	952	520	620	260	*2,010	562	779	194	124	290
6	*233	f597	2,240	500	580	270	6,570	562	662	180	132	243
7	211	f646	1,430	400	490	260	3,100	709	933	174	135	218
8	370	3,170	1,730	360	*470	270	2,050	669	853	168	126	197
9	554	1,670	1,200	370	440	260	1,680	656	709	168	124	184
10	437	1,030	921	*380	410	240	2,030	723	599	259	126	178
11	362	778	661	360	380	*407	3,100	868	527	565	143	171
12	308	648	616	360	370	1,240	2,200	2,880	709	387	180	165
13	284	566	447	380	320	977	1,730	3,680	*662	290	171	152
14	259	579	380	370	310	722	2,680	2,050	521	240	158	149
15	248	1,420	320	430	330	548	4,330	1,420	429	204	149	165
16	240	1,100	290	640	340	480	2,400	1,280	376	180	153	168
17	233	929	320	520	350	442	2,110	*1,020	353	*168	1,150	174
18	218	749	340	720	360	416	2,650	845	367	158	654	174
19	211	a603	310	760	360	411	3,050	744	340	204	395	171
20	208	a452	360	600	350	396	4,640	716	323	218	263	229
21	200	380	450	500	350	474	3,500	1,680	290	191	240	225
22	204	430	840	380	350	622	2,290	1,820	270	187	346	218
23	197	a531	700	490	340	548	3,860	1,590	251	165	398	201
24	211	1,230	600	490	310	579	2,570	1,190	247	149	290	208
25	656	945	520	410	310	597	1,760	1,570	353	161	236	204
26	687	680	500	440	300	572	1,460	2,660	362	140	*204	191
27	496	540	470	520	290	674	1,500	1,710	395	138	177	201
28	401	*400	420	540	280	585	1,640	1,180	345	132	171	197
29	348	540	430	440	270	531	1,700	948	315	143	174	233
30	313	490	420	350	-	519	1,760	816	255	138	315	177
31	292	-	430	380	-	572	-	689	-	143	345	-
Total	9,697	25,507	20,327	15,250	11,160	14,827	75,152	38,658	17,211	6,350	7,582	6,285
Mean	313	850	656	492	385	478	2,505	1,247	574	205	245	210
Cfsm	0.699	1.90	1.46	1.10	0.859	1.07	5.59	2.78	1.28	0.458	0.547	0.469
In.	0.80	2.12	1.69	1.27	0.93	1.23	6.24	3.21	1.43	0.53	0.63	0.52

Calendar year 1951: Max 9,860 Min 197 Mean 747 Cfsm 1.67 In. 22.62
Water year 1951-52: Max 6,570 Min 121 Mean 678 Cfsm 1.51 In. 20.60

Peak discharge (base, 6,200 cfs).--Apr. 6 (5:30 a.m.) 8,350 cfs (7.14 ft).
* Discharge measurement made on this day.
a No recorder record; discharge estimated on basis of recorded range in stage, observer's float-tape gage reading, and reconstructed gage-height graph.
f Fragmentary gage-height record; discharge computed on basis of recorded range in stage and partly estimated gage-height record.
Note.--Stage-discharge relation affected by ice Nov. 21, 22, Nov. 26 to Dec. 4, Dec. 14 to Mar. 10.

Bouquet River at Willsboro, N. Y.

Location.--Lat 44°21'30", long. 73°23'50", on right bank at Willsboro, Essex County, 2½ miles downstream from North Branch Bouquet River and 3 miles upstream from mouth.

Drainage area.--275 sq mi.

Records available.--August and September 1904 (gage heights and discharge measurements only), August to November 1908, July 1923 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 150.88 ft above mean sea level, datum of 1929. Prior to November 1908, staff gages at site three-quarters of a mile downstream at various datums. July 23 to Aug. 28, 1923, staff gage at site 600 ft downstream at same datum.

Average discharge.--29 years (1923-52), 302 cfs.

Extremes.--Maximum discharge during year, 6,100 cfs Apr. 6 (gage height, 7.94 ft); minimum, 46 cfs Sept. 14 (gage height, 2.25 ft).
1923-52: Maximum discharge, about 11,800 cfs Oct. 1, 1924 (gage height, 10.85 ft), from rating curve extended above 4,600 cfs by logarithmic plotting; minimum, 10 cfs Nov. 26, 1941 (gage height, 1.87 ft).

Remarks.--Records good except those for periods of ice effect, which are fair. Occasional slight diurnal fluctuation at low flow caused by powerplants above station.

Revisions.--W 759: Drainage area.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 6				Apr. 7 to Sept. 30			
2.4	76	4.0	957	2.2	38	3.5	556
2.6	129	5.0	1,920	2.4	72	4.0	926
3.0	291	7.4	5,200	2.7	156	5.0	1,880
3.5	583			3.0	276	5.7	2,730

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	86	136	260	280	230	180	668	505	660	127	66	72
2	98	139	290	390	270	155	1,730	432	1,300	113	66	92
3	90	*876	270	340	260	150	1,930	393	710	110	61	138
4	88	1,620	306	290	280	160	1,430	366	530	102	59	146
5	86	622	428	270	350	180	1,810	345	474	98	68	110
6	83	409	900	260	330	185	*5,060	329	398	99	66	82
7	86	420	680	230	310	180	2,730	371	415	94	66	76
8	*117	2,130	603	210	290	*175	1,770	355	404	84	64	66
9	218	1,190	518	*220	*280	170	1,550	324	345	83	64	62
10	174	631	450	230	260	165	1,730	319	295	108	66	66
11	132	487	353	220	245	300	2,470	334	267	185	85	66
12	120	415	327	205	235	800	1,680	970	281	174	93	64
13	109	358	220	210	205	900	1,290	2,140	258	130	85	61
14	103	332	170	200	200	700	1,280	918	*224	102	77	57
15	98	546	150	220	215	520	2,440	652	200	*99	68	57
16	90	657	140	310	225	420	1,520	*590	178	87	72	61
17	90	738	165	270	230	400	1,360	505	174	82	162	59
18	95	512	170	340	235	340	1,650	438	181	79	167	59
19	95	403	150	350	230	300	1,820	393	167	93	115	64
20	90	327	180	300	225	280	2,060	371	156	102	82	64
21	90	230	240	250	225	300	1,900	660	146	91	88	68
22	93	282	370	210	225	350	1,150	823	134	89	102	59
23	93	316	310	260	220	320	1,320	583	134	84	101	65
24	98	415	280	250	210	380	1,090	468	127	79	87	62
25	360	403	250	215	205	420	762	468	181	78	70	72
26	385	310	240	225	200	410	674	1,180	163	73	*70	66
27	244	*260	220	260	200	430	652	769	160	72	67	63
28	190	220	210	260	190	480	645	537	153	68	68	68
29	167	290	225	230	185	540	652	450	134	72	64	52
30	149	270	220	195	-	600	638	404	133	70	140	64
31	139	-	225	215	-	631	-	340	-	68	118	-
Total	4,156	15,944	9,520	7,915	6,965	11,521	47,461	17,732	9,082	2,995	2,627	2,161
Mean	134	531	307	255	240	372	1,582	572	303	96.6	84.7	72.0
Cfsm	0.487	1.93	1.12	0.927	0.873	1.35	5.75	2.08	1.10	0.351	0.308	0.262
In.	0.56	2.16	1.29	1.07	0.94	1.56	6.42	2.40	1.23	0.41	0.36	0.29

Calendar year 1951: Max 4,610 Min 72 Mean 351 Cfsm 1.28 In. 17.30
Water year 1951-52: Max 5,060 Min 52 Mean 377 Cfsm 1.37 In. 18.69

Peak discharge (base, 2,800 cfs).--Apr. 6 (4 p.m.) 6,100 cfs (7.94 ft); May 13 (8:45 a.m.) 2,800 cfs (5.75 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 21, Nov. 26 to Dec. 3, Dec. 13 to Mar. 30.

Lake George at Rogers Rock, N. Y.

Location.--Lat 43°48'10", long. 73°27'25", on west shore 500 ft north of Hooper's dock at Rogers Rock, Essex County, and 0.4 mile west of Baldwin.

Records available.--July 1913 to September 1952.

Gage.--Water-stage recorder. Datum of gage is 315.93 ft above mean sea level, adjustment of 1912. Prior to Nov. 4, 1929, staff gages at several sites within half a mile of present site at same datum. Nov. 4, 1929, to Sept. 26, 1936, staff gage at present site and datum.

Extremes.--Maximum gage height during year, 4.67 ft Apr. 17; minimum, 2.53 ft Nov. 1.
1913-52: Maximum gage height observed, 5.09 ft Apr. 9, 1936; minimum, 0.64 ft Dec. 20, 1941.

Remarks.--Elevation of lake surface regulated by powerplant and floodgates at Ticonderoge. Lake George has been controlled by a dam at its outlet for more than 100 years.

Gage height, in feet, water year October 1950 to September 1951

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.95	2.65	3.37	3.66	3.23	2.77	3.22	4.08	4.14	3.74	3.35	3.04
2	2.93	2.68	3.32	3.61	3.18	2.75	3.37	4.09	4.35	3.77	3.35	3.16
3	2.91	2.83	3.35	3.63	3.15	2.71	3.57	4.08	4.37	3.76	3.30	3.22
4	2.90	2.95	3.34	3.60	3.15	2.70	3.68	4.07	4.35	3.77	3.33	3.21
5	2.88	2.95	3.40	3.61	3.20	2.78	3.90	4.07	4.30	3.74	3.33	3.19
6	2.82	2.92	3.49	3.56	3.21	2.77	4.35	4.09	4.30	3.74	3.27	3.11
7	2.81	2.97	3.55	3.52	3.19	2.75	4.46	4.09	4.23	3.72	3.25	3.00
8	2.93	3.18	3.62	3.50	3.18	2.74	4.48	4.06	4.17	3.71	3.23	3.06
9	2.88	3.23	3.62	3.49	3.21	2.72	4.50	4.05	4.17	3.70	3.22	3.07
10	2.85	3.25	3.65	3.45	3.19	2.71	4.54	4.03	4.12	3.72	3.24	3.02
11	2.82	3.24	3.68	3.43	3.18	2.78	4.58	4.03	4.05	3.78	3.33	3.02
12	2.81	3.24	3.68	3.42	3.20	2.91	4.57	4.22	3.96	3.79	3.33	2.99
13	2.80	3.29	3.67	3.38	3.15	2.90	4.55	4.34	3.92	3.76	3.32	2.97
14	2.82	3.31	3.66	3.33	3.12	2.92	4.59	4.29	3.87	3.78	3.31	2.93
15	2.80	3.32	3.71	3.34	3.08	2.91	4.59	4.24	3.83	3.78	3.30	2.99
16	2.78	3.28	3.73	3.34	3.05	2.89	4.64	4.22	3.73	3.75	3.33	2.96
17	2.76	3.32	3.75	3.33	3.05	2.89	4.64	4.17	3.78	3.72	3.31	2.92
18	2.74	3.35	3.73	3.35	3.10	2.87	4.61	4.11	3.73	3.71	3.27	2.93
19	2.74	3.35	3.77	3.32	3.10	2.87	4.59	4.07	3.74	3.71	3.26	2.92
20	2.66	3.31	3.77	3.34	3.06	2.91	4.53	4.03	3.68	3.66	3.24	2.88
21	2.69	3.32	3.85	3.31	3.03	2.91	4.46	4.07	3.67	3.65	3.24	2.87
22	2.67	3.34	3.89	3.27	3.01	2.91	4.45	4.04	3.66	3.65	3.16	2.85
23	2.66	3.34	3.84	3.32	2.98	2.94	4.41	4.00	3.66	3.67	3.14	2.81
24	2.67	3.33	3.81	3.29	2.95	2.97	4.36	3.96	3.66	3.61	3.11	2.82
25	2.79	3.34	3.77	3.27	2.92	2.99	4.32	4.03	3.76	3.57	3.10	2.80
26	2.78	3.39	3.76	3.30	2.90	3.00	4.24	4.14	3.76	3.56	3.08	2.80
27	2.77	3.38	3.75	3.31	2.86	3.07	4.19	4.13	3.72	3.52	3.06	2.72
28	2.78	3.39	3.69	3.30	2.83	3.12	4.13	4.12	3.72	3.53	3.05	2.73
29	2.77	3.37	3.68	3.27	2.81	3.12	4.13	4.11	3.74	3.39	3.04	2.72
30	2.77	3.37	3.63	3.27	-	3.15	4.08	4.08	3.72	3.43	2.98	2.64
31	2.75	-	3.63	3.24	-	3.18	-	4.02	-	3.38	3.04	-
Mean	2.80	3.21	3.65	3.40	3.08	2.89	4.29	4.10	3.93	3.67	3.22	2.94

Calendar year 1951: Max 4.79 Min 2.65 Mean 3.50
Water year 1951-52: Max 4.64 Min 2.64 Mean 3.43

Lake Champlain at Burlington, Vt.

Location.--Lat 44°29'00", long. 73°13'30", at Burlington, Chittenden County, 0.6 mile north of railroad station.

Records available.--May 1907 to September 1952.

Gage.--Water-stage recorder. Prior to July 20, 1937, staff gage at site three-quarters of a mile south and July 20, 1937, to Sept. 7, 1939, float gage at site 0.1 mile south, both at present datum. Datum of gage is 92.86 ft above mean sea level, datum of 1929.

Extremes.--Maximum gage height during year, 6.92 ft Apr. 21; minimum, 0.74 ft Oct. 23, 1907-52: Maximum gage height observed, 8.65 ft Mar. 27, 28, 1936; minimum observed, -0.25 ft Dec. 4, 1908.

Revisions (water years).--W 684: 1912-29 (datum correction). W 1207: 1938 (datum correction).

Gage height, in feet, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.07	0.96	2.25	2.53	3.22	2.98	3.92	6.29	4.75	4.07	2.27	1.28
2	1.06	.99	2.28	2.70	3.20	2.94	4.13	6.17	5.05	3.99	2.23	1.34
3	1.04	1.09	2.25	2.82	3.20	2.89	4.44	6.05	5.32	3.90	2.17	1.41
4	.99	1.21	2.23	2.89	3.21	2.85	4.70	5.93	5.42	3.81	2.11	1.42
5	1.03	1.32	2.29	2.90	3.30	2.86	4.93	5.81	5.43	3.73	2.03	1.41
6	1.03	1.40	2.38	2.94	3.41	2.84	5.33	5.68	5.40	3.68	2.00	1.38
7	1.03	1.47	2.41	2.95	3.46	2.82	5.72	5.59	5.41	3.60	2.00	1.36
8	1.01	1.64	2.48	2.94	3.47	2.79	5.94	5.51	5.41	3.50	1.94	1.35
9	1.00	1.79	2.59	2.92	3.49	2.74	6.06	5.41	5.38	3.42	1.88	1.27
10	1.01	1.86	2.64	2.92	3.47	2.67	6.13	5.32	5.33	3.39	1.83	1.24
11	1.00	1.94	2.95	2.91	3.44	2.65	6.24	5.23	5.28	3.40	1.82	1.24
12	1.01	1.95	2.95	2.86	3.46	2.69	6.36	5.19	5.24	3.36	1.81	1.25
13	1.00	1.88	2.60	2.86	3.45	2.78	6.41	5.18	5.21	3.30	1.78	1.24
14	.96	1.89	a2.59	2.85	3.42	2.84	6.49	5.24	5.15	3.24	1.76	1.22
15	.90	1.97	a2.66	2.81	3.40	2.87	6.66	5.24	5.07	3.17	1.70	1.11
16	.92	2.09	a2.56	2.87	3.37	2.88	6.77	5.20	4.99	3.08	1.63	1.12
17	.92	2.22	a2.50	2.89	3.37	2.89	6.79	5.17	4.89	3.04	1.69	1.12
18	.92	2.25	2.50	2.97	3.42	2.89	6.82	5.12	4.82	2.98	1.72	1.08
19	.89	2.30	2.53	3.06	3.38	2.86	6.82	5.05	4.74	2.98	1.71	1.09
20	.88	2.30	2.47	3.10	3.34	2.87	6.86	4.97	4.65	2.95	1.65	1.09
21	.85	2.28	2.52	3.19	3.30	2.88	6.91	4.95	4.57	2.90	1.58	1.08
22	.80	2.19	2.53	3.20	3.29	2.91	6.87	4.94	4.47	2.83	1.59	1.06
23	.79	2.16	2.56	3.23	3.25	2.96	6.86	4.93	4.34	2.78	1.60	1.05
24	.83	2.25	2.57	3.24	3.21	3.02	6.85	4.90	4.23	2.72	1.57	1.04
25	.95	2.29	2.57	3.22	3.16	3.11	6.78	4.82	4.21	2.68	1.53	1.02
26	.96	2.31	2.61	3.20	3.12	3.21	6.71	4.82	4.21	2.59	1.48	.98
27	1.00	2.35	2.60	3.25	3.09	3.35	6.64	4.88	4.25	2.52	1.46	.97
28	1.01	2.28	2.58	3.28	3.06	3.49	6.57	4.87	4.27	2.48	1.44	.93
29	1.01	2.27	2.54	3.30	3.02	3.60	6.48	4.84	4.22	2.43	1.42	.89
30	.96	2.25	2.56	3.28	-	3.71	6.39	4.79	4.16	2.40	1.45	.91
31	.93	-	2.57	3.25	-	3.83	-	4.72	-	2.33	1.37	-
Mean	0.96	1.90	2.50	3.01	3.31	2.99	6.15	5.25	4.86	3.14	1.75	1.16

Calendar year 1951: Max 7.19 Min 0.79 Mean 2.98
Water year 1951-52: Max 6.91 Min 0.79 Mean 3.08

a Estimated on basis of recorded range in stage and weather records.

Richelieu River (Lake Champlain) at Rouses Point, N. Y.

Location.--Lat 44°59'45", long. 73°21'40", on left bank at outlet of Lake Champlain, 90 ft north of Rutland Railroad bridge at Rouses Point, Clinton County, and 1 mile south of Fort Montgomery.

Drainage area.--8,277 sq mi.

Records available.--October 1863 to December 1870 (maximum and minimum monthly gage heights at St. Johns, Quebec, published in Water-Supply Paper 97) and March 1871 to September 1952 (daily gage heights; those for 1871-1907 published in Water-Supply Paper 894). January 1875 to September 1916 (monthly discharge) at Chambly, Quebec, published in Water-Supply Paper 424. Gage heights prior to Oct. 1, 1925, published as Richelieu River at Fort Montgomery, Rouses Point.

Gage.--Water-stage recorder. Datum of gage is 93.00 ft above mean sea level, datum of 1929. March 1871 to May 1923, staff gage located in Fort Montgomery at present datum. May 1923 to October 1938, staff gage at present site and datum.

Extremes.--Maximum gage height during year, 7.02 ft Apr. 22; minimum, 0.57 ft Oct. 27.
1871-1952: Maximum gage height observed, 8.80 ft Mar. 30, 1903; minimum observed, -0.83 ft Oct. 23, 1941.
Observations at St. Johns, Quebec, indicate a maximum gage height of 8.83 ft (computed) during April 1869.

Gage height, in feet, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.02	0.79	2.26	2.68	3.19	2.87	3.81	6.19	4.71	3.99	2.20	1.45
2	.99	.88	2.18	2.63	3.12	2.84	4.03	6.08	4.98	3.95	2.18	1.32
3	1.09	.99	2.38	2.78	3.13	2.79	4.37	5.96	5.30	3.81	2.09	1.34
4	1.09	1.40	2.46	2.83	3.16	2.75	4.62	5.83	5.37	3.81	2.20	1.36
5	.94	1.31	2.28	2.86	3.24	2.78	4.82	5.76	5.38	3.70	2.12	1.42
6	.85	1.31	2.35	2.81	3.33	2.76	5.24	5.68	5.38	3.62	1.95	1.31
7	.97	1.38	2.62	2.82	3.38	2.74	5.62	5.47	5.28	3.56	1.88	1.21
8	1.02	1.59	2.42	2.83	3.43	2.70	5.82	5.41	5.36	3.54	1.88	1.29
9	.93	1.74	2.47	2.84	3.41	2.67	5.97	5.33	5.38	3.46	1.91	1.39
10	.94	1.89	2.49	2.81	3.40	2.64	6.16	5.23	5.32	3.38	1.97	1.26
11	.94	1.80	2.74	2.82	3.42	2.64	6.09	5.20	5.17	3.33	1.83	1.22
12	.87	1.91	2.52	2.83	3.29	2.64	6.29	5.28	5.11	3.32	1.82	1.17
13	.91	2.21	2.46	2.77	3.33	2.70	6.38	5.29	5.12	3.24	1.71	1.13
14	1.05	2.05	2.50	2.75	3.30	2.75	6.42	5.15	5.14	3.23	1.69	1.15
15	1.06	1.98	2.39	2.82	3.29	2.78	6.49	5.19	4.97	3.22	1.73	1.45
16	.90	1.94	2.48	2.76	3.28	2.82	6.69	5.10	4.90	3.04	1.85	1.14
17	.91	2.06	2.54	2.91	3.25	2.80	6.74	5.06	4.91	3.01	1.64	1.11
18	.89	2.16	2.43	2.91	3.27	2.79	6.75	4.99	4.72	2.97	1.60	1.23
19	.92	2.15	2.42	3.03	3.28	2.82	6.84	4.94	4.65	2.92	1.64	1.07
20	.77	2.16	2.49	3.16	3.25	2.82	6.73	4.90	4.48	2.86	1.64	1.07
21	.87	2.25	2.45	3.03	3.25	2.78	6.84	4.85	4.47	2.87	1.78	1.06
22	.94	2.44	2.52	3.19	3.19	2.80	6.92	4.80	4.36	2.82	1.50	1.01
23	.84	2.25	2.49	3.17	3.16	2.88	6.75	4.84	4.34	2.82	1.43	.96
24	.79	2.14	2.50	3.14	3.11	2.93	6.82	4.83	4.24	2.66	1.38	.99
25	.87	2.28	2.53	3.20	3.08	3.02	6.82	4.95	4.16	2.60	1.44	1.01
26	.99	2.28	2.56	3.17	3.05	3.12	6.65	4.81	4.14	2.64	1.45	1.07
27	.89	2.12	2.57	3.14	3.00	3.27	6.60	4.76	4.15	2.50	1.41	.92
28	.98	2.47	2.58	3.13	2.97	3.42	6.50	4.81	4.15	2.47	1.42	1.03
29	.86	2.32	2.62	3.17	2.93	3.53	6.40	4.79	4.15	2.28	1.36	.95
30	1.05	2.30	2.55	3.21	-	3.63	6.23	4.71	4.00	2.34	1.31	.80
31	1.03	-	2.56	3.20	-	3.73	-	4.69	-	2.24	1.85	-
Mean	0.94	1.88	2.48	2.95	3.22	2.91	6.08	5.19	4.79	3.11	1.73	1.16

Calendar year 1951: Max 7.13 Min 0.77 Mean 2.93
Water year 1951-52: Max 6.92 Min 0.77 Mean 3.03

Lake George Outlet at Ticonderoga, N. Y.

Location.--Lat 43°50'35", long. 73°26'00", at Ticonderoga, Essex County. River channel gage on right bank 250 ft downstream from "C" Mill dam of International Paper Co., 250 ft upstream from Trout Brook, and half a mile downstream from upper dam ("A" Mill dam) of International Paper Co. Turbine gate-opening gage on tailrace in powerhouse at "C" Mill dam.

Drainage area.--234 sq mi.

Records available.--August 1904 to December 1905, October 1942 to September 1952.

Gage.--Water-stage recorder and concrete control on river channel. Datum of gage is 190.41 ft above mean sea level, datum of 1929. Turbine gate-opening recorder in powerhouse. Prior to Dec. 31, 1905, staff gage at site 2,000 ft upstream at different datum.

Average discharge.--10 years (1942-52), 332 cfs.

Extremes.--Maximum daily discharge during year, 1,160 cfs Apr. 16, 17; minimum daily, 6.1 cfs July 6.
1942-52: Maximum daily discharge, 1,290 cfs June 5, 6, 1947; minimum daily, that of July 6, 1952.

Remarks.--Records excellent except those for period of doubtful gage-height record, which are good, and those for periods of doubtful or no gate-opening record, which are fair. Discharge in tailrace determined from rating for turbine gates developed from discharge measurements. Records represent total discharge from Lake George and include flow in river channel and in tailrace. Appreciable regulation by Lake George. Diurnal fluctuation at low and medium flow caused by three powerplants.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	221	220	227	714	660	567	344	450	801	6.3	235	16
2	243	219	223	700	653	537	252	305	962	6.3	213	155
3	245	230	220	700	653	468	250	303	1,110	6.3	87	185
4	249	220	225	693	653	421	248	202	1,100	6.7	208	182
5	242	220	229	700	660	425	326	224	1,080	7.0	208	186
6	242	219	229	686	660	421	986	291	1,090	6.1	198	184
7	139	223	230	686	653	421	1,100	286	1,050	230	195	65
8	217	220	232	d678	646	416	1,110	284	1,040	242	195	152
9	254	231	230	d678	653	399	1,120	282	1,050	236	195	189
10	254	235	231	d671	653	406	1,140	282	1,020	232	81	162
11	253	212	232	671	646	416	1,140	185	996	232	169	147
12	253	228	231	671	646	430	1,130	473	954	227	195	147
13	253	237	229	664	639	421	1,130	1,010	946	157	195	144
14	118	239	229	657	632	421	1,140	1,080	800	169	195	45
15	193	238	230	682	632	421	1,120	1,070	608	232	195	127
16	224	238	230	689	626	391	1,160	1,060	608	236	195	154
17	225	238	230	682	619	410	1,160	1,040	540	236	62	153
18	235	233	230	703	619	426	1,150	1,010	403	236	173	153
19	234	232	230	682	626	426	1,150	998	247	236	195	152
20	233	232	459	682	619	426	1,140	832	236	93	195	149
21	155	232	744	674	619	426	1,100	897	163	173	195	55
22	196	232	767	674	613	426	1,110	998	141	236	195	127
23	218	233	760	682	613	379	1,080	989	227	232	195	161
24	222	233	744	667	606	407	1,070	556	241	236	80	161
25	227	219	700	674	606	435	1,060	179	235	235	169	161
26	218	218	707	674	599	435	1,050	631	236	236	196	161
27	220	230	707	674	593	440	1,030	838	232	74	203	128
28	166	226	700	667	593	440	927	830	89	198	196	14
29	202	228	700	667	580	440	716	830	6.7	236	188	106
30	225	229	700	660	-	396	566	822	6.3	235	183	129
31	219	-	700	660	-	417	-	775	-	235	94	-
Total	6,795	6,844	12,735	21,062	18,270	13,310	28,005	20,012	18,218.0	5,358.7	5,476	4,050
Mean	219	228	411	679	630	429	934	646	607	173	177	135
Cfsm	-	-	-	-	-	-	-	-	-	-	-	-
In.	-	-	-	-	-	-	-	-	-	-	-	-

Calendar year 1951: Max 1,250 Min 29 Mean 382 Cfsm 1.63 In. 22.16
Water year 1951-52: Max 1,160 Min 6.1 Mean 438 Cfsm 1.87 In. 25.45

d Doubtful gage-height record for river channel; discharge computed on basis of "C" Mill pond record.

Note.--No gate-opening record Oct. 24, 25, Nov. 2-9, Dec. 24-29, Mar. 31 to Apr. 5; discharge estimated on basis of observer's notes and powerplant records. Doubtful gate-opening record June 28 to July 6, July 9 to Aug. 27; discharge computed on basis of "A" Mill powerplant records, 4 discharge measurements, and gage-height observations on temporary pond gage.

Poultney River below Fair Haven, Vt.

Location.--Lat 43°37'40", long. 73°18'50", on right bank a third of a mile downstream from Carver Falls, 1.9 miles upstream from Hubbardton River, and 3¼ miles northwest of Fair Haven, Rutland County.

Drainage area.--187 sq mi.

Records available.--October 1928 to September 1952.

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

Average discharge.--24 years, 249 cfs.

Extremes.--Maximum discharge during year, 4,390 cfs June 2 (gage height, 14.52 ft), from rating curve extended as described below; minimum daily, 23 cfs Aug. 3, 9, 10.
1928-52: Maximum discharge, 14,800 cfs July 20, 1945 (gage height, 24.36 ft, from high-water mark in gage well), from rating curve extended above 1,900 cfs on basis of computations of peak flow over dam at gage heights 16.10, 21.40, and 24.36 ft; minimum daily, 2.9 cfs Oct. 13, 1935.

Remarks.--Records good except those for periods of ice effect, no gage-height record, or shifting control, which are fair. Flow regulated by powerplant above station and by Lake Bomoseen.

Revisions (water years).--W 1114: 1929(M), 1932-35.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used July 20 to Sept. 30)

1.9	16	4.0	355
2.1	31	7.0	1,140
2.5	71	10.0	2,020
3.0	140	13.0	3,430

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	101	202	237	700	450	202	738	238	1,010	*126	36	24
2	156	205	259	940	372	177	1,900	245	3,050	*116	24	70
3	154	398	270	740	392	200	2,030	182	*1,200	89	23	79
4	135	636	284	560	501	194	1,560	137	860	88	27	53
5	125	382	524	460	927	186	2,050	133	743	91	47	40
6	145	347	517	420	687	197	2,800	137	582	56	38	29
7	49	506	449	410	531	180	1,650	125	515	75	34	24
8	125	745	510	410	470	166	1,180	120	426	65	35	34
9	129	506	449	430	408	107	949	136	354	135	23	35
10	75	390	559	*460	362	119	822	113	342	100	23	33
11	129	*338	506	374	365	246	754	95	317	148	66	33
12	213	299	466	386	377	692	655	313	325	175	32	46
13	148	274	421	330	330	568	583	569	206	63	*50	42
14	121	265	350	319	345	440	784	456	166	75	52	23
15	*103	397	329	352	315	342	857	396	157	98	61	56
16	116	388	330	608	305	292	629	356	147	79	47	40
17	139	431	370	465	292	290	580	345	99	66	27	40
18	99	315	380	635	257	308	445	289	130	64	55	34
19	84	312	360	558	275	342	475	263	94	72	40	44
20	45	358	330	499	274	316	328	249	111	24	37	25
21	65	323	600	490	268	362	*294	284	57	90	43	25
22	128	214	1,070	400	265	398	326	301	99	56	47	26
23	131	247	811	450	239	410	334	283	82	50	24	37
24	153	596	713	410	227	538	324	216	75	47	29	33
25	235	459	560	375	231	705	290	210	322	45	26	25
26	153	370	590	393	232	890	238	405	217	29	52	25
27	123	344	600	868	210	1,540	194	406	204	24	35	25
28	109	283	440	801	218	1,270	190	*338	150	60	44	26
29	169	263	450	500	211	938	248	308	125	68	41	26
30	188	239	460	460	-	854	241	263	144	40	25	*34
31	183	-	620	450	-	849	-	211	-	37	24	-
Total	4,028	11,032	14,814	15,653	10,336	14,318	24,448	8,122	12,309	2,351	1,167	1,087
Mean	130	368	478	505	356	462	815	262	410	75.8	37.6	36.2
Cfsm	0.695	1.97	2.56	2.70	1.90	2.47	4.36	1.40	2.19	0.405	0.201	0.194
In.	0.80	2.19	2.95	3.11	2.06	2.85	4.86	1.62	2.45	0.47	0.23	0.22

Calendar year 1951: Max 1,800 Min 17 Mean 298 Cfsm 1.59 In. 21.60
Water year 1951-52: Max 3,050 Min 23 Mean 327 Cfsm 1.75 In. 23.81

Peak discharge (base, 2,600 cfs).--Apr. 2 (9 p.m.) 2,850 cfs (11.94 ft); Apr. 6 (2:30 a.m.) 3,520 cfs (13.15 ft); June 2 (3 to 3:30 a.m.) 4,390 cfs (14.52 ft).
* Discharge measurement made ontthis day.
Note.--No gage-height record Dec. 28 to Jan. 10, July 23 to Aug. 13; discharge estimated on basis of 2 discharge measurements, weather records, recorded range in stage when available, powerplant records, and records for Otter Creek at Center Rutland. Stage-discharge relation affected by ice Dec. 16-21, 25-27, Jan. 21-25, Jan. 29 to Feb. 1, Feb. 13-16, and at times during period of no gage-height record in winter. Shifting-control method used July 20, Aug. 14 to Sept. 30 and shifts applicable during period of no gage-height record July 23 to Aug. 13.

East Creek at Rutland, Vt.

Location.--Lat 43°37'40", long. 72°59'20", on left bank on grounds of Rutland County Club, at Rutland, Rutland County, 280 ft downstream from Grove Street Bridge and 2 miles upstream from mouth.

Drainage area.--51.1 sq mi.

Records available.--August 1940 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 570 ft (from topographic map).

Average discharge.--12 years, 101 cfs (adjusted for diversion and storage).

Extremes.--Maximum discharge during year, 1,800 cfs June 1 (gage height, 4.75 ft), from rating curve extended above 470 cfs on basis of computation of flow over dam and slope-area determination at gage height 7.10 ft; minimum daily, 16 cfs July 20, Aug. 17, Sept. 28.

1940-52: Maximum discharge, 36,500 cfs June 3, 1947 (gage height, 20.3 ft, from high-water mark in gage house), mean of two slope-area determinations, caused by failure of East Pittsford Dam 5.8 miles upstream; minimum daily, 3.1 cfs Nov. 8, 1947.

Remarks.--Records excellent except those for periods of ice effect or no gage-height record and those below 30 cfs, which are good. Diversion above station from Mendon Brook for municipal supply of Rutland. Flow regulated by powerplants and, prior to June 3, 1947, by Chittenden and East Pittsford Reservoirs (combined usable capacity, 969,800,000 cu ft), after June 3, 1947, by Chittended Reservoir (capacity, 819,800,000 cu ft).

Rating table, water year 1951-52, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.0	15	2.0	215
1.1	22	2.5	410
1.3	41	3.0	655
1.5	72	4.0	1,270
1.7	118		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	99	92	68	131	141	140	119	118	686	46	42	22
2	97	94	80	220	159	50	410	101	652	*31	44	131
3	104	241	134	191	81	105	278	71	321	40	18	86
4	90	156	128	165	157	150	215	62	290	44	76	53
5	85	141	230	82	246	145	376	69	250	27	90	70
6	50	124	198	70	178	155	473	68	197	27	68	21
7	24	142	166	140	158	120	266	63	98	39	93	28
8	157	222	132	126	146	120	212	56	79	45	89	89
9	78	149	134	140	144	57	197	64	153	58	58	88
10	90	81	187	*146	70	120	244	46	125	94	18	80
11	106	74	165	137	130	150	259	54	165	74	102	98
12	98	*70	143	70	139	210	195	174	193	38	108	97
13	56	122	129	54	126	175	148	141	129	27	104	42
14	41	136	*120	126	124	150	287	91	68	48	84	18
15	*59	142	52	186	*129	*132	277	86	58	80	106	100
16	71	161	b52	203	129	49	216	89	98	78	72	91
17	71	100	b125	155	52	134	174	75	90	52	16	91
18	69	88	b120	209	140	140	187	66	99	71	97	86
19	100	116	121	109	140	128	190	73	91	31	88	93
20	37	126	120	80	105	94	210	76	70	16	98	40
21	26	114	194	122	130	119	170	118	44	78	96	18
22	93	49	170	122	120	90	137	159	34	84	96	75
23	89	162	86	180	120	75	221	150	58	88	36	99
24	98	181	131	148	53	125	150	64	73	85	17	89
25	164	97	78	123	120	132	118	143	168	83	82	88
26	108	143	131	103	140	169	100	212	103	53	95	89
27	54	121	138	259	135	194	87	167	74	29	97	54
28	32	125	128	201	150	145	143	150	46	107	102	16
29	95	128	83	155	140	95	146	151	45	86	99	90
30	96	128	61	130	-	101	139	95	58	76	52	94
31	94	-	187	138	-	144	-	60	-	76	18	-
Total	2,529	3,825	3,991	4,421	3,802	3,913	6,344	3,112	4,615	1,811	2,261	2,136
Mean	81.6	128	129	143	131	126	211	100	154	58.4	72.9	71.2
(†)	-8.59	+7.72	+5.60	-14.9	-43.5	-30.2	+120	+32.9	-6.56	-19.4	-48.2	-46.7

Adjusted for diversion and change in reservoir contents

Mean	73.0	135	134	128	87.6	96.0	332	133	147	39.0	24.8	24.5
Cfsm	1.43	2.64	2.62	2.50	1.71	1.88	6.50	2.60	2.88	0.763	0.485	0.479
In.	1.65	2.95	3.03	2.88	1.85	2.17	7.25	3.01	3.22	0.88	0.56	0.54

	Observed			Adjusted			
Calendar year 1951:	Max 498	Min 22	Mean 104	Mean 116	Cfsm 2.27	In. 30.82	
Water year 1951-52:	Max 686	Min 16	Mean 117	Mean 112	Cfsm 2.19	In. 29.99	

* Discharge measurement made on this day.

† Change in contents in Chittenden Reservoir and diversion from Mendon Brook for municipal supply of Rutland, equivalent in cubic feet per second. Records furnished by Central Vermont Public Service Corp. and city of Rutland.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Feb. 18 to Mar. 14; discharge computed on basis of powerplant records and records for Otter Creek at Center Rutland.

Otter Creek at Center Rutland, Vt.

Location.--Lat 43°36'15", long. 73°00'50", on right bank at downstream side of bridge on U. S. Highway 4 at Center Rutland, Rutland County, 200 ft downstream from dam, 1.2 miles downstream from East Creek, and 1½ miles west of Rutland.

Drainage area.--307 sq mi.

Records available.--May 1928 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 500 ft (from topographic map). Prior to July 22, 1929, chain gage at same site and datum.

Average discharge.--24 years, 548 cfs.

Extremes.--Maximum discharge during year, 7,680 cfs June 2 (gage height, 9.79 ft), from rating curve extended above 2,900 cfs on basis of computation of flow over dam at gage height 11.51 ft; minimum daily, 59 cfs Aug. 31.
1928-52: Maximum discharge, 13,700 cfs Sept. 22, 1938 (gage height, 12.45 ft), from rating curve extended above 3,500 cfs on basis of computation of flow over dam; minimum daily, 45 cfs Sept. 21, 1947.

Remarks.--Records excellent except those for period of ice effect, which are fair. Flow regulated by powerplants and, prior to June 3, 1947, by Chittenden and East Pittsford Reservoirs on East Creek (combined usable capacity, 969,800,000 cu ft), after June 3, 1947, by Chittenden Reservoir (capacity, 819,800,000 cu ft).

Revisions (water years).--W 1084: 1929.

Rating table, water year 1951-52, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.2	53	2.5	700
.6	109	3.0	995
1.0	193	4.0	1,700
1.5	325	6.0	3,340
2.0	481	10.0	7,950

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	226	355	484	1,030	571	365	960	724	2,230	338	125	91
2	221	369	605	1,420	790	279	2,100	615	6,860	*268	115	376
3	222	1,080	639	1,210	774	332	2,360	526	3,700	231	86	343
4	217	1,750	558	917	837	363	2,250	476	2,000	219	145	261
5	202	1,130	963	670	1,430	363	2,620	450	1,530	200	167	209
6	158	741	1,350	675	1,110	364	5,100	424	1,110	179	151	114
7	139	728	1,100	581	803	364	3,940	417	969	178	*169	112
8	1,210	1,430	995	493	660	357	2,500	396	761	186	162	166
9	1,090	1,180	917	530	664	300	2,070	375	722	185	129	161
10	532	773	1,090	*603	540	324	2,050	338	630	234	90	151
11	441	642	812	532	563	454	2,230	359	651	505	185	160
12	814	578	708	446	536	1,250	2,130	1,100	862	355	210	158
13	638	575	581	442	397	1,100	1,760	1,650	626	238	201	102
14	*439	574	421	492	454	778	1,850	1,200	455	214	175	66
15	392	899	387	720	447	*602	2,150	859	395	220	171	160
16	368	831	b440	1,150	431	467	2,040	821	380	208	151	176
17	339	855	b560	796	394	498	1,790	671	372	172	122	202
18	314	686	b550	1,050	402	485	1,800	585	411	179	187	178
19	324	609	b500	885	454	492	1,920	525	346	142	170	177
20	257	552	b460	702	444	455	2,040	478	299	122	167	119
21	231	469	b620	659	433	531	*2,140	706	248	171	160	92
22	283	398	b1,150	440	406	629	1,730	995	227	190	158	156
23	282	607	962	753	394	627	1,680	829	237	181	93	177
24	291	1,110	766	669	332	682	1,630	585	245	190	64	173
25	893	933	612	479	384	746	1,160	709	1,570	185	131	162
26	749	718	590	622	394	910	943	1,300	780	143	152	163
27	458	633	538	1,520	394	1,490	823	1,010	644	124	151	138
28	370	483	457	1,430	394	1,320	844	781	408	207	150	86
29	433	570	464	809	384	982	1,160	705	342	183	151	156
30	393	544	467	576	-	936	943	691	417	163	100	159
31	365	-	1,010	581	-	1,050	-	511	-	156	59	-
Total	13,291	22,802	21,756	23,882	16,216	19,895	58,713	21,811	30,427	6,466	4,447	4,944
Mean	429	760	702	770	559	642	1,957	704	1,014	209	143	165
Cfsm	1.40	2.48	2.29	2.51	1.82	2.09	6.37	2.29	3.30	0.681	0.466	0.537
In.	1.61	2.76	2.64	2.89	1.96	2.41	7.11	2.64	3.69	0.78	0.54	0.60
(†)	-13.1	+3.5	+1.1	-19.8	-48.3	-34.7	+116	+28.0	-11.6	-24.3	-53.0	-51.7

Calendar year 1951: Max 4,300 Min 116 Mean 613 Cfsm 2.00 In. 27.09 (†) +73.3
Water year 1951-52: Max 6,860 Min 59 Mean 668 Cfsm 2.18 In. 29.63 (†) -90.4

Peak discharge (base, 3,400 cfs).--Apr. 6 (1 to 2 p.m.) 5,650 cfs (8.17 ft); June 2 (5:30 a.m.) 7,680 cfs (9.79 ft).
* Discharge measurement made on this day.
† Change in contents, equivalent in cubic feet per second, in Chittenden Reservoir, furnished by Central Vermont Public Service Corp.
b Stage-discharge relation affected by ice.

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Otter Creek at Middlebury, Vt.

Location.--Lat 44°00'45", long. 73°10'05", on right bank 150 ft upstream from highway bridge in Middlebury, Addison County, and 3½ miles downstream from Middlebury River.
Drainage area.--628 sq mi.
Records available.--April 1903 to April 1907, October 1910 to January 1920, October 1928 to September 1952.
Gage.--Water-stage recorder. Altitude of gage is 330 ft (from topographic map). Apr. 1, 1903, to Apr. 30, 1907, Oct. 5, 1910, to Jan. 31, 1920, chain gage at site 1,800 ft upstream at datum 10 ft lower, and Oct. 1, 1928, to Oct. 17, 1933, at present datum.
Average discharge.--36 years (1903-6, 1910-19, 1928-52), 978 cfs.
Extremes.--Maximum discharge during year, 4,830 cfs Apr. 11 (gage height, 6.18 ft); minimum daily, 160 cfs Sept. 1.
1903-7, 1910-20, 1928-52: Maximum discharge, 11,000 cfs Mar. 20, 21, 1936 (gage height, 10.3 ft); minimum daily, 100 cfs Dec. 28, 1914.
Maximum discharge known, 13,600 cfs Nov. 4, 1927 (gage height, 13.3 ft, present datum, at chain-gage site, 1,800 ft upstream), from rating curve extended above 9,000 cfs by logarithmic plotting.
Remarks.--Records excellent except those for periods of ice effect and fragmentary or no gage-height record, which are good, and those for periods of backwater from aquatic vegetation, which are fair. Some regulation by Chittenden Reservoir (capacity, 819,800,000 cu ft) on East Creek.
Revisions (water years).--W 434: 1903-4. W 684: 1913(M), drainage area. W 1114: 1913. W 1207: 1929, 1931.

Rating table, water year 1951-52, except periods of ice effect or backwater from aquatic vegetation (gage height, in feet, and discharge, in cubic feet per second)

1.1	152	2.0	545
1.3	197	3.0	1,300
1.6	300	7.0	5,860

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	412	664	1,040	1,520	1,240	741	2,360	1,980	1,770	*636	288	160
2	433	643	1,040	1,800	1,210	b630	2,630	1,760	2,750	587	259	257
3	475	1,020	1,090	1,790	1,300	b545	2,740	1,460	2,590	482	214	482
4	454	1,780	1,130	1,810	1,430	b620	2,760	1,150	2,630	412	197	468
5	433	1,830	1,280	1,790	1,810	615	2,960	952	2,790	393	252	381
6	405	1,810	1,590	1,730	1,800	713	3,550	848	3,010	376	*280	292
7	364	1,770	1,720	1,620	1,770	713	3,760	825	3,230	332	259	235
8	f435	2,110	1,830	b1,460	1,720	713	3,970	818	3,220	364	256	173
9	a1,000	2,050	1,790	1,270	1,610	650	4,440	762	3,110	346	242	232
10	a1,200	2,010	1,770	1,190	1,470	580	4,740	692	2,900	364	211	225
11	968	*1,870	1,730	1,160	1,270	664	4,690	629	2,710	777	242	219
12	855	1,680	1,620	1,070	1,160	1,340	4,470	1,050	2,560	840	328	214
13	968	1,470	*1,460	960	975	1,810	4,210	1,730	2,290	643	346	219
14	*908	1,300	b1,130	908	*b930	*1,780	4,030	1,850	2,030	447	328	185
15	755	1,410	b850	1,030	b920	1,530	3,890	1,860	1,680	419	296	167
16	664	1,470	b900	1,440	b870	1,270	3,710	1,780	1,280	387	284	271
17	636	1,570	b960	1,530	825	1,060	3,590	1,630	945	352	280	263
18	573	1,510	b1,000	1,640	741	968	3,470	1,380	762	358	259	275
19	559	1,350	a960	1,670	769	975	3,400	1,150	713	352	280	267
20	552	1,230	a920	1,660	811	960	*3,290	1,040	657	332	267	296
21	475	1,090	a1,100	1,610	832	990	3,180	1,080	566	292	259	211
22	454	968	1,310	1,380	811	1,240	3,070	1,340	475	328	271	187
23	475	885	1,510	1,230	783	1,380	2,980	1,490	412	341	256	256
24	489	1,190	1,520	1,320	b750	1,470	2,950	1,410	426	337	219	275
25	798	1,520	1,470	1,170	664	1,710	2,930	1,240	720	337	173	275
26	1,150	1,490	1,350	1,040	685	1,920	2,810	1,520	1,310	318	217	256
27	1,120	1,380	1,260	1,620	769	2,260	2,660	1,700	1,200	275	225	235
28	878	1,160	b1,150	1,740	762	2,340	2,480	*1,670	990	249	225	195
29	720	b1,090	f1,010	1,790	755	2,400	2,290	1,500	727	296	228	*185
30	713	1,070	945	f1,730	-	2,400	2,130	1,340	636	314	214	225
31	692	-	1,140	1,460	-	2,380	-	1,140	-	300	187	-
Total	21,013	42,390	39,575	45,138	31,442	39,367	100,140	40,776	51,089	12,586	7,842	7,581
Mean	678	1,413	1,277	1,456	1,084	1,270	3,338	1,315	1,703	406	253	253
Cfsm	1.08	2.25	2.03	2.32	1.73	2.02	5.32	2.09	2.71	0.646	0.403	0.403
In.	1.24	2.51	2.34	2.67	1.86	2.33	5.93	2.41	3.03	0.75	0.46	0.45
(†)	-13.1	+3.5	+1.1	-19.8	-48.3	-34.7	+116	+28.0	-11.6	-24.3	-53.0	-51.7

Calendar year 1951: Max 4,530 Min 252 Mean 1,112 Cfsm 1.77 In. 24.01 (†) +73.3
Water year 1951-52: Max 4,740 Min 160 Mean 1,199 Cfsm 1.91 In. 25.98 (†) -90.4

* Discharge measurement made on this day.
† Change in contents in Chittenden Reservoir, equivalent in cubic feet per second, furnished by Central Vermont Public Service Corp.
a No gage-height record; discharge estimated on basis of weather records, recorded range in stage, observer's readings, and records for station at Center Rutland.
b Stage-discharge relation affected by ice.
f Fragmentary gage-height record; discharge computed from partly estimated gage heights.
Note.--Backwater from aquatic vegetation Oct. 1 to Nov. 9, May 29 to Sept. 30.

Jail Branch at East Barre, Vt.

Location.--Lat 44°09'40", long. 72°27'00", on right bank 75 ft downstream from highway bridge, at East Barre, Washington County, 0.6 mile downstream from East Barre Detention Reservoir, and 3.9 miles upstream from mouth.
Drainage area.--40.4 sq mi.
Records available.--August 1920 to September 1923, November 1933 to September 1952. Prior to October 1922, published as Jail Brook at East Barre.
Gage.--Water-stage recorder. Datum of gage is 1,071.59 ft above mean sea level (levels by Corps of Engineers). Aug. 14, 1920, to Sept. 30, 1923, staff gage at site a quarter of a mile upstream at different datum. Nov. 1, 1933, to Jan. 25, 1935, staff gage at present site and datum.
Average discharge.--22 years, 56.9 cfs (adjusted for storage).
Extremes.--Maximum discharge during year, 529 cfs June 1 (gage height, 1.64 ft); maximum gage height, 3.91 ft Jan. 30 (affected by ice); minimum discharge, 1.4 cfs Aug. 29.
1920-23, 1933-52: Maximum discharge, 1,820 cfs (revised) Oct. 1, 1920 (gage height, 9.50 ft, from graph based on gage readings, site and datum then in use), from rating curve extended above 900 cfs; minimum, 0.1 cfs Aug. 18, 1950.
Revisions.--The maximum discharge for the water year 1921 has been revised to 1,820 cfs Oct. 1, 1920 (gage height, 9.50 ft, from graph based on gage readings, site and datum then in use), superseding figure published in Water-Supply Paper 524.
Remarks.--Records good except those below 10 cfs and those for periods of ice effect, which are fair. Discharge affected by East Barre Detention Reservoir since 1935 (see p. 332). Diurnal fluctuation at low flow caused by mill above station. Diversion from reservoir on Orange Brook, a tributary above station, for city of Barre.
Revisions (water years).--W 564: 1922. W 1034: Drainage area.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Feb. 4				Feb. 5 to Sept. 30					
-0.2	4.1	0.4	37	-1.0	1.2	-0.1	6.2	0.9	142
-.1	5.5	.6	66	-.9	1.8	0	9.8	1.2	257
0	8.2	.9	133	-.7	2.7	.2	21	1.6	495
.1	13	1.2	235	-.4	3.8	.4	41		
.2	19			-.2	4.6	.6	70		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.7	12	17	40	23	15	65	86	251	18	2.9	2.9
2	5.5	11	35	65	27	15	209	72	446	15	2.6	42
3	5.3	146	33	50	34	15	277	62	432	13	2.4	17
4	5.3	235	29	42	31	14	253	59	413	12	2.4	13
5	7.6	132	115	38	100	15	257	54	406	12	*3.1	5.6
6	4.9	115	123	36	70	14	335	60	394	9.8	5.3	4.4
7	4.5	104	63	35	56	14	335	90	382	7.8	3.8	4.2
8	43	196	67	*34	48	14	341	65	363	5.8	2.4	3.9
9	18	*123	50	32	44	14	341	49	335	4.9	2.1	3.7
10	11	83	46	24	*40	13	363	41	236	5.2	2.1	3.7
11	9.4	77	28	21	36	15	375	53	103	55	2.6	3.8
12	14	51	24	22	*33	60	352	178	173	21	3.6	3.6
13	*11	30	20	22	31	*52	346	213	102	12	4.2	3.4
14	9.0	30	18	20	29	39	352	127	65	9.0	3.3	3.3
15	8.6	55	17	25	27	32	*346	86	51	5.8	2.7	3.4
16	7.8	41	16	40	26	30	346	100	42	4.8	2.6	3.8
17	7.2	61	17	30	24	29	*346	68	39	4.5	5.0	3.9
18	6.9	36	18	33	24	28	346	59	34	4.3	4.1	3.8
19	6.4	26	18	27	23	28	357	51	36	14	3.2	14
20	6.1	22	17	24	21	27	346	46	30	25	2.6	15
21	5.9	19	25	22	18	28	346	172	26	12	2.3	6.0
22	6.1	22	45	21	18	34	341	148	24	9.8	2.4	*4.6
23	5.9	32	32	35	18	37	335	90	23	6.2	2.3	5.3
24	6.4	50	25	25	18	40	324	62	20	4.4	2.1	9.8
25	37	32	21	22	17	38	318	88	56	4.1	2.0	7.2
26	16	24	20	25	16	48	329	*231	55	3.8	1.8	5.4
27	12	20	18	40	15	92	324	222	112	3.6	1.7	5.4
28	12	18	16	36	16	59	318	126	40	3.8	1.6	4.9
29	16	19	17	30	15	51	287	84	27	4.3	1.5	5.0
30	12	18	21	23	-	65	196	78	*27	4.0	3.5	4.8
31	13	-	45	21	-	67	-	56	-	3.3	3.2	-
Total	339.5	1,840	1,056	960	898	1,042	9,406	2,976	4,743	318.2	87.4	216.8
Mean	11.0	61.3	34.1	31.0	31.0	33.6	314	96.0	158	10.3	2.82	7.23
(†)	+0.09	+0.07	+0.64	-0.29	0	+0.23	+0.39	-0.54	-0.45	-0.25	0	+0.02

Adjusted for change in reservoir contents

Mean	11.0	61.4	34.7	30.7	31.0	33.8	314	95.5	158	10.0	2.82	7.25
Cfsm	0.272	1.52	0.859	0.760	0.767	0.837	7.77	2.36	3.91	0.248	0.070	0.179
In.	0.32	1.70	0.99	0.88	0.83	0.97	8.67	2.72	4.35	0.29	0.08	0.20

	Observed			Adjusted				
Calendar year 1951:	Max 380	Min 3.7	Mean 57.8	Mean 57.9	Cfsm 1.43	In. 19.45
Water year 1951-52:	Max 446	Min 1.5	Mean 65.3	Mean 65.2	Cfsm 1.61	In. 22.00

* Discharge measurement made on this day.
† Change in contents, equivalent in cubic feet per second, in East Barre Detention Reservoir.
Note.--Stage-discharge relation affected by ice Nov. 2, 20-22, Nov. 26 to Dec. 5, Dec. 11 to Mar. 26, Mar. 28-30.

North Branch Winooski River at Wrightsville, Vt.

Location.--Lat 44°18'00", long. 72°34'45", on right bank at Wrightsville, Washington County, three-quarters of a mile downstream from Wrightsville Detention Reservoir and 3½ miles upstream from mouth.

Drainage area.--69.2 sq mi.

Records available.--October 1933 to September 1952.

Gage.--Water-stage recorder and concrete control. Datum of gage is 550.53 ft above mean sea level (levels by Corps of Engineers). Prior to Nov. 21, 1934, staff gage at same site and datum.

Average discharge.--19 years, 133 cfs (adjusted for storage).

Extremes.--Maximum discharge during year, 700 cfs Apr. 20, 21 (gage height, 3.57 ft); minimum daily, 5.5 cfs Aug. 29.

1933-52: Maximum discharge, 2,170 cfs Apr. 12, 1934 (gage height, 6.53 ft), from rating curve extended above 920 cfs; minimum daily, 0.2 cfs Aug. 13, 1941.

Maximum discharge known, 17,200 cfs Nov. 3, 1927, by computation of flow over dam three-quarters of a mile above gage.

Remarks.--Records excellent except those for periods of backwater from debris, which are good, and those for periods of ice effect, which are fair. Discharge affected since 1935 by Wrightsville Detention Reservoir (see p. 332). Diurnal fluctuation at low flow caused by small mill above station.

Revisions.--Revised figures of discharge for low-water periods of water years 1934-39 are given herein. They supersede those published in Water-Supply Papers 804, 824, 854, and 874.

Day (water year)	Discharge (cfs)	Day (water year)	Discharge (cfs)	Day (water year)	Discharge (cfs)	Day (water year)	Discharge (cfs)
1933-34		1935-36		1935-36		1936-37	
Aug. 1....	19	June 12....	22	Aug. 16....	7.6	Sept.28....	11
2....	11	13....	20	17....	11	29....	8.4
3....	16	14....	19	18....	15	30....	8.4
5....	28	15....	16	19....	15		
6....	26	16....	14	20....	12	1937-38	
7....	18	17....	13	21....	9.7	Oct. 3....	5.2
8....	14	18....	14	22....	9.3	4....	5.6
9....	12	19....	17	23....	14	6....	7.3
10....	6.4	20....	19	24....	14	8....	15
11....	11	21....	18	25....	12	9....	15
12....	10	22....	14	26....	11	10....	14
13....	8.9	23....	12	27....	9.7	11....	14
14....	8.9	24....	12	28....	9.3	12....	16
15....	6.0	25....	11	29....	19	13....	15
16....	6.6	26....	12			14....	14
17....	8.4	27....	18	1936-37		15....	12
18....	9.7	28....	20	Aug. 1....	12	16....	13
19....	6.2	29....	21	2....	13	17....	11
20....	6.2	30....	24	3....	14	18....	8.9
22....	7.8	July 1....	22	4....	14	19....	11
23....	5.5	2....	17	5....	14	June 7....	19
24....	3.1	3....	17	6....	12	8....	20
26....	3.7	4....	29	7....	11	9....	18
27....	15	5....	27	8....	14	10....	17
28....	16	6....	22	9....	17	11....	21
29....	7.6	7....	21	10....	17	12....	24
31....	4.2	8....	18	11....	16	13....	20
		9....	18	12....	15	14....	17
1934-35		10....	33	13....	21	15....	17
Aug. 1....	14	12....	28	14....	27	16....	18
4....	9.3	13....	19	15....	23	17....	16
9....	30	14....	15	24....	28	18....	14
10....	25	15....	13	25....	21	27....	14
16....	30	16....	12	26....	16	28....	15
17....	23	17....	11	27....	15		
18....	19	18....	9.7	28....	13	1938-39	
19....	14	19....	7.6	29....	11	Aug. 1....	17
20....	14	20....	7.3	30....	7.6	2....	16
21....	12	21....	6.6	Sept. 3....	8.0	3....	12
22....	18	22....	7.0	4....	9.3	4....	17
23....	21	23....	5.9	5....	9.3	6....	27
24....	17	28....	34	6....	9.7	7....	18
25....	15	29....	25	12....	2.3	8....	16
26....	14	30....	18	14....	8.4	9....	14
27....	12	31....	14	15....	7.6	10....	14
28....	17	Aug. 1....	11	16....	6.2	11....	12
29....	17	2....	9.3	17....	5.9	15....	16
30....	14	3....	9.3	18....	6.6	16....	14
31....	12	4....	7.3	19....	11	Sept.11....	22
		5....	5.9	20....	18	13....	25
1935-36		6....	7.3	21....	30	14....	18
June 6....	32	7....	7.3	22....	24	28....	14
7....	25	8....	4.8	23....	19	29....	17
8....	19	9....	5.6	24....	12	30....	20
9....	18	10....	8.0	25....	14		
10....	17	11....	6.6	26....	13		
11....	19	12....	5.2	27....	11		

North Branch Winooski River at Wrightsville, Vt.--Continued

Month	Cfs-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
August	341.2	32	3.1	11.0	0.159	0.18
Water year 1933-34	37,478.5	1,620	3.1	103	1.49	20.16
Calendar year 1934	42,337.5	1,620	3.1	116	1.68	22.75
August	789.5	71	.5	25.5	.368	.42
Water year 1934-35	49,871.3	1,410	.5	137	1.98	26.80
Calendar year 1935	48,038.3	1,410	.5	132	1.91	28.84
June	667	54	11	22.2	.321	.36
July	786.1	122	5.9	25.4	.367	.42
August	434.4	84	3.4	14.0	.202	.23
Water year 1935-36	56,857.5	1,000	3.4	155	2.24	30.55
Calendar year 1936	62,745.5	1,000	3.4	171	2.47	33.70
August	823.6	160	7	26.6	.384	.44
September	292.7	30	2.0	9.76	.141	.16
Water year 1936-37	57,070.4	710	1.4	156	2.25	30.69
October	2,069.3	413	5.2	66.8	.965	1.11
Calendar year 1937	52,097.7	710	1.4	143	2.07	28.02
June	505.0	30	6	16.8	.243	.27
Water year 1937-38	45,657.2	770	4.2	125	1.81	24.53
Calendar year 1938	49,134.9	770	4.2	135	1.95	26.41

Month	Observed				(†)	Adjusted for change in reservoir contents		
	Cfs-days	Maximum	Minimum	Mean		Mean	Per square mile	Runoff in inches
August	339.7	32	1.6	11.0	-1.29	9.71	0.140	0.16
September	276.6	31	3.1	9.22	+1.33	10.6	.153	.17
Water year 1938-39	49,968.1	890	1.6	137	0	137	1.98	26.85
Calendar year 1939	43,269.1	890	1.6	119	0	119	1.72	23.29

† Change in contents, equivalent in cubic feet per second, in Wrightsville Detention Reservoir.

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	38	79	94	103	110	64	203	409	310	35	7.4	19
2	34	80	100	115	125	62	370	314	640	28	6.3	113
3	31	223	104	125	120	62	494	180	636	24	6.3	115
4	30	449	102	115	123	64	518	117	612	23	6.1	86
5	30	429	167	110	234	63	542	97	590	22	9.2	53
6	28	368	361	105	320	61	612	92	560	17	9.6	34
7	26	304	387	98	270	60	636	188	521	12	9.2	24
8	93	*353	384	92	200	61	636	192	473	13	*9.2	19
9	134	363	353	105	160	61	633	152	409	12	8.1	13
10	98	316	*304	110	140	56	644	125	324	14	6.6	12
11	73	252	210	110	130	57	668	117	203	39	7.8	12
12	*58	186	160	105	115	100	668	312	282	46	9.2	11
13	49	151	117	94	105	125	658	429	254	33	9.6	10
14	42	147	88	88	100	115	661	409	166	24	11	8.1
15	38	261	80	84	96	98	672	363	119	17	11	7.4
16	35	277	76	115	94	88	664	337	90	14	10	8.5
17	33	314	72	119	90	82	664	294	76	13	21	10.
18	31	292	68	122	88	78	*668	210	84	11	30	10
19	30	221	62	140	86	78	682	160	72	38	23	11
20	29	166	60	130	82	76	689	132	57	73	18	12
21	27	130	66	110	78	78	700	194	46	57	13	11
22	26	109	110	100	74	109	686	302	39	39	12	11
23	24	123	100	105	72	134	675	296	35	27	14	9.6
24	24	190	90	110	68	141	661	243	31	22	12	9.6
25	120	182	80	105	65	139	640	210	37	18	10	11
26	151	151	78	110	68	147	605	*354	42	14	8.5	12
27	109	130	70	150	66	210	578	*356	114	12	7.8	13
28	82	100	64	145	68	225	545	340	92	11	5.8	13
29	78	98	62	125	68	207	515	304	*58	11	5.5	12
30	79	97	76	105	-	192	473	238	45	10	14	11
31	72	-	108	100	-	210	-	162	-	10	19	-
Total	1,752	6,541	4,253	3,450	3,415	3,303	18,060	7,628	7,017	739	350.2	701.2
Mean	56.5	218	137	111	118	107	602	246	234	23.8	11.3	23.4
(†)	-0.11	+1.31	+0.45	+0.35	-0.74	+2.71	+19.6	-20.6	-2.84	-0.99	+0.34	-0.44
Adjusted for change in reservoir contents												
Mean	56.4	219	138	112	117	109	622	225	231	22.8	11.6	22.9
Cfsm	0.815	3.16	1.99	1.62	1.69	1.58	8.99	3.25	3.34	0.329	0.168	0.331
In.	0.94	3.54	2.29	1.86	1.82	1.82	10.02	3.76	3.73	0.38	0.19	0.37

	Observed	Adjusted
Calendar year 1951:	Max 700 Min 17 Mean 146	Mean 146 Cfsm 2.11 In. 28.64
Water year 1951-52:	Max 700 Min 5.5 Mean 156	Mean 156 Cfsm 2.25 In. 30.72

* Discharge measurement made on this day.
† Change in contents, equivalent in cubic feet per second, in Wrightsville Detention Reservoir.
Note.--Backwater from debris May 22, 23, 25-30, June 1. Stage-discharge relation affected by ice Nov. 28, 30, Dec. 14-30, Jan. 2, 4-12, 19, Jan. 21 to Feb. 3, Feb. 6-10, Feb. 13 to Mar. 5, Mar. 11-13, 15-17.

Reservoirs in Winooski River basin above Montpelier, Vt.

East Barre Detention Reservoir.--Lat 44°09'20", long. 72°26'40", at reservoir on Jail Branch at East Barre, Washington County, 4½ miles upstream from mouth of Jail Branch. Staff gage read once daily. Datum of gage is 1,127.9 ft above mean sea level (levels by Corps of Engineers). Drainage area, 38.8 sq mi. Records available, March and April 1936, September 1938 to September 1952. Maximum gage height observed during year, 20.3 ft Apr. 15, 21; minimum observed, 0.3 ft Aug. 2, 3, 24-29. Maximum gage height observed during period 1936, 1938-52, 36.0 ft Mar. 22, 1936; minimum observed, 0.1 ft several days in August and September 1939.

Reservoir is formed by earth-fill dam completed by Corps of Engineers in 1935 for flood control. Capacity of reservoir, 506,000,000 cu ft between gage heights 0.0 ft (bottom of outlet opening) and 37.1 ft (crest of spillway). Dam has no gates; below gage height 37.1 ft, outflow from reservoir is dependent on capacity of outlet opening, 4 ft square, near base of dam. Gage read daily by employee of State of Vermont Water Conservation Board.

Wrightsville Detention Reservoir.--Lat 44°18'35", long. 72°34'30", at reservoir on North Branch Winooski River at Wrightsville, Washington County, a third of a mile downstream from Long Meadow Brook and 4¼ miles upstream from mouth. Staff gage read once daily. Datum of gage is 612.75 ft above mean sea level (levels by Corps of Engineers). Drainage area, 66.5 sq mi. Records available, March and April 1936, September 1938 to September 1952. Maximum gage height observed during year, 41.6 ft Apr. 21; minimum not determined. Maximum gage height during period 1936, 1938-52, 63.7 ft Mar. 22, 1936, from graph based on gage readings; minimum observed, 0.2 ft Aug. 17, 1949, and Aug. 17-19, 1950.

Reservoir is formed by earth-fill dam completed by Corps of Engineers in 1935 for flood control. Capacity of reservoir, 873,500,000 cu ft between gage heights 0.0 ft (bottom of outlet opening) and 72.25 ft (crest of spillway). Dam has no gates; below gage height 72.25 ft, outflow from reservoir is dependent on capacity of outlet opening, 5¼ ft square, near base of dam. Gage read daily prior to Feb. 29 by employee of State of Vermont Water Conservation Board; thereafter read irregularly except during April when almost daily readings were obtained.

Monthly gage height and contents, water year October 1951 to September 1952

Date	East Barre Detention Reservoir			
	Gage height (feet)†	Contents (millions of cubic feet)	Change in contents during month	
			Millions of cubic feet	Equivalent in cfs
Sept.30	1.0	0.50	-	-
Oct. 31	1.4	.74	+0.24	+0.09
Nov. 30	1.7	.93	+.19	+.07
Dec. 31	3.9	2.65	+1.72	+.64
Calendar year 1951	-	-	+1.31	+.04
Jan. 31	3.0	1.86	-.79	-.29
Feb. 29	3.0	1.86	0	0
Mar. 31	3.7	2.48	+.62	+.23
Apr. 30	4.7	3.48	+1.00	+.39
May 31	3.2	2.04	-1.44	-.54
June 30	1.6	.87	-1.17	-.45
July 31	.4	.20	-.67	-.25
Aug. 31	.4	.20	0	0
Sept.30	.5	.25	+.05	+.02
Water year 1951-52	-	-	-.25	-.01
Date	Wrightsville Detention Reservoir			
Sept.30	2.2	5.35	-	-
Oct. 31	2.1	5.05	-0.30	-.11
Nov. 30	3.3	8.45	+3.40	+1.31
Dec. 31	3.7	9.65	+1.20	+.45
Calendar year 1951	-	-	+4.30	+.14
Jan. 31	4.0	10.6	+.95	+.35
Feb. 29	3.4	8.75	-1.85	-.74
Mar. 31	5.6	16.0	+7.25	+2.71
Apr. 30	16.4	66.8	+50.8	+19.6
May 31	4.3	11.6	-55.2	-20.6
June 30	1.8	4.25	-7.35	-2.84
July 31	.7	1.60	-2.65	-.99
Aug. 31	1.1	2.50	+.90	+.34
Sept.30	.6	1.35	-1.15	-.44
Water year 1951-52	-	-	-4.00	-.13

† Gage height at 12 p.m., determined from graph based on observer's readings and records for station on river below reservoir.

Winooski River at Montpelier, Vt.

Location.--Lat 44°15'25", long. 72°35'35", on right bank 0.4 mile upstream from Dog River and 1 mile downstream from depot at Montpelier, Washington County.
Drainage area.--397 sq mi.
Records available.--May 1909 to September 1923, August 1928 to September 1952.
Gage.--Water-stage recorder. Datum of gage is 499.99 ft above mean sea level, datum of 1929. Prior to June 16, 1914, chain gage 0.9 mile upstream at different datum. June 16 to July 3, 1914, staff gage at present site and datum.
Average discharge.--33 years (1914-23, 1928-52), 590 cfs (adjusted for storage since October 1938).
Extremes.--Maximum discharge during year, 10,900 cfs June 1 (gage height, 14.16 ft), from rating curve extended above 4,900 cfs on basis of computation of flow over dam and slope-area determination at gage height 13.90 ft; minimum daily, 48 cfs Aug. 28.
1909-23, 1928-52: Maximum discharge, 20,200 cfs Apr. 7, 1912 (gage height, about 16.7 ft, present datum), from rating curve extended above 6,900 cfs by logarithmic plotting; minimum daily, 17 cfs Sept. 3, 1933.
Maximum discharge known, 57,000 cfs Nov. 3, 1927 (gage height, 27.1 ft), from rating curve extended above 6,900 cfs by logarithmic plotting.
Remarks.--Records excellent except those for periods of doubtful gage-height record or backwater from aquatic vegetation, which are good, and those for periods of ice effect or no gage-height record, which are fair. Flow regulated by several small powerplants above station, by Peacham Pond, and since 1926, by Mollys Falls Reservoir (combined usable capacity, 492,000,000 cu ft) which regulate runoff from 24 sq mi, and since 1935, by East Barre and Wrightsville Detention Reservoirs (combined usable capacity, 1,379,500,000 cu ft; see p.
Revisions (water years).--W 434: 1915. W 894: Drainage area.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to June 1				June 2 to Sept. 30			
3.1	87	5.0	1,020	2.9	41	4.5	575
3.5	186	6.0	1,870	3.2	82	5.0	890
4.0	385	8.0	3,760	3.6	174	7.0	2,760
4.5	665	10.0	5,830	4.0	324	10.0	5,830

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	121	286	435	740	460	360	1,090	1,160	3,930	325	*116	98
2	185	294	430	900	540	290	2,650	1,000	*5,680	290	82	686
3	189	1,210	452	780	620	310	2,750	765	2,750	260	74	d475
4	177	1,620	457	680	620	330	2,610	599	2,230	225	84	d368
5	146	1,080	829	580	1,250	340	3,120	587	2,170	170	83	d258
6	130	885	1,160	600	1,200	370	4,860	625	1,780	165	104	d188
7	103	814	1,020	440	860	360	3,630	1,060	2,020	170	123	d136
8	340	1,350	1,100	460	720	350	3,330	870	1,570	190	99	d124
9	424	1,120	908	470	710	320	3,330	710	1,440	180	60	d161
10	*286	*856	863	480	610	310	3,630	581	1,270	260	58	d140
11	267	730	634	450	540	390	3,930	540	1,030	343	85	d107
12	227	605	*563	430	560	720	3,140	1,560	1,480	232	66	d98
13	169	518	410	380	*450	*700	2,730	1,710	1,110	154	81	d80
14	121	576	360	390	460	600	3,360	1,340	770	145	85	d77
15	130	863	370	470	450	540	3,330	1,120	600	207	114	90
16	192	847	320	720	430	450	2,810	1,180	500	190	112	118
17	191	1,090	350	560	390	450	2,750	990	510	179	93	128
18	185	800	380	680	400	460	*2,870	744	600	137	117	111
19	142	665	390	680	430	490	2,880	672	480	206	110	102
20	132	587	400	560	430	460	2,980	653	430	311	91	152
21	92	506	420	500	420	500	2,800	1,230	390	236	91	102
22	107	450	660	410	420	700	2,490	1,410	320	222	100	95
23	163	513	640	560	400	724	2,480	1,160	290	208	80	153
24	175	710	530	540	350	751	2,240	918	300	193	86	138
25	393	593	450	440	370	772	1,980	780	430	179	93	135
26	394	480	450	450	390	892	1,820	1,560	370	139	63	118
27	276	470	460	580	380	1,250	1,670	*1,590	1,010	95	56	129
28	189	370	430	720	380	1,100	1,510	1,250	550	92	48	*97
29	224	450	440	580	370	982	1,560	1,040	370	155	54	111
30	282	440	410	450	-	1,010	1,420	878	340	152	89	135
31	276	-	360	450	-	1,050	-	653	-	155	103	-
Total	6,428	21,778	17,081	17,130	15,610	18,331	81,750	30,933	36,720	6,165	2,700	4,910
Mean	207	726	551	553	538	591	2,725	998	1,224	199	87.1	164
(+)	-18.2	+0.55	+6.26	-22.9	-20.5	-16.2	+112	-18.3	-2.67	-28.9	+1.75	-22.1

Adjusted for change in reservoir contents

Mean	189	726	557	530	518	575	2,837	980	1,221	170	88.8	142
Cfsm	0.476	1.83	1.40	1.34	1.30	1.45	7.15	2.47	3.08	0.428	0.224	0.358
In.	0.55	2.04	1.62	1.54	1.41	1.67	7.97	2.84	3.43	0.49	0.26	0.40

	Observed			Adjusted			
Calendar year 1951:	Max 4,460	Min 91	Mean 635	Mean 636	Cfsm 1.60	In. 21.74	
Water year 1951-52:	Max 5,680	Min 48	Mean 709	Mean 707	Cfsm 1.78	In. 24.22	

Peak discharge (base, 3,900 cfs).--Apr. 6 (3:30 to 4 a.m.) 5,650 cfs (9.84 ft); Apr. 10 (9 to 10 p.m.) 4,390 cfs (8.63 ft); June 1 (10 p.m.) 10,900 cfs (14.16 ft).

* Discharge measurement made on this day.

† Change in contents, equivalent in cubic feet per second, in Peacham Pond, Mollys Falls Reservoir, and East Barre and Wrightsville Detention Reservoirs. Part of records furnished by State of Vermont Water Conservation Board and Green Mountain Power Corp.

d Doubtful gage-height record; discharge computed from gage-height graph adjusted on basis of appearance of graph and powerplant records.

Note.--No gage-height record Dec. 28 to Jan. 9, June 14-26, June 28 to July 9; discharge estimated on basis of weather records, recorded range in stage when available, and powerplant records. Stage-discharge relation affected by ice Nov. 22, 26-30, Dec. 14 to Mar. 22. Backwater from aquatic vegetation Oct. 1 to Nov. 2.

Dog River at Northfield, Vt.

Location.--Lat 44°08'20", long. 72°40'00", on left bank at downstream side of highway bridge at Norwich University, Northfield, Washington County, 1 mile upstream from Union Brook.

Drainage area.--52 sq mi, approximately.

Records available.--May 1909 to October 1920, October 1928 to November 1934 (discontinued).

Gage.--Water-stage recorder. Altitude of gage is 730 ft (from topographic map). Prior to Aug. 23, 1910, staff gage at site 1½ miles downstream at different datum. Aug. 24, 1910, to Oct. 7, 1914, staff gage, Oct. 8, 1914, to Sept. 21, 1918, water-stage recorder, and Sept. 22, 1918, to Oct. 31, 1920, staff gage at present site and datum.

Average discharge.--15 years (1911-20, 1928-34), 77.9 cfs (revised).

Extremes.--1909-20, 1928-34: Maximum discharge, 3,820 cfs (revised) Apr. 13, 1920 (gage height, 8.6 ft, from graph based on gage readings); no flow Aug. 15, 1909.

Maximum discharge known, 8,000 cfs Nov. 3, 1927 (gage height, 10.9 ft, from flood-marks), by computation of peak flow over dam.

Revisions.--The figures of maximum discharge for the water years 1913-20 and 1929-34 have been revised, as shown in the following table. They supersede those published in the water-supply papers indicated.

Water-Supply Paper	Water year	Date	Gage height (feet)	Discharge (cfs)
354.....	1912-13	Mar. 25	†8.5	3,690
384.....	1913-14	Apr. 19	†7.8	2,880
404.....	1914-15	Apr. 11	6.02	1,270
434.....	1915-16	May 17	5.83	1,160
454.....	1916-17	Mar. 28	5.78	1,140
474.....	1917-18	Oct. 30	5.77	1,140
504.....	1918-19	Mar. 28	†8.0	3,100
504.....	1919-20	Apr. 13	†8.6	3,820
684.....	1928-29	Mar. 24	5.66	1,100
699.....	1929-30	Apr. 7	5.93	1,220
714.....	1930-31	Apr. 11	6.48	1,590
729.....	1931-32	Apr. 12	6.86	1,910
744.....	1932-33	Apr. 18	7.17	2,220
759.....	1933-34	Apr. 12	7.66	2,730

† From graph based on gage readings.

Remarks.--Some diurnal fluctuation at low flow caused by powerplant upstream.

Revisions.--W 684: Drainage area. Revised figures of discharge for the water years 1915, 1919, and 1920 are given herein. They supersede those published in Water-Supply Papers 404, 424, and 504.

Day (water year)	Discharge (cfs)	Day (water year)	Discharge (cfs)	Day (water year)	Discharge (cfs)	Day (water year)	Discharge (cfs)	Day (water year)	Discharge (cfs)
1914-15		1914-15		1914-15		1918-19		1918-19	
Dec. 5	30	Jan. 11	33	Feb. 17	53	Dec. 29	85	Feb. 15	25
6	22	12	23	18	32	30	82	16	27
7	23	13	23	19	26	31	76	17	29
8	24	14	17	20	25	Jan. 5	95	18	31
9	18	15	17	21	22	6	82	19	31
10	15	16	16	22	22	7	75	20	29
11	12	17	15	23	22	8	75	21	27
12	9	18	60	24	55	9	75	22	23
13	11	19	160	25	440	10	70	Mar. 7	170
14	11	20	130	26	370	11	68	8	120
15	9	21	60	27	240	12	66	11	130
16	10	22	25	28	180	13	70	12	105
17	10	23	25	Mar. 1	160	14	68	13	100
18	9	24	27	2	120	15	65	14	95
19	9	25	24	3	100	16	62	15	85
20	10	26	23	4	86	17	65	16	75
21	11	27	21	5	80	18	58	17	65
22	13	28	19	6	76	19	53	28	1,770
23	13	29	15	7	71	20	51	1919-20	
24	12	30	12	8	68	21	47	Mar. 9	27
25	11	31	11	9	62	22	45	10	29
26	11	Feb. 1	11	10	60	30	45	11	31
27	11	2	11	11	54	31	42	12	66
28	12	3	12	12	51	Feb. 1	38	13	300
29	11	4	14	13	48	2	42	14	200
30	16	5	18	14	45	3	55	15	140
31	16	6	21	15	42	4	44	16	105
Jan. 1	14	7	22	16	39	5	41	17	240
2	15	8	19	17	37	6	35	18	165
3	11	9	17	18	35	7	30	19	120
4	11	10	17	19	35	8	32	20	95
5	11	11	16	20	37	9	35	21	72
6	15	12	21	21	40	10	40	22	60
7	60	13	19			11	36	23	75
8	190	14	16	1918-19		12	33	24	85
9	110	15	76	Dec. 27	120	13	30	25	250
10	62	16	62	28	90	14	27	26	630
								27	920

Note.--Stage-discharge relation affected by ice Dec. 5, 1914, to Mar. 21, 1915; Dec. 27-31, 1918; Jan. 5-22, Jan. 30 to Feb. 22, Mar. 7, 8, 11-17, 1919; Mar. 9-27, 1920.

Month	Cfs-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
December 1914.....	594	74	9	19.2	0.369	0.42
January 1915.....	1,255	190	11	40.5	.779	.90
February.....	1,859	440	11	66.4	1.28	1.33
March.....	2,085	160	35	67.3	1.29	1.49
Water year 1914-15...	18,318.0	695	8.1	50.2	.965	13.10
December 1918.....	3,432	270	63	111	2.13	2.45
January 1919.....	2,266	155	42	73.1	1.41	1.62
February.....	902	55	23	32.2	.619	.65
March.....	8,147	1,770	65	263	5.06	5.83
Water year 1918-19...	39,402	1,770	7	108	2.08	28.18
March 1920.....	6,141	920	19	198	3.81	4.39
Water year 1919-20...	35,847	1,540	4	97.9	1.88	25.64

Dog River at Northfield Falls, Vt.

Location.--Lat 44°10'55", long. 72°38'30", on right bank 1 mile downstream from Northfield Falls, Washington County, and 1¼ miles downstream from Cox Branch.
Drainage area.--76.1 sq mi.
Records available.--November 1934 to September 1952.
Gage.--Water-stage recorder. Datum of gage is 603.00 ft above mean sea level (levels by Corps of Engineers).
Average discharge.--18 years (1934-52), 124 cfs.
Extremes.--Maximum discharge during year, 7,140 cfs June 1 (gage height, 9.46 ft), from rating curve extended above 1,500 cfs on basis of computation of flow over dam at gage height 8.49 ft and determinations of discharge by slope-area method at gage heights 8.96 and 11.53 ft; minimum, 9.2 cfs Aug. 29.
1934-52: Maximum discharge, 9,750 cfs Sept. 21, 1938 (gage height, 11.53 ft), by slope-area method; minimum, 4.3 cfs Aug. 31, Sept. 7, 1942.
Revisions.--The figures of minimum discharge for some water years have been revised, as shown in the following table. They supersede those published in the water-supply papers indicated.

Water-Supply Paper	Water year	Date	Gage height (feet)	Discharge (cfs)
804.....	1934-35	Sept. 7	0.54	6.8
804.....	1935-36	Aug. 16	.52	6.3
824.....	1936-37	Sept. 3, 26, 26, 30	.57	7.6

Remarks.--Records excellent except those for periods of ice effect or backwater from debris, which are good. Some regulation at low flow caused by powerplant above station.
Revisions.--Revised figures of discharge for low-water periods of water years 1935-37 are given herein. They supersede those published in Water-Supply Papers 804, 824, and 854.

Day (water year)	Discharge (cfs)	Day (water year)	Discharge (cfs)	Day (water year)	Discharge (cfs)	Day (water year)	Discharge (cfs)
1934-35		1934-35		1935-36		1935-36	
July 3	37	Sept.19	24	June 12	39	Aug. 12	8.0
4	29	20	39	13	22	13	10
5	29	21	31	14	24	14	7.5
6	29	22	28	15	29	15	11
7	29	24	22	16	23	16	26
11	39	25	23	17	22	18	17
12	33	26	23	18	31	19	14
13	22	27	19	19	21	20	12
14	21	28	22	20	15	21	14
15	35			21	18	22	23
16	35	1935-36		22	29	25	26
17	38	Oct. 1	29	23	14	26	20
18	27	6	37	24	16	27	16
19	24	7	39	25	17	28	16
21	32	8	30	26	17		
22	37	9	26	27	26	1936-37	
27	29	10	29	28	30	Aug. 5	24
28	22	11	28	29	32	6	20
31	40	12	23	30	26	7	17
Aug. 2	25	13	18	July 1	22	8	21
3	20	14	26	2	16	10	21
4	23	15	26	3	18	17	24
7	35	16	21	4	40	18	22
8	30	17	21	5	27	19	23
9	25	18	22	6	33	27	26
10	15	19	22	7	20	28	21
16	28	20	14	8	19	29	19
17	22	21	26	9	15	30	25
18	18	22	19	11	30	31	20
19	26	23	25	12	28	Sept. 1	19
20	18	24	28	13	29	2	15
21	18	25	29	14	24	3	18
22	30	26	21	15	21	4	11
23	29	27	18	16	16	5	15
24	17	28	27	17	17	6	16
25	16	29	21	18	14	7	23
26	21	30	22	19	7.8	8	13
27	15	31	21	20	18	9	11
28	17	Nov. 1	19	21	15	10	10
29	21	2	20	22	14	11	8.8
30	15	3	14	23	11	12	12
31	12	4	28	26	31	13	20
Sept. 1	12	5	19	27	30	14	22
2	15	6	27	28	20	15	20
3	23	7	32	29	18	16	17
4	18	8	29	30	19	17	15
5	23	9	25	31	15	18	9.8
6	24	10	23	Aug. 1	15	19	15
7	15	11	26	2	7.8	20	33
8	8.8	12	33	3	14	21	22
9	25	June 4	39	4	11	22	15
10	29	5	37	5	11	23	14
11	30	6	25	6	14	24	12
12	22	7	25	7	15	25	14
13	17	8	35	8	15	26	8.8
14	17	9	26	9	7.6	27	15
17	39	10	27	10	11	28	12
18	31	11	27	11	10	29	13
						30	11

Dog River at Northfield Falls, Vt.--Continued

Month	Cfs-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
July 1935	1,269	102	21	40.9	0.537	0.62
August	895	65	12	28.9	.380	.44
September	870.8	108	8.8	29.0	.381	.43
Calendar year 1935	42,472.8	2,690	8.8	116	1.52	20.75
October 1935	877	59	14	28.3	.372	.43
November	3,191	640	14	106	1.39	1.56
June	835	54	14	27.8	.365	.41
July	720.8	51	7.8	23.3	.306	.35
August	788.9	142	7.5	25.4	.334	.39
Water year 1935-36	52,788.7	4,390	7.5	144	1.89	25.80
Calendar year 1936	58,977.7	4,390	7.5	161	2.12	28.82
August 1936	1,064	80	17	34.3	.451	.52
September	460.4	33	8.8	15.3	.201	.22
Water year 1936-37	57,062.4	2,710	8.8	156	2.05	27.89
Calendar year 1937	52,579.4	2,710	8.8	144	1.89	25.70

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.6	7.9	1.2	52	3.0	655
.7	12	1.5	102	4.0	1,230
.8	16	2.0	234	5.0	1,900
.9	23	2.5	420	6.0	2,800

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	28	43	86	150	110	67	273	152	2,330	42	*13	15
2	20	41	107	240	135	66	760	137	1,250	36	12	142
3	19	499	103	165	130	66	695	125	506	33	12	69
4	19	324	96	140	140	63	625	118	372	30	13	46
5	20	170	209	135	330	65	949	116	302	29	14	29
6	12	125	335	130	247	63	1,880	110	244	27	15	22
7	19	165	250	*97	192	63	876	125	254	29	15	19
8	66	*340	244	97	160	61	810	107	192	22	14	17
9	49	212	203	130	157	62	876	98	203	23	12	16
10	*37	159	189	130	*137	62	1,120	88	162	29	12	15
11	33	142	*152	110	132	80	1,190	100	170	100	17	16
12	29	125	138	100	114	*172	776	540	212	48	19	15
13	22	114	100	91	107	132	620	401	153	34	19	13
14	25	123	82	85	115	114	938	264	125	29	15	13
15	32	165	95	98	115	100	810	228	107	25	14	14
16	25	168	85	125	110	99	710	247	86	22	13	16
17	25	218	94	100	100	94	*766	195	84	20	16	15
18	23	162	105	120	100	94	930	170	81	20	16	*14
19	23	137	96	110	100	95	859	149	77	28	13	16
20	14	118	91	105	92	95	1,010	*135	70	30	12	20
21	19	102	120	90	86	108	625	228	58	29	12	16
22	28	94	160	91	80	147	465	203	55	27	13	16
23	21	116	125	125	78	154	524	167	52	22	12	15
24	22	132	105	100	82	157	360	140	50	19	11	16
25	125	116	95	90	78	162	284	206	94	18	11	16
26	77	106	95	105	74	201	247	400	59	16	11	16
27	52	94	86	135	74	325	215	264	*60	16	10	16
28	46	89	88	125	71	284	212	197	49	17	11	15
29	41	95	100	93	67	247	212	175	46	*16	11	14
30	42	87	92	92	-	244	172	157	48	15	22	15
31	42	-	140	120	-	264	-	137	-	14	15	-
Total	1,055	4,581	4,066	3,624	3,513	4,006	20,789	5,879	7,551	865	425	697
Mean	34.0	153	131	117	121	129	693	190	252	27.9	13.7	23.2
Cfsm	0.447	2.01	1.72	1.54	1.59	1.70	9.11	2.50	3.31	0.367	0.180	0.305
In.	0.52	2.24	1.99	1.77	1.72	1.96	10.16	2.87	3.69	0.42	0.21	0.34

Calendar year 1951: Max 1,220 Min 12 Mean 130 Cfsm 1.71 In. 23.25
Water year 1951-52: Max 2,330 Min 10 Mean 156 Cfsm 2.05 In. 27.89

Peak discharge (base, 1,600 cfs).--Apr. 6 (1:30 a.m.) 2,670 cfs (5.87 ft); Apr. 10 (8 p.m.) 1,700 cfs (4.75 ft); June 1 (6 p.m.) 7,140 cfs (9.46 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 13 to Feb. 5, Feb. 8, Feb. 14 to Mar. 7. Backwater from debris Nov. 3 to Dec. 6.

Mad River near Moretown, Vt.

Location.--Lat 44°16'40", long. 72°44'35", on left bank at downstream side of highway bridge, 2.4 miles downstream from Moretown, Washington County, and 3.8 miles upstream from mouth.

Drainage area.--139 sq mi.

Records available.--July to November 1910, November 1928 to September 1952.

Gage.--Water-stage recorder. Concrete control since Oct. 13, 1933. Altitude of gage is 545 ft (from topographic map). July 6 to Nov. 4, 1910, staff gage at same site and different datum. Nov. 20, 1928, to Sept. 27, 1930, chain gage at same site and present datum.

Average discharge.--24 years (1928-52), 251 cfs.

Extremes.--Maximum discharge during year, 7,310 cfs June 1 (gage height, 9.88 ft), from rating curve extended above 2,500 cfs on basis of computations of flow over dam at gage heights 9.98, 11.51, 16.34, and 19.4 ft; minimum, 14 cfs Aug. 28, 29; minimum daily, 20 cfs Aug. 10.

1910, 1928-52: Maximum discharge, 18,400 cfs Sept. 22, 1938 (gage height, 16.34 ft, from floodmarks), from rating curve extended above 2,500 cfs as explained above; minimum, 1.4 cfs Oct. 1, 1930.

Maximum discharge known, 23,000 cfs Nov. 3, 1927 (gage height, 19.4 ft, from floodmarks), by computation of peak flow over dam.

Remarks.--Records excellent except those for periods of ice effect or no gage-height record, which are fair. Regulation at low flow by mill in Moretown.

Revisions (water years).--W 744: Drainage area. W 854: 1934(M). W 1114: 1929, 1930(M), 1936-37.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

3.1	16	4.0	254
3.2	26	4.5	560
3.4	56	5.0	980
3.6	104	7.0	3,130

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	79	112	210	290	200	125	422	360	3,030	75	*29	44
2	72	107	300	440	250	120	1,440	304	1,840	66	25	433
3	69	1,120	255	320	240	120	1,090	269	770	58	21	443
4	67	666	230	260	260	115	944	250	553	53	33	203
5	63	363	514	250	600	120	1,830	228	470	54	31	111
6	60	269	771	240	460	115	a3,000	232	360	48	39	77
7	60	601	558	220	360	115	a1,550	332	420	43	34	65
8	263	1,150	588	190	300	110	a1,400	288	310	40	28	60
9	175	*547	444	235	290	115	a1,550	246	357	40	25	50
10	125	395	399	240	255	115	a1,900	229	260	46	20	42
11	105	338	*302	200	240	150	a2,000	296	392	493	58	45
12	*102	294	276	185	210	320	a1,300	1,660	670	135	49	44
13	88	254	205	170	200	240	a1,150	1,140	365	83	47	36
14	83	306	155	160	230	210	a1,500	754	268	67	44	32
15	78	516	165	180	210	185	a1,350	608	214	57	30	37
16	75	460	145	230	200	185	a1,200	607	181	53	26	44
17	71	504	155	190	185	170	a1,300	449	186	46	90	47
18	69	354	175	220	185	175	a1,600	372	164	41	69	35
19	67	298	170	200	185	175	*1,450	321	154	88	41	35
20	64	255	165	190	170	180	2,020	284	131	91	34	35
21	60	235	220	175	155	200	1,190	585	111	64	30	38
22	61	230	310	160	145	270	872	746	99	54	43	35
23	59	335	230	230	145	285	1,470	531	89	48	51	40
24	61	386	200	190	150	290	827	391	85	43	32	34
25	527	294	180	170	145	300	612	634	282	34	39	35
26	223	250	180	195	135	370	546	*980	135	29	28	38
27	160	230	160	250	135	560	539	605	109	29	26	65
28	135	220	170	230	130	400	553	429	88	76	24	*49
29	135	250	185	180	125	345	598	360	*81	53	23	44
30	118	210	200	170	-	357	463	311	94	38	141	35
31	110	-	260	220	-	384	-	259	-	*32	62	-
Total	3,484	11,549	8,477	6,780	6,495	6,921	37,666	15,060	12,268	2,177	1,272	2,332
Mean	112	385	273	219	224	223	1,256	486	409	70.2	41.0	77.7
Cfsm	0.806	2.77	1.96	1.58	1.61	1.60	9.04	3.50	2.94	0.505	0.295	0.559
In.	0.93	3.09	2.27	1.81	1.74	1.85	10.08	4.03	3.28	0.58	0.34	0.62

Calendar year 1951: Max 2,700 Min 40 Mean 275 Cfsm 1.98 In. 26.87
Water year 1951-52: Max 3,030 Min 20 Mean 313 Cfsm 2.25 In. 30.62

Peak discharge (base, 3,400 cfs).--Apr. 6 (time unknown) about 4,700 cfs; June 1 (7 p.m.) 7,310 cfs (9.88 ft).

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of weather records and records for Dog River at Northfield Falls.

Note.--Stage-discharge relation affected by ice Nov. 21, 22, Nov. 26 to Dec. 4, Dec. 13 to Mar. 29.

Waterbury Reservoir near Waterbury, Vt.

Location.--Lat 44°22'55", long. 72°46'15", at dam on Waterbury River, 2 2/3 miles upstream from mouth and 3½ miles north of Waterbury, Washington County.

Drainage area.--109 sq mi.

Records available.--September 1938 to September 1952.

Gage.--Water-stage recorder. Prior to Dec. 10, 1938, staff gage at same site and datum. Datum of gage is at mean sea level (levels by Corps of Engineers).

Extremes.--Maximum elevation during year, 601.23 ft June 3; minimum, 552.57 ft Mar. 22, 24.

1938-52: Maximum elevation, 613.45 ft May 4, 1940; minimum observed, 501.3 ft Oct. 16, 1938.

Remarks.--Reservoir is formed by earth-fill dam completed by Corps of Engineers during summer of 1937 for conservation and flood control. Total usable capacity for flood control, 2,812,300,000 cu ft between elevations 500.0 ft (bottom of lowest outlet) and 617.5 ft (crest of spillway) above mean sea level. Usable capacity for conservation, 1,582,700,000 cu ft between elevations 500.0 and 592.0 ft (sill of taintor gate) above mean sea level.

Elevation at 12 p.m., water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	576.47	574.54	590.00	590.48	588.46	571.21	563.46	589.51	598.33	593.05	592.49	592.89
2	575.91	574.34	590.60	590.43	588.46	570.09	567.68	588.78	600.90	592.95	592.48	593.51
3	574.81	577.52	591.09	590.04	588.96	569.08	570.81	586.06	600.00	592.87	592.48	593.66
4	574.83	579.12	590.99	590.02	589.54	568.03	573.19	583.25	598.61	592.82	592.47	593.47
5	574.33	579.89	591.33	590.40	590.89	567.08	576.88	583.09	597.28	592.76	592.49	593.25
6	574.46	580.42	592.88	590.76	591.05	566.08	582.70	583.81	595.82	592.72	592.48	593.10
7	574.31	581.56	592.06	590.85	590.03	564.97	585.32	586.12	595.02	592.67	592.46	592.93
8	574.37	584.17	590.27	590.10	590.04	564.47	587.13	587.40	594.47	592.63	592.45	592.83
9	574.83	585.14	588.00	589.70	590.52	563.29	588.90	588.31	595.00	592.58	592.43	592.72
10	575.17	585.99	587.70	589.24	589.92	562.18	592.19	589.02	595.47	592.75	592.46	592.68
11	575.15	586.55	588.20	589.00	589.29	561.73	592.76	589.78	596.31	593.22	592.48	592.64
12	575.04	587.01	588.71	589.25	587.98	561.43	591.42	592.72	597.42	593.09	592.50	592.60
13	575.20	587.40	588.82	589.53	587.16	560.79	589.74	593.48	596.85	592.97	592.49	592.58
14	575.01	587.87	588.60	589.52	586.39	560.78	590.36	592.91	596.08	592.88	592.48	592.52
15	574.48	589.01	588.97	589.49	585.63	559.80	590.84	592.37	595.50	592.82	592.46	592.52
16	573.83	589.84	588.96	590.04	585.39	557.79	590.75	591.99	595.02	592.74	592.53	592.55
17	573.33	590.48	588.51	590.38	584.55	556.88	590.87	591.28	594.59	592.68	592.50	592.55
18	572.86	591.13	588.04	591.17	583.18	555.87	591.78	590.40	594.09	592.65	593.36	592.52
19	572.61	591.22	587.75	591.67	581.75	554.94	591.41	589.46	593.71	593.03	593.13	592.52
20	572.74	590.63	587.73	591.11	580.91	553.98	592.47	589.66	593.45	593.10	592.98	592.55
21	572.57	590.46	587.70	590.96	579.61	553.07	591.70	590.82	593.27	592.99	592.90	592.53
22	571.87	590.71	588.25	590.75	578.08	553.05	590.31	592.58	593.12	592.92	593.00	592.52
23	571.27	591.28	588.67	590.21	577.77	553.00	589.84	593.24	593.01	592.85	592.96	592.51
24	571.00	592.01	589.03	590.01	576.80	553.40	590.00	593.21	593.02	592.85	592.87	592.50
25	573.31	592.20	589.39	590.27	575.87	554.49	589.34	593.77	593.07	592.78	592.79	592.52
26	574.03	591.66	589.73	590.80	574.87	555.78	587.42	594.59	593.69	592.72	592.71	592.55
27	574.45	591.05	589.78	590.98	573.90	557.40	585.55	594.66	593.84	592.67	592.65	592.60
28	574.80	590.40	589.67	591.10	572.98	558.76	586.28	594.65	593.55	592.61	592.60	592.57
29	575.01	589.81	589.96	590.43	571.56	559.83	587.77	594.45	593.36	592.57	592.66	592.53
30	574.72	589.68	590.14	589.72	-	560.97	588.81	594.05	593.19	592.54	592.83	592.51
31	574.72	-	590.46	589.10	-	562.13	-	593.79	-	592.51	592.78	-

Note.--Elevations for periods Oct. 18, 19, Nov. 7-9, 11-16, 19-21, 23, 26-30, Dec. 2-12, 17-21, 28, 30, 31, Jan. 4, 6-8, 14, 21-25, 29-31, Sept. 2-5, 8, 18, computed from twice-daily tape-gage readings, records of valve operations at dam, and records for station on Waterbury River. No gage-height record Oct. 20, Nov. 17, 18, 22, 24, 25, Dec. 1, 22, 29, Jan. 5, 26, Sept. 6, 7; elevations determined on basis of records of valve operations at dam and records for station on Waterbury River.

Monthly elevation and contents, water year October 1951 to September 1952

Date	Elevation (feet)†	Contents (millions of cubic feet)	Change in contents during month	
			Millions of cubic feet	Equivalent, cubic feet per second
Sept.30	577.07	1,083.5	-	-
Oct. 31	574.72	1,016.2	-67.3	-25.1
Nov. 30	589.68	1,493.6	+477.4	+184
Dec. 31	590.46	1,522.8	+29.2	+10.9
Calendar year 1951	-	-	-9.3	-0.29
Jan. 31	589.10	1,473.1	-49.7	-18.6
Feb. 29	571.56	932.9	-540.2	-216
Mar. 31	562.13	706.6	-226.3	-84.5
Apr. 30	588.81	1,462.8	+756.2	+292
May 31	593.79	1,652.5	+189.7	+70.8
June 30	593.19	1,629.1	-23.4	-9.03
July 31	592.51	1,602.6	-26.5	-9.89
Aug. 31	592.78	1,613.1	+10.5	+3.92
Sept.30	592.51	1,602.6	-10.5	-4.05
Water year 1951-52	-	-	+519.1	+16.4

† Elevation at 12 p.m.

Waterbury River near Waterbury, Vt.

Location.--Lat 44°22'10", long. 72°46'10", on right bank 1 mile downstream from Waterbury Reservoir, 1 2/3 miles upstream from mouth, and 2½ miles north of Waterbury, Washington County.
Drainage area.--111 sq mi.
Records available.--July to October 1910 (gage heights only), December 1935 to September 1952.
Gage.--Water-stage recorder. Concrete control since Dec. 8, 1937. Datum of gage is 428.00 ft above mean sea level (levels by Corps of Engineers), July 7 to Oct. 31, 1910, staff gage 2 miles upstream at different datum.
Average discharge.--16 years, 230 cfs (adjusted for storage).
Extremes.--Maximum discharge during year, 1,500 cfs June 1, (gage height, 9.49 ft); minimum daily, 2.2 cfs Oct. 28.
1935-52: Maximum discharge, 6,520 cfs Mar. 18, 1936 (gage height, 19.38 ft); minimum daily, 0.6 cfs several times during summers of 1938, 1939, 1941, and 1944.
Remarks.--Records excellent except those below 25 cfs, and those for days of no gage-height record or those computed from twice-daily tape-gage readings, which are good. Flow completely regulated by Waterbury Reservoir (see preceding page).
Revisions (water years).--W 824: 1936.

Rating table, water year 1951-52 (gage height, in feet, and discharge, in cubic feet per second)

4.85	2.0	6.5	163
4.9	2.8	7.0	287
5.0	5.0	7.5	450
5.1	7.8	8.0	665
5.3	15	9.0	1,230
5.6	34	10.0	1,740
6.0	77		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	267	203	6.8	218	396	213	9.3	4.8	504	161	43	78
2	247	167	8.4	410	227	396	24	510	38	135	38	173
3	388	20	7.0	410	8.4	380	20	1,290	882	121	38	240
4	50	10	217	a205	7.6	364	19	1,270	1,180	102	38	230
5	195	6.9	211	5.0	9.7	374	34	280	1,020	88	39	186
6	4.5	4.5	259	5.5	263	369	46	6.6	990	80	39	149
7	98	12	1,000	111	652	368	24	9.0	792	73	38	121
8	213	18	1,310	416	206	240	20	6.0	557	68	36	99
9	5.0	12	1,300	304	5.0	379	23	5.3	109	63	33	83
10	4.8	11	403	344	399	360	30	4.5	6.2	62	33	74
11	88	11	7.2	204	422	239	533	5.7	68	151	38	67
12	*104	10	6.2	3.4	647	357	1,370	25	257	163	40	62
13	5.0	10	58	3.2	442	364	1,330	447	575	134	41	63
14	101	10	204	74	437	178	791	825	584	112	38	56
15	219	12	7.4	225	419	339	790	726	458	94	37	50
16	245	9.4	109	6.5	227	570	782	680	377	83	37	51
17	197	9.7	297	3.4	413	331	761	665	428	72	146	52
18	190	8.1	298	3.8	634	329	775	660	443	64	212	53
19	109	201	247	3.8	629	317	1,330	656	335	109	174	58
20	4.5	437	134	423	391	315	1,340	159	265	151	134	58
21	87	220	229	205	560	319	1,330	11	212	141	109	60
22	242	6.6	a6.2	213	624	248	1,320	17	178	122	109	57
23	224	8.4	6.0	399	222	223	1,320	142	153	104	121	56
24	212	9.5	5.0	205	405	158	863	319	137	97	105	*54
25	12	238	4.8	3.4	398	5.5	775	341	151	91	90	56
26	3.4	437	4.8	3.8	399	6.8	1,310	498	164	78	77	57
27	2.6	424	101	273	393	8.1	1,300	*562	335	69	67	63
28	2.2	413	204	203	382	7.2	275	354	296	63	57	64
29	36	413	5.0	410	516	6.2	5.8	380	235	57	51	62
30	204	207	47	406	-	7.0	5.0	418	196	51	78	56
31	96	-	42	412	-	7.8	-	328	-	*47	87	-
Total	3,856.0	3,559.1	6,744.8	6,111.8	10,733.7	7,778.6	18,555.1	11,604.9	11,925.2	3,006	2,223	2,588
Mean	124	119	218	197	370	251	619	374	398	97.0	71.7	86.3
(†)	-25.1	+184	+10.9	-18.6	-216	-84.5	+292	+70.8	-9.03	-9.89	+3.92	-4.05

Adjusted for change in reservoir contents

Mean	99.3	303	228	179	155	166	910	445	388	87.1	75.6	82.2
Cfsm	0.895	2.73	2.05	1.61	1.40	1.50	8.20	4.01	3.50	0.785	0.681	0.741
In.	1.03	3.04	2.37	1.86	1.50	1.73	9.15	4.62	3.90	0.90	0.79	0.83

	Observed			Adjusted		
Calendar year 1951:	Max 1,360	Min 2.2	Mean 231	Mean 231	Cfsm 2.08	In. 28.23
Water year 1951-52:	Max 1,370	Min 2.2	Mean 242	Mean 259	Cfsm 2.33	In. 31.72

* Discharge measurement made on this day.
† Change in contents, equivalent in cubic feet per second, in Waterbury Reservoir.
a No gage-height record; discharge estimated on basis of recorded range in stage, appearance of sketched gage-height graph, records for station at Waterbury Reservoir, and records of valve operations at reservoir dam.
Note.--Discharge for periods Nov. 9, Dec. 17-21, Dec. 23 to Jan. 3, Jan. 5-8 computed form twice-daily tape-gage readings, records for station at Waterbury Reservoir, and records of valve operations at reservoir dam.

Winooski River near Essex Junction, Vt.

Location.--Lat 44°28'40", long. 73°08'20", on right bank half a mile downstream from Muddy Brook and 2 miles southwest of Essex Junction, Chittenden County.
Drainage area.--1,044 sq mi.
Records available.--October 1928 to September 1952.
Gage.--Water-stage recorder. Altitude of gage is 185 ft (from topographic map).
Average discharge.--24 years, 1,658 cfs (adjusted for storage since October 1938).
Extremes.--Maximum discharge during year, 24,900 cfs June 2 (gage height, 14.16 ft); minimum daily, 81 cfs Aug. 10.

1928-52: Maximum discharge, 45,300 cfs Mar. 19, 1936 (gage height, 23.54 ft), from rating curve extended above 27,000 cfs on basis of computations of flow over dam at gage heights 18.72, 23.54, and 50.4 ft and slope-area determination at gage height 50.4 ft; minimum daily, 70 cfs Sept. 25, 1937.

Maximum discharge known, 113,000 cfs Nov. 4, 1927 (gage height, 50.4 ft, from flood-marks), from rating curve extended above 27,000 cfs by method explained above.

Remarks.--Records excellent except those for periods of ice effect or no gage-height record, which are fair. Flow regulated by powerplants above station, by Peacham Pond and Mollys Falls Reservoir (combined usable capacity, 492,000,000 cu ft), by Waterbury Reservoir since 1937 (see p. 338), and by East Barre and Wrightsville Detention Reservoirs since 1935 (see p. 332).
Revisions (water years).--W 714: 1930(M). W 894: Drainage area.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.2	80	2.5	1,630
.3	101	3.0	2,380
.6	183	4.0	4,320
1.0	350	6.0	9,040
1.5	650	13.0	22,600
2.0	1,060		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	694	786	1,400	2,200	1,550	1,350	2,850	2,400	5,040	808	374	328
2	620	715	1,200	3,000	1,650	920	7,070	2,040	21,500	*714	210	1,030
3	600	2,220	1,400	2,500	1,550	1,200	8,400	2,990	8,050	712	126	1,870
4	691	5,280	1,500	2,000	1,500	1,150	6,770	2,740	5,900	514	226	1,540
5	575	2,760	2,300	1,500	3,100	1,100	7,590	2,200	5,450	635	250	1,030
6	370	1,970	3,400	1,400	3,500	1,050	17,200	1,110	4,590	352	266	583
7	239	*1,810	3,800	1,300	3,100	1,100	10,500	1,600	4,520	546	288	482
8	661	5,180	4,200	1,400	2,500	1,150	7,870	2,160	3,840	450	278	464
9	1,080	3,560	3,700	1,600	1,750	760	7,160	1,730	3,220	532	285	430
10	*820	2,330	2,800	1,550	1,750	1,150	7,940	1,540	2,600	409	81	368
11	638	1,850	1,800	1,400	1,900	1,250	10,500	1,510	2,280	1,170	211	*434
12	625	1,630	1,500	1,200	2,100	1,750	9,060	3,540	3,680	1,300	274	350
13	450	1,390	1,300	1,050	1,700	2,400	7,260	6,160	3,290	530	296	264
14	276	1,170	1,100	1,000	1,600	1,950	7,620	4,590	2,720	640	250	116
15	608	1,830	950	1,200	1,500	1,450	9,620	3,720	2,040	492	266	269
16	602	2,160	880	1,600	1,400	1,650	7,280	3,660	1,720	418	353	263
17	680	2,970	1,100	1,600	1,150	1,500	6,820	3,220	1,420	466	502	311
18	562	2,300	1,250	1,500	1,550	1,400	7,550	2,700	1,730	478	548	353
19	526	1,770	1,270	1,750	1,550	1,520	8,490	2,360	1,630	670	472	413
20	314	1,920	1,300	1,500	1,500	1,460	9,380	1,990	1,320	606	*426	388
21	314	1,720	1,050	1,300	1,400	*1,590	8,530	2,030	1,090	722	308	178
22	536	1,390	1,550	1,100	1,450	2,210	*6,620	3,760	558	640	347	312
23	540	1,310	1,800	1,600	1,400	2,080	*7,360	3,250	926	516	425	338
24	566	1,750	1,500	1,750	1,100	2,380	6,000	2,670	850	497	208	382
25	1,200	1,760	1,250	1,050	1,350	2,240	4,770	*2,230	1,030	496	310	356
26	1,440	1,820	1,150	1,150	1,250	2,420	4,770	4,170	1,180	425	302	400
27	974	1,730	1,300	1,900	1,300	3,480	5,610	4,300	1,260	284	250	425
28	596	1,500	1,400	2,000	1,250	3,230	3,840	3,220	1,580	277	234	254
29	586	1,600	1,200	1,700	1,300	2,890	3,330	2,650	1,170	374	237	285
30	800	1,600	1,100	1,450	-	2,690	2,990	2,420	817	367	318	306
31	698	-	1,400	1,500	-	3,020	-	1,920	-	399	356	-
Total	19,881	61,781	52,850	48,750	49,700	55,490	219,750	86,580	97,001	17,439	9,277	14,522
Mean	641	2,059	1,705	1,573	1,714	1,790	7,325	2,793	3,233	563	299	484
(†)	-43.4	+185	+17.2	-41.5	-236	-101	+404	+52.6	-11.7	-38.8	+5.67	-26.2
Adjusted for change in reservoir contents												
Mean	598	2,244	1,722	1,531	1,478	1,689	7,729	2,845	3,222	524	305	458
Cfsm	0.573	2.15	1.65	1.47	1.42	1.62	7.40	2.73	3.09	0.502	0.292	0.439
In.	0.66	2.40	1.90	1.69	1.53	1.87	8.26	3.14	3.44	0.58	0.34	0.49

	Observed				Adjusted			
Calendar year 1951:	Max 11,500	Min 133	Mean 1,778		Mean 1,779	Cfsm 1.70	In. 23.13	
Water year 1951-52:	Max 21,500	Min 81	Mean 2,003		Mean 2,017	Cfsm 1.93	In. 26.30	

Peak discharge (base, 12,500 cfs).--Apr. 6 (2 p.m.) 19,500 cfs (11.43 ft); June 2 (12:30 to 1 p.m.) 24,900 cfs (14.16 ft).

* Discharge measurement made on this day.

† Change in contents in Peacham Pond, Mollys Falls Reservoir, East Barre and Wrightsville Detention Reservoirs, and Waterbury Reservoir, equivalent in cubic feet per second. Part of records furnished by State of Vermont Water Conservation Board and Green Mountain Power Corp.

Note.--No gage-height record Nov. 28 to Dec. 17, Dec. 28 to Jan. 1, Jan. 22 to Feb. 15; discharge estimated on basis of weather records, recorded range in stage, powerplant records, and records for other stations in Winooski River basin. Stage-discharge relation affected by ice Dec. 18 to Mar. 18 and at times during period of no gage-height record Nov. 28 to Dec. 17.

Lamoille River at Cadys Falls, Vt.

Location (revised).--Lat 44°34'35", long. 72°37'00", on right bank a quarter of a mile downstream from powerplant of Morrisville Electric Light & Power Co. at Cadys Falls, Lamoille County, a third of a mile upstream from Kenfield Brook, and 1¼ miles northwest of Morrisville.

Drainage area.--268 sq mi (revised).

Records available.--September 1913 to September 1923 (discontinued).

Gage.--Water-stage recorder. Altitude of gage is 535 ft (from topographic map).

Average discharge.--10 years, 430 cfs.

Extremes.--1913-23: Maximum discharge, 8,730 cfs Oct. 1, 1920 (gage height, 11.63 ft), from rating curve extended above 4,400 cfs by logarithmic plotting; practically no flow at times during 1919-23 because of regulation; minimum daily, 10 cfs Mar. 4, 1923.
Revisions.--The maximum discharge for the water year 1915 has been revised to 5,140 cfs (estimated) Apr. 11, 1915, superseding figure published in Water-Supply Paper 404.

Remarks.--Some regulation by reservoirs above station.

Revisions.--Revised figures of discharge, in cubic feet per second, for high-water periods in the water year 1915 are given herein. They supersede those published in Water-Supply Papers 404 and 424.

Feb. 25.....	2,500	Apr. 11.....	2,600
26.....	1,800	12.....	3,700

Month	Maximum	Minimum	Mean	Per square mile	Runoff in inches
February.....	2,500	90	346	1.29	1.35
April.....	3,700	198	733	2.74	3.05
Water year 1914-15..	3,700	90	267	.996	13.54

Lamoille River at Johnson, Vt.

Location.--Lat 44°37'20", long. 72°40'50", on right bank at falls 0.7 mile upstream from bridge in Johnson, Lamoille County, and 0.8 mile upstream from Gihon River.

Drainage area.--310 sq mi.

Records available.--July 1910 to December 1913, September 1928 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 495 ft (from topographic map).. Prior to December 1913, chain gage at bridge 0.7 mile downstream at different datum.

Average discharge.--24 years (1928-52), 518 cfs.

Extremes.--Maximum discharge during year, 9.060 cfs June 2 (gage height, 13.83 ft); minimum daily, 150 cfs Oct. 20.

1910-13, 1928-52: Maximum discharge, 13,000 cfs Mar. 18, 1936 (gage height, 16.48 ft), from rating curve extended above 8,500 cfs on basis of computation of peak flow over dam; minimum, 11 cfs Sept. 2, 1935; minimum daily, 16 cfs Oct. 26, 1947.

Revisions.--The figures of maximum discharge for some water years have been revised, as shown in the following table. They supersede those published in the water-supply papers indicated.

Water-Supply Paper	Water year	Date	Gage height (feet)	Discharge (cfs)
Several.....	1911-12	Apr. 8	†16.4	12,200
729.....	1931-32	Apr. 12	11.92	6,770
-	1942-43	May 12	-	‡6,700
-	1943-44	Nov. 9	-	‡6,000

† From graph based on gage readings.
‡ Estimated; not previously determined.

Remarks.--Records good except those for periods of ice effect, doubtful gage-height record, or no gage-height record, which are fair. Flow regulated by powerplant above station.

Revisions (water years).--W 894: Drainage area. W 1114: 1933, 1934(M). Revised figures of discharge for the winter period in the water year 1930, superseding those published in Water-Supply Paper 699, are given herewith:

Discharge, in cubic feet per second, water year October 1929 to September 1930

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	146	170	80	230	175	612	533	777	592	205	204	56
2	168	520	100	250	170	500	1,060	1,060	495	188	180	130
3	252	451	140	400	165	400	883	1,550	388	184	116	164
4	353	343	170	560	165	350	819	1,290	320	128	142	135
5	302	290	185	430	160	320	1,090	861	296	191	169	180
6	245	322	180	420	155	310	1,700	735	250	80	133	132
7	218	272	175	540	155	340	4,730	632	210	182	176	72
8	256	256	155	2,500	150	480	4,930	572	128	210	181	125
9	221	254	155	4,340	150	700	2,200	647	302	188	150	168
10	210	104	160	1,560	150	620	1,340	541	1,480	172	348	174
11	194	171	160	889	150	700	1,240	375	749	166	351	194
12	202	192	145	500	145	760	2,210	286	450	117	263	170
13	102	184	135	510	145	620	2,910	300	342	116	196	170
14	144	430	125	506	145	520	3,140	274	266	262	186	81
15	148	1,150	115	479	145	440	2,090	126	216	402	180	132
16	178	1,080	130	430	145	380	1,290	156	242	278	152	347
17	248	556	155	380	145	350	950	330	265	210	76	540
18	234	560	180	330	145	340	972	299	346	170	139	368
19	180	912	200	300	160	340	1,240	293	861	150	166	250
20	156	608	210	270	290	330	1,160	861	475	94	190	226
21	300	409	195	250	400	320	905	950	840	169	198	118
22	242	329	180	235	900	305	950	533	928	188	182	142
23	222	224	190	225	1,080	290	972	381	572	196	134	174
24	166	148	200	210	1,900	280	735	299	425	134	68	154
25	211	256	200	205	2,420	310	694	618	355	148	108	148
26	226	250	200	200	1,550	700	798	1,730	284	170	160	162
27	165	218	185	190	905	950	714	2,280	241	240	171	158
28	196	160	175	180	735	1,140	714	2,030	258	412	152	74
29	201	160	155	180	-	777	674	1,020	238	489	204	122
30	204	165	230	180	-	612	694	840	211	478	200	160
31	202	-	250	185	-	572	-	777	-	296	66	-
Total	6,492	11,144	5,215	18,064	13,100	15,668	44,337	23,423	13,025	6,613	5,341	5,226
Mean	209	371	168	583	468	505	1,480	756	434	213	172	174
Cfsm	0.674	1.20	0.542	1.88	1.51	1.63	4.77	2.44	1.40	0.687	0.555	0.561
In.	0.78	1.34	0.63	2.17	1.57	1.88	5.32	2.81	1.56	0.79	0.64	0.63

Calendar year 1929: Max 3,770 Min 49 Mean 548 Cfsm 1.77 In. 24.02
Water year 1929-30: Max 4,930 Min 56 Mean 459 Cfsm 1.48 In. 20.12

Note.--Stage-discharge relation affected by ice Nov. 28 to Jan. 8, Jan. 12, 13, Jan. 16 to Feb. 24, Mar. 2-27.

Lamoille River at Johnson, Vt.--Continued

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.8	139	5.0	1,480
2.0	193	8.0	3,280
3.0	546	12.0	6,860

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	287	260	350	370	265	250	700	542	2,440	354	205	224
2	281	280	470	700	300	220	2,200	480	6,500	262	218	d815
3	278	700	472	560	340	290	2,670	429	1,770	*267	208	615
4	271	1,500	433	430	390	225	2,230	315	1,120	180	262	399
5	255	800	700	360	560	220	2,130	480	1,260	181	233	d234
6	236	480	1,200	330	800	215	4,260	464	897	216	217	d190
7	223	460	1,140	350	540	230	3,250	476	d1,410	241	231	d171
8	318	*1,500	1,320	305	410	220	2,640	499	980	221	223	d185
9	344	1,000	826	310	360	210	2,640	472	807	201	204	d178
10	237	645	747	280	320	255	2,950	410	678	230	203	d165
11	*200	499	480	280	300	270	4,020	391	628	439	228	d190
12	180	464	440	*285	330	370	2,330	850	1,220	302	225	*217
13	165	414	330	205	350	500	1,760	1,300	841	213	229	226
14	160	425	240	280	300	450	2,560	1,000	620	d231	233	180
15	190	831	270	270	*320	400	2,840	765	511	d213	215	201
16	220	738	240	430	290	450	1,880	708	438	d209	216	188
17	210	1,140	300	460	270	370	1,920	566	429	d201	d812	226
18	190	699	290	550	300	360	2,200	464	674	d186	*400	218
19	190	546	250	640	270	330	2,350	472	519	d403	215	224
20	150	429	260	500	270	305	2,670	402	425	d368	222	267
21	170	350	320	390	265	330	2,280	636	366	d257	227	241
22	190	329	450	370	255	*455	1,500	1,040	306	274	322	240
23	185	600	570	330	260	670	*1,560	826	331	240	269	236
24	185	738	490	350	240	780	1,300	578	290	240	214	243
25	800	540	360	370	280	740	971	*552	370	253	243	251
26	600	450	320	310	280	620	840	1,300	2,070	225	196	246
27	400	370	340	370	270	860	708	1,200	3,450	207	196	255
28	300	370	310	420	280	910	774	789	1,020	226	189	244
29	250	350	280	370	260	770	804	542	594	210	202	239
30	270	390	290	315	-	670	695	480	504	197	256	213
31	270	-	320	280	-	800	-	424	-	180	212	-
Total	8,205	18,297	14,808	11,770	9,675	13,745	61,632	19,852	33,468	7,627	7,725	7,719
Mean	265	610	478	380	334	443	2,054	640	1,116	246	249	257
Cfsm	0.855	1.97	1.54	1.23	1.08	1.43	6.63	2.06	3.60	0.794	0.803	0.829
In.	0.98	2.20	1.78	1.41	1.16	1.65	7.39	2.38	4.02	0.91	0.93	0.93

Calendar year 1951: Max 5,450 Min 150 Mean 548 Cfsm 1.77 In. 23.99
Water year 1951-52: Max 6,500 Min 150 Mean 586 Cfsm 1.89 In. 25.74

Peak discharge (base, 5,400 cfs).--June 2 (4 to 5 a.m.) 9,060 cfs (13.83 ft); June 26 (11 p.m.) 7,620 cfs (12.67 ft).

* Discharge measurement made on this day.

d Doubtful gage-height record; discharge computed from gage-height graph adjusted where necessary on basis of appearance of recorder chart, weather records, and records for station at East Georgia.

Note.--Stage-discharge relation affected by ice Nov. 25 to Dec. 2, Dec. 11 to Apr. 1. No gage-height record Oct. 11 to Nov. 8, Apr. 2, May 12, 13; discharge estimated on basis of 2 discharge measurements, weather records, and records for station at East Georgia.

Lamoille River at East Georgia, Vt.

Location.--Lat 44°40'45", long. 73°04'20", on right bank, at East Georgia, Franklin County, 0.5 mile upstream from railroad bridge and 1 mile downstream from Beaver Meadow Brook.

Drainage area.--686 sq mi.

Records available.--August 1929 to September 1952. Prior to October 1937 published as "near Milton."

Gage.--Water stage recorder. Altitude of gage is 285 ft (from topographic map). Prior to December 1937, at site 3½ miles downstream at different datum.

Average discharge.--23 years, 1,219 cfs, adjusted to present drainage area.

Extremes.--Maximum discharge during year, 12,900 cfs June 2 (gage height, 10.00 ft); minimum, 107 cfs Oct. 24; minimum daily, 251 cfs Oct. 24.
1929-52: Maximum discharge, 23,200 cfs Mar. 19, 1936 (gage height, 12.52 ft, site and datum then in use), by computation of peak flow over dam; maximum gage height, 15.86 ft Mar. 11, 1946 (ice jam); minimum discharge, 49 cfs July 30, 1933; minimum daily, 91 cfs July 30, 1933.

Remarks.--Records excellent except those below 500 cfs, which are good, and those for periods of ice effect, which are fair. Low flow regulated by powerplants above station.

Revisions.--W 894: Drainage area.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.6	243	5.0	2,000
3.0	395	6.0	3,290
3.5	655	8.0	7,150
4.0	1,010	10.0	12,900

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	448	527	950	1,500	670	640	1,700	1,260	3,130	935	293	369
2	452	562	1,150	1,800	800	610	5,400	1,060	11,200	*748	323	878
3	444	1,670	1,150	1,400	900	570	8,420	928	7,120	590	351	1,910
4	415	4,110	1,080	1,100	950	610	5,410	846	2,740	537	388	1,210
5	390	2,130	1,250	950	1,500	590	5,110	797	2,410	465	385	769
6	401	1,300	2,700	850	1,700	610	8,590	912	2,010	417	358	536
7	356	*1,220	2,590	730	1,300	630	7,920	1,640	2,930	511	318	509
8	441	4,120	2,780	670	1,050	650	5,590	1,990	2,510	500	338	402
9	619	3,160	2,150	660	940	640	5,090	1,450	1,900	493	322	411
10	631	1,790	1,780	660	860	640	5,470	1,110	1,620	485	280	*362
11	*506	1,330	1,300	*640	800	740	6,780	980	1,370	986	356	393
12	433	1,190	1,100	600	760	1,350	5,470	1,740	3,150	956	354	401
13	394	1,030	800	620	720	1,400	3,720	3,260	2,350	572	348	408
14	338	995	620	560	680	1,150	4,480	2,720	1,580	442	354	374
15	335	1,910	670	740	680	940	6,750	2,190	1,160	452	350	346
16	322	2,060	600	1,100	*660	840	4,650	1,930	972	448	332	371
17	340	2,930	720	1,000	610	800	4,000	1,630	875	430	3,210	374
18	350	2,100	700	1,500	670	760	4,350	1,310	1,250	414	1,860	389
19	350	1,470	600	1,500	690	740	4,830	1,130	1,080	621	788	449
20	284	1,180	600	1,200	890	730	5,170	1,040	898	1,030	464	613
21	286	960	800	1,000	680	*760	5,310	1,290	769	734	*454	535
22	296	870	1,200	900	690	1,000	*5,390	2,520	573	625	1,010	470
23	340	1,220	1,400	920	650	1,500	3,430	2,470	595	584	1,110	470
24	251	2,020	1,100	920	670	1,600	3,070	*1,620	590	469	662	490
25	1,860	1,550	900	750	680	1,800	2,250	1,330	1,110	454	494	586
26	1,610	1,150	840	750	720	1,700	1,890	2,480	3,350	397	460	617
27	912	1,020	780	1,100	710	2,200	1,740	3,150	7,990	325	364	643
28	643	1,020	740	1,000	700	2,100	1,640	2,160	3,120	424	362	508
29	512	980	700	870	700	1,900	1,740	1,550	1,550	350	338	490
30	558	1,020	680	760	-	1,600	1,630	1,280	1,060	358	456	436
31	553	-	760	700	-	1,750	-	1,120	-	331	516	-
Total	16,070	48,594	35,190	29,450	23,830	33,550	132,990	50,893	72,962	17,081	17,996	16,719
Mean	518	1,620	1,135	950	822	1,082	4,433	1,642	2,432	551	581	557
Cfsm	0.755	2.36	1.65	1.38	1.20	1.58	6.46	2.39	3.55	0.803	0.847	0.812
In.	0.87	2.63	1.91	1.60	1.29	1.82	7.21	2.76	3.96	0.93	0.98	0.91

Calendar year 1951: Max 9,910 Min 251 Mean 1,207 Cfsm 1.76 In. 23.88
Water year 1951-52: Max 11,200 Min 251 Mean 1,353 Cfsm 1.97 In. 26.87

Peak discharge (base, 10,400 cfs).--June 2 (3 to 7:30 p.m.) 12,900 cfs (10.00 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 20-23, Nov. 26 to Dec. 6, Dec. 11 to to Apr. 2.

Missisquoi River near North Troy, Vt.

Location.--Lat 44°58'20", long. 72°23'15", on right bank 200 ft upstream from Big Falls, 1½ miles downstream from Jay Branch, and 2¼ miles upstream from North Troy, Troy County.

Drainage area.--131 sq mi.

Records available.--August 1931 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 580 ft (from topographic map).

Average discharge.--21 years, 267 cfs.

Extremes.--Maximum discharge during year, 5,060 cfs June 2 (gage height, 10.21 ft); minimum, 13 cfs Aug. 16 (gage height, 0.88 ft); minimum daily, 20 cfs Aug. 10.
1931-52: Maximum discharge, 7,980 cfs May 3, 1940 (gage height, 12.87 ft), from rating curve extended above 3,600 cfs by logarithmic plotting, verified by computation of flow over dam at gage height, 11.70 ft; minimum, 9.4 cfs Aug. 28, 1949 (gage height, 0.74 ft); minimum daily, 11 cfs Aug. 28, 1949.

Remarks.--Records excellent except those for periods of ice effect or no gage-height record, which are fair. Some regulation from small powerplant above station.

Revisions (water years).--W 924: 1940. W 1114: 1933(M), 1936-39.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 7				Nov. 8 to Sept. 30			
1.4	38	3.0	352	1.0	18	3.0	372
1.6	53	4.0	729	1.2	28	4.0	763
2.0	103	5.0	1,170	1.6	58	6.0	1,700
2.5	213			2.0	108	8.0	3,100
				2.5	213		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	54	92	170	220	130	85	410	246	1,580	*98	34	60
2	51	90	420	420	200	80	1,210	203	3,100	86	31	586
3	49	700	299	330	250	80	1,300	179	650	78	22	305
4	47	860	226	220	240	76	1,010	183	399	61	45	178
5	44	400	510	180	350	80	940	203	350	71	38	97
6	42	*206	940	170	320	88	1,730	206	261	72	39	74
7	41	184	703	130	250	82	1,420	542	1,130	54	34	72
8	71	1,070	592	120	200	80	1,150	444	437	49	31	47
9	*117	522	368	125	170	85	1,160	273	336	46	31	*49
10	84	283	289	*130	150	87	1,490	216	226	44	20	50
11	70	235	180	115	130	105	2,090	203	301	131	35	50
12	60	206	170	105	120	280	948	463	691	104	35	49
13	54	167	110	105	110	310	783	611	342	72	34	41
14	50	208	100	105	125	260	1,400	711	213	60	31	38
15	47	616	110	150	125	190	1,630	468	159	49	30	39
16	45	391	98	270	120	165	986	600	134	53	*26	44
17	43	495	110	240	*115	150	1,100	372	202	45	379	55
18	41	305	120	410	110	135	1,350	273	325	42	162	50
19	40	226	110	370	105	135	1,410	226	170	82	76	54
20	39	170	105	300	105	*136	1,960	193	146	116	48	102
21	40	125	150	220	100	160	*1,230	478	113	80	47	76
22	38	125	320	165	100	300	819	577	99	61	194	65
23	38	542	280	180	96	305	1,290	*387	88	61	114	53
24	45	676	190	165	94	290	747	*255	83	53	70	53
25	500	322	150	135	92	310	538	244	730	46	54	81
26	300	205	130	135	90	275	487	707	404	40	45	71
27	170	165	120	200	88	480	471	588	634	37	40	69
28	130	135	110	220	88	500	433	336	226	36	35	62
29	110	175	110	170	87	420	448	252	146	61	149	49
30	100	165	120	130	-	430	350	276	120	47	367	43
31	95	-	160	135	-	470	-	188	-	39	101	-
Total	2,855	10,061	7,570	6,090	4,260	6,629	32,291	11,303	13,795	1,974	2,397	2,662
Mean	85.6	335	244	196	147	214	1,076	365	460	63.7	77.3	88.7
Cfsm	0.653	2.56	1.86	1.50	1.12	1.63	8.21	2.79	3.51	0.486	0.590	0.677
In.	0.75	2.86	2.15	1.73	1.21	1.88	9.17	3.21	3.92	0.56	0.68	0.76

Calendar year 1951: Max 2,930 Min 31 Mean 249 Cfsm 1.90 In. 25.78
Water year 1951-52: Max 3,100 Min 20 Mean 278 Cfsm 2.12 In. 28.88

Peak discharge (base, 3,300 cfs).--June 2 (4 a.m.) 5,060 cfs (10.21 ft).
* Discharge measurement made on this day.
Note.--No gage-height record Oct. 10 to Nov. 5; discharge estimated on basis of weather records, recorded range in stage, and records for station near Richford. Stage-discharge relation affected by ice Nov. 21, 22, Nov. 26 to Dec. 2, Dec. 11 to Mar. 19, Mar. 22 to Apr. 3.

Missisquoi River near Richford, Vt.

Location.--Lat 44°57'30", long. 72°41'55", on left bank 1 2/3 miles upstream from Trout River, 3 miles south of Richford, Franklin County, and 3¾ miles downstream from North Branch.

Drainage area.--479 sq mi.

Records available.--July 1911 to September 1923, October 1928 to September 1952.

Gage.--Water stage recorder. Altitude of gage is 410 ft (from topographic map). Prior to Aug. 1, 1915, chain gage at site a quarter of a mile downstream at datum 4.35 ft lower. Aug. 1, 1915, to Sept. 30, 1923, water-stage recorder at present site and datum. Oct. 1, 1928, to Sept. 30, 1929, chain gage at former site and datum 4.6 ft lower.

Average discharge.--32 years (1911-19, 1928-52), 914 cfs.

Extremes.--Maximum discharge during year, 8,160 cfs June 2 (gage height, 10.87 ft); minimum, 72 cfs Aug. 15, 16.

1911-23, 1928-52: Maximum discharge, 17,200 cfs May 4, 1940 (gage height, 15.15 ft), from rating curve extended above 9,300 cfs on basis of computation of flow over dam at gage height 14.70 ft, slope-area determination at gage height 12.90 ft, and study of discharge per foot of width at measuring section; maximum gage height, 18.92 ft Mar. 15, 1946 (ice jam); minimum discharge observed, 8 cfs July 14, 1911.

Maximum discharge known, 45,000 cfs during flood of November 1927 (gage height, 23.1 ft, from floodmarks), from rating curve extended above 9,300 cfs by method explained above.

Revisions.--The figures of maximum discharge for some years have been revised, as shown in the following table. They supersede those published in the water-supply papers indicated.

Water-Supply Paper	Water year	Date	Gage height (feet)	Discharge (cfs)
354.....	1912-13	Mar. 26	†17.0	12,200
384.....	1913-14	Apr. 20	†16.2	11,000
434.....	1915-16	Apr. 1	-	‡7,600
544.....	1921-22	Apr. 12	12.30	9,700
564.....	1922-23	Apr. 30	††14.38	9,170
684.....	1928-29	Apr. 8	†11.1	7,080
1054.....	1945-46	Mar. 15	-	‡11,000

† From graph based on gage readings.
‡ Estimated; not previously determined.
†† Occurred Apr. 7, backwater from ice.

Remarks.--Records excellent except those below 300 cfs, which are good, and those for periods of ice effect, which are fair. Slight diurnal fluctuation at low flow; regulation greater prior to 1934.

Revisions (water years).--W 784: Drainage area. Revised figures of discharge for winter and high-water periods in the water years 1923, 1929, and 1930, are given herein. They supersede those published in Water-Supply Papers 564, 684, and 699.

Day (water year)	Discharge (cfs)	Day (water year)	Discharge (cfs)	Day (water year)	Discharge (cfs)	Day (water year)	Discharge (cfs)
1922-23		1922-23		1928-29		1929-30	
Apr. 3.....	1,000	Apr. 16.....	1,700	Mar. 20.....	2,500	Mar. 15.....	950
4.....	2,000	17.....	1,500	21.....	3,000	16.....	830
5.....	3,500	18.....	1,400	22.....	4,000	17.....	780
6.....	6,000	19.....	1,400	23.....	5,000	18.....	730
7.....	7,000					19.....	700
8.....	6,000	1928-29		1929-30		20.....	680
9.....	4,500	Mar. 13.....	1,000	Mar. 8.....	1,000	21.....	660
10.....	3,500	14.....	2,500	9.....	1,800	22.....	640
11.....	3,500	15.....	3,500	10.....	1,400	23.....	620
12.....	4,100	16.....	4,000	11.....	1,500	24.....	600
13.....	3,900	17.....	3,000	12.....	1,700	25.....	700
14.....	3,500	18.....	2,500	13.....	1,400	26.....	1,500
15.....	2,000	19.....	2,300	14.....	1,100	27.....	3,000

Note.--Stage-discharge relation affected by ice Apr. 3-19, 1923, Mar. 13-23, 1929.

Month	Cfs-days	Maximum	Minimum	Mean	Per square mile	Runoff in inches
April 1923.....	105,650	7,610	830	3,520	7.35	8.20
Water year 1922-23..	258,248	7,610	50	708	1.48	20.05
March 1929.....	82,120	5,000	262	2,000	4.18	4.82
Water year 1928-29..	383,994	6,560	104	1,050	2.19	29.82
March 1930.....	33,657	3,000	551	1,090	2.28	2.61
Water year 1929-30..	375,726	8,150	48	1,030	2.15	29.16

Missisquoi River near Richford, Vt.--Continued

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.5	65	4.0	670
2.7	111	5.0	1,440
3.0	198	7.0	3,360
3.5	400	11.0	8,350

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	211	346	700	1,000	480	320	1,800	706	2,930	*410	106	192
2	192	332	1,170	1,550	650	310	3,890	594	7,450	337	87	305
3	182	971	1,230	1,300	840	300	4,420	516	5,660	294	124	872
4	173	2,280	890	920	890	290	4,620	495	2,510	275	101	480
5	164	1,470	1,130	700	1,300	300	4,600	550	1,560	286	106	298
6	155	*830	2,200	660	1,250	310	5,730	538	1,200	238	114	195
7	147	785	2,130	560	980	320	5,600	942	2,210	231	87	161
8	158	2,320	1,700	500	740	320	4,780	1,260	1,900	192	94	147
9	*195	2,130	1,310	460	670	330	4,080	851	1,070	176	97	111
10	263	1,160	1,050	460	590	350	4,300	652	837	173	85	*133
11	231	865	730	*450	540	410	5,290	572	1,060	294	87	124
12	201	743	620	420	500	1,050	4,820	743	1,900	315	85	119
13	186	634	450	410	460	1,100	3,320	1,620	1,280	263	101	109
14	164	753	370	400	430	940	3,850	1,860	790	205	83	106
15	155	1,940	400	520	430	780	5,350	1,420	594	182	76	87
16	144	1,680	390	900	410	660	4,520	1,490	485	147	79	114
17	138	1,940	440	910	*390	620	3,670	1,340	593	150	433	130
18	135	1,460	470	1,500	410	580	3,670	935	1,100	141	487	127
19	130	1,000	410	1,550	400	560	3,830	756	718	161	267	246
20	124	795	390	1,250	390	*545	4,260	652	544	189	161	294
21	130	640	430	940	380	640	3,980	1,110	455	228	138	231
22	119	650	1,000	720	370	900	*2,800	1,800	370	186	*405	176
23	119	1,310	1,100	730	370	1,050	2,910	1,500	310	158	395	144
24	127	2,220	800	700	360	1,100	2,610	*1,020	318	167	263	144
25	1,080	1,400	650	590	350	1,100	1,700	830	1,820	144	198	182
26	1,320	890	550	570	340	1,050	1,350	1,440	1,900	130	135	179
27	668	620	480	820	330	1,500	1,200	2,030	2,140	114	114	195
28	470	600	440	800	330	1,550	1,070	1,450	1,180	106	109	155
29	400	700	430	680	330	1,600	995	1,010	658	138	194	141
30	375	680	450	540	-	1,700	900	928	511	152	428	116
31	346	-	540	500	-	1,900	-	769	-	127	365	-
Total	8,602	34,144	25,050	24,010	15,910	24,485	105,915	32,379	46,053	6,309	5,604	6,013
Mean	277	1,138	808	775	549	790	3,530	1,044	1,535	204	181	200
Cfsm	0.578	2.38	1.69	1.62	1.15	1.65	7.37	2.18	3.20	0.426	0.378	0.418
In.	0.67	2.65	1.94	1.86	1.24	1.90	8.22	2.51	3.58	0.49	0.44	0.47

Calendar year 1951: Max 8,200 Min 111 Mean 837 Cfsm 1.75 In. 23.73
Water year 1951-52: Max 7,450 Min 76 Mean 914 Cfsm 1.91 In. 25.97

Peak discharge (base, 7,600 cfs).--June 2 (8 p.m.) 8,160 cfs (10.87 ft).
* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Nov. 21, 22, Nov. 25 to Dec. 4, Dec. 11 to Apr. 1

Lake Memphremagog at Newport, Vt.

Location.--Lat 44°56'10", long. 72°12'15", on east side of bridge on U. S. Highway 5 at Newport, Orleans County.

Records available.--May 1931 to September 1952.

Gage.--Chain gage read once or twice daily. Datum of gage is 673.00 ft above mean sea level, datum of 1929. Prior to July 21, 1934, chain gage on highway bridge 0.1 mile southeast at same datum.

Extremes.--Maximum gage height observed during year, 10.96 ft Apr. 12; minimum observed, 7.42 ft Oct. 24.
1931-52: Maximum gage height observed, 12.92 ft Apr. 20, 1933; minimum observed, 6.69 ft Nov. 4, 1934.

Remarks.--Elevation of lake regulated by powerplant and gates at Magog, Quebec.

Gage height, in feet, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.96	7.56	8.91	9.63		-	9.13	10.20	10.16	9.99	8.87	7.84
2	7.94	7.64	8.95	9.91		-	9.20	10.18	10.83	9.91	8.81	7.97
3	7.93	7.69	8.97	9.70		-	9.38	10.24	10.91	9.81	8.83	8.16
4	7.92	7.75	8.99	9.70		-	9.60	10.24	10.94	9.73	8.87	8.11
5	7.91	7.81	9.01	9.66		-	9.53	10.31	10.85	9.71	8.81	8.08
6	7.90	7.73	9.05	10.03		9.63	9.87	10.20	10.66	9.65	8.77	8.06
7	8.15	7.88	9.11	9.84		9.64	9.89	10.29	10.64	9.63	8.79	8.02
8	8.32	7.98	9.24	9.84		9.64	10.36	10.19	10.46	9.61	8.71	7.88
9	8.50	8.07	9.33	9.85		9.23	10.48	10.09	10.35	9.59	8.67	-
10	8.60	8.13	9.38	9.75		9.13	10.64	9.82	10.28	9.53	8.65	7.80
11	8.74	8.16	9.36	9.66		9.15	10.86	9.88	10.24	9.59	8.56	7.88
12	8.80	8.18	9.34	9.66		9.11	10.96	9.61	10.18	9.57	8.51	7.86
13	8.81	8.23	9.31	9.70		9.06	10.87	9.64	10.08	9.53	8.43	7.82
14	8.73	8.29	9.35	9.66		9.09	10.89	9.67	10.04	9.49	8.37	7.80
15	8.47	8.31	9.35	9.61		9.05	10.92	9.67	9.94	9.41	8.31	7.65
16	8.25	8.33	9.42	9.68		9.05	10.90	9.72	9.94	9.39	8.33	7.70
17	8.05	8.36	9.42	9.71		9.03	10.85	9.77	9.91	9.35	8.39	7.73
18	7.74	8.62	9.44	9.79	9.96	9.01	10.76	9.88	9.93	9.33	8.35	7.71
19	7.65	8.70	9.46	9.90		9.01	10.68	9.85	9.95	9.37	8.27	7.71
20	7.61	8.73	9.49	9.94		9.01	10.72	9.86	9.96	9.31	8.21	7.77
21	7.56	8.76	9.51	9.90		9.03	10.68	9.88	9.91	9.23	8.19	7.75
22	7.52	8.74	9.45	-		8.99	10.66	10.03	9.87	9.31	8.25	7.71
23	7.46	8.76	9.47	-		8.99	10.45	10.09	9.93	9.26	8.21	7.71
24	7.43	8.79	9.50	-		9.09	10.24	10.11	9.95	9.23	8.17	7.65
25	7.52	8.86	9.59	-		9.11	10.20	10.13	10.10	9.21	8.07	7.75
26	7.62	8.88	9.62	-		9.09	10.16	10.16	10.11	9.11	8.05	7.80
27	7.65	8.86	9.61	-		9.11	10.14	10.23	10.13	9.01	8.01	7.74
28	7.72	8.85	9.61	-		9.09	10.08	10.19	10.09	8.94	7.95	7.70
29	7.71	8.86	9.62	-		9.09	10.14	10.16	10.07	8.97	7.90	7.54
30	7.68	8.88	9.63	-		9.09	10.18	10.09	10.01	8.91	7.98	7.52
31	7.52	-	9.65	-		9.09	-	10.03	-	8.89	-	-

Note.--Gage heights for periods Dec. 14-21, 23-25, 28, 29, Jan. 7-21, Mar. 6-8, 15-17 were taken to to top of ice.

Black River at Coventry, Vt.

Location.--Lat 44°52'08", long. 72°16'14", on right bank 15 ft downstream from highway bridge, 800 ft upstream from Stony Brook, and 0.35 mile northwest of Coventry, Orleans County.

Drainage area.--122 sq mi.

Records available.--October 1951 to September 1952.

Gage.--Water-stage recorder. Altitude of gage is 725 ft (from topographic map).

Extremes.--Maximum discharge during year, 2,010 cfs June 1 (gage height, 6.33 ft); minimum daily, 16 cfs Aug. 10.

Remarks.--Records excellent except those for periods of ice effect, which are fair. Flow regulated by mill above station.

Rating table, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.5	16	3.5	317
1.8	30	4.0	475
2.2	61	5.0	885
2.5	103	6.0	1,670
3.0	196		

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	54	64	110	145	100	81	310	176	654	112	39	62
2	42	67	165	210	115	77	650	152	1,430	96	34	433
3	44	182	178	205	145	76	860	143	905	80	19	277
4	42	408	150	170	155	73	800	139	686	74	41	233
5	42	*334	216	140	280	77	859	142	520	68	40	127
6	35	229	372	130	315	79	1,200	140	314	65	36	72
7	19	151	381	125	265	82	1,270	171	522	62	36	54
8	*43	346	419	125	225	82	1,290	175	331	57	39	*59
9	70	337	337	124	185	82	1,250	144	250	54	31	49
10	79	243	261	*113	160	86	1,430	120	186	51	16	42
11	66	160	175	107	140	93	1,620	112	168	80	33	44
12	50	140	140	105	125	150	1,160	160	234	102	35	43
13	43	127	125	94	115	190	905	296	223	75	34	33
14	36	138	105	96	115	175	998	270	156	66	33	29
15	51	330	100	120	110	160	1,050	196	127	59	*32	50
16	40	320	100	250	100	135	873	220	107	49	33	42
17	46	369	110	220	94	126	820	199	107	47	131	43
18	42	292	120	260	98	116	805	156	145	46	162	36
19	37	207	110	300	94	*114	810	136	149	64	80	43
20	34	149	105	245	94	110	*820	121	122	100	51	56
21	17	115	120	195	94	116	795	181	93	84	53	72
22	40	110	150	155	94	155	640	*266	83	60	58	61
23	43	167	165	145	92	190	584	230	85	58	68	52
24	38	262	160	150	90	215	496	167	76	53	53	49
25	78	210	150	135	88	225	384	141	386	48	55	52
26	139	140	135	125	86	230	304	234	314	39	42	65
27	101	120	125	140	84	285	257	294	408	37	42	61
28	65	165	120	170	86	310	225	237	342	51	39	61
29	69	140	120	165	82	285	240	158	264	44	47	60
30	68	120	120	135	-	295	218	146	*149	41	70	45
31	66	-	130	110	-	330	-	122	-	40	50	-
Total	1,639	6,142	5,274	4,909	3,826	4,800	23,923	5,544	9,536	1,961	1,532	2,405
Mean	52.9	205	170	158	132	155	797	179	318	63.3	49.4	80.2
Cfsm	0.434	1.68	1.39	1.30	1.08	1.27	6.53	1.47	2.61	0.519	0.405	0.657
In.	0.50	1.87	1.61	1.50	1.17	1.46	7.29	1.69	2.91	0.60	0.47	0.73

Calendar year 1951: Max - Min - Mean - Cfsm - In. -
Water year 1951-52: Max 1,620 Min 16 Mean 195 Cfsm 1.60 In. 21.80

Peak discharge (base, 1,700 cfs).--Apr. 11 (3 to 4 a.m.) 1,770 cfs (6.11 ft); June 1 (11 p.m.) 2,010 cfs (6.33 ft).

* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 21, 22, Nov. 25 to Dec. 2, Dec. 11 to Jan. 8, Jan. 12 to Mar. 5, Mar. 12-16, Mar. 22 to Apr. 4.

Clyde River at Newport, Vt.

Location.--Lat 44°56'20", long. 72°11'25", on right bank in Newport, Orleans County, just downstream from small tributary entering from north, 1 mile upstream from mouth.

Drainage area.--142 sq mi.

Records available.--May 1909 to September 1924, November 1928 to May 1936, September 1938 to September 1952. Prior to November 1928, published as "at West Derby."

Gage.--Water-stage recorder. Datum of gage is 682.36 ft above mean sea level, datum of 1929. May 25, 1909, to Sept. 20, 1915, staff or chain gage and Sept. 21, 1915, to Sept. 30, 1924, Nov. 16, 1928, to May 4, 1936, water-stage recorder at site 0.65 mile upstream at different datum.

Average discharge.--30 years (1909-19, 1929-35, 1938-52), 246 cfs.

Extremes.--Maximum discharge during year, 1,340 cfs Apr. 23 (gage height, 6.34 ft); minimum daily, 12 cfs Aug. 16, 30, 31, Sept. 1.
1909-24, 1928-36, 1938-52: Maximum discharge, 3,900 cfs Mar. 20, 1936 (gage height, 5.76 ft, site and datum then in use), by computation of flow over dam; minimum daily, 3.0 cfs Oct. 27, 1930; practically no flow at times because of regulation.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Flow regulated by powerplant and reservoirs above station.

Revisions (water years).--W 744: 1913(M), drainage area. W 924: 1940.

Rating tables, water year 1951-52, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 20				Apr. 21 to Sept. 30			
2.3	24	4.0	325	2.1	11	3.5	204
2.6	48	4.5	485	2.3	20	4.0	335
3.0	100	5.0	695	2.6	46	5.0	700
3.5	204	6.0	1,160	3.0	100	6.0	1,160

Discharge, in cubic feet per second, water year October 1951 to September 1952

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	113	102	158	128	186	135	278	644	494	240	43	12
2	134	87	106	210	110	150	354	608	767	230	16	159
3	132	214	135	210	157	165	342	538	826	240	14	149
4	83	187	175	215	243	140	327	483	868	250	85	129
5	74	*271	211	200	249	120	503	480	808	210	82	169
6	66	253	216	155	234	110	778	453	740	200	28	16
7	39	260	226	227	230	125	888	468	716	130	28	144
8	*104	280	197	228	255	140	888	403	680	130	45	140
9	*89	258	189	187	245	170	924	327	654	130	13	*98
10	72	265	229	166	215	102	952	403	607	250	13	*103
11	74	211	287	169	225	168	985	393	559	80	70	107
12	49	233	281	159	230	209	947	438	526	40	46	103
13	36	165	275	144	230	205	898	368	485	35	32	96
14	32	221	223	211	211	188	911	361	442	100	*54	66
15	102	253	145	223	197	144	902	405	399	190	60	138
16	94	286	185	204	181	77	880	398	377	170	12	128
17	114	255	155	222	145	215	888	419	361	140	13	95
18	107	198	115	219	207	213	852	401	345	145	94	108
19	89	220	110	176	192	*184	902	393	355	35	78	106
20	37	260	193	120	174	137	990	376	362	30	146	23
21	27	256	231	213	184	144	*1,070	370	372	94	48	23
22	62	197	164	210	158	155	1,140	331	344	80	35	40
23	67	220	145	185	145	94	1,120	*365	353	105	15	200
24	55	207	190	160	135	213	1,040	373	326	80	95	125
25	68	154	140	130	185	205	975	384	295	70	92	130
26	52	225	229	155	140	207	880	412	258	20	66	70
27	70	213	228	135	160	238	780	417	272	15	104	40
28	112	192	234	150	145	192	754	398	284	75	36	30
29	85	194	188	145	145	162	703	398	170	40	60	158
30	78	158	171	160	-	137	664	372	*215	31	12	171
31	79	-	231	164	-	258	-	363	-	24	12	-
Total	2,395	6,495	5,962	5,580	5,513	5,102	24,515	12,942	14,258	3,609	1,547	3,076
Mean	77.3	216	192	180	190	165	817	417	475	116	49.9	103
Cfsm	0.544	1.52	1.35	1.27	1.34	1.16	5.75	2.94	3.35	0.817	0.351	0.725
In.	0.63	1.70	1.56	1.46	1.44	1.34	6.42	3.39	3.73	0.95	0.41	0.81

Calendar year 1951: Max 1,160 Min 27 Mean 243 Cfsm 1.71 In. 23.25
Water year 1951-52: Max 1,140 Min 12 Mean 249 Cfsm 1.75 In. 23.84

Peak discharge (base, 960 cfs).--Apr. 11 (8 a.m.) 1,160 cfs (5.99 ft); Apr. 23 (7 a.m.) 1,340 cfs (6.34 ft); June 4 (7 a.m.) 980 cfs (5.63 ft).
* Discharge measurement made on this day.
Note.--No gage-height record July 1 to Aug. 14, Aug. 22, Sept. 22-28; discharge estimated on basis of 1 discharge measurement, weather records, recorded range in stage when available, and powerplant records. Stage-discharge relation affected by ice Dec. 15-19, 23-25, Jan. 2-6, 20, 22-30, Feb. 7-13, Feb. 23 to Mar. 7. Discharge in cubic feet per second per square mile and runoff in inches may not represent natural flow because of regulation.

For several years records of the water-surface elevation of many of the lakes in Indiana have been collected by the Geological Survey under cooperative agreements with the Indiana Department of Conservation, Division of Water Resources. These records have not been published but are available in the files of the district office of the Geological Survey in Indianapolis, Ind. In general, the records are based on once-daily readings of a staff gage by a local observer and consist of daily, monthly, and yearly mean water surface elevations as well as graphs showing the fluctuation in elevation. Discharge measurements, made at the outflow, are also available in some instances.

The lakes for which records have been collected are listed in the following table. The established level, sometimes referred to as the legal level, is that elevation set by the courts to which the average level of the lake is to be held; it is normally set at about the average level that has prevailed for a number of years prior to the establishment of the level.

Lakes in Indiana in the St. Lawrence River basin for which records are available

Lake	County	Drainage area (square miles)	Surface area (acres)	Established level*	Records available
Adams Lake near Wolcottville	LaGrange	5.69	267	953.59	1945-52
Attwood Lake near Wolcottville	LaGrange	1.31	156	899.99	1947-52
Bear Lake near Wolflake	Noble	6.12	125	-	1942-52
Big Turkey Lake at Stroh	LaGrange	34.6	424	-	1945-52
Bixler Lake at Kendallville	Noble	3.63	112	964.00	1945-52
Bower Lake near Pleasant Lake	Steuben	87.5	24	-	1945-52
Cedar Lake near Ontario	LaGrange	1.66	108	871.90	1948-51
Cedar Lake near Waterloo	DeKalb	21.8	27	896.76	1943-51
Cree Lake near Kendallville	Noble	4.90	54	945.23	1949-52
Crooked Lake at Crooked Lake	Steuben	11.9	733	988.17	1945-52
DeWart Lake near Leesburg	Kosciusko	7.88	476	867.70	1945-52
Diamond Lake near Wawaka	Noble	2.82	96	-	1945-52
Eagle Lake near Kimmel	Noble	1.77	59	-	1945-48
Fish Lake near Plato	LaGrange	10.8	91	-	1945-51
Fox Lake near Angola	Steuben	1.13	142	1,018.83	1945-52
Hackenburg Lake near Wolcottville	LaGrange	54.8	37	-	1945-52
Hamilton Lake at Hamilton	Steuben	12.8	765	898.83	1943-52
Heaton Lake near Elkhart	Elkhart	8.78	69	767.30	1945-52
Hogback Lake near Angola	Steuben	106	121	-	1945-52
Hunter Lake near Middlebury	Elkhart	0.72	94	856.90	1945-52
Indiana Lake near Bristol	Elkhart	0.53	129	759.73	1945-52
Jimerson Lake at Nevada Mills	Steuben	47.0	346	964.66	1945-52
Knapp Lake near Washington Center	Noble	6.52	77	-	1945-52
Lake Gage at Panama	Steuben	17.2	324	954.25	1945-52
Lake George at Hobart	Lake	124	282	-	1946-52
Lake George at Jamestown	Steuben	12.3	488	985.28	1945-52
Lake James at Lake James	Steuben	43.0	1,030	964.96	1942-49
Lake of the Woods near Helmer	LaGrange	-	-	-	1951-52
Little Otter Lake near Fremont	Steuben	19.8	88	965.18	1945-52
Little Turkey Lake at Elmira	LaGrange	56.0	124	-	1945-52
Long Lake at Moonlight	Steuben	70.8	92	-	1945-52
Lower Long Lake near Albion	Noble	3.96	60	-	1945-52
Oliver Lake near Valentine	LaGrange	11.3	362	899.45	1945-52
Pleasant Lake at Pleasant Lake	Steuben	0.94	50	963.52	1945-52
Pretty Lake near Stroh	LaGrange	2.91	185	965.50	1949-52
Round Lake at Clear Lake	Steuben	7.25	28	1,037.38	1943-52
Sand Lake near Burr Oak	Noble	15.0	44	-	1945-51
Shipshewana Lake near Shipshewana	LaGrange	-	-	-	1951-52
Silver Lake near Angola	Steuben	3.72	233	959.40	1945-52
Simonton Lake near Elkhart	Elkhart	4.37	245	772.19	1945-52
Skinner Lake near Albion	Noble	13.8	122	-	1945-52
Sparta Lake at Kimmel	Noble	0.26	24	-	1945-51
Sylvan Lake at Rome City	Noble	31.5	575	916.20	1942-52
Syracuse Lake at Syracuse	Kosciusko	37.3	367	858.87	1943-52
Wabee Lake near Milford	Kosciusko	13.4	180	829.79	1945-52
Waldron Lake near Cosperville	Noble	131	198	-	1947-52
Wawasee Lake near Wawasee	Kosciusko	37.3	2,620	858.89	1942-52
Witmer Lake near Wolcottville	LaGrange	35.8	215	-	1945-47
Wolf Lake near Goshen	Elkhart	0.88	100	-	1947-52
Wolf Lake at Hammond	Lake	5.72	999	-	1946-48

* Elevation, in feet, above mean sea level.

Measurements of streamflow in the St. Lawrence River basin, made at points other than gaging stations are given in the following table:

Miscellaneous discharge measurements in St. Lawrence River basin during water year October 1951 to September 1952

Streams tributary to Lake Superior

Date	Stream	Tributary to or diverting from--	Locality	Discharge (cfs)
Jan. 29	Iron River.....	Lake Superior.....	NE¼SE¼ sec. 13, T. 51 N., R. 42 W., 1 mile south of Silver City, Mich.	21.4
Mar. 13	....do.....	....do.....	....do.....	32.6
Jan. 29	Mineral River.....	....do.....	NE¼SE¼ sec. 5, T. 50 N., R. 42 W., at State Highway 64 in White Pine, Mich.	3.26
Mar. 13	....do.....	....do.....	....do.....	3.52
Oct. 19	Iron River.....	....do.....	Sec. 13, T. 51 N., R. 27 W., at outlet of Lake Independence near Big Bay, Mich.	107
Apr. 30	....do.....	....do.....	....do.....	240

Streams tributary to Lake Michigan

Oct. 16	Gulliver Lake Outlet.	Lake Michigan.....	SW¼ sec. 2, T. 41 N., R. 14 W., near Gulliver, Mich.	7.53
Jan. 17	....do.....	....do.....	....do.....	5.33
Apr. 24	....do.....	....do.....	....do.....	18.8
June 17	....do.....	....do.....	....do.....	6.07
Oct. 17	North Manistique Lake Outlet.	Manistique Lake....	Sec. 20, T. 45 N., R. 11 W., at bridge on State Highway 98, ¼ mile east of Helmer, Mich.	14.7
Jan. 16	....do.....	....do.....	....do.....	18.3
Apr. 21	....do.....	....do.....	....do.....	43.7
June 18	....do.....	....do.....	....do.....	14.8
Oct. 18	Big Spring.....	Indian Lake.....	S½ sec. 25, T. 42 N., R. 17 W., at Palms Book State Park, near Manistique, Mich.	29.1
Apr. 24	....do.....	....do.....	....do.....	39.4
July 22	....do.....	....do.....	....do.....	32.5
Oct. 9	Lake Lory Outlet...	Escanaba River.....	NW¼ sec. 13, T. 47 N., R. 29 W., near Humboldt, Mich.	3.82
Nov. 29	....do.....	....do.....	....do.....	2.53
Jan. 31	....do.....	....do.....	....do.....	1.02
Feb. 28	....do.....	....do.....	....do.....	.594
Apr. 4	....do.....	....do.....	....do.....	1.61
25	....do.....	....do.....	....do.....	20.9
May 29	....do.....	....do.....	....do.....	2.57
June 30	....do.....	....do.....	....do.....	2.32
July 28	....do.....	....do.....	....do.....	1.49
Aug. 20	....do.....	....do.....	....do.....	1.87
Sept.25	....do.....	....do.....	....do.....	.121
4	Partridge Creek....	Goose Lake.....	SW¼ sec. 5, T. 47 N., R. 26 W., at Negaunee, Mich.	1.78
15	....do.....	....do.....	....do.....	1.56
17	....do.....	....do.....	....do.....	1.34
23	....do.....	....do.....	....do.....	2.01
29	....do.....	....do.....	....do.....	2.18
Oct. 2	Chicagon Creek.....	Paint River.....	Chicagon Lake outlet, SW¼ sec. 24, T. 43 N., R. 34 W., at U. S. Highway 2 near Crystal Falls, Mich.	8.41
Jan. 7	....do.....	....do.....	....do.....	9.31
May 6	....do.....	....do.....	....do.....	9.33
Aug. 5	....do.....	....do.....	....do.....	29.0
Nov. 1	Briar Hill Creek...	....do.....	Fortune Lake outlet, SW¼ sec. 24, T. 43 N., R. 33 W., at New Bristol location, near Crystal Falls, Mich.	16.7
Jan. 7	....do.....	....do.....	....do.....	14.7
May 6	....do.....	....do.....	....do.....	16.8
Aug. 5	....do.....	....do.....	....do.....	26.1
May 13	Paint River.....	Brule River.....	SW¼ sec. 24, T. 42 N., R. 32 W., below Paint River diversion dam, near Crystal Falls, Mich.	20.4
13	....do.....	....do.....	....do.....	7.22
15	....do.....	....do.....	....do.....	99.3
15	....do.....	....do.....	....do.....	101
16	....do.....	....do.....	....do.....	11.2
Apr. 14	Calumet Union drainage ditch.	Little Calumet River.	On Dixie Highway at Markham, Ill.....	58.6
14	....do.....	....do.....	On U. S. Highway 6, near South Holland, Ill.	37.2
Nov. 14	Klinger Lake Outlet	Fawn River.....	SE¼ sec. 35, T. 7 S., R. 11 W., 5 miles east of White Pigeon, Mich.	35.2
Feb. 12	....do.....	....do.....	....do.....	35.2
Mar. 27	....do.....	....do.....	....do.....	33.5
June 12	....do.....	....do.....	....do.....	27.3
Aug. 7	....do.....	....do.....	....do.....	19.3
Mar. 27	Pleasant Lake Outlet.	St. Joseph River...	SW¼ sec. 5, T. 8 S., R. 15 W., at Edwardsburg, Mich.	1.0
27	....do.....	....do.....	NE¼ sec. 5, T. 8 S., R. 15 W., 1 mile northeast of Edwardsburg, Mich.	1.8
27	Garver Lake Outlet.	Garver Lake.....	SE¼ sec. 4, T. 8 S., R. 15 W., at bridge on U. S. Highway 112, 1 mile east of Edwardsburg, Mich.	8.2
27	Garver Lake Outlet.	St. Joseph River...	SE¼ sec. 16, T. 8 S., R. 15 W., 1,000 ft below Garver Lake, 2 miles southeast of Edwardsburg, Mich.	10.0
July 9	Little Cedar Lake Outlet.	Dowagiac Creek.....	NE¼ sec. 32, T. 4 S., R. 13 W., 5½ miles south of Lawton, Mich.	.9

Miscellaneous discharge measurements in St. Lawrence River basin during water year October 1951 to September 1952--Continued

Streams tributary to Lake Michigan--Continued

Date	Stream	Tributary to or diverting from--	Locality	Drainage area (sq mi)	Discharge (cfs)
July 9	Gravel Lake Outlet.	Dowagiac Creek..	SW¼ sec. 32, T. 4 S., R. 13 W., 6 miles south of Lawton, Mich.		3.7
Oct. 19	Brownwood Lake Outlet.	Paw Paw River...	NE¼ sec. 3, T. 3 S., R. 14 W., 1,500 ft below Brownwood Lake and 2 miles northwest of Paw Paw, Mich.		1.0
17	Minges Creek..	Kalamazoo River.	SE¼ sec. 27, T. 2 S., R. 8 W., near Battle Creek, Mich.		5.76
Jan. 25	....do.....	....do.....	....do.....		15.9
Feb. 14	....do.....	....do.....	....do.....		12.5
June 10	....do.....	....do.....	....do.....		8.32
Sept. 5	....do.....	....do.....	....do.....		5.01
Oct. 10	Gun Lake Outlet.	Gun River.....	NW¼ sec. 6, T. 2 N., R. 10 W., near Shelbyville, Mich.		65.3
Jan. 10	....do.....	....do.....	....do.....		58.4
June 5	....do.....	....do.....	....do.....		42.7
Aug. 20	....do.....	....do.....	....do.....		15.7
Nov. 28	Portage River.	Grand River.....	SW¼ sec. 21, T. 1 S., R. 2 E., near Munith, Mich.		21.4
Feb. 25	....do.....	....do.....	....do.....		14.4
June 11	....do.....	....do.....	....do.....		14.5
Aug. 4	....do.....	....do.....	....do.....		1.17
Nov. 28	Trist Branch Portage River.	Portage River...	SW¼ sec. 33, T. 1 S., R. 2 E., near Munith, Mich.		14.7
Feb. 25	....do.....	....do.....	....do.....		14.2
June 11	....do.....	....do.....	....do.....		6.67
Aug. 4	....do.....	....do.....	....do.....		4.17
Nov. 28	Portage Lake Inlet.	....do.....	SE¼ sec. 6, T. 2 S., R. 2 E., near Munith, Mich.		3.18
Feb. 25	....do.....	....do.....	....do.....		3.74
June 11	....do.....	....do.....	....do.....		2.46
Aug. 4	....do.....	....do.....	....do.....		2.44
Oct. 9	Baker Creek...	Maple River.....	On line between secs. 13 and 14, T. 8 N., R. 1 W., at Elsie, Mich.		2.33
Nov. 27	....do.....	....do.....	....do.....		3.16
Dec. 11	....do.....	....do.....	....do.....		5.18
Jan. 29	....do.....	....do.....	....do.....		7.11
Feb. 15	....do.....	....do.....	....do.....		4.45
Mar. 27	....do.....	....do.....	....do.....		12.0
Nov. 29	Jordan Lake Outlet.	Thornapple River	NW¼ sec. 9, T. 4 N., R. 7 W., near Lake Odessa, Mich.		32.3
Feb. 15	....do.....	....do.....	....do.....		35.4
June 2	....do.....	....do.....	....do.....		12.4
Aug. 19	....do.....	....do.....	....do.....		6.06
Apr. 21	Mill Creek....	Grand River.....	NW¼SW¼ sec. 31, T. 8 N., R. 11 W., at Comstock Park, near Grand Rapids, Mich.	19.7	18.0
May 6	....do.....	....do.....	....do.....	19.7	10.9
June 24	....do.....	....do.....	....do.....	19.7	8.86
Sept. 9	....do.....	....do.....	....do.....	19.7	9.27
Apr. 21	Indian Creek..	....do.....	SW¼SE¼ sec. 10, T. 7 N., R. 12 W., at Walker Drive, near Grand Rapids, Mich.	13.7	9.09
May 6	....do.....	....do.....	....do.....	13.0	6.15
June 24	....do.....	....do.....	....do.....	13.0	3.83
Sept. 9	....do.....	....do.....	....do.....	13.0	4.36
Apr. 21	....do.....	....do.....	NE¼NE¼ sec. 14, T. 7 N., R. 12 W., at State Highway 37, at Grand Rapids, Mich.	16.5	12.6
May 6	....do.....	....do.....	....do.....	16.5	9.16
Sept. 9	....do.....	....do.....	....do.....	16.5	6.66
Apr. 21	Plaster Creek.	....do.....	SE¼NE¼ sec. 17, T. 6 N., R. 11 W., at Kalamazoo St., near Grand Rapids, Mich.	43.9	24.2
May 5	....do.....	....do.....	....do.....	43.9	8.67
Sept. 8	....do.....	....do.....	....do.....	43.9	4.02
Apr. 21	....do.....	....do.....	NE¼SE¼ sec. 12, T. 6 N., R. 12 W., at U. S. Highway 131, at Grand Rapids, Mich.	48.0	25.1
May 5	....do.....	....do.....	....do.....	48.0	12.5
June 24	....do.....	....do.....	....do.....	48.0	9.95
Sept. 8	....do.....	....do.....	....do.....	48.0	7.99
Apr. 21	Unnamed stream	Buck Creek.....	NE¼NW¼ sec. 36, T. 6 N., R. 12 W., at Fisher Station, near Grand Rapids, Mich.	6.4	6.76
May 5	....do.....	....do.....	....do.....	6.4	3.64
Sept. 8	....do.....	....do.....	....do.....	6.4	1.34
Apr. 21	Buck Creek....	Grand River.....	SW¼SW¼ sec. 25, T. 6 N., R. 12 W., at Clyde Park Ave., near Grand Rapids, Mich.	40.0	39.2
May 5	....do.....	....do.....	....do.....	40.0	23.4
Sept. 8	....do.....	....do.....	....do.....	40.0	12.5
Apr. 21	....co.....	....do.....	NE¼SE¼ sec. 21, T. 6 N., R. 12 W., at Byron Center Ave., near Grand Rapids, Mich.	44.2	38.7
May 6	....do.....	....do.....	....do.....	44.2	28.9
June 24	....do.....	....do.....	....do.....	44.2	21.9
Sept. 8	....do.....	....do.....	....do.....	44.2	16.6
Apr. 22	Rush Creek....	....do.....	On line between sec. 13, T. 6 N., R. 13 W., and sec. 18, T. 6 N., R. 12 W., at Jenison, Mich.	61.4	52.3

Miscellaneous discharge measurements in St. Lawrence River basin during water year October 1951 to September 1952--Continued

Streams tributary to Lake Michigan--Continued

Date	Stream	Tributary to or diverting from--	Locality	Drainage area (sq mi)	Discharge (cfs)
May 6	Rush Creek.....	Grand River.....	On line between sec. 13, T. 6 N., R. 13 W., and sec. 18, T. 6 N., R. 12 W., at Jenison, Mich.	61.4	31.7
Sept. 8	....do.....	....do.....	....do.....	61.4	23.6
Jan. 16	Black Creek.....	Mona Lake.....	NE¼ sec. 3, T. 9 N., R. 16 W., 2 miles southeast of Muskegon, Mich.		162
Feb. 19	....do.....	....do.....	....do.....		57.2
Jan. 16	Unnamed stream...	Black Creek.....	NW¼ sec. 10, T. 9 N., R. 16 W., 1½ miles southeast of Muskegon, Mich.		6.20
Feb. 19	....do.....	....do.....	....do.....		2.06
Jan. 16	Little Black Creek.	Mona Lake.....	On line between secs. 7 and 8, T. 9 N., R. 16 W., ½ mile south of Muskegon, Mich.		17.3
Feb. 19	....do.....	....do.....	....do.....		11.8
Oct. 25	Backus Creek.....	Houghton Lake....	Sec. 5, T. 22 N., R. 2 W., near Prudenville, Mich.		23.9
Jan. 25	....do.....	....do.....	....do.....		25.6
Apr. 16	....do.....	....do.....	....do.....		105
July 25	....do.....	....do.....	....do.....		36.5
Dec. 6	Hess Lake Outlet.	Muskegon River...	NW¼ sec. 33, T. 12 N., R. 12 W., near Newaygo, Mich.		21.8
Feb. 6	....do.....	....do.....	....do.....		24.3
June 3	....do.....	....do.....	....do.....		13.3
Aug. 15	....do.....	....do.....	....do.....		10.5
Oct. 25	Portage Creek....	Manistee River...	SW¼ sec. 8, T. 26 N., R. 4 W., near Grayling, Mich.		32.8
Jan. 25	....do.....	....do.....	....do.....		33.8
Apr. 6	....do.....	....do.....	....do.....		40.8
July 23	....do.....	....do.....	....do.....		47.1
Oct. 8	Fife Lake Outlet.	....do.....	Fife Lake, Mich.....		5.20
Jan. 30	....do.....	....do.....	....do.....		9.02
Apr. 23	....do.....	....do.....	....do.....		16.1
July 29	....do.....	....do.....	....do.....		6.96
Sept. 29	Beaver Creek.....	Pine River.....	NE¼ sec. 16, T. 19 N., R. 10 W., 2½ miles west of Leroy, Mich.	10.7	3.24
29	Little Beaver Creek.	Beaver Creek.....	NE¼ sec. 18, T. 19 N., R. 10 W., 5 miles west of Leroy, Mich.	3.6	2.53
29	Beaver Creek.....	Pine River.....	SW¼ sec. 7, T. 19 N., R. 10 W., 5 miles west of Leroy, Mich.	19.1	12.6
29	Pine River.....	Manistee River...	NE¼ sec. 24, T. 20 N., R. 12 W., 4½ miles south of Hoxeyville, Mich.	183	130
29	....do.....	....do.....	NW¼ sec. 13, T. 20 N., R. 12 W., 3¼ miles west of Hoxeyville, Mich.	195	138
29	....do.....	....do.....	SE¼ sec. 2, T. 20 N., R. 12 W., 2 miles south of Hoxeyville, Mich.	200	154
Oct. 8	Betsie River.....	Lake Michigan....	Sec. 5, T. 25 N., R. 12 W., near Karlin, Mich.		46.3
Jan. 21	....do.....	....do.....	....do.....		95.0
Apr. 23	....do.....	....do.....	....do.....		149
July 29	....do.....	....do.....	....do.....		66.2
Mar. 21	Boardman River...	Grand Traverse Bay.	Sec. 17, T. 26 N., R. 10 W., near Mayfield, Mich.		302
Oct. 22	Tobeco Creek.....	P-To-Ba-Go Pond..	NW¼ sec. 5, T. 28 N., R. 9 W., near Elk Rapids, Mich.		9.47
Jan. 30	....do.....	....do.....	....do.....		5.27
Apr. 10	....do.....	....do.....	....do.....		10.7
July 29	....do.....	....do.....	....do.....		7.90
Oct. 23	Carp Lake River..	Lake Michigan....	Carp Lake, Mich.....		31.4
Jan. 16	....do.....	....do.....	....do.....		27.6
Apr. 18	....do.....	....do.....	....do.....		117
July 16	....do.....	....do.....	....do.....		6.43

Streams tributary to Lake Huron

Oct. 23	East Branch Maple River.	Maple River.....	Pellston, Mich.....		12.3
Jan. 16	....do.....	....do.....	....do.....		43.5
Apr. 18	....do.....	....do.....	....do.....		150
July 16	....do.....	....do.....	....do.....		19.4
Oct. 18	Rainy River.....	Black River.....	Near Onaway, Mich.....		34.2
Nov. 13	....do.....	....do.....	....do.....		116
Dec. 21	....do.....	....do.....	....do.....		34.6
Jan. 15	....do.....	....do.....	....do.....		56.4
Feb. 20	....do.....	....do.....	....do.....		23.1
Mar. 19	....do.....	....do.....	....do.....		34.7
Apr. 16	....do.....	....do.....	....do.....		437
May 21	....do.....	....do.....	....do.....		35.7
June 17	....do.....	....do.....	....do.....		7.90
July 16	....do.....	....do.....	....do.....		48.0
Aug. 19	....do.....	....do.....	....do.....		9.77
Sept. 17	....do.....	....do.....	....do.....		2.20
Oct. 4	Grand Lake Outlet	Lake Huron.....	Rogers City, Mich.....		22.8
Jan. 8	....do.....	....do.....	....do.....		57.5
Apr. 2	....do.....	....do.....	....do.....		69.9
July 8	....do.....	....do.....	....do.....		14.0
Oct. 4	McCormick Lake Outlet.	Thunder Bay River	Atlanta, Mich.....		24.4

Miscellaneous discharge measurements in St. Lawrence River basin during water year October 1951 to September 1952--Continued

Streams tributary to Lake Huron--Continued

Date	Stream	Tributary to or diverting from--	Locality	Discharge (cfs)
Jan. 28	McCormick Lake Outlet.	Thunder Bay River	Atlanta, Mich.	23.2
Apr. 24	....do.....	....do.....	....do.....	22.6
July 7	....do.....	....do.....	....do.....	16.9
Jan. 28	East Fish Lake Outlet.	Fuller Creek.....	NE¼ sec. 34, T. 29 N., R. 2 E., near Lewiston, Mich.	1.35
Apr. 9	....do.....	....do.....	....do.....	1.60
July 7	....do.....	....do.....	....do.....	1.80
Oct. 24	Fuller Creek..	Hunt Creek.....	S½NE¼ sec. 35, T. 29 N., R. 2 E., near Lewiston, Mich.	11.6
Jan. 28	....do.....	....do.....	....do.....	7.89
Apr. 9	....do.....	....do.....	....do.....	9.75
July 7	....do.....	....do.....	....do.....	7.37
Oct. 24	Hunt Creek....	Thunder Bay River	Sec. 25, T. 29 N., R. 2 E., near Lewiston, Mich.	45.6
Jan. 28	....do.....	....do.....	....do.....	22.4
Apr. 9	....do.....	....do.....	....do.....	32.4
July 7	....do.....	....do.....	....do.....	23.3
Aug. 13	North Branch Thunder Bay River.	....do.....	SE¼ sec. 21, T. 32 N., R. 3 E., 14 miles northeast of Atlanta, Mich.	13.3
15	Middle Branch AuSable River.	Lake Huron.....	Near Grayling, Mich.	59.4
Oct. 25	Lake St. Helen Outlet.	Au Sable River...	St. Helen, Mich.	55.7
Jan. 29	....do.....	....do.....	....do.....	55.6
Apr. 15	....do.....	....do.....	....do.....	125
Oct. 29	South Branch AuSable River	....do.....	Near Luzerne, Mich.	285
Nov. 6	....do.....	....do.....	....do.....	195
Jan. 30	....do.....	....do.....	....do.....	243
Apr. 2	....do.....	....do.....	....do.....	599
24	....do.....	....do.....	....do.....	402
July 24	....do.....	....do.....	....do.....	204
Oct. 29	Big Creek.....	North Branch AuSable River.	Near Lovells, Mich.	98.5
Nov. 7	....do.....	....do.....	....do.....	72.4
Jan. 30	....do.....	....do.....	....do.....	70.9
Apr. 24	....do.....	....do.....	....do.....	148
July 24	....do.....	....do.....	....do.....	250
Oct. 23	East Branch Au Gres River.	Au Gres River....	E½ sec. 8, T. 22 N., R. 6 E., near Whittemore, Mich.	29.2
Jan. 23	....do.....	....do.....	....do.....	54.0
Apr. 24	....do.....	....do.....	....do.....	82.4
July 22	....do.....	....do.....	....do.....	28.4
Oct. 23	Guiley Creek..	East Branch Au Gres River.	W½ sec. 9, T. 22 N., R. 6 E., near Whittemore, Mich.	14.8
Jan. 23	....do.....	....do.....	....do.....	14.3
Apr. 24	....do.....	....do.....	....do.....	33.7
July 22	....do.....	....do.....	....do.....	18.0
June 4	Gamble Creek..	Rifle River.....	SE¼ sec. 35, T. 24 N., R. 3 E., near Lupton, Mich.	12.2
Sept.11	Oyster Creek..	....do.....	S½ sec. 34, T. 24 N., R. 3 E., 2 miles southeast of Lupton, Mich.	2.46
June 2	Bixby Creek...	Houghton Creek...	NW¼ sec. 31, T. 24 N., R. 3 E., near Rose City, Mich.	.84
July 21	....do.....	....do.....	....do.....	2.02
June 2	Sandback Creek	....do.....	Rose City, Mich.	19.3
25	....do.....	....do.....	....do.....	32.2
2	Houghton Creek	Rifle River.....	....do.....	29.5
25	....do.....	....do.....	....do.....	38.1
25	....do.....	....do.....	....do.....	9.69
3	Wilkens Creek.	Houghton Creek...	NE¼ sec. 7, T. 23 N., R. 3 E., near Rose City, Mich.	16.9
3	Prior Creek...	Rifle River.....	NE¼ sec. 19, T. 23 N., R. 3 E., near Rose City, Mich.	5.28
11	Ammond Creek..	Prior Creek.....	NW¼ sec. 32, T. 23 N., R. 3 E., near Selkirk, Mich.	1.00
3	Klacking Creek	Rifle River.....	NE¼ sec. 2, T. 22 N., R. 2 E., near Selkirk, Mich.	13.8
July 23	....do.....	....do.....	....do.....	21.3
June 11	Shepards Creek	....do.....	SE¼ sec. 8, T. 22 N., R. 3 E., near Selkirk, Mich.	.17
July 21	....do.....	....do.....	....do.....	3.38
Apr. 22	Butternut Creek.	Flint River.....	NE¼NW¼ sec. 30, T. 9 N., R. 8 E., at bridge on State Highway 57, 2 miles west of Otisville, Mich.	18.8
May 6	....do.....	....do.....	....do.....	6.30
Apr. 22	....do.....	....do.....	NW¼NW¼ sec. 12, T. 8 N., R. 7 E., 1 mile northeast of Genesee, Mich.	33.1
May 6	....do.....	....do.....	....do.....	14.9
June 25	....do.....	....do.....	....do.....	7.66
Apr. 22	Kearsley Creek	....do.....	NE¼NW¼ sec. 18, T. 7 N., R. 8 E., 2½ miles southwest of Davison, Mich.	84.9
May 6	....do.....	....do.....	....do.....	33.4
Apr. 22	Black Creek...	Kearsley Creek...	NW¼SW¼ sec. 8, T. 7 N., R. 8 E., 2 miles west of Davison, Mich.	16.2
May 6	....do.....	....do.....	....do.....	2.14
Apr. 22	Kearsley Creek	Flint River.....	NW¼SE¼ sec. 2, T. 7 N., R. 7 E., 1½ miles east of Flint, Mich.	109
May 6	....do.....	....do.....	....do.....	36.0

Miscellaneous discharge measurements in St. Lawrence River basin during water year October 1951 to September 1952--Continued

Streams tributary to Lake Huron--Continued

Date	Stream	Tributary to or diverting from--	Locality	Discharge (cfs)
June 25	Kearsley Creek.....	Flint River.....	NW¼SE¼ sec. 2, T. 7 N., R. 7 E., 1½ miles east of Flint, Mich.	3.73
Apr. 21	Swartz Creek.....	....do.....	SE¼SW¼ sec. 11, T. 6 N., R. 6 E., 1½ miles northwest of Rankin, Mich.	114
May 5	....do.....	....do.....	....do.....	28.7
Apr. 21	....do.....	....do.....	SE¼SW¼ sec. 28, T. 7 N., R. 6 E., at bridge on State Highway 121, 1½ miles east of Otterborn, Mich.	126
May 5	....do.....	....do.....	....do.....	27.0
Apr. 21	West Branch Swartz Creek.	Swartz Creek.....	NW¼NW¼ sec. 33, T. 7 N., R. 6 E., at bridge on State Highway 121, 1 mile east of Otterborn, Mich.	26.0
May 5	....do.....	....do.....	....do.....	6.64
Apr. 21	Swartz Creek.....	Flint River.....	NW¼NW¼ sec. 26, T. 7 N., R. 6 E., at bridge on Rablee Road at Flint, Mich.	150
May 6	....do.....	....do.....	....do.....	33.2
June 25	....do.....	....do.....	....do.....	6.67
Apr. 22	Thread Creek.....	Swartz Creek.....	NE¼ sec. 15, T. 6 N., R. 6 E., at east limits of Grand Blanc, Mich.	43.7
May 6	....do.....	....do.....	....do.....	11.6
Apr. 21	....do.....	....do.....	SE¼NE¼ sec. 20, T. 7 N., R. 7 E., at bridge on U. S. Highway 10 at Flint, Mich.	58.8
May 6	....do.....	....do.....	....do.....	15.5
June 25	....do.....	....do.....	....do.....	3.78
Oct. 18	West Branch Chippewa River.	Chippewa River.....	SW¼ sec. 5, T. 15 N., R. 7 W., 2½ miles southwest of Barryton, Mich.	20.6
Nov. 29	....do.....	....do.....	....do.....	43.9
Dec. 14	....do.....	....do.....	....do.....	39.6
Jan. 9	....do.....	....do.....	....do.....	42.8
Feb. 21	....do.....	....do.....	....do.....	45.4
Mar. 27	....do.....	....do.....	....do.....	98.2
Apr. 17	....do.....	....do.....	....do.....	168
May 23	....do.....	....do.....	....do.....	28.6
June 16	....do.....	....do.....	....do.....	8.58
July 17	....do.....	....do.....	....do.....	14.6
Aug. 11	....do.....	....do.....	....do.....	23.2
Oct. 18	Mission Creek.....	....do.....	NE¼ sec. 9, T. 14 N., R. 4 W., at Mt. Pleasant, Mich.	3.77
May 7	Pine River.....	....do.....	On line between secs. 8 and 17, T. 11 N., R. 3 W., 1 mile southwest of Alma, Mich.	153
7	Coles Creek.....	Pine River.....	NW¼SE¼ sec. 5, T. 11 N., R. 3 W., 1 mile west of Alma, Mich.	23.8

Streams tributary to Lake St. Clair

Nov. 20	Loon Lake Outlet...	Clinton River.....	SW¼ sec. 10, T. 3 N., R. 9 E., at Drayton Plains, Mich.	76.2
Feb. 14	....do.....	....do.....	....do.....	96.8
June 5	....do.....	....do.....	....do.....	72.5
Aug. 8	....do.....	....do.....	....do.....	8.54
Nov. 20	Cass Lake Outlet...	....do.....	NE¼ sec. 2, T. 2 N., R. 9 E., at Keego Harbor, Mich.	29.3
Feb. 14	....do.....	....do.....	....do.....	45.8
June 5	....do.....	....do.....	....do.....	30.2
Aug. 8	....do.....	....do.....	....do.....	5.38

Streams tributary to Lake Erie

Feb. 14	Huron River.....	Lake Erie.....	SE¼ sec. 13, T. 3 N., R. 8 E., at Pontiac Lake Outlet, 5 miles north of Commerce, Mich.	39.0
Oct. 4	Union Lake Outlet..	Huron River.....	SE¼ sec. 1, T. 2 N., R. 8 E., 2 miles east of Commerce, Mich.	.90
Nov. 21	....do.....	....do.....	....do.....	3.77
Dec. 7	....do.....	....do.....	....do.....	5.76
Jan. 24	....do.....	....do.....	....do.....	6.69
Feb. 19	....do.....	....do.....	....do.....	6.24
Mar. 26	....do.....	....do.....	....do.....	10.2
Apr. 8	....do.....	....do.....	....do.....	10.3
June 5	....do.....	....do.....	....do.....	.48
Nov. 21	Huron River.....	Lake Erie.....	SE¼ sec. 18, T. 2 N., R. 8 E., at Proud Lake Outlet, 3 miles southwest of Commerce, Mich.	82.1
Feb. 19	....do.....	....do.....	....do.....	110
June 6	....do.....	....do.....	....do.....	74.3
Aug. 8	....do.....	....do.....	....do.....	17.7
Apr. 25	Murray Lake Outlet.	Ore Creek.....	NE¼ sec. 2, T. 1 N., R. 5 E., 2 miles southwest of Brighton, Mich.	6.94
May 9	....do.....	....do.....	....do.....	4.86
June 12	....do.....	....do.....	....do.....	2.37
July 23	....do.....	....do.....	....do.....	2.91
Aug. 19	....do.....	....do.....	....do.....	1.57
Sept.25	....do.....	....do.....	....do.....	1.65
Apr. 14	Horseshoe Lake Outlet.	Huron River.....	NW¼ sec. 8, T. 1 S., R. 6 E., at Whitmore Lake, Mich.	62.3
25	Hay Creek.....	....do.....	SE¼ sec. 6, T. 1 N., R. 5 E., at bridge on Chambers Road, 3½ miles northeast of Pinckney, Mich.	2.92

Miscellaneous discharge measurements in St. Lawrence River basin during water year October 1951 to September 1952--Continued

Streams tributary to Lake Erie--Continued

Date	Stream	Tributary to or diverting from--	Locality	Discharge (cfs)
May 9	Hay Creek.....	Huron River.....	SE¼ sec. 6, T. 1 N., R. 5 E., at bridge on Chambers Road, 3½ miles northeast of Pinckney, Mich.	1.49
June 12	....do.....	....do.....	....do.....	1.16
July 22	....do.....	....do.....	....do.....	.76
Aug. 18	....do.....	....do.....	....do.....	.39
Sept.25	....do.....	....do.....	....do.....	.31
Apr. 15	Arms Creek.....	....do.....	NW¼ sec. 5, T. 1 S., R. 5 E., at bridge on Arms Road, 6 miles north of Dexter, Mich.	60.2
25	....do.....	....do.....	....do.....	22.7
May 14	....do.....	....do.....	....do.....	7.1
Nov. 28	Portage Creek.....	....do.....	NW¼ sec. 34, T. 1 N., R. 3 E., 1 mile northwest of Unadilla, Mich.	30.7
Feb. 25	....do.....	....do.....	....do.....	24.7
June 11	....do.....	....do.....	....do.....	20.0
Aug. 18	....do.....	....do.....	....do.....	6.92
Nov. 15	Huron River.....	Lake Erie.....	On line between sec. 31, T. 4 S., R. 10 E., and sec. 6, T. 5 S., R. 10 E., at bridge on U. S. Highways 24 and 25 at Flatrock, Mich.	1,450
Aug. 5	Cook drain.....	South Branch Raisin River.	On line between secs. 18 and 19, T. 6 S., R. 4 E., 3 miles northeast of Adrian, Mich.	1.14
Sept.23	....do.....	....do.....	....do.....	.86
Oct. 16	Miami and Erie Canal.	Auglaize River....	Delphos, Ohio.....	7.64
Nov. 27	....do.....	....do.....	....do.....	4.53
Jan. 15	....do.....	....do.....	....do.....	8.59
Feb. 27	....do.....	....do.....	....do.....	.68
Apr. 14	....do.....	....do.....	....do.....	3.39
May 27	....do.....	....do.....	....do.....	.90
July 23	....do.....	....do.....	....do.....	14.3
Aug. 25	....do.....	....do.....	....do.....	1.02
Nov. 7	Roller Creek.....	Town Creek.....	At bridge on county highway, 3½ miles upstream from mouth and ¼ mile west of Ohio City, Ohio.	.47
Dec. 12	....do.....	....do.....	....do.....	1.98
Jan. 17	....do.....	....do.....	....do.....	43.6
27	....do.....	....do.....	....do.....	64.7
Feb. 26	....do.....	....do.....	....do.....	.60
Apr. 7	....do.....	....do.....	....do.....	7.40
June 24	....do.....	....do.....	....do.....	.12
Sept.18	Miami and Erie Canal.	Maumee River.....	½ mile below diversion, 4½ miles east of Defiance, Ohio.	57.7
Mar. 12	Hill ditch.....	Tenmile Creek.....	At culvert on U. S. Highway 20, 1 mile west of Richards, Ohio.	19.8
Nov. 7	Havens Creek.....	Sandusky River....	At bridge on State Highway 12, ¾ mile southwest of Havens, Ohio.	.3
Dec. 12	....do.....	....do.....	....do.....	1.58
Jan. 16	....do.....	....do.....	....do.....	4.12
Feb. 26	....do.....	....do.....	....do.....	1.38
Mar. 11	....do.....	....do.....	....do.....	202
11	....do.....	....do.....	....do.....	148
12	....do.....	....do.....	....do.....	32.3
Apr. 7	....do.....	....do.....	....do.....	15.1
Aug. 29	Miller's Blue Hole Spring.	Unnamed creek.....	T. 5 N., R. 17 E., SW¼ sec. 9, at Miller's Blue Hole Spring Outlet, 1¼ miles northwest of Whitmore, Sandusky County, Ohio.	2.97
Mar. 11	Norwalk Creek.....	East Branch Huron River.	Lat 41°14'00", long. 82°32'30", T. 4 N., R. 21 W., 4 miles east of Norwalk, Ohio.	122
Feb. 27	Unnamed stream....	Chippewa Creek....	200 ft above mouth, 1 mile west of Brecksville, Ohio.	.79
27	Chippewa Creek....	Cuyahoga River....	0.3 mile above mouth, 1.9 miles east of Brecksville, Ohio.	3.86
Sept. 3	Chagrin River.....	Lake Erie.....	0.9 mile below Bass Lake, 3.8 miles southwest of Chardon, Ohio.	2.33
Aug. 7	Walnut Creek.....	....do.....	At Weis Library, Pa.....	2.06
7	Mill Creek.....	....do.....	At Erie, Pa.....	1.28

Streams tributary to Niagara River

Oct. 11	Tonawanda Creek...	Niagara River.....	At Millersport, N. Y. Drainage area, 363 sq mi.	39.6

Streams tributary to Lake Ontario*

1952				
Jan. 15	Vandermark Creek..	Genesee River.....	At Scio, N. Y. Drainage area, 22.7 sq mi.	264
Apr. 7	....do.....	....do.....	....do.....	74.3
July 9	Ninemile Creek....	Onondaga Lake.....	At Belle Isle, N. Y. Drainage area, 109 sq mi.	47.5
17	....do.....	....do.....	....do.....	49.7
24	....do.....	....do.....	....do.....	63.8
1951				
July 19	Mud Creek tributary.	Mud Creek.....	Near Bennett Corners, N. Y. Drainage area, 0.85 sq mi.	a65.5

* Includes discharge measurement made in the 1951 water year.
a Flow at crest stage; computed by indirect method.

Miscellaneous discharge measurements in St. Lawrence River basin during water year October 1951 to September 1952--Continued

Streams tributary to Lake Ontario*--Continued

Date	Stream	Tributary to or diverting from--	Locality	Drainage area (sq mi)	Discharge (cfs)
1951					
July 19	Taylor Creek.....	Oneida Creek.....	Near Sherrill, N. Y.....	3.76	a222
19	Ostrander Brook...	Oneida Lake.....	Near Jewell, N. Y.....	1.35	a437
1952					
June 26	Black River.....	Lake Ontario.....	At Greig, N. Y.....	921	1,120
July 15	....do.....	....do.....	....do.....	921	1,050
17	....do.....	....do.....	....do.....	921	874
22	....do.....	....do.....	....do.....	921	1,390
30	....do.....	....do.....	....do.....	921	477
Aug. 5	....do.....	....do.....	....do.....	921	631
12	....do.....	....do.....	....do.....	921	871
Sept.30	....do.....	....do.....	....do.....	921	660
July 15	....do.....	....do.....	At Castorland, N. Y.....	1,626	2,540
17	....do.....	....do.....	....do.....	1,626	1,610
22	....do.....	....do.....	....do.....	1,626	1,940
29	....do.....	....do.....	....do.....	1,626	1,290
Aug. 6	....do.....	....do.....	....do.....	1,626	1,360
12	....do.....	....do.....	....do.....	1,626	1,450
June 25	....do.....	....do.....	At Felts Mills, N. Y.....	1,851	1,790
July 14	....do.....	....do.....	....do.....	1,851	4,610
17	....do.....	....do.....	....do.....	1,851	2,120
22	....do.....	....do.....	....do.....	1,851	2,220
29	....do.....	....do.....	....do.....	1,851	1,350
Aug. 6	....do.....	....do.....	....do.....	1,851	1,270
12	....do.....	....do.....	....do.....	1,851	1,480

* Includes discharge measurement made in the 1951 water year.
a Flow at crest stage; computed by indirect method.

Streams tributary to St. Lawrence River

Aug. 21	Clarendon River...	Otter Creek.....	Between Clarendon Springs and Chippenhook, Vt.		2.63
21	....do.....	....do.....	At West Rutland, Vt.....		4.97
21	....do.....	....do.....	Just above mouth at Center Rutland, Vt.		4.79
22	Ira Brook.....	Clarendon River...	Above Ira, Vt.....		1.20
22	....do.....	....do.....	Below Ira, Vt.....		1.42

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